DIFFERENTIAL OUTCOMES OF TEMPERAMENTAL INHIBITION IN SOCIAL DEVELOPMENT: INTERACTION BETWEEN CHILD TEMPERAMENT AND PARENTING PRACTICES

LUKE YEUNG FELIX

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The Hong Kong Polytechnic University

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The Hong Kong Polytechnic University

Department of Applied Social Sciences

Differential outcomes of temperamental inhibition in social development: Interaction between child temperament and parenting practices

LUKE Yeung Felix

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CERTIFICATE OF ORIGINALITY

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_____ (Signed)

Luke Yeung Felix (Name of Student)

Dedications

This thesis is dedicated to my daughter, Samantha Luke, for inspiring and motivating me to keep learning to be a better father in our daily interactions. This work is also dedicated to my mother, my late father, and my late grandmother, for their parental love and care in raising me from infancy to adulthood.

Abstract

Adaptive functioning in social groups and peer relations is essential to children's development. Conversely, internalizing problems and social withdrawal experienced in childhood are associated with developmental difficulties and possibly later anxiety disorders. Contemporary research has found evidence to show that internalizing problems and social withdrawal are largely related to child temperamental inhibition and overprotective and over-controlling parenting behaviors. Moreover, the two risk factors of temperamental inhibition and maladaptive parenting are likely to co-occur and maintain each other in a transactional manner over time. Meanwhile, intervention at an early age to modify such risk factors has proven to reduce children's negative developmental outcomes in some studies.

The present investigation was undertaken with three inter-related studies based on a sample of 352 children aged 3 to 5 years (199 boys) and their parents and preschool teachers recruited from 10 local kindergartens. Data were collected from these participants at 3 time points over a 12-month period. Study 1 examined the interaction between child temperament and parenting practices in predicting children's social development outcomes concurrently and prospectively. As the literature on the longitudinally transactional nature of these predictive relations is still sparse, Study 2 explored how child temperamental inhibition, child social outcomes and maladaptive parenting practices influence each other reciprocally over time. Moreover, Study 3 conducted a randomized controlled trial to test the efficacy of a selective parenting intervention program adapted from Western studies to help temperamentally inhibited preschool-aged Hong Kong Chinese children alleviate anxious shyness to improve their longer-term social development.

Temperamental inhibition is an important construct and both observational protocols and parent/teacher rating scales have been developed in Western studies for its measurement. These instruments have not yet been validated for use with the Hong Kong Chinese population. The present research therefore developed a brief observational method and adapted two commonly used parent/teacher rating scales for the assessment of Hong Kong Chinese children's levels of temperamental inhibition.

The present investigation hypothesized and confirmed that (H1.1) temperamental inhibition could be measured through the observation of preschool-aged children's inhibition to speak to an unfamiliar conversational partner by demonstrating the adequate validity and reliability of a lab observational method; (H1.2) temperamental inhibition positively predicted preschool-aged children's internalizing problems, social withdrawal, and anxious shyness but not regulated shyness, and negatively predicted their social initiative and academic competence; (H1.3) maternal protective parenting positively predicted children's academic competence; (H1.4) maternal protective parenting moderated the relations between temperamental inhibition and internalizing problems/social withdrawal, replicating findings from Western studies. However, the hypotheses that (H1.5) maternal supportive parenting would positively predict children's academic competence and (H1.6) maternal supportive parenting would moderate the relation between temperamental inhibition and internalizing problems/social withdrawal were not supported.

Moreover, the present research provided preliminary support for the hypothesis that child temperamental inhibition, child social outcomes and parenting practices would influence one and other over time. In particular, using cross-lagged panel

analysis, (H2.1) although only one-directional but not reciprocal effects were detected between child temperamental inhibition and internalizing problems/social withdrawal over time, (H2.2) maladaptive parenting practices, in terms of verbal hostility and lack of autonomy granting, and the negative child social outcomes of internalizing problems and social withdrawal were found to influence one and other in a transaction manner over time.

Last, the present research confirmed the efficacy of the early intervention program by empirically evidencing that (H3.1) temperamentally inhibited children of the participating parents randomly assigned to the intervention group reduced in anxious shyness but not regulated shyness relative to children of parents in the waitlist control group, as rated repeatedly by their teachers after the parents participated in the program. However, (H3.2) the intervention effects on the improvement of children's social initiative with peers and reduction of internalizing problems were not supported.

The present research concluded by discussing the implications of the affirmative findings in the Hong Kong Chinese context. Since predictive effects of maternal protective parenting on both children's academic competence and unfavorable social development outcomes were found, a way of resolving the parenting dilemma was suggested. Meanwhile, the parenting intervention evaluated to be both efficacious and feasible was recommended for wider dissemination in the local community. Lastly, plausible explanations for the unexpected findings were also provided.

Publications arising from the thesis

Part of the work presented in this thesis has been published or presented in the following forums:

PUBLISHED PAPERS

CONFERENCE PRESENTATION

Luke, F., Chan, C. C., & Au, A. (2016, February 22, 2016). *Preliminary findings from a pilot randomized controlled trial of the Cool Little Kids program: Parent training for inhibited Hong Kong Chinese children*. Paper presented at the 2016 Cognitive-Behavioral Psychology (CBP) Conference, Singapore.

OTHER PUBLICATIONS

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Chapter 1

Introduction

The importance of adaptive social functioning in child development

Adaptive functioning in social groups and peer relations is essential to children's development. Conversely, internalizing problems experienced in childhood are likely to bring about subsequent developmental challenges. Research on internalizing problems has grown since the 1980's when clinical psychologists began to identify over-control problems as warranting intervention (Rubin & Coplan, 2004). In recent years, the World Health Organization (WHO) has even projected that internalizing problems will be second to human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) among "diseases" burdening developed and developing countries by 2030 (Mathers & Loncar, 2006, as cited in Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011). Of particular importance, internalizing problems have been found to adversely influence young children's peer relations (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011).

Peer interaction is a major milestone that enables children's development of socially competent behavior (Rubin, Root, & Bowker, 2010). Therefore, such dysfunctional childhood behavior as social withdrawal, driven by or manifested as internalizing problems, presents major risks of failing to develop social skills important in successful interactions to establish peer relationships (Rubin & Coplan, 2004). In addition, social withdrawal has been found to predict the long-term negative consequences of loneliness, depression, social anxiety, negative self-regard, as well as delays in transition to school, poorer expressive language development and academic achievement (Rubin, Coplan, & Bowker, 2009).

Rubin et al. (2009) defined social withdrawal as an umbrella term to describe a particular behavioral profile of solitude caused by fearfulness, wariness and anxiety

as children interact with peers. Constructs conceptualized by other researchers correlated with social withdrawal include *behavioral inhibition* (Kagan, Reznick, Clarke, Snidman, & Garcia-coll, 1984), s*ocial reticence* (Coplan, Rubin, Fox, Calkins, & Stewart, 1994) and *shyness* (Coplan, Prakash, O'Neil, & Armer, 2004). In their developmental framework, Rubin et al. (2009) described inhibition and wariness as conditions during toddlerhood, social reticence at preschool ages, social withdrawal in elementary school years, and internalizing problems during middle childhood and early adolescence.

The combined risk factors of temperamental inhibition and maladaptive parenting

Temperament plays an important role in shaping children's social adjustment and the development of social competence (Rothbart, 2011; Rothbart & Bates, 2006). In particular, behavioral inhibition, a temperament construct extensively studied in the past three decades (Kagan, 2012), is now considered a major risk for children's development of internalizing problems (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011; Klein, Dyson, Kujawa, & Kotov, 2012), social withdrawal (Hane, Cheah, Rubin, & Fox, 2008; Rubin et al., 2009) and later anxiety disorders (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2010; Rosenbaum et al., 1993). Temperamental inhibition has been demonstrated to be moderately stable throughout early childhood in longitudinal studies (Kagan, 2012; Kagan, Snidman, & Arcus, 1998; Rubin, Burgess, & Hastings, 2002).

Besides child temperament, parenting practices have been identified as another major factor affecting children's social development (Ladd, 1999; Rubin et al., 2009). A number of parenting practices have been found to heighten the developmental risks of temperamentally vulnerable children. Researchers have now

recognized that there is no one single parenting style or practice that benefits all children. Rather, the effects of different parenting practices, or combinations of parental warmth and parental control, vary for children with different temperament profiles (Bates, Schermerhorn, & Petersen, 2012).

For temperamentally inhibited children, certain parenting practices that appear to be both negative and positive may adversely influence their social development outcomes. Overcritical or derisive maternal parenting, exhibited with hostility, has been found to contribute to the social withdrawal of inhibited children from toddlerhood to preschool years (Rubin et al., 2002). Meanwhile, overprotective or over-solicitous maternal parenting, despite its affectionate expression, discourages children's autonomy, and has been found to contribute to the continuity of inhibited children's social withdrawal from preschool years to childhood (Degnan, Henderson, Fox, & Rubin, 2008). It should be noted that such inappropriate or maladaptive parenting behaviors correspond to some of the lower-order dimensions defined under the authoritarian and authoritative parenting styles, namely, verbal hostility and (inadequate) autonomy granting (Baumrind, 1971; Robinson, Mandleco, Olsen, & Hart, 1995, 2001).

Even more noteworthy is that the two risk factors of temperamental inhibition and maladaptive parenting are likely to co-occur and maintain each other in a transactional manner over time (Degnan et al., 2008; Kiel & Buss, 2011; Rubin et al., 2002; Sameroff, 2009b). For example, while a shy, inhibited child tends to spontaneously elicit his or her parent's protective behavior, the parent's well-intended protective behavior in turns deprives the child of opportunities to learn how to overcome distress from social novelty. This transactional and cyclical influence between the inhibited child and the protective parent over time would maintain the

stability of the child's temperamental inhibition and the concomitant maladaptive social outcomes (Degnan et al., 2008; Hastings, Nuselovici, Rubin, & Cheah, 2010; Rubin et al., 2002).

Temperamental inhibition and overprotective parenting have now been well established as the most salient risk factors for the development of children's internalizing problems and social withdrawal (Coplan, Arbeau, & Armer, 2008; Hastings, Rubin, & DeRose, 2005). In order to break the vicious cycle of mutual influence between the inhibited child and the protective parent, parenting intervention programs have been developed and implemented to train the parent to be less overprotective by not intervening too early and rewarding child confident behavior in the face of social anxiety (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011; Kennedy, Rapee, & Edwards, 2009; Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005; Rapee, Kennedy, et al., 2010).

Operationalizing temperamental inhibition with young children's social speech

To measure behavioral or temperamental inhibition, researchers have used both observational procedures and parent or teacher rating scales. Both methods have their strengths and limitations as summarized by Bishop, Spence, and McDonald (2003). While parent/teacher rating scales have the advantage of being able to capture useful data based on a relevant informant's daily observations of the child's behavior patterns across different contexts, observational procedures may arguably be a more objective method with well-controlled stimuli to elicit the child's responses for standardized coding to minimize response bias. Both methods continue to be widely used and are sometimes employed simultaneously in the same studies.

Observational procedures to assess temperamental inhibition are typically administered in laboratory settings to expose a child subject to various types of novel stimuli or social situations for the observation and measurement of their inhibited behaviors (Biederman et al., 2001; Bishop et al., 2003; Garcia-Coll, Kagan, & Reznick, 1984; Kagan et al., 1984; Kagan, Reznick, & Gibbons, 1989; Kagan, Reznick, & Snidman, 1987). Most procedures assess some aspects of social speech displayed by the child (Bishop et al., 2003; Kagan et al., 1989; Kennedy et al., 2009; Rapee et al., 2005). This is no accident because it has long been reported by researchers that a typical inhibited behavior observed in young children with temperamental inhibition is inhibited speech (Bishop et al., 2003; Kagan, 1997). Consistently, parent and teacher rating scales developed to measure children's levels of temperamental inhibition also assess their speech inhibition (Bishop et al., 2003). Further, since temperamental inhibition among children at preschool ages or older is mostly manifested in the social domain, features in the non-social domain will become less predictive of an inhibited profile and therefore measuring social signs of inhibition may likely attain adequate content validity (van Brakel & Muris, 2006). Indeed, at least one parent/teacher rating scale designed as a measure of temperamental inhibition taps only children's social speech with unfamiliar adults and peers (van Brakel & Muris, 2006).

Research gaps

Researchers have made substantial progress in studying how child temperament and parenting practices are related to children's social adjustment in recent years (Rothbart, 2011; Rothbart & Bates, 2006). However, there exist noticeable gaps in the literature in the studies of temperament × parenting interactions as predictors of

children's development outcomes, especially with only sparse investigations of cultural differences (Bates et al., 2012).

Theoretically, both overprotective parenting and overcritical parenting as risk factors for temperamentally inhibited children have been encapsulated under the concept of manipulative psychological control (Hastings et al., 2010). How this should be interpreted differently in the Chinese culture is an important research question in and of itself. While Chinese parenting has been seen as generally controlling (Chan, Bowes, & Wyver, 2009), it may not necessarily be viewed negatively by children and adults (Chao, 1994; Tsang, 2012), especially when the parenting goal is not dominion but rather training children to achieve school success (Chao, 2000; Chao & Sue, 1996). In particular, Hong Kong Chinese parents especially mothers are seen as controlling but not harsh in parenting (Shek & Sun, 2013; Tsang, 2012). Thus, the effects of the generally positive, controlling parenting behaviors among Hong Kong Chinese mothers on their children's outcomes in both social and academic development, particularly during the preschool years, need to be clarified.

Empirically, although temperamental inhibition and maladaptive parenting practices have now been well established to operate in a transactional manner, studies based on longitudinal models to evaluate the reciprocal effects between the two factors over time in predicting and maintaining such developmental outcomes as internalizing problems and social withdrawal are still limited (Bates et al., 2012; Williams et al., 2009). Moreover, to the author's knowledge, no longitudinal studies have yet been conducted to investigate these specific transactions in the Chinese culture. More longitudinal studies are required to better fill this gap in the literature and to explore this line of research under-studied in the Chinese culture.

Pragmatically, while efforts have been made in a few Western studies to start developing and testing the efficacy of intervention programs designed to help alleviate temperamentally inhibited children's social anxiety and reduce their developmental risks (Kennedy et al., 2009; Rapee et al., 2005), preventive intervention in early childhood is still in its infancy. Replicating efficacy testing of such programs is warranted, especially with participants from different cultures, to understand and meet the developmental needs of temperamentally vulnerable children. Moreover, to date, no such programs have yet been established, adapted or implemented for Chinese communities notwithstanding the same pressing needs.

Lastly, to measure temperamental inhibition, well-validated instruments based on observational protocols and parent/teacher rating scales are commonplace in Western studies. However, the validity and reliability of such instruments have not undergone rigorous testing to assure acceptable psychometric properties for their use with Chinese participants. Moreover, standardized observational methods are not yet available today for assessing children's temperamental inhibition and protective parenting behaviors among Chinese populations. Meanwhile, although a parent/teacher rating scale has been established to measure children's temperamental inhibition by assessing their social speech (van Brakel & Muris, 2006), to date, there is no observational method for measuring preschool-aged children's temperamental inhibition that is focused solely on observing their inhibition to speak to unfamiliar conversational partners. Nonetheless, such an observational measure is justified as a parsimonious instrument to supplement the equivalent parent/teacher rating scales for measuring children's temperamental inhibition (van Brakel & Muris, 2006).

Four research goals and three interrelated studies

To fill the foregoing research gaps to the extent possible, the present investigation aimed to achieve four research goals. The first goal was to develop and implement observational protocols to assess children's temperamental inhibition and maternal parenting behaviors. In the absence of a well-validated observational protocol for the local population, a brief but effective method was designed and implemented to measure preschool-aged children's temperamental inhibition through lab observations of their social speech to an unfamiliar adult. This observational instrument was also used to test the validity of parent/teacher rating scales adapted from Western studies and used with the participants of the present investigation. Meanwhile, a lab observational method to assess maternal protective and supportive parenting behaviors was also adapted from a Western study for use in the present investigation. The second goal was to test the additive and interactive effects of child temperamental inhibition and maternal parenting behaviors on children's development outcomes of internalizing problems and social withdrawal both concurrently and prospectively, using the instruments developed in the first goal. The findings would be compared with those from Western studies to identify and interpret any cultural differences. The third goal was to investigate the transactional nature of the relationships between child temperamental inhibition, child social development outcomes, and parenting behaviors. Their reciprocal effects on each other would be evaluated longitudinally. The fourth goal was to adapt and implement an early intervention program from Western studies for Hong Kong Chinese families. A randomized controlled trial of the program was conducted to test its efficacy in alleviating preschool-aged children's social anxiety and internalizing problems in the local context.

To achieve these goals, three interrelated studies were conducted by means of multi-source, multi-method measurement tools (Brewer & Hunter, 2006). Using the observational methods to measure children's temperamental inhibition and their mothers' parenting behaviors, together with other parent and teacher rating scales to measure children's development outcomes, Study 1 investigated how child temperamental inhibition and maternal protective and supportive parenting behaviors contribute and interact to predict children's internalizing problems, social withdrawal and academic competence concurrently and prospectively. This study also attempted to interpret the effects of parental overprotection in the light of the Hong Kong Chinese culture. Recent research findings have shown that Hong Kong Chinese parents generally hold high expectations of their children's academic achievements; moreover, Hong Kong Chinese mothers are seen as more involved and demanding than fathers but positive in parental control (Shek & Sun, 2013). Since academic achievement is an obsessed priority in parenting among Hong Kong Chinese parents, academic competence, which has thus far been less studied on its relation with temperamental inhibition in Western research, was included as an outcome measure in the present investigation. With the newly developed observational method, this study also tested the convergent validity of the parent/teacher rating scales adapted from Western studies to measure Hong Kong Chinese children's temperamental inhibition. The triangulated measurement of temperamental inhibition allowed the lab observation and parent/teacher rating methods to complement and contrast with each other and enhanced the confidence in interpreting the study findings.

Using cross-lagged panel analyses, Study 2 investigated how the levels of temperamental inhibition and social development outcomes as rated by both teachers and parents are related to specific authoritative and authoritarian parenting practices

reciprocally and longitudinally over a 12-month period. Data collected at three time points during the period were used to assess any mutual influence between the child and parent variables in contributing to the stability of unfavorable outcomes of social development over time.

Using a randomized controlled trial (RCT) design, Study 3 implemented and evaluated a preventive intervention program adapted from Western studies to specifically address the cyclical nature of daily parent-child interactions that are understood to maintain and exacerbate adverse social development outcomes among temperamentally inhibited children. Through parent training on adaptive parenting skills, the intervention was to help temperamentally inhibited preschool-aged children reduce social anxiety and internalizing problems, assessed repeatedly by their teachers before and after the intervention. The RCT would test the efficacy of the parenting intervention by measuring the program effects on children from an intervention group relative to children from a waitlist control group. This study would also evaluate the implementation feasibility and parental receptivity of the program for the potential of wider dissemination of the intervention in the future.

The three studies were conducted with the participation of Hong Kong Chinese parents, their preschool-aged children, and the children's preschool teachers. Cultural differences were taken into account in the formulation of research hypotheses and the interpretation of study findings.

Chapter 2

Literature Review

An outline of the present review of the literature

Figure 2.1 is a roadmap showing the topics covered by this review of the literature and how the various topics are related, leading to the formulation of the research hypotheses. We began by reviewing the definitions of child temperament with a specific focus on the importance of temperamental inhibition in its relations with children's developmental outcomes. The major approaches to operationalizing temperamental inhibition were also compared for the selection of measurement tools to be adapted and developed in the present investigation. Next, we looked at the effects of parenting on child development. Both global parenting styles and fine-grained parenting dimensions were considered in terms of their impact on children's developmental outcomes. We then could see how the two salient risk factors of temperamental inhibition and maladaptive parenting were encapsulated within the theory of goodness of fit to elucidate their additive and interactive effects on unfavorable child outcomes as well as the reciprocal and cyclical nature of these effects on one another in predicting negative developmental consequences among children. To mitigate these risk factors, researchers and practitioners have developed and implemented early intervention programs. We reviewed the two most well-known programs and chose a selective parenting intervention designed for parents of temperamentally inhibited young children for evaluation in the present investigation. Since the current research was conducted in the Hong Kong Chinese context, the latest research findings on the cultural differences in children's temperamental inhibition and parenting styles and practices were also examined. The synthesis of these various topics positioned us to formulate the research hypotheses to be tested in three inter-related studies.

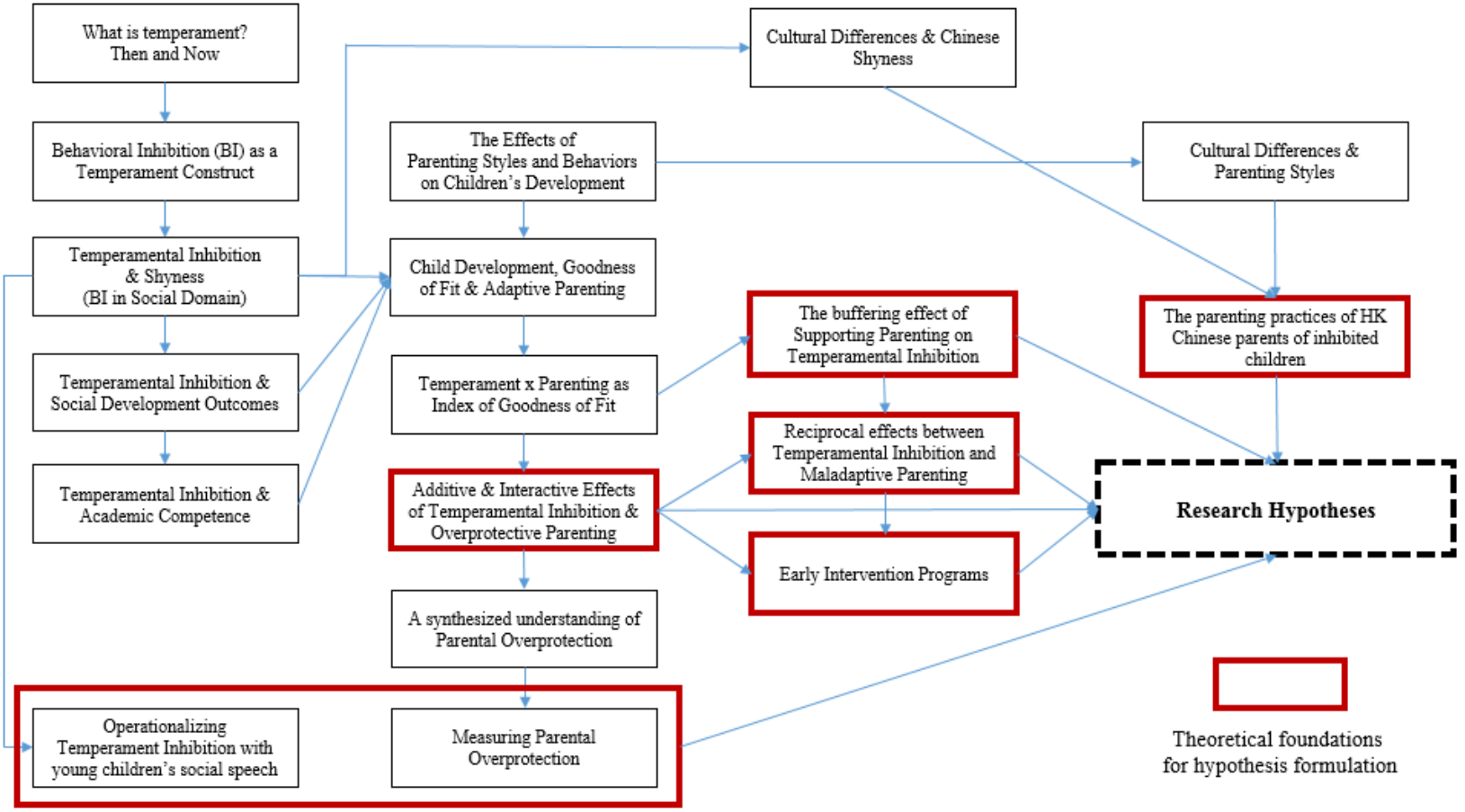

Figure 2.1. A roadmap showing the topics covered in the literature review and their relations to the research hypotheses.

Table 2.1. The four classic models of temperament theories.

	Thomas & Chess	**Goldsmith & Campos**	**Buss & Plomin**	**Rothbart**
What is Temperament?	The style of behavior, that is, the how of behavior versus motivation, the why of behavior, and abilities, the what of behavior.	Individual differences in experiencing and expressing the primary emotions and arousal at the behavioral level.	A set of inherited personality traits that appear early in life that are genetic and not acquired.	Relatively stable, primarily biologically based individual differences in reactivity and self-regulation.
Elements of Temperament	Nine temperament categories: 1. Activity level 2. Rhythmicity of biological reactions 3. Approach to or Withdrawal from new stimuli 4. Adaptability 5. Sensory threshold 6. Quality of Mood 7. Intensity of Mood Expression 8. Distractibility 9. Persistence/Attention Span	Individual differences in expression of primary emotions: • Joy and Pleasure • Anger • Sadness • Fear • Disgust • Interest • Surprise Motor activity level also studied.	Three traits among the more heritable personality traits specified as constituting temperament: 1. Emotionality 2. Activity 3. Sociability	Four major dimensions of temperamental variability, each with a somewhat different developmental time course: 1. Negative reactivity 2. Positive reactivity 3. Behavioral inhibition (to novel or intense stimuli) 4. Capacity through effort to focus and shift attention

What is temperament then and now?

Temperament research was originally initiated by Thomas, Chess and colleagues half a century ago with their well-known New York Longitudinal Study (Thomas, Chess, Birch, Hertzig, & Korn, 1963). Ever since this pioneering effort, the field has evolved with several theories of temperament using different approaches to research. In 1987, a roundtable discussion was convened to debate the different views of four major schools of temperament theories (Goldsmith et al., 1987). These four approaches were proposed by Thomas and Chess (1977), Rothbart (1989), Goldsmith and Campos (1986), and Buss and Plomin (1984), respectively, as summarized in Table 2.1.

Among the four positions, Thomas and Chess's theory was the oldest model. Thomas and Chess conceptualized temperament as *behavioral style* or *how* instead of *what* and *why* an individual behaves in the environment (Thomas et al., 1963). They identified nine temperament categories: Activity Level, Rhythmicity, Approach/Withdrawal, Adaptability, Intensity, Mood, Sensitivity, Distractibility and Persistence. These categories include simple descriptions of behavior such as Activity Level that can be directly observed, as well as complex descriptions such as Adaptability that may change in response to different situations (Seifer, 2000). The Carey Temperament Scales (McDevitt & Carey, 1978) have been widely used as the assessment tools to measure temperament along these nine dimensions.

Goldsmith and Campos (1986) defined temperament as the individual differences in how one experiences and expresses the primary emotions and how the consequential behavior is aroused. Primary emotions include joy and pleasure, fear, anger, sadness, disgust, interest and surprise. As the emotionally aroused behavior is part of temperament, motor activity level is also studied. Temperament is by nature

emotional and expected to be relatively stable. It is therefore assessed by the individual differences in emotional expression. Goldsmith (1996) constructed the Toddler Behavior Assessment Questionnaire (TBAQ) to measure early temperament in children aged 16 to 36 months. The TBAQ instrument measures the temperamental dimensions of Activity Level, Pleasure, Social Fearfulness, Anger Proneness and Interest/Persistence.

Buss and Plomin (1984) defined temperament as a set of personality traits that are inherited and observable in infancy and during the first year of life. In contrast to the general conception of personality traits, temperament traits are genetic and inherited rather than acquired. Three major temperament traits identified in this theory are Emotionality, Activity and Sociability (EAS). Emotionality refers to distress experienced by the infant or young child and expressed as such behaviors as crying, tantrums and reactions to aversive stimuli. Activity refers to the rate, amplitude and duration of bodily movements and speaking. Sociability refers to the child's preference for social interaction with other people or solitude, as manifested by the frequency of social initiation, the amount of time spent with others, the number of affiliations, and responses to social isolation. The 20-item EAS Temperament Survey is the usual questionnaire instrument to measure the three temperament traits as defined with this model (Buss & Plomin, 1984).

Among the four positions, Rothbart's theory is the broadest model. Rothbart et al. (2001) defined temperament as constitutionally-based individual differences in reactivity and self-regulation. These differences are attributed to the biological makeup of the individual and are influenced over time by progressive maturation and later experience with the environment. Reactivity refers to the behavioral and physiological levels of excitability or arousability of the individual, manifested by

expressed negative emotions and overt activity levels. Self-regulation refers to the neural and behavioral processes that provide the capacity to focus and shift attention in order to modulate the individual's reactivity. At the time of the roundtable debate, Rothbart proposed four major temperament dimensions (Goldsmith et al., 1987) including Negative Reactivity (later known as Negative Affectivity), Positive Reactivity (later called Surgency/Extraversion), Behavioral Inhibition (not included in the subsequent revised model), and Capacity through effort to focus and shift attention (later termed Effortful Control).

In her revised model, Rothbart et al. (2001) subsequently defined 15 temperament dimensions and developed the Children's Behavior Questionnaire (CBQ) to measure these characteristics of children at 3 to 7 years with parent report and teacher report ratings. Factor analysis showed that the 15 dimensions clustered into three higher-order factors labeled Surgency/Extraversion (SE; equivalent to Positive Affect), Negative Affectivity (NA) and Effortful Control (EC), respectively. In particular, High Intensity Pleasure, Activity Level, Impulsivity and Shyness load on SE; Discomfort, Fear, Anger/Frustration, Sadness and Soothability load on NA; Inhibitory Control, Attentional Focusing, Low Intensity Pleasure and Perceptual Sensitivity load on EC. Positive Anticipation load doubly on both SE and NA while Smiling/Laughter load doubly on both SE and EC. These latter two traits are excluded when the three higher-order factors are determined from the lower-order dimensions.

From the debate, major points of convergence were that temperament refers to individual differences in behavioral tendencies rather than specific behavioral acts, temperament has its biological underpinnings and thus most directly observable early in life during infancy or first few years of life, and probably most conceptually

important when applied in developmental psychology, temperament is modifiable in its expression but not as much its substrates. Major points of disagreement had to do with what dimensions to include in the broader temperament construct, and the boundaries between temperament and personality, although it is generally agreed that the former refers to innate individual differences and the latter refers to such differences shaped by later life experiences (Tackett, 2006).

A caveat was stated by the convener of the roundtable discussion that there were other approaches to temperament studies not included, most notably the construct of "behavioral inhibition (BI) to the unfamiliar" proposed by Kagan et al. (1984), which was somewhat encompassed at the time under Rothbart's model (Goldsmith et al., 1987). The commentator, Robert McCall, offered a synthesized definition of temperament at the conclusion of the discussion as follows (Goldsmith et al., 1987):

> Temperament consists of relatively consistent, basic dispositions inherent in the person that underlie and modulate the expression of activity, reactivity, emotionality, and sociability. Major elements of temperament are present early in life, and those elements are likely to be strongly influenced by biological factors. As development proceeds, the expression of temperament increasingly become more influenced by experience and context. (p.524)

This definition emphasized the biological basis and thus early manifestation of temperament traits, and the complex interaction and influence between context and the expression of temperament (and not temperament itself).

Since then, temperament research has made significant progress based on these different traditions. The next generation of researchers from the four schools of

thought convened again after 25 years to revisit the nature of temperament and assess the state of affairs in the field. The dialogues produced a revised definition of temperament as follows (Shiner et al., 2012):

> Temperament traits are early emerging basic dispositions in the domains of activity, affectivity, attention, and self-regulation, and these dispositions are the product of complex interactions among genetic, biological, and environmental factors across time. (p. 437)

A few points are worth noting from this alternative definition and the related discussions. First, the cognitive aspects of attention and executive control were explicitly added to the definition of temperament, thanks to Rothbart's advocate of the inclusion of regulatory traits in her model of temperament (Rothbart, 2011). Second, the complex interactions between temperament and environment were re-emphasized, possibly due to the large amount of research on the interaction and mutual influence between temperament and environment in the past two decades, especially on how temperament and parenting interact to shape children's developmental outcomes over time (Rothbart & Bates, 2006). Third, the boundary between temperament and personality was further elucidated with more empirical evidence supporting the convergence of the Big Five personality traits and basic temperamental factors (Grist & McCord, 2010; Shiner & Caspi, 2012). Fourth, temperament was mentioned again as a potentially useful screening tool to identify children at risk for adverse developmental outcomes as well as a follow-up measure to assess improvement (Klein et al., 2012; Lengua & Wachs, 2012). Last, temperament-based intervention was underscored as a means to improve the

goodness of fit between children's temperament and their environment to help temperamentally vulnerable children through parent or teacher training to develop resilient and self-regulatory capacity and minimize negative developmental outcomes (McClowry & Collins, 2012; McClowry, Rodriguez, & Koslowitz, 2008).

Behavioral inhibition as a temperament construct

Although Behavioral Inhibition as a temperament construct was omitted in the original roundtable discussion in 1987 (Goldsmith et al., 1987) and not mentioned in the paper on the revisited definition published a quarter-century afterwards (Shiner et al., 2012), it was identified as one of the five models of child temperament and compared and discussed with the other four traditions in a major chapter of the recently published Handbook of Temperament (Mervielde & De Pauw, 2012). Behavioral Inhibition (BI) has been extensively studied for the past three to four decades by Kagan and other researchers (Kagan, 1997; Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984; Kagan, Reznick, & Gibbons, 1989; Kagan, Reznick, & Snidman, 1987; Manassis, Hudson, Webb, & Albano, 2004; Muris & Dietvorst, 2006). BI is a behavioral profile referring to the individual differences in infants, toddlers and young children in their tendency to exhibit fearfulness, restraint and withdrawal in the face of novelty. These inhibited behaviors manifest when the individual encounters such new and novel objects, events and situations as unfamiliar rooms, toys, peers and adults, reflecting a low threshold of reactivity in the amygdala (Kagan, 1997). Kagan (2012) emphasized that BI was measured by direct behavioral observation and therefore should be defined and understood as such based on this source of evidence. The definition of BI therefore did not explicitly cover the underlying biological mechanisms but there was an implicit assumption

that since almost all unexpected events trigger the amygdala, BI observed in infants and toddlers reflects the excitability of the amygdala; moreover, repeating stressful conditions due to novelty would further cause the bed nucleus of the stria terminalis to produce a chronic state of anticipatory anxiety leading to avoidant behavior (Kagan, 2012; Kagan & Fox, 2006). These inferences about the relations between BI and the amygdala and its projections are supported by neuroimaging studies (Schwartz, Wright, Shin, Kagan, & Rauch, 2003; Schwartz, Wright, Shin, Kagan, Whalen, et al., 2003; Straube, Mentzel, & Miltner, 2007).

The BI profile had been proven to have modest stability over the first 5 years of life (Kagan, 2012). Studies have shown that children with high levels of BI are more likely to develop anxiety disorders in later childhood and adolescence (Biederman et al., 2001), in particular, social phobia (Muris, Rassin, Franken, & Leemreis, 2007). High BI in toddlerhood has also been shown to maintain high levels of internalizing problems across childhood and adolescence (Williams et al., 2009). It has been estimated that 15- 20% of American Caucasian children possess a BI profile (Rosenbaum et al., 1993).

The definition of BI may seem to represent children's general fearfulness due to novelty. However, as Bishop et al. (2003) pointed out, the degree of BI may vary across different contexts. Instead of being regarded as a unitary construct, BI is therefore considered a temperament construct with specificity of behavior in different settings. A child may be inhibited in unfamiliar situations or social interactions with unfamiliar people but may learn to control inhibition in some contexts but not others (Kagan, Snidman, & Arcus, 1998). Furthermore, Rubin et al. (2002) reasoned that different types of inhibition in children might predict different outcomes later in life. In particular, their study differentiated inhibition with peers

from the traditional inhibition with unfamiliar adults and novel objects, and produced evidence to show that 2-year-old toddlers' peer inhibition, moderated by maternal behavior, was a stronger predictor of withdrawn and reticent behaviors at age 4 than traditional inhibition.

To measure BI, observational procedures are typically administered in laboratory settings in which a child subject is exposed to different episodes presenting various types of novel stimuli or social situations (Biederman et al., 2001; Bishop, Spence, & McDonald, 2003; Kagan et al., 1984, 1989; Garcia-Coll, Kagan, & Reznick, 1984). More recently, parent and teacher rating scales have also been developed to measure children's levels of BI (Bishop et al., 2003; van Brakel & Muris, 2006).

Temperamental inhibition and shyness

Both the conceptual and operational definitions of Behavioral Inhibition comprise children's behaviors in social and non-social domains (Bishop et al., 2003; Garcia-Coll et al., 1984; Kagan, 1997). Although on different occasions, Kagan had referred to BI as equivalent to shyness (Kagan, 2012; Schmidt & Buss, 2010), it is inhibition in the social domain, or social inhibition, that has been conceptualized as similar to the notion of shyness but not inhibition to novel objects or unfamiliar environments in the non-social domain.

Shyness was used by Coplan, Prakash, O'Neil, & Armer (2004) to refer to wariness and anxiety when an individual experiences social novelty and perceived social-evaluation, characterized by an approach-avoidance conflict in such situations. This definition of shyness is equivalent to Asendorpf's (1993) notion of social inhibition, although the latter construct explicitly includes also inhibition toward strangers.

Based on Gray's (1982) concept of behavioral inhibition system as aroused by three different classes of inhibitory cues, namely, novelty, conditioned cues for punishment and conditioned cues for frustrating non-reward, Asendorpf (1993) defined social inhibition as inhibition toward stranger or social-evaluative inhibition due to the anticipation of negative evaluation or insufficiently positive evaluation. Social inhibition refers to an emotional state that is characterized by an inhibited approach motivation. The individual has an approach tendency but is inhibited to do so, thus resulting in social avoidance. However, this avoidance is passive avoidance (e.g., a child stops playing when a stranger appears, freezes and looks at the stranger for a long time) and not active avoidance (e.g., the child moves to mother when a stranger appears). The approach component distinguishes social inhibition from being unsociable. Therefore, social inhibition is conceived of as an emotional reaction to three classes of social situations: being confronted with strangers, anticipating from others a negative evaluation, or anticipating from others an insufficiently positive evaluation that is highly valued. In essence, Asendorpf integrated Gray's theory of behavioral inhibition system and behavioral activation system with Kagan's concept of behavioral inhibition in the social domain. Social inhibition, according to Asendorpf (1993), may be observed in children with a temperamentally inhibited disposition beginning at the end of the second year.

In the literature, a generalized term that encompasses the notions of behavioral inhibition and shyness is Temperamental Inhibition (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011). In the present thesis, *Temperamental Inhibition* is adopted to refer to social inhibition observable in children during preschool years and expressed as shy or socially withdrawn behaviors, signifying a BI profile.

Operationalizing temperamental inhibition with young children's social speech

Researchers have used both observational procedures and parent or teacher rating scales to measure temperamental inhibition. Temperament researchers acknowledged the relative strengths and limitations of both methods (Bishop et al., 2003; Rothbart & Bates, 2006). While parent or teacher rating scales are able to capture more comprehensive data about children based on the informant's daily observations of the child's behavioral patterns across different contexts, observational procedures are considered by some researchers as more objective because well-controlled stimuli are used to elicit the child's responses for standardized coding to attenuate response bias (Kagan & Fox, 2006). Both methods continue to be widely used and often employed simultaneously in the same studies.

Observational procedures to assess temperamental inhibition are typically administered in laboratory settings. A child subject is exposed to different novel stimuli or social situations for the observational measurement of the level of inhibition displayed in their behaviors (Biederman et al., 2001; Bishop et al., 2003; Garcia-Coll, Kagan, & Reznick, 1984; Kagan, Reznick, Clarke, Snidman, & Garcia-coll, 1984; Kagan, Reznick, & Gibbons, 1989). Such procedures capture a variety of children's responses to stimuli in different episodes such as a moving robot, a ladder mounted on wall, a large mask of a dog's face, a long cloth tunnel, a stranger unexpectedly appearing in the room to start talking to the child, an alarm clock gone off suddenly, another unfamiliar child in a peer play session. The recorded behaviors are coded afterwards by two or multiple raters, preferably blind to the study hypotheses, when the videotape is viewed to measure a number of behavioral variables, such as latency to touch a first toy, percentage of time within arm's reach

of the parent, total time the child is not in social interaction with another child, latency to the first vocalization, amount of talking.

It is noteworthy that observational procedures for the measurement of temperamental inhibition almost always assess some aspects of social speech exhibited by the child (Bishop et al., 2003; Kagan et al., 1989; Kennedy et al., 2009; Rapee et al., 2005). This is no surprise because researchers have repeatedly reported that a typical inhibited behavior observed in young children with temperamental inhibition is inhibited speech. Kagan (1997) pointed out that when children high on behavioral inhibition reach 4 to 5 years old, restraint on speech is a common behavioral manifestation in novel situations. Bishop et al. (2003) also found that children aged 3 to 5 years who were high on behavioral inhibition took significantly longer to initiate verbal contact with the stranger in their experiment, spoke for shorter durations with the stranger and required more prompting to elicit speech. Meanwhile, some researchers have even noted that temperamental inhibition has similar characteristics to those of selective mutism, a childhood disorder suffered by some children who consistently fail to speak to unfamiliar people in social situations (Cohan, Price, & Stein, 2006).

Consistently, parent and teacher rating scales developed to measure children's levels of temperamental inhibition also assess their speech inhibition. For example, Bishop et al. (2003) developed the Behavioral Inhibition Questionnaire (BIQ) for measuring inhibition in children aged 3 to 5 years across multiple contexts. The BIQ contains items measuring a child's social speech particularly with adults. Meanwhile, van Brakel and Muris (2006) developed the Behavioral Inhibition Scale (BIS) and used it with children at 7 to 12 years old. All BIS items test a child's levels of inhibition in social speech with both adults and peers.

In the absence of an observational measure for the local participants, consequently, the present investigation introduced an observational method designed to assess Hong Kong Chinese children's temperamental inhibition. Based on the foregoing review, an effective measure with adequate construct validity could focus on observing children's inhibition to speak to an unfamiliar person in terms of the amount of verbal communication, the volume at which sounds are made and words and sentences are verbalized, and latency in making verbal responses to questions or prompts for communication from the unfamiliar conversational partner. This observational protocol is detailed in the next chapter on Method.

Temperamental inhibition and social development outcomes

Adaptive functioning in social groups is essential to children's development. Since the 1970's, researchers have conducted studies on the significant impact of social competence and peer relations on development in both basic and applied research (Ladd, 1999). Social competence may be generally defined as children's social skills that contribute to positive relationship outcomes with peers due to active participation and prosocial behavior in social settings. Conversely, social incompetence refers to the absence of these skills or social deficits that lead to negative relationship outcomes caused by social withdrawal and aggressive behavior in peer interactions (Ladd, 2005).

In their study on children's social competence in cultural context, Chen and French (2008) categorized the notions of social competence into two major dimensions. Social initiative refers to children's behavior to initiate and sustain positive peer interactions. Behavioral control refers to the self-regulatory abilities that inhibit the use of negative behaviors and maintain social appropriateness. Its

flip side, social incompetence, may therefore be conceptualized as the opposites of these two dimensions, namely, social isolation and social withdrawal on the one hand, and behavioral excesses (e.g., hyperactivity) and lack of prosocial behavior on the other. Although these authors have not made such an association, these constructs may be equivalently linked to the psychopathological view of children's internalizing and externalizing problems.

Internalizing and externalizing problems are common difficulties in early childhood. Internalizing problems take the form of anxiety, depression, low self-esteem, and loneliness, whereas externalizing problems manifest as aggression, hyperactivity, and defiance (Bowen, Vitaro, Kerr, & Pelletier, 1995; Gilliom & Shaw, 2004). While research on externalizing problems has been well-established since the 1980's, equivalent research on internalizing problems has only been more extensively conducted recently (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011). As researchers demonstrated that the behavioral manifestations of internalizing problems could be equally salient to caregivers, clinical psychologists in the 1980's began to identify over-control difficulties as warranting intervention (Rubin & Coplan, 2004). Internalizing problems have now been found to affect children's peer relations and school engagement as well as later anxiety disorders (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, Clifford, et al., 2011; Rapee et al., 2005; Rapee, Kennedy, et al., 2010).

Peer interaction is a major milestone for children's development of socially competent behavior (Rubin et al., 2010). Meanwhile, social withdrawal and internalizing problems are likely to heighten the risks of failing to develop social skills important in successful peer relationships (Rubin & Coplan, 2004). Moreover, social withdrawal has been found to predict loneliness, depression, anxiety disorders

(particularly social phobia), negative self-regard, as well as difficulties in transition to school, poorer expressive language development and academic achievement among at-risk children (Rubin et al., 2009).

Social withdrawal is an umbrella term defined by Rubin et al. (2009) to describe a specific behavioral profile of solitude due to such underlying causes as fearfulness, wariness and anxiety as children interact with peers. A related concept called social reticence was defined by Coplan et al. (1994) to represent a behavioral construct comprising the watching of others from a distance, remaining unoccupied in social company, and hovering near but not engaging others in interaction. This construct reflects internalized feelings of social anxiety and an approach-avoidance conflict.

Rubin et al. (2009) proposed a transactional model for social withdrawal that encompasses the various related constructs, internalizing symptoms and disorders (e.g., loneliness, social anxiety, negative self-concept, depression mood, social anxiety and phobia), as well as parenting practices (e.g., over-solicitous, overprotective, intrusive, controlling parenting behaviors) and peer relationship problems (e.g., bullied and rejected by peers, poor-quality friendships). Inhibition and wariness are described as conditions during toddlerhood, social reticence at preschool ages, social withdrawal during elementary school years, internalizing problems and disorders during middle childhood and early adolescence. The model represents a hypothesized developmental framework within which pathways to and from social withdrawal are described for validation.

Central in this model of social development is the construct of temperamental inhibition due to its relations with social reticence and social withdrawal, internalizing problems and anxiety disorders, as well as parenting behaviors, as will be evident in the review of numerous studies to follow.

Temperamental inhibition and academic competence

In addition to children's social development, parents and teachers are also concerned with children's academic development especially after the preschool years. Are temperamentally inhibited children at a disadvantage when compared with other children in academic competence?

Evans (2010) conducted a comprehensive review on the relation between shyness-inhibition and academic performance among children and adolescents. Based on a review of twenty-six studies, a negative and modest association was generally found between shyness-inhibition and academic abilities. Nine studies from the review were conducted with preschool-aged children and all but one study reported a negative correlation between shyness and standardized tests or academic grades. The exceptional study was conducted with fifty-five Hong Kong Chinese preschoolers and found a small and positive correlation (r = .16) between shyness and Chinese word reading ability (Ting, 2008).

In general, as Evans (2010) pointed out, shy children are speculated to be less academically competent than non-shy children in that they are less open to asking questions and joining discussions with peers, they may be less willing to take risks which is sometimes required in learning, and they are more sensitive to negative evaluations which may obstruct learning. Moreover, shy children may be perceived by teachers to be less academically competent and less ready for school due to their inhibition to speech. Indeed, competent academic behaviors expected of young children and assessed by Fuchs-Beauchamp (1996) using the Behavior Rating Scale for Presented Academic Self-Esteem in Young Children, for instance, include such behaviors as involving in group activities, maintaining eye contacts with others, eager to try new things, which are challenging to shy children.

The effects of parenting styles and behaviors on children's development

In parenting research, Baumrind's (1967, 1971) typology of parenting styles has been applied widely in Western studies for the past half century. This model has also been imported in studies of parenting in other cultures including research with Chinese populations (Wang & Chang, 2010). A parenting style as defined by Darling and Steinberg (1993) is "a constellation of attitudes toward the child that are communicated to the child and create an emotional climate in which the parent's behaviors are expressed" (p. 493). Parenting styles have generally been found to influence different children's developmental outcomes in both Western and Chinese studies (Wang & Chang, 2010).

Authoritative parenting refers to relatively flexible parenting practices exhibited with parental acceptance and warmth, firm control, the use of conductive reasoning, encouragement of democratic participation, granting of autonomy and bidirectional communication. Authoritative parents are caring but firm in demanding children's appropriate behavior. They exercise firm control but also make use of conductive reasoning to convince their children of compliance with their demands. They respect their children's right to express their needs and encourage them to participate in decision making democratically in bidirectional communication. They also grant their children autonomy and encourage their independence where age-appropriate. Authoritative parenting has been found to be negatively related to internalizing and externalizing problems (Williams et al., 2009). It has also been shown to positively predict academic competence among children and adolescents (Nyarko, 2013).

Authoritarian parenting refers to very rigid parenting practices manifested with parental restrictiveness, dominion, punitive and non-reasoning strategies, physical coercion, verbal hostility, and unilateral communication. Authoritarian parents are

stern and harsh in their socialization with their child. They demand strict compliance to their demands with little or no explanations on the reasoning behind their expectations. They restrict children's behavior and discipline them for any non-compliance with physical punishment or verbal rebuke. They do not encourage any two-way communication and do not accept objection or argument to their requests. Authoritarian parenting has been found to be positively related to internalizing and externalizing problems among children and adolescents (Williams et al., 2009). It has also been found to predict lower academic achievement in children than authoritative parenting (Nyarko, 2013).

Permissive parenting refers to parenting practices with laxness and inconsistent discipline. Permissive parents are warm but negligent of children's behavior. They hold low expectations and make few demands on children's appropriate behavior with little monitoring. They allow children to freely express their needs and rarely use punishments to correct disobedience. Permissive parenting has been found to be positively related to internalizing and externalizing problems (Williams et al., 2009). It has been demonstrated to negatively predict academic competence (Nyarko, 2013). Compared with authoritative and authoritarian parenting, permissive parenting is less studied especially in Chinese parenting research as permissiveness is not considered a responsible parenting style in the Chinese culture and thus difficult to measure with reliability (Wu et al., 2002).

Parenting styles have been differentiated from parenting practices by Darling and Steinberg (1993). Parenting styles refer to parental attitude toward the child and not the child's behavior and therefore encompass both goal-directed parenting behavior as well as parent-child interactions that may not always be goal-directed, such as explaining the reasoning for a parental demand with an open line of communication.

Parenting practices on the other hand are domain-specific and are the means by which parents influence specific child behavior to achieve certain socialization goals, thus are expected to have direct effect on child outcomes (Darling & Steinberg, 1993).

To measure parenting styles and practices or dimensions, one common self-report measure is the Parenting Styles and Dimensions Questionnaire (PSDQ) developed by Robinson et al. (1995, 2001). The parenting dimensions of Warmth and Involvement, Reasoning/Induction, Democratic Participation and Good Natured/Easy Going constitute Authoritative Parenting; Verbal Hostility, Corporal Punishment, Nonreasoning, Punitive Strategies and Directiveness make up Authoritarian Parenting; and Lack of Follow Through, Ignoring Misbehavior and Self-confidence establish Permissive Parenting.

Child temperament, goodness of fit, and adaptive parenting

The original temperament research with the New York Longitudinal Study by Thomas, Chess and colleagues over half a century ago (Thomas et al., 1963) was pursued against a dominant theory of parent-child relationship at the time that asserted that a child's problematic behavior was caused by a pathogenic mother's parenting behavior (Chess & Thomas, 1999). From their clinical experience, these authors disapproved such a theory but hypothesized that children's behavioral individuality had significant effects on the variations of parent-child relationship. Their investigation took a clinically oriented approach that related temperament with parenting issues. This promoted the idea that parenting must be discussed by considering temperament (Putnam, Sanson, & Rothbart, 2002).

Chess and Thomas (1999) conceptualized *goodness of fit* as the condition when the demands and expectations of the environment are compatible with a person's temperament, capabilities and other characteristics. Such a state of consonance between the person and the environment enables the individual's optimal development. Conversely, poorness of fit results due to dissonances between environmental demands and expectations on the one hand, and a person's temperament, capabilities and other characteristics on the other. The individual consequently experiences excessive stress with which he/she fails to cope, resulting in distorted development and maladaptive functioning.

The concept of goodness of fit integrates child temperament with its context, and for a young child, this is primarily the child's family or significant others such as the child's parent, teacher or caregiver. In particular, researchers have been interested in understanding, with or without referring to the concept of goodness of fit, how toddlers and young children interact with their mothers. Goodness of fit therefore can be viewed as an index of the dyadic relationship. In such a relationship, a mother and a child are seen as capable of influencing each other. Moreover, even if the degree of fit is established at some point in time, it is not permanently fixed but may change over time as distresses occur in the relationship due to some change in either partner. Thus, goodness of fit may describe how a competent parent adapts to difficulties presented by a challenging child as much as how a resilient child adjusts to unfavorable caregiving received from an inadequate parent. In their dynamic interactions, there can be child effects on the parent as well as parent effects on the child (Seifer, 2000).

The goodness of fit theory therefore advocates that parents and caregivers modify the environment to enable a better fit for children as well as to scaffold and develop

children's resilience to fit with the environmental demands by means of temperament-oriented adaptive parenting practices (Shiner et al., 2012). For instance, a shy and fearful child may easily become overwhelmed by unfamiliar social situations. Adaptive parenting calls for a parent to not only sensitively withhold intervening too early but also gradually exposing an inhibited child to progressively challenging social situations. Moreover, by consistently employing rewards to build and reinforce confident child behaviors, the child may overcome feelings of distress from social wariness in such situations. However, what parenting strategies to apply will depend on the individual differences of the child's unique temperament. Practitioners therefore encourage parents to understand their children's temperament profiles and adapt their parenting styles accordingly (Kristal, 2005; McClowry, 2003).

Temperament × parenting interaction as an index of goodness of fit

Thomas and Chess never explicitly operationalized the construct of goodness of fit. In response to this lack of operational definition, Seifer (2000) proposed three distinct ways for the measurement of goodness of fit: (1) objective behavior matching between parent and child, (2) objective matching of parent's expectations and child's behaviors, and (3) parent's subjective appraisal of the experience of stress and availability of coping strategies. These approaches to the operationalization of goodness of fit, however, have not been widely and consistently adopted by researchers.

In recent years, many studies have been conducted on the interaction between child temperament and environment to investigate how the effect of one factor might depend on another factor in influencing children's developmental outcomes and

problem behaviors (Rothbart, 2011; Rothbart & Bates, 2006). In particular, models with moderated linkages between child temperament and parenting practices to predict children's adjustment abound. Some studies describe these interactional models with reference to the hypothesis of goodness of fit. For instance, van Aken, Junger, Verhoeven, van Aken, and Dekovic (2007) investigated how the effects of maternal negative control and lack of maternal sensitivity were stronger on the development of externalizing behaviors for toddlers with difficult temperament than those with non-difficult temperament. In other words, poorness of fit results when specific parenting behaviors interact with particular temperament traits or profiles to produce negative outcomes.

Empirical studies on the trajectories of internalizing and externalizing problems have determined certain parenting practices and temperament profiles as joint risk factors (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011; Gilliom & Shaw, 2004). Temperamental inhibition (or behavioral inhibition) and difficultness have been found to combine with different parenting behaviors to develop and maintain children's problem behaviors. In general, externalizing problems are more likely to develop in children with a disinhibited temperament profile (or low fearfulness) and high negative emotionality when their parents respond to their behaviors with negative control, harsh and inconsistent discipline. Meanwhile, internalizing problems are more likely to develop in children with an inhibited temperament profile (or high fearfulness) and high negative emotionality when their parents interact with them with negative control, overprotective parenting and harsh discipline.

A review of this large research literature has revealed that researchers have primarily investigated maternal parenting practices much more than paternal

parenting practices as related to children's developmental outcomes, most likely because mothers generally play a larger childrearing role than fathers do in families. For externalizing problems, maternal parenting practices that have been more recently studied include maternal negative control (Gilliom & Shaw, 2004; van Aken et al., 2007), maternal sensitivity (Belsky, Fearon, & Bell, 2007; Mesman et al., 2009; Miner & Clarke-Stewart, 2008), maternal warmth (Chang, Olson, Sameroff, & Sexton, 2011), harsh parenting (Chang et al., 2011; Miner & Clarke-Stewart, 2008; Slobodskaya & Akhmetova, 2010). For internalizing problems, maternal parenting practices more recently investigated encompass maternal overprotectiveness (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011; Bowen et al., 1995; Kiel & Buss, 2011), maternal solicitous behavior (Degnan et al., 2008), maternal harsh discipline (Engle & McElwain, 2011), maternal negative control (Gilliom & Shaw, 2004; Hagekull & Bohlin, 1998), maternal negativity (Hane et al., 2008).

In addition to internalizing and externalizing problems, researchers have also studied how parenting practices influence other developmental outcomes. Social-emotional development has been found to be associated with maternal warmth, supportiveness, positive and negative control (Deater-Deckard et al., 2001), maternal neglect and rejection (Esser et al., 1993; Gulay, 2011), maternal protective parenting (Hastings et al., 2005), maternal positivity and negativity (Hane et al., 2008), maternal sensitivity (Moreno, Klute, & Robinson, 2008), harsh parenting (Scaramella & Leve, 2004), and maternal warmth (Yagmurlu, Sanson, & Koymen, 2005). Cognitive development has been found to be related to maternal involvement (Gauvain & Fagot, 1995), and maternal sensitivity (Lemelin, Tarabulsy, & Provost, 2006; Moreno et al., 2008).

These models of moderated linkages between child temperament and parenting practices may be viewed as indices of goodness of fit between children and parents in that consonant and dissonant pairings of child temperament and parenting practices are identified as good and poor fits for examination. These models are useful since findings produced out of such studies point to how prevention and intervention programs can be specifically designed to effectively influence the effects of particular child and/or parent variables on children's developmental outcomes, such as parent training programs developed to reduce the additive and moderation effects of the parenting variables in the regression equation (Kennedy et al., 2009; Rapee et al., 2005; Rapee, Kennedy, et al., 2010). In summary, the underlying goodness of fit theory has guided this growing line of research on the interaction between child temperament and parenting practices (Bates et al., 2012) including the present investigation.

The additive and interactive effects of temperamental inhibition and overprotective parenting

A number of recent studies have converged and specifically identified temperamental inhibition and overprotective parenting as major contributors to children's social withdrawal and internalizing problems. Rubin, Cheah, and Fox (2001) found that 4-year-old children's socially reticent behavior was concurrently predicted by the degree of over-solicitous maternal behavior observed during a free play session. Another study by Rubin et al. (2002) revealed that toddlers' peer inhibition at age 2 predicted reticence in both unfamiliar social and nonsocial situations at age 4. Moreover, toddlers inhibited with peers at age 2 were more likely to be reticent at age 4 only if their mothers were intrusive (over-controlling) or

derisive (over-critical). In other words, the relation between toddlers' peer inhibition and reticence two years later was found to be insignificant if their mothers were neither intrusive nor derisive.

Meanwhile, Coplan et al. (2008) found that kindergarten children's shyness was more strongly related to internalizing problems and social dissatisfaction for those children whose mothers displayed fretful or overprotecting parenting behavior. Moreover, Degnan et al. (2008) reported that preschool social reticence at 4 years old was significantly related to childhood social wariness at 7 years old for children whose mothers exhibited solicitous parenting behavior but not for children whose mothers did not. They concluded preschool social reticence was significantly more likely to continue into middle childhood for children whose mothers were highly solicitous. In addition, Kiel and Buss (2011) found that fearful child temperament and protective parenting behavior at child age 2 predicted child social withdrawal as well as protective parenting behavior at child age 5.

In summary, temperamental inhibition and overprotective parenting behavior have now been well-recognized as the most salient risk factors for internalizing problems and social withdrawal. However, while the construct of temperamental inhibition has been well understood as supported by decades of empirical research, there has yet been a universally agreed definition of parental overprotection among researchers. The various studies have adopted different definitions without explicitly comparing the conceptualization and operationalization being used against other studies for a synthesis of the research findings.

A synthesized understanding of parental overprotection

Based on an understanding that both a parent and a child contribute to the bonding established between them, Parker, Tupling, and Brown (1979) introduced the conceptualization of overprotection with the development and validation of the Parental Bonding Instrument (PBI), a self-report scale rated by an adult child to retrospectively assess parental behaviors. Parental contributions to the parent-child bonding were encapsulated with the two parenting dimensions of care and overprotection. Whereas *care* represents caring/warm versus indifferent/rejecting parental behaviors, *overprotection* represents parental behaviors that are controlling, overprotective and intrusive resulting in the prevention of child independence versus those behaviors that encourage child autonomy and independence. While the combination of high care and low overprotection is considered optimal parenting, the presence of overprotection regardless of the degree of parental care may conceivably stifle children's development of autonomy and independence, which were termed affectionless control (low care / high overprotection) and affectionate constraint (high care / high overprotection), respectively, by these authors.

In the context of young children's needs to adapt to new environments, Rubin and colleagues (Rubin et al., 2002; Rubin et al., 2001) conceptualized parental overprotection as parenting behaviors that discourage independent child attempts to explore in novel or unfamiliar situations by excessively directing and intruding in children's activities. Highly affectionate and overprotective parents may attempt to shield their children from emotional distress in situations they expect their children to experience anxiety even when the situations do not warrant their intervention. These parents take over the situations too early and vigorously by maintaining close proximity and restricting their children's actions to ensure children's success and

enjoyment. Such parental interferences prevent young children from acquiring independent and self-regulated behaviors which are important to their adaptive functioning in increasingly demanding environments as they grow older. Parental overprotection thus contributes to the stability of children's temperamental inhibition and social wariness in novel settings.

Kiel and Buss (2011) defined parental protective behavior with respect to situations that are novel or uncertain to the child. Such situations induce some discomfort for the child but present no danger or threat to safety. Parental overprotection encompasses both physical restriction of child behavior as well as presentation of parental warmth and physical comfort that are unnecessary in these situations. These authors also pointed out that such parental behaviors may often be elicited by children's fearfulness in unfamiliar settings, implying a transactional nature in the interaction between the fearful child and the protective parent.

Specifically relevant to children's social development, Coplan et al. (2008) described overprotective parents as over-managing situations for shy children. These authors suggested that overprotective parenting undermines shy children's necessary development of coping strategies on the one hand, and maintain or exacerbate their social wariness on the other.

Furthermore, Rubin et al. (2002) viewed parental overprotection as a feature encapsulated within the construct of psychological control in that parents restricts their children's independence and encourage them to forfeit of their independence for the fear of losing or failing to gain parental love. The same study also provided evidence that critical or derisive parenting, a second feature of psychological control, also contributes to children's social reticence.

Taken together, although a universal definition of parental overprotection has not been agreed upon among researchers, the construct essentially refers to parenting behaviors that are over-controlling, restrictive and directive in situations where the actions are not warranted. Such behaviors may or may not be presented as warm and affectionate. Overprotective parents exhibit these behaviors because they either perceive their children to be unable to cope with a supposedly stressful situation thus needing their support, or wish to strengthen their children's dependence on them with such actions to maintain the bonding. In the latter sense, overprotective parents may also be psychologically controlling parents.

Measuring parental overprotection

To assess parental overprotection, lab observations are commonly used by researchers. In one protocol (Degnan et al., 2008; Hane et al., 2008; Rubin et al., 2001), mother-child dyads were invited to participate in an assessment comprising two sessions. In the first session, the mother was observed when the child was given toys for a free play time in the mother's presence in the same activity room. In the second session, the mother was asked to work with the child to perform a block-building task. Individual coders blind to the research hypotheses subsequently watched the video recording of each assessment session and coded the maternal behaviors using a taxonomy on the display and expression of the mother's behavioral and emotional responses toward the child across six domains. *Proximity/orientation* refers to the mother's physical location from the child and her nonverbal attentiveness while the child plays freely. *Positive Affect* is the positive quality of maternal emotional expressiveness toward the child such as expression of warmth, positive feeling, pleasantness and enjoyment toward the child. *Hostile Affect* refers

to the mother's verbal and nonverbal behaviors due to hostile feeling toward child and expression of anger, irritability, annoyance or hostility. *Negative Affect* refers to verbal and nonverbal behaviors that do not involve feelings of hostility but displays sadness, fearfulness, concern and anxiety in response to the child's behavior. *Positive Control* is the extent to which the mother facilitates the child's behavior by actively and positively providing guidance and well-timed supportive assistance in the child's ongoing activities. *Negative Control* is the amount of control a parent exerts over the child which is ill-timed, excessive, or inappropriate in response to what the child is doing regardless of the child's wishes.

Maternal solicitousness is measured by summing up the degrees of maternal proximity/orientation, positive affect, positive control and negative control (Degnan et al., 2008; Rubin et al., 2001). Based on Rubin et al.'s (2001) conceptualization, these maternal behaviors in the unstructured free play episode are excessive parental control unwarranted when the child is supposed to explore in a stress-free environment. High maternal solicitousness observed in the free play episode is considered over-controlling, thus maternal overprotection. However, the display of the same maternal behaviors in the structured block-building episode is justified as the child may experience some stress from the demand of the task, thus solicitousness in the right context. Low or inadequate maternal solicitousness in the block-building episode is therefore considered under-controlling and unfavorable for those children who get upset easily by stress. This operationalization of parental overprotection and supportiveness was based on a theory of adaptive parenting in context (Rubin et al., 2001).

Besides observational methods, parental overprotection toward young children has also been measured using self-rating scales which tap the participating parent's

attitudes and behavioral tendencies in general (Coplan et al., 2008) as well as in specific hypothetical situations (McShane & Hastings, 2009).

In the absence of an instrument to measure parental overprotection with local participants, the present research adapted and administered Rubin et al.'s (2001) observational protocol and Coplan et al.'s (2008) self-report scale to assess Hong Kong Chinese parents' protective parenting behavior. These instruments are described in detail in the next chapter on Method.

The buffering effects of supportive parenting on temperamental inhibition

Studies have shown not only how overprotective parenting may contribute to unfavorable outcomes of temperamental inhibition but also how supportive parenting may buffer the effects of temperamental inhibition on such outcomes. In Rubin et al.'s (2001) study on maternal solicitousness by context, one important finding is that children's emotional dysregulation was *not* significantly correlated with social reticence for those children whose mothers were highly solicitous in the Lego-task episode but significantly correlated with social reticence for children whose mothers' solicitousness was low or medium in the same episode, a situation that created stress on the mother-child dyads. In structured play situations where children were required to complete tasks with mothers, maternal solicitousness, unoccupied with negative affective tone, was viewed as supportive parenting in the appropriate context (Rubin et al., 2001).

In Coplan et al.'s (2007) study, authoritative parenting, as measured with the PSDQ (Robinson et al., 2001), was hypothesized to contribute positively to the developmental outcomes of shy children. The study found that low supportive parenting, aggregated with maternal agreeableness and authoritative parenting, but

not high supportive parenting, exacerbated the effects of children's shyness-reticence on internalizing problems, peer difficulties and social adjustment.

Hane et al. (2008) studied the effects of maternal positivity and negativity on shy children's social withdrawal. Maternal positivity, which may be considered a type of supportive parenting, was found to moderate the effect of shyness on social withdrawal such that the relation between shyness and social withdrawal was significant for children whose mothers displayed low maternal positivity but not children whose mothers displayed high maternal positivity.

Taken together, the absence of supportive parenting in a context stressful to children contributes to unfavorable developmental outcomes among temperamentally vulnerable children. In other words, the presence of supportive parenting may buffer the negative effects of temperamental inhibition on children's developmental outcomes.

Reciprocal effects between temperamental inhibition and maladaptive parenting over time

Researchers have hypothesized and produced empirical evidence to establish that the two risk factors of temperamental inhibition and maladaptive parenting are likely to co-occur and maintain each other in a transactional manner over time (Degnan et al., 2008; Kiel & Buss, 2011; Rubin et al., 2002; Williams et al., 2009). This may be termed the *inhibition-overprotection cycle*, in contrast to the *coercive parent-child cycle* between child emotional dysregulation and harsh parenting for children with externalizing problems. (Scaramella & Leve, 2004).

However, these studies in support of the inhibition-overprotection cycle were primarily based on prospective predictive models with data collected at two time

points only. Limited research in the literature has explored the reciprocal effects of temperamental inhibition, maladaptive parenting (i.e., overprotective or intrusive parenting) and social development outcomes on each other over multiple time points (Bates et al., 2012). To fill this gap and to investigate the transactional nature of these relations, repeated assessments of child temperament, child outcomes and parenting practices at multiple time points are required to allow detailed structural analyses of the bidirectional effects with autoregressive controls (Williams et al., 2009).

Sameroff (2009a) proposed possible designs for such transactional research. Transactions are conceptualized to represent how the activity of a partner in the process changes the usual activity of another either quantitatively or qualitatively. Sameroff offered a generalized transactional model to depict how transactions occur between parents and children. In such a model, both children and parents are measured in representation and behavior. A representation refers to a meaning system that organizes behaviors. Any specific behavior is the output of a representation of an organizing system. When transactions between parent and child occur, there will be expected changes in the represented meaning systems, which will be accessed for different behavior performance in the future.

Such a model is generally used for longitudinal research in which a measure of one partner in the relationship at some point in time predicts a measure of the other partner at a later point in time, usually after a period of months or years although measurement may be taken at a higher frequency. Moreover, not all studies will measure both behavior and representation for the child and the parent in the model but only capture changes between different combinations of behaviors and representations.

As an example, a child's representation may be his/her temperament profile. Due to the child's unique profile, temperament influences the child's behavior in the environment. Meanwhile, while the parent's behavior exerts influence on the child's behavior, the child's behavior may also shape the parent's behavior. Thus, in a transactional model, the child temperament, child behavior and parent behavior would produce reciprocal effects on each other over time.

The present investigation established a transactional model for formulating and validating the research hypotheses on the reciprocal effects between temperamental inhibition and maladaptive parenting. Three waves of data were collected during children's preschool years for a short-term longitudinal study of the effects of the various parent and child variables at one time point on the outcome variables concurrently at the same time point as well as prospectively at subsequent time points. Transactions between child temperament, child behavior and parent behavior were examined. This transaction model and the different measures used to assess the study variables are described in detail in the next chapter on Method.

Early Intervention programs

As reviewed in the foregoing sections, contemporary research has evidenced the long-term consequences of untreated impairment due to social withdrawal and internalizing problems in childhood (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011; Rubin et al., 2009) and identified temperamental inhibition and certain maladaptive parenting practices, most concerning being overprotecting parenting, as the major risk factors for the development of these unfavorable child development outcomes (Degnan et al., 2008; Kiel & Buss, 2011; Rubin et al., 2002; Rubin et al., 2001). To mitigate the developmental risks of

temperamentally vulnerable children, early prevention and intervention programs have been developed and implemented. The aim of such programs is to offer timely help for at-risk children and to minimize the negative impact on the wider community involving higher costs of treatment for later anxiety and internalizing disorders in middle childhood and adolescence (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, Clifford, et al., 2011; Rapee, 2002).

There are however not many existing temperament-based parenting intervention programs developed to date (McClowry & Collins, 2012). Two programs that have been implemented and tested for their efficacy are the *INSIGHTS* intervention program offered to parents and teachers of school-age children for the reduction of problem behaviors at home and disruptive behaviors at school (McClowry, Snow, & Tamis-LeMonda, 2005; McClowry, Snow, Tamis-Lemonda, & Rodriguez, 2010; O'Connor, Rodriguez, Cappella, Morris, & McClowry, 2012) and the *Cool Little Kids* prevention program offered to parents of temperamentally inhibited preschoolers for the reduction of children's anxiety disorders (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, Clifford, et al., 2011; Rapee et al., 2005; Rapee, Kennedy, et al., 2010).

The *INSIGHTS* program is a Tier 1 or *universal*, preventive intervention program (McClowry & Collins, 2012). This program (McClowry et al., 2010) consists of a teacher and parent version and a children version. The teacher and parent program comprises 2-hour weekly sessions delivered over a 10-week period. Parents and teachers are educated on child temperament and facilitated to recognize the unique qualities of each child, reframe their perceptions with the understanding of the strengths and limitations of each temperament trait, and restructure their responses to each unique child's behavior based on the newly gained knowledge in temperament.

Behavioral management strategies are also taught as tools to gain compliance. Additional strategies are then covered on how to help the child to gain control depending on different situations which may be too challenging or manageable from the child's perspective. The children's program is implemented as a weekly session lasting 45 minutes for a 10-week period. Children are taught about temperament and the different situations that are either easy or challenging depending on their unique temperament profile. Children interact with puppets and their peers to deal with daily problem solving dilemmas.

The *INSIGHTS* program has been tested for its efficacy in a few studies and evidenced to demonstrate significant effects in reducing primary school children's problem behaviors at home (McClowry et al., 2005), attentional difficulties and overt aggression toward others at school (McClowry et al., 2010), and reducing kindergarten and primary school children's disruptive behavior at home and increasing their parents' parenting efficacy (O'Connor et al., 2012).

The *Cool Little Kids* program is a tier 2, *selective*, preventive intervention program (McClowry & Collins, 2012). This program (Rapee et al., 2005; Rapee, Kennedy, et al., 2010) was designed for parents of children at preschool age who are assessed as high on temperamental inhibition. The program consists of six group sessions conducted over 10 weeks. The program educates parents on the nature of inhibition and the risk factors for anxiety, and equips parents with strategies in dealing with inhibited behaviors such as reducing overprotection and anxiety modeling, as well as rewarding confident child behaviors. Graded exposure is introduced as a key technique of helping children to learn how to deal with fears and avoidance. Meanwhile, parents are also helped to deal with their own fears and worries using cognitive restructuring. The program has also been extended to an 8-

session program for higher-risk preschool-aged children of parents with an anxiety disorder (Kennedy et al., 2009).

The *Cool Little Kids* program has been tested in one study with 146 inhibited preschool children to demonstrate its efficacy in significantly reducing anxiety diagnoses (i.e., separate anxiety disorder, social anxiety disorder and specific phobia) among children in the intervention group compared to the waitlist control group (Rapee et al., 2005; Rapee, Kennedy, et al., 2010). In a second study with 71 inhibited preschool children having a parent with a current anxiety disorder, the program, extended to 8 sessions, was found to significantly reduce not only anxiety diagnoses but also interference from the anxiety as well as levels of inhibition among children in the intervention group relative to the waitlist group (Kennedy et al., 2009).

Compared to the *INSIGHTS* program which is targeted for older children with externalizing problems, the *Cool Little Kids* program was evaluated to be more suitable for the present research since it is targeted for parents of temperamentally inhibited preschool-aged children. The brevity of the program intended to be least intrusive to participants in terms of time investment fits well with the usually hectic schedules of Hong Kong Chinese parents. Its relatively low cost of delivery and its robust evidence base established in prior studies further presented as the best choice for adaptation in the Hong Kong context.

There are also efficacious intervention programs designed to provide direct training to children with anxiety, such as the 16-session Coping Cat program for children aged 7 to 13 years (Kendall & Hedtke, 2006) or its 9-session adaptation in Hong Kong known as Anxiety Group-Treatment Program for anxious children aged 6 to 11 years (Lau, Chan, Li, & Au, 2010). However, as pointed out by Rapee

(2013), although direct training could be effective for older children, parent training would be more effective to enable parents to guide and influence their younger children in behavioral change.

The present research selected and implemented the *Cool Little Kids* program as an early intervention program for temperamentally inhibited children in Hong Kong. This program had never been tested for efficacy among Chinese populations. A randomized controlled trial was used to test its efficacy and its parental receptivity was also evaluated in the Hong Kong Chinese context.

Cultural differences and Chinese shyness

Although inhibition and shyness have been identified to predict unfavorable social development outcomes in the various studies, culture plays a role in the socialization of such childhood behaviors. Chen and French (2008) reviewed children's social competence in cultural contexts and purported that, in general, in the Western, individualistic culture, e.g., North America, since assertiveness, expressiveness and competitiveness are highly valued, social initiative is more encouraged than behavioral control. Thus, shy-inhibited behaviors, i.e., wary, vigilant, and sensitive behavior due to internal anxiety in social-evaluative situations, are viewed by parents as immature and socially incompetent, especially for boys. Shy-inhibited children are therefore rejected by peers and viewed by adults with concern and disappointment. Consequently, these children are more likely to develop negative self-perceptions and depression. On the other hand, in the Eastern, collectivist culture, e.g., China, as group cohesion and harmony are highly valued, behavioral control is more encouraged than social initiative. Shy-inhibited behaviors are accepted by peers and even viewed by parents as socially appropriate. Such

children may regard themselves positively and do not necessarily feel depressed or lonely.

Against this backdrop of cultural differences, Xu, Farver, Chang, Zhang, and Yu (2007) proposed a multi-dimensional model of shyness with the differentiation of three forms of shyness in Chinese children. *Shyness toward strangers* corresponds to behavioral inhibition toward unfamiliar people (Kagan, 1997; Kagan et al., 1984). *Anxious shyness* or social evaluative shyness refers to inhibition toward negative or insufficiently positive social evaluation (Asendorpf, 1993). *Regulated shyness*, newly introduced by Xu et al. (2007), refers to nonassertive and unassuming shy behavior in Chinese children that is differentiated from anxiously shy behavior. While the first two forms of shyness largely correspond to Western theories of inhibition (Asendorpf, 1993; Coplan et al., 2004), regulated shyness, as observed in Chinese populations, appears to be unique in collectivist cultures and reflects social initiative in a low key, non-threatening fashion, which are not viewed negatively nor rejected by peers. In fact, this form of shyness may even minimize social disapproval usually caused by perceived competitiveness and assertiveness because it demonstrates to peers that one wishes to fit in with the group in harmony (Xu et al., 2007). Therefore, distinguishing anxious shyness and regulated shyness in the observation and measurement of child behaviors may be crucial to the identification of development needs and difficulties among Chinese children.

Adaptive social functioning therefore must be viewed through the lens of culture. The present investigation accounted for how the culturally different concept of shyness in the Chinese, Confucius tradition could be applicable to the comparatively westernized Hong Kong Chinese community. The Chinese Shyness Scale developed by Xu and colleagues (Xu, Farver, Yu, & Zhang, 2009; Xu et al., 2007) was used to

measure anxious shyness and regulated shyness differentially among the participating Hong Kong Chinese children.

Cultural differences and parenting styles

As Baumrind's typology of parenting styles were discussed earlier, the relationships between authoritative and authoritarian parenting and children's development outcomes were summarized from Western studies. Whether these parenting styles are applicable to the Chinese culture and whether the same relationships with child outcomes are consistent have been two major research questions that Chinese parenting researchers have attempted to answer in the past two decades. As summarized by Wang and Chang (2010), studies comparing Western and Chinese parenting with China, Taiwan and Hong Kong participants across different age groups from preschoolers to adolescents have produced reasonably convergent evidence for general applicability of the Western parenting models in the Chinese culture. Authoritative and authoritarian parenting styles and practices have been confirmed to be meaningful to Chinese parents with convincing support for construct validity. Moreover, both global parenting styles and specific parenting practices have been shown to be functionally relevant to Chinese parenting. In general, authoritative parenting has been found to be positively related to children's self-esteem and academic achievement and negatively associated with social withdrawal. Meanwhile, authoritarian parenting has been shown to be positively associated with children's aggression and negatively related to their self-esteem and academic success. Moreover, the parenting dimensions of physical coercion and punitive discipline have been found to be associated with children's aggression and anxiety as well as lower self-esteem and deteriorated academic

achievement. Further, autonomy granting and supportive parenting have been found to be related to higher self-esteem and better academic performance.

However, instead of directly importing the Western parenting models, a different approach has been taken by some researchers to study Chinese parenting through indigenous constructs based on the conception of parenting in the Chinese culture. In particular, Chao (1994) differentiated Chinese parenting from Western parenting with the indigenous parenting construct of "guan" or training. This construct was introduced to reflect the traditional parenting concept of the role responsibilities of parents to train and govern their children and raise them to be matured adults who will fit in the society under the Confucius ideologies. This notion of parenting was believed to uniquely characterize Chinese parents and elucidate their motivation to be controlling in parenting children.

Some studies found that Chinese parents were higher in authoritarian parenting style compared to Western parents (Chao & Tseng, 2002; Ng, Pomerantz, & Deng, 2014; Pearson & Rao, 2003). On the other hand, as Chao (1994) argued, the Western concept of authoritarianism reflects parental control with such negative parenting behaviors as verbal hostility, physical coercion and non-reasoning, unilateral communication with children. This is not typical of Chinese parents in child-rearing. While Chinese parents exert and maintain parental control over children's behavior, such parenting practices as interpreted with the "guan" construct actually reflects parental love and role responsibilities (Chao, 1994; Wang & Chang, 2010). These parenting behaviors are mostly expressed positively and not negatively, unlike the Western definition of authoritarian parenting, and is therefore viewed favorably by both adults and children in the Chinese culture (Chao & Tseng, 2002). Thus, the Western construct of authoritarian parenting does not appropriately

and accurately capture the "guan" parenting behavior among Chinese parents. Chao (1994) therefore advocated the use of indigenous constructs to study parenting practices with sociocultural meanings such as "guan" to investigate parenting among Chinese and other non-Western cultures influenced by the Confucius traditions. To recapitulate, Chinese parents especially mothers have been found to be more controlling and higher on authoritarian parenting style than Western parents but accompany parental control with parental warmth (Chao & Sue, 1996; Chao & Tseng, 2002; Tsang, 2012). Such parental controlling behaviors are justified by the concept of "guan" that delineates Chinese parents' close monitoring and dedicated attention extended to enable children's well-being and development, in particular in academic achievement and school success (Chao & Sue, 1996; Chao & Tseng, 2002; Ng et al., 2014; Wang & Chang, 2010). In fact, some researchers argued that Chinese parents' authoritarian parenting style almost always reflects their intention to assist their children in achieving academic success (Wang & Chang, 2010) since educational achievement is of highest priority among their parenting responsibilities (Chao & Tseng, 2002; Shek & Sun, 2013) and may even be what parents' or mothers' self-worth is contingent upon (Ng et al., 2014).

Cross-cultural researchers also conducted studies to compare Chinese and Western parenting. The investigation by Wu et al. (2002), for instance, examined not only how the Western dimensions of authoritative and authoritarian parenting were applicable to Chinese culture but also how Chinese parenting dimensions of protection, encouragement of modesty, shaming/love withdrawal, maternal involvement, and directiveness were applicable to Western culture in the US. The study recruited mothers of preschoolers from Beijing, China and western United States and administered self-report measures including the PDSQ and a newly

developed instrument to measure parenting practices among the participants. Interestingly, consistent factor structures were found for both measures of Chinese and Western parenting assessing mothers of preschoolers across the two cultures. The study also found that Chinese mothers scored higher on the Chinese parenting dimensions than the US mothers except maternal involvement but lower on the authoritative parenting dimensions of warmth/acceptance and democratic participation and higher on the authoritarian parenting dimension of physical coercion. Among the Chinese parenting dimensions, mothers in China were found to be more protective, more directive, used more shaming and love withdrawal, and encouraged modest child behaviors more than their US counterparts.

Another cross-cultural study conducted by Jose, Huntsinger, Huntsinger, and Liaw (2000) used a multi-informant and multi-method approach to collect questionnaire data from parents and teachers as well as observational data from a game-playing session with parental teaching among father-mother-child triads to compare parenting practices between European American, Chinese American, and Taiwanese Chinese parents of preschool-aged children. Chinese parents from both the Taiwanese and Chinese American groups were found to be more controlling with a heavier emphasis on children's academic achievements compared to the European American group. The two Chinese parent groups exerted more control on their children's use of time with a focus on developing academic and music skills. The observational data revealed that parents of the two Chinese groups were more directive (with Chinese American parents scoring highest in this dimension) than the European American parents but were found to be equally warm. These Chinese parents adopted more positive than punitive discipline techniques such as positive reinforcement, in contrast to Wu et al.'s (2002) finding. In other words, the

parenting style exhibited by the Chinese parents was authoritative and not authoritarian. As these Chinese parents were mostly well-educated and came from urban populations, it was believed that their parenting styles were influenced by their exposure to Western ideologies. Taken together, Chinese parenting in urban cities today appears to be a combination of firm control with parental warmth similar to the authoritative parenting style. This finding has been also echoed with a more recent study with Chinese parents of only children in primary schools from Shenzhen, China, which found that the parenting style of these parents from an educated urban population was predominately authoritative (Lu & Chang, 2013).

Another way to assess the parenting style of Chinese parents to determine whether it leans toward authoritative parenting or authoritarian parenting is to review within-culture comparisons (Wang & Chang, 2010). When the two parenting styles assessed for the same participants were compared, studies consistently revealed that today Chinese parents from urban cities are more authoritative than authoritarian. A few recent studies illustrated this pattern. In Meng's (2012) study with 148 Taiwanese parents of preschoolers of who 117 were mothers, the mean score on authoritative parenting style assessed, using the PSDQ on a 5-point Likert scale with 1 for 'never', 3 for 'about half of the time' and 5 for 'always', was 3.89 whereas the mean score on authoritarian parenting style was only 2.40. Two recent local studies on Hong Kong Chinese parents of young children using the same instrument indicated this distinction similarly. Chan et al. (2009) reported that the 189 Hong Kong Chinese mothers of children at 6 to 8 years of age used authoritative parenting style more often than the authoritarian parenting style based on the different mean scores derived using the PSDQ. Moreover, in Tse's (2011) study with Hong Kong Chinese parents of primary school students, the mean scores on authoritative

parenting and authoritarian parenting assessed using also the PSDQ were 3.97 vs. 2.18 for the high-income group of 183 parents and 3.67 vs. 2.32 for the low-income group of 114 parents.

In summary, Chinese parents especially mothers practice authoritative parenting more than authoritarian parenting. They exert firm control with parental warmth over children's behaviors to train and assist them in order to facilitate their development and in particular enable children to achieve academic success.

The parenting practices of Hong Kong Chinese parents of inhibited children

The different perception of shyness and inhibition between Chinese and Western cultures as described earlier is likely to encourage different parenting styles adopted by parents of temperamentally inhibited children in the Chinese culture. For instance, Chen et al. (1998) compared the different child-rearing attitudes between Chinese and Canadian mothers of temperamentally inhibited toddlers. The study found that Canadian mothers of behaviorally inhibited children were more rejecting, more protective and punishment-oriented, and not encouraging achievement, similar to authoritarian parenting. In contrast, Chinese mothers of behaviorally inhibited children were more accepting, less protective, not punishment-oriented, encouraging achievement and independence, similar to authoritative parenting. Thus, perhaps due to their higher receptivity of children's shyness, Chinese mothers appeared to be more positive in parenting temperamentally inhibited children as compared to their Western counterparts. However, it is important to note that although Chinese mothers were found to be less protective in this inter-group comparison, it does not imply no within-group differences in protective parenting between Chinese mothers of temperamentally inhibited children and other Chinese mothers.

As pointed out earlier, Chinese mothers have been found to be controlling but accompany parental control with parental warmth (Chao & Tseng, 2002, Tsang, 2012), as justified by the parenting construct of "guan". In support of this understanding of most Chinese parenting researchers, one recent study revealed that psychological control was a prevailing parenting style among Hong Kong Chinese mothers (Chan, Bowes, & Wyver, 2009). Furthermore, a number of recent studies found that Chinese parents in general and Hong Kong Chinese parents in particular were more likely to practice authoritative parenting and much less likely to use authoritarian parenting (Chan et al., 2009; Chen & Luster, 2002; Meng, 2012; Zhou et al., 2004; Tse, 2011). Consistent with the findings from Meng's (2012) study, Chan et al. (2009) found that authoritative parenting was used more often by Hong Kong Chinese mothers who wanted children to learn and maintain harmonious relationships with others, a child-centered goal of socioemotional development.

Based on this review, Hong Kong Chinese parents of temperamentally inhibited children were expected to generally parent positively as they might not view inhibition as very negative and too concerning children's behaviors especially at a young child age as perceived by parents in the Western culture. Moreover, Hong Kong Chinese parents might empathize with their inhibited children's experience of distress in adapting to novel social situations and tend to over-manage to protect these children with positive and affective control. Such overprotective parenting practices would not help their children alleviate inhibited and shy behaviors but might likely exacerbate the negative effects of temperamental inhibition on children's social development. Meanwhile, as children are used to such parental protection, they would continue to expect and depend on their parents' salvage in stressful social situations and delay in learning adaptive coping strategies. This

typical vicious cycle of parental overprotection and child over-dependence among temperamentally inhibited children has found empirical support in Western studies reviewed earlier and was expected to manifest similarly among Hong Kong Chinese families.

Moreover, as affectionate controlling parenting behaviors toward children are common practices among Chinese parents in urban cities, especially mothers, who have been found to be more positive and involved than fathers (Chao & Tseng, 2002; Jose et al., 2000; Lu & Chang, 2013; Tsang, 2012; Wang & Chang, 2010), Hong Kong Chinese parents were also expected to exhibit such parenting practices, as justified by their paramount parenting goal of enabling children's academic success most emphasized in the Hong Kong Chinese parenting culture (Shek & Sun, 2013). Despite the negative effects on children's social development outcomes, such affective controlling parenting practices would generally predict children's academic achievement (Cheung & Pomerantz, 2011; Ng et al., 2014; Tsang, 2012).

Meanwhile, although authoritarian parenting is not the predominant parenting style, it might likely still be practiced by Hong Kong Chinese parents when they need to reinforce parental authority and child obedience (Chan et al., 2009). However, verbal hostility would be more often used than physical coercion and non-reasoning/punitive strategies as their preferred parenting strategy, as evidenced in studies on this parenting style with Chinese participants (Meng, 2012). The use of verbal hostility may be a kind of psychological control, and if excessively employed, similar to the resulting relations as shown in the Western culture, would negatively predict children's social development outcomes in general (Wang & Chang, 2010), and aggravate temperamentally inhibited children's risk for social withdrawal and internalizing problems in particular (Rubin et al., 2002; Williams et al., 2009).

Research questions and hypotheses

The foregoing sections have detailed the importance of two major risk factors, namely, temperamental inhibition and maladaptive parenting, for children's developmental outcomes. In addition to revisiting their conceptual and operational definitions, we have examined the additive and interactive effects of the two factors as well as their reciprocal effects on one another in differentially influencing and maintaining children's social development outcomes. Meanwhile, we have also reviewed research on the cultural differences in temperamental inhibition and parenting practices. This has positioned us to consider the relevance of these contemporary research findings in the Hong Kong Chinese context. For easy reference of the key terms and constructs defined by the various studies examined in the literature review and adopted in the present thesis, a glossary can be found in Appendix I.

Based on the foregoing review of the literature, the present investigation asked the following research questions about Hong Kong Chinese parenting and the differential developmental outcomes of temperamentally inhibited children:

- Can children's temperamental inhibition be measured by observing their social speech with an unfamiliar conversational partner?
- Is temperamental inhibition related to social withdrawal, internalizing problems, social initiative and anxious shyness (but not regulated shyness), significantly and in the same direction among Hong Kong Chinese children as it is among children in the Western culture?
- Do protective and supportive parenting practices predict children's academic competence among Hong Kong Chinese families?

- Do protective parenting and supportive parenting moderate the predictive relations between Hong Kong Chinese children's temperamental inhibition and their social developmental outcomes such that the relations are significant only for children of highly protective and inadequately supportive parents?
- Are child inhibition, child social outcomes and maladaptive parenting related with reciprocal effects on one another over time in a transactional manner among Hong Kong Chinese parents and children?
- If negative child social outcomes and maladaptive parenting practices influence each other in an unfavorable course over time, can an early intervention program help temperamentally inhibited Hong Kong Chinese preschool-aged children alleviate their socially anxious behaviors by training their parents to be less overprotective in parenting and to develop children's confident behaviors by rewarding, essentially breaking the vicious inhibition-overprotection cycle between these children and their parents?

To answer the above research questions, the present investigation conducted three inter-related studies, to be detailed in the next chapter on Method. A large sample of Hong Kong Chinese parents was recruited to participate in the three studies. Data collected from the participants was used to describe the characteristics of Hong Kong Chinese parenting styles and practices in general and the parenting behaviors of Hong Kong Chinese mothers of temperamentally inhibited children in particular. The three studies were designed to test the hypotheses formulated below.

Study 1 hypothesized that (H1.1) temperamental inhibition could be reliably measured by observing preschool-aged children's inhibition to speak to an

unfamiliar conversational partner; (H1.2) temperamental inhibition would positively predict preschool-aged children's internalizing problems, social withdrawal and anxious shyness, and negatively predict their social initiative and academic competence, but not regulated shyness; (H1.3) maternal protective parenting would positively predict children's academic competence; (H1.4) maternal protective parenting would moderate the relation between temperamental inhibition and internalizing problems, social withdrawal, anxious shyness and (lower) social initiative among Hong Kong Chinese preschool-aged children such that higher maternal protective parenting would exacerbate the negative effects of temperamental inhibition on these developmental outcomes but not lower maternal protective parenting; (H1.5) maternal supportive parenting would positively predict children's academic competence; (H1.6) maternal supportive parenting would moderate the relation between temperamental inhibition and internalizing problems, social withdrawal, anxious shyness and (lower) social initiative among Hong Kong Chinese preschool-aged children such that lower maternal supportive parenting would exacerbate the negative effects of temperamental inhibition on these developmental outcomes but not higher maternal supportive parenting.

Study 2 hypothesized that child temperamental inhibition, child social outcomes and parenting practices will influence one and other over time among Hong Kong Chinese families whereby child social outcomes include internalizing problems and social withdrawal, and maladaptive parenting practices include such parenting styles as high parental overprotection, low authoritative parenting and high authoritarian parenting as well as such parenting dimensions as high verbal hostility and low autonomy granting. In particular, (H2.1) child temperamental inhibition and negative child social outcomes would operate in a transactional manner with

reciprocal effects on one another other over time; (H2.2) maladaptive parenting practices and negative child social outcomes would influence one and other in a transaction manner over time.

Study 3 hypothesized that (H3.1) temperamentally inhibited children of the participating parents of the early intervention program randomly assigned to the intervention group would reduce in anxious shyness but not regulated shyness relative to children of parents in the waitlist control group, as rated repeatedly by their teachers after the parents participated in the program; (H3.2) children from the intervention group would increase in social initiative with peers and reduce in internalizing problems in comparison with children from the control group.

Chapter 3

Method

Participants

The present investigation consisted of three inter-related studies approved for ethical clearance by the Human Subjects Ethics Sub-committee of the Hong Kong Polytechnic University Research Committee under project ID, HSEARS20130915001. Participants were Hong Kong resident Chinese parents and their preschool-aged children at 3 to 5 years old recruited from 10 participating kindergartens at the start of the research. In Hong Kong, kindergartens provide services for children from 3 to 6 years old by offering nursery (K1), lower kindergarten (K2) and upper kindergarten (K3) classes before children enter primary schools (Education Bureau, The Government of the Hong Kong Special Administrative Region, 2015). The present research recruited children who were attending K1 and K2 classes from the 10 kindergartens to ensure the participants were available for complete data collection since the program spanned over one school year.

Procedure

A formal invitation letter was first sent to the participating organization and the principals of 10 local kindergartens to invite their participation in the present research program. A visit was then made to each kindergarten to give a briefing session to the principal and teachers on the objectives of the research as well as how the participants would be involved in the program, including questionnaire data collection and observational assessment of selected parent-child dyads. Class teachers teaching the children of the participating parents were also asked to fill out a teacher version of the questionnaire for each student. The kindergarten was

requested to assist in inviting and encouraging qualified parent-child dyads to participate in the present research.

A subsequent visit to each kindergarten was made to meet with the participating parents and deliver an information session on the importance of children's social development and how parents may observe and understand their children's unique temperamental differences to enable effective parenting. In the meeting, the present research program and its objectives were introduced. Parents were invited to participate in the research and fill out a parent version of the questionnaire during the session while teachers were given about two weeks to fill out and return the teacher questionnaires due to the larger amount of information about their students being collected. Parents who were unable to attend the information session were also invited to participate in the program through the kindergarten. The kindergarten was requested to distribute the questionnaires with an information sheet attached to each copy to parents of K1 and K2 class students who were unable to attend the information session. The information sheet explained the objectives of the research and the questionnaire contained appropriate instruction on how to answer the questions. A contact number was provided with the questionnaire to the participants for any inquiry about the research and how to fill out the questionnaire although the school teachers were already asked to assist parents as they could. From both the participating parents and teachers, a written informed consent was obtained with assurance of confidentiality being maintained of the data they provided. The participants were also told that they would be asked to fill out questionnaires about the children at two later time points, once six months later before the end of the current school year and another time twelve months later in the following school year, respectively. To reinforce the research objectives and encourage continuous

participation, at each subsequent time point when a new set of questionnaires were distributed, a school visit was made to each kindergarten to provide a similar information session to parents and answer any questions regarding the research program and how to fill out the questionnaire.

The invitation letters, information sheet and the consent forms used in the present research may be found in Appendices II and III.

Sampling for the three studies

Figure 3.1 provides a graphical summary of the sampling methods and the research activities in different project phases for the three studies. Minimum sample sizes for Study 1 and Study 3 were estimated using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). For Study 1, with five predictors assumed to be required for the regression analyses, i.e., temperamental inhibition, maternal protective parenting, maternal supportive parenting, temperamental inhibition × maternal protective parenting, and temperamental inhibition × maternal supportive parenting, a minimum sample size of 43 participants would be required to detect a large effect of R^2 = .26 (Cohen's f^2 = .35) to achieve a power (1-β) of .80 with a significance level (α) of .05 as recommended by Cohen (1992), estimated with reference to other Western Studies (Coplan et al., 2008; Degnan et al., 2008; Hane et al., 2008). For Study 3, a minimum sample size of 34 participants would be required to detect a medium effect size of η_p^2 = .06 (Cohen's f = .25) for between-group interaction with two repetitions of assessment used to achieve a power (1 - β) of .80 with a significance level (α) of .05 as recommend by Cohen (1992), estimated with reference to a similar Western study (Kennedy et al., 2009). For Study 2, a minimum sample size of 200 participants would be required to achieve acceptable

fix indices for Structural Equation Modeling of typical complexity based on the rule of thumb recommended by Hoyle and Gottfredson (2015).

The present research aimed to collect a large sample of questionnaire data about young children as provided by their parents and teachers at three time points for a short-term longitudinal study on the reciprocal and transactional effects between children's temperamental inhibition, children's social development outcomes, and parenting practices (Study 2). A total of 673 sets of questionnaires were initially distributed to the 10 kindergartens located in different districts in Hong Kong for inviting parents and teachers to participate in the research program. In the first wave, 572 parents filled out and returned the questionnaires with a response rate of 78.3%. In the second wave, 421 questionnaires were returned with an attrition rate of 26.4%. And in the third wave, 352 questionnaires were returned with an attrition rate of 16.4%. Thus, eventually both parent and teacher questionnaire data were collected for a total of 352 children across three time points within a 12-month period from the 10 participating kindergartens. This satisfied the minimum sample size for Study 2.

From this larger sample, two sub-samples were taken, one enriched with observational data for the investigation of the additive and interactive effects between child temperamental inhibition and maternal parenting practices in predicting children's social development outcomes concurrently and prospectively (Study 1) and another for a randomized controlled trial of a parenting intervention for temperamentally inhibited children (Study 3).

Four hundred and eighty-seven participants from 8 kindergartens selected from the original sample were screened for children whose level of Behavioral Inhibition fell within the highest 20% (Rosenbaum et al., 1993), as rated by their kindergarten

teachers using the Behavior Inhibition Questionnaire (BIQ; Bishop et al., 2003) at time point 1. However, nine participants whose children had been formally diagnosed with one or more mild childhood disorders and thus enrolled in the *integrated program* (Education Bureau, The Government of the Hong Kong Special Administrative Region, 2015) at their attending kindergartens were excluded in this sample. Parents of these 88 children were invited by letter through the school administration to participate in a parent training and an additional assessment. Parents were told that their children were identified with a shy temperament and a parent training service would be provided to them that would help them in parenting their children. They were also invited to visit the research center at the university with their child for whom the parent questionnaire was filled for a 30-minute observational assessment.

A total of 57 out of the 88 invited participants replied to express their consent to participate in the observational assessment and parent training but eventually only 45 parent-child dyads received the lab observational assessment successfully. A second written informed consent was obtained from each visiting parent before the lab observational assessment was administered. For the parent training, 29 participants were randomly assigned to an intervention group to receive the first offering immediately and the remaining 28 participants formed the waitlist control group and were told that they were enrolled in a second offering to be delivered at a later time. However, eventually only parents of 25 children from the intervention group participated in the parent training. This constituted the sample for the randomized controlled trial in Study 3, meeting the minimum sample size, to be further described in detail below.

To acquire a sample for Study 1 with maximized data variation in children's temperamental inhibition, participants from the 8 kindergartens selected earlier from the larger sample were again screened using the BIQ scores assessed by teachers at time point 1 for children who fell outside of the highest 20% of inhibited children. From these participants, parents of children with BI within the lowest 20%, and parents of half of the children with BI within the middle range randomly selected, were invited to the observational assessment using a similar invitation letter without the verbiage on parent training. Eventually, 18 dyads from the lowest 20% and 25 dyads from the middle 60% received the lab observational assessment successfully. A second written informed consent was obtained from each visiting participant before the lab observational assessment was administered.

To summarize, 88 participants had attended the observational assessment which include 45 dyads with inhibited children, 18 dyads with uninhibited children and 25 dyads with children who were neither inhibited nor uninhibited. Since the parents of 25 dyads with inhibited children were already selected to receive the parenting intervention immediately, they were excluded from the sample for Study 1 (and the sample for Study 2). In addition, 6 of the remaining dyads were pairings of child and non-mother caregiver and were therefore also not included in the sample. The final sample for Study 1 consisted of 56 mother-child dyads, composed of 19 participants whose levels of BI were highest (top 20%), 16 participants whose levels of BI were lowest (bottom 20%) and 21 participants whose levels of BI were in between (middle 60%). This satisfied the minimum sample size.

No monetary incentives were offered to the participants nor the kindergartens in the present research program except the participants who visited the research center for the lab observational assessment. To provide some incentive for these

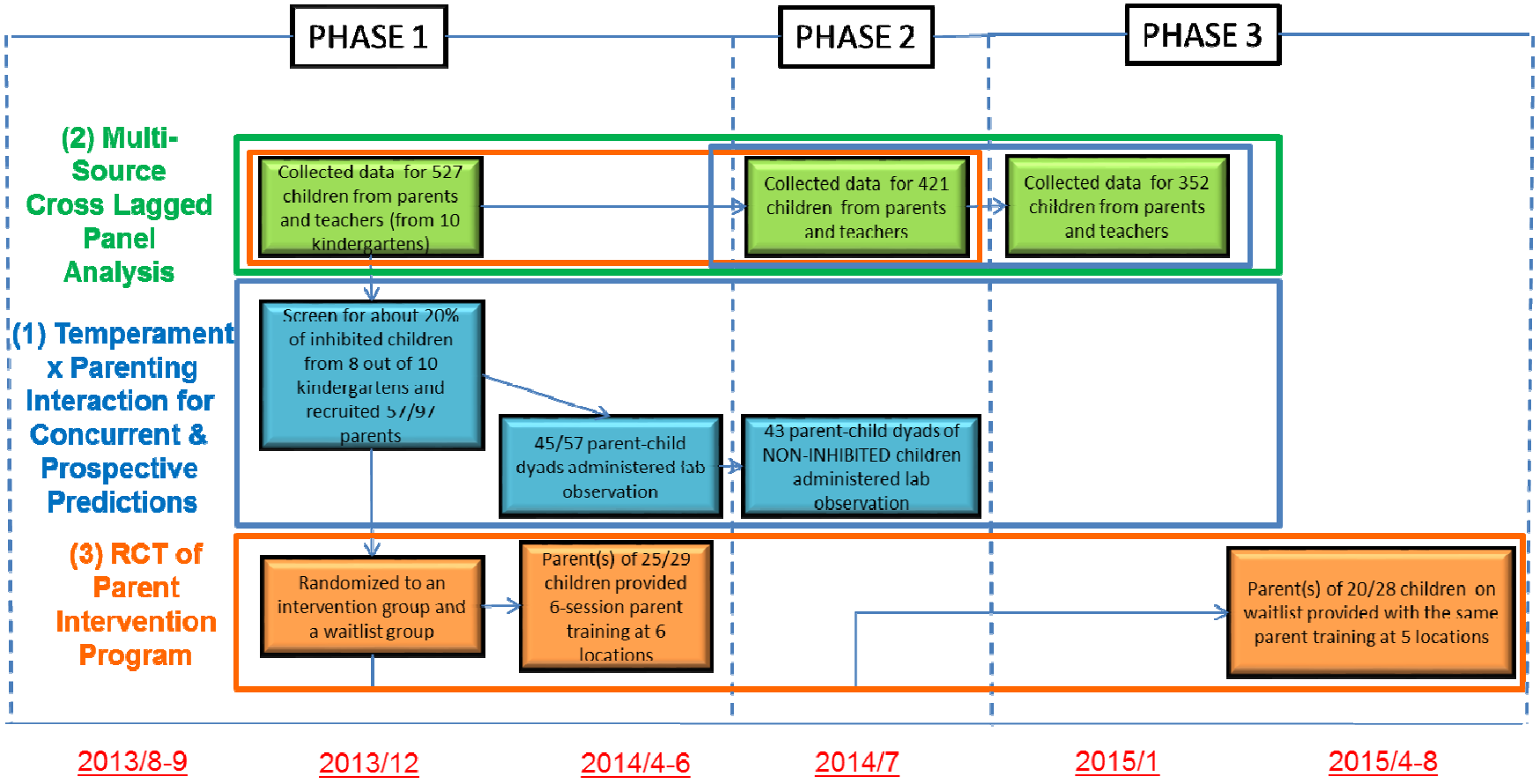

Figure 3.1. Sampling and project activities for the three studies of the present research.

participants to attend the laboratory visit, each participating parent was compensated for transportation fees with two supermarket coupons worth HK$100.

Randomized Controlled Trial (RCT)

As mentioned before, 487 participants from eight local kindergartens were screened for children whose level of BI fell within the highest 20% (Rosenbaum et al., 1993), as rated by their kindergarten teachers using the Behavior Inhibition Questionnaire (Bishop et al., 2003) at the beginning of the school year. Ninety-seven children were assessed to be eligible to meet the inclusion criteria for participating in the program. However, 9 children had been found to have later enrolled in the integrated program for special educational needs at their attending kindergartens and therefore were excluded from the recruitment. Parents of the remaining 88 children were invited by letter through the school administration to participate in the program. Thirty-one participants declined to participate.

Parents of a total of 57 children (35 boys, 22 girls) replied to express their consent to participate. The mean age of the children was 3.91 (*SD* = .60), ranging from 3.01 to 5.29 years. They were randomly assigned to an intervention group of 29 participants and a waitlist control group of 28 participants based on a simple computerized random number generation procedure using the Microsoft Excel RAND function (Microsoft, 2016) performed by the author. Welcome letters were sent to parents of the intervention group on the training schedule. Letters were also sent to the control group to inform them that they were enrolled in a second offering to be delivered later. However, 8 participants from the control group withdrew from the training program. Subsequently, when the program was delivered to the intervention group, 4 participants declined to attend.

About three months into the school year, after being trained by the author on how to use a battery of measures, class teachers from the participating kindergartens who observed the children on a daily basis assessed children's levels of temperamental inhibition, anxious shyness, regulated shyness, social initiative and internalizing problems. About three months after the parent training was delivered, the same teachers completed the measures again for their students. Since the second assessment was conducted before the end of the school year, the same teachers provided the data before and after the parenting intervention. Both pre-intervention and post-intervention assessments were completed for all participating children who provided consent to participate in the program, including the four children from the intervention group whose parents did not attend the training.

Figure 3.2 is the CONSORT flowchart (Moher et al., 2012; Moher, Schulz, & Altman, 2005) summarizing the recruitment, randomization and analysis of the participants in the present RCT for Study 3. The Intention-to-Treat (ITT) sample was composed of 29 participants from the intervention group and 20 participants from the control group. The Per Protocol (PP) sample consisted of 25 participants from the intervention group and 20 participants from the control group.

Parent intervention program

The present investigation selected the *Cool Little Kids* parent training program as an early intervention for the temperamentally inhibited children due to its brevity and evidence base as demonstrated in previous studies in the literature (Kennedy et al., 2009; Rapee et al., 2005; Rapee, Kennedy, et al., 2010). Permission was sought directly from the developer and granted with the provision of the training package by email (R. Rapee, personal communication, August 8, 2012). Meanwhile, the author

was given a contact point from the Department of Health under the Hong Kong SAR Government to request a version of the manuals translated into traditional Chinese. The Chinese version of the training package was provided by the Department of Health upon completion of the translation in February, 2013 (Rapee, Lau, & Kennedy, 2013a, 2013b). A subsequent update on the program implementation was provided by the author to the program developer by email (R. Rapee, personal communication, May 13, 2014) as well as a brief face-to-face communication subsequently in Hong Kong (R. Rapee, personal communication, June 25, 2014).

The author's thesis supervisor, a registered clinical psychologist in Hong Kong, had reviewed the training materials with the author before the program was implemented. He had since maintained his oversight of the delivery of this parenting intervention program to the target participants in the present research.

As mentioned, all training materials including a therapist's manual (Rapee, Lau, & Kennedy, 2010a) and a parent's workbook (Rapee, Lau, & Kennedy, 2010b) with exercise forms from the original *Cool Little Kids* program package were translated into traditional Chinese for use in Hong Kong by the Department of Health under the Government of the Hong Kong Special Administrative Region (Rapee et al., 2013a, 2013b).

The standard six-session *Cool Little Kids* program was delivered at six kindergarten locations for the intervention group of parents. Each session lasted about 90 minutes. The six sessions were mostly separated by one week and in some cases two weeks due to scheduling difficulties. The participating parent(s) of each child was given a training workbook with homework tasks assigned in each session for practicing the skills and tools learned from the training with their child at home.

The training was conducted by following the structure of each session based on the therapist's manual from the *Cool Little Kids* program package. During each training session, topics were first explained conceptually before practical parenting skills were introduced with real-life examples. For instance, parents were first made aware that shy children may often demand help from parents and parents may habitually offer assistance even when children do not need it, thus discouraging their independence. Examples were then used to illustrate such overprotective parenting behavior. Parents were encouraged to share their experiences through group discussions to ensure the topics were well received. Afterwards, practical skills and tools were introduced to help parents improve on the interactions with their inhibited children. In particular, worksheets to guide parents in establishing effective parenting strategies and apply such skills as graded exposure are often employed. Two sample worksheets used in the training can be found Appendix V for reference.

In each session, practice tasks would be assigned for parents to attempt with children at home. Starting from the second session, the homework tasks attempted since the previous session were reviewed and any difficulties in applying the skills were addressed with recommendations provided by the trainer. The author delivered about 75% of all training sessions. The other 25% was delivered by another trainer with a Master's degree in parenting education. The second trainer was trained by observing how the first author delivered the initial training sessions. To maximize the fidelity to the original program, a training checklist developed from the therapist's manual was used by each trainer to ensure all topics were covered in each session. The trainer filled out the checklist to indicate topics fully covered as outlined in the therapist's manual for each training session completed. A sample checklist is provided for reference in Appendix IV.

After the post-intervention assessment was completed for all children of parents who participated in Study 3, training sessions covering the same contents of the *Cool Little Kids* program were delivered at five kindergarten locations to the control group of participants.

Instrumentation

A number of parent-rated and teacher-rated measures were administered at three time points to assess children's levels of temperamental inhibition and such development outcomes as levels of anxious and regulated shyness, social initiative, internalizing problems, and academic competence as well as parents' parenting styles. These questionnaire data were used in all three studies. Moreover, observational methods were administered to assess children's temperamental inhibition and maternal parenting behaviors to obtain additional data for Study 1. These instruments are summarized in Table 3.1 and described in detail below.

Parent- and teacher-rated measures

Behavioral Inhibition Questionnaire (BIQ). Both the parent version and the teacher version of the BIQ (Bishop et al., 2003) were administered in the present investigation. The parent version contains 30 items spanned across six contexts reflecting behavioral inhibition in 3 domains: social novelty (unfamiliar adults, 4 items, e.g., "is very quiet around new (adult) guests to our home"; peers, 6 items, e.g., "will happily approach a group of unfamiliar children to join in their play", performance situations, 4 items, e.g., "enjoys being the center of attention"), situational novelty (separation and preschool, 4 items, e.g., "quickly adjusts to new situations (e.g., kindergarten, preschool, childcare)"; unfamiliar situations in general,

8 items, e.g., “seems comfortable in new situations”), and physical challenges with a minor risk of injury (4 items, e.g., “happily explores new play equipment”). The teacher version of the BIQ (Bishop et al., 2003) contains 28 items spanned across the same six contexts with two irrelevant items in the school setting removed from the context of general unfamiliar situations. A parent or teacher is asked to rate from 1 (hardly ever) to 7 (almost always) on a Likert scale against each item that indicates how frequently the behavior described in the item occurs for his/her child or student.

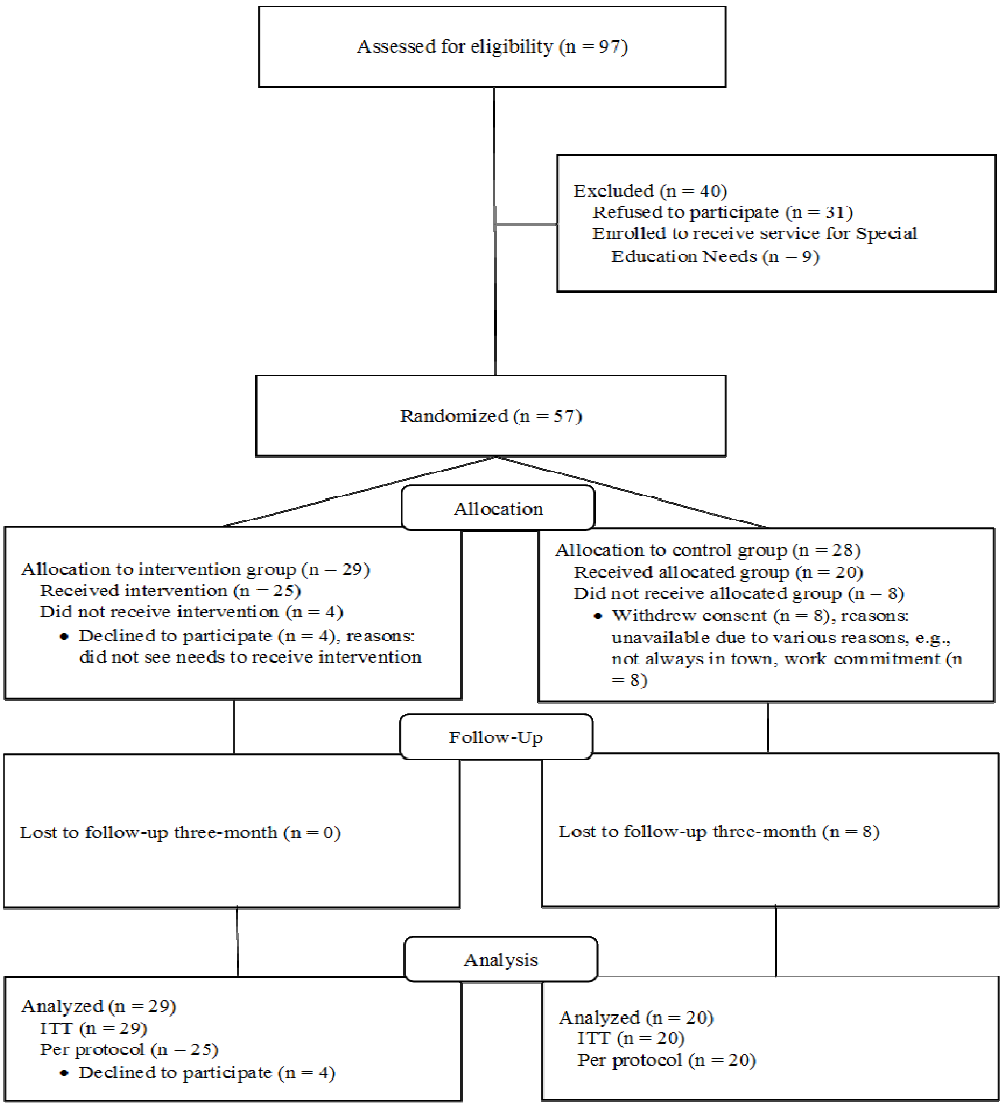

Figure 3.2. CONSORT flow diagram for the present randomized controlled trial.

The BIQ yields a Total BI score as a measure of overall BI. In addition, individual subscale ratings for the six different contexts can be computed. The mean of the scores belonging to each context is computed as an individual subscale rating. The Total BI rating is computed as the mean of the individual subscale ratings. Each rating will range from 1 to 7.

Table 3.1. Constructs and measures in the present investigation.

Construct / Variable	**Method**	**Measure / Instrument**
Behavioral Inhibition	Parent/Teacher rating scale (30 & 28 items, respectively)	Behavioral Inhibition Questionnaire (BIQ; Bishop et al., 2003)
Behavioral Inhibition	Parent/Teacher rating scale (8 items)	Behavioral Inhibition Scale (BIS; van Brakel & Muris, 2006)
Temperamental Inhibition	Observational method	Temperamental Inhibition Scale (TIS); see below
Chinese Shyness - Anxious Shyness (AS) and Regulated Shyness (RS)	Teacher rating scale (5 + 5 items)	Chinese Shyness Scale (CSS; Xu et al., 2009; Xu et al., 2007)
Social Initiative (SCI-SI)	Parent/Teacher rating scales (8 items)	Social Competence Inventory (SCI; Rydell, Hagekull, & Bohlin, 1997)
Internalizing Problems and Socially Withdrawn, Socially Anxious and Asocial Behaviors	Parent rating scale (36 items for internalizing problems); teacher rating scales (10 items for internalizing problems)	Child Behavior Checklist for Ages 1½-5 (CBCL/1½-5; Achenbach & Rescorla, 2000) – Internalizing Syndrome Score (CBCL_INTERNAL), Withdrawal (CBCL_WD), Anxious Problems (CBCL_ANXP) Child Behavior Scale (CBS; Ladd, 2010) – Internalizing Subscales (CBS_INTERNAL), Asocial with Peers (CBS_AS)
Academic competence	Teacher rating scale (15 items)	Behavior academic competence (TBAC; Fuchs-Beauchamp, 1996; Leung, Lo, & Leung, 2012)
School Readiness	Teacher rating scale (6 items)	Gumpel School Readiness Inventory (GSRI; Gumpel, 1999; Ho, Leung, & Lo, 2013)

Table 3.1. Constructs and measures in the present investigation (cont'd)

Construct / Variable	**Method**	**Measure / Instrument**
Authoritative and Authoritarian Parenting Styles and Dimensions	Parent self-report scale (32 items)	Parenting Styles and Dimensions Questionnaires – Short Form (PSDQ-SF; Robinson et al., 2001; Tse, 2011) Authoritative Parenting Style (PSDQ_AUTHORITATIVE), Authoritarian Parenting Style (PSDQ_AUTHORITARIAN), Connection (PSDQ_CON), Regulation (PSDQ_REG), Autonomy Granting (PSDQ_AUT), Physical Coercion (PSDQ_PHY), Verbal Hostility (PSDQ_VER), Non-reasoning, punitive strategies (PSDQ_NON)
Parental Overprotection	Parent self-report scale (5 items)	Parenting Overprotection Scale (POS; Coplan et al., 2004)
Maternal Positive Protection (MPP) and Maternal Positive Support (MPS)	Observational method	Parental Warmth and Control Scale (PWCS; Rubin & Cheah, 2009; Rubin et al., 2001); see below

The internal consistency of the BIQ Total scale and all subscales were reported to be satisfactory with Cronbach's alphas ranging from .80 to .95, and moderate stability over a 12-month retest was found to be acceptable (Bishop et al., 2003). The BIQ was translated into traditional Chinese for use in the present investigation.

Behavioral Inhibition Scale (BIS). The BIS (van Brakel & Muris, 2006) consists of 4 pairs of items for the assessment of four types of inhibited behavior when the child has to speak to either an unfamiliar adult or an unfamiliar child, in terms of shyness, fearfulness, lack of communication, and smiling. Examples are such items as "My child is shy when he/she has to talk to an unfamiliar child", "My child is shy when he/she has to talk to an unfamiliar adult", and "My child feels good and is able to laugh when he/she talks to an unfamiliar child". Items are rated on a 4-point Likert scale with 1 being 'never', 2 being 'sometimes', 3 being 'often' and 4 being 'always'.

With the positive items recoded, the scores are averaged to yield a Total BIS score. The BIS was found to be reliable in terms of internal consistency with Cronbach's alphas ranging from .88 to .95, and fairly stable over a 2-year period (van Brakel & Muris, 2006). The present investigation administered the BIS with both parents and teachers. The BIS was translated into traditional Chinese for use in the present research.

Chinese Shyness Scale (CSS). The CSS was developed to measure Chinese shyness (Xu et al., 2007) and can be used as a teacher-rating measure (Xu et al., 2009). Teachers are asked to rate children's anxious shyness (AS; 5 items) and regulated shyness (RS; 5 items) on a 5-point Likert scale with 1 indicating 'not at all true' and 5 indicating 'very true' about each description of child behavior. Examples of AS items are "is afraid to join or approach peer play groups" and "does not initiate peer contact". Examples of RS items are "behaves modestly" and "avoids conflict with peers". The teacher-rated CSS was found to be reliable in terms of internal consistency with Cronbach's alphas reaching .81 for AS and .86 for RS (Xu et al., 2009). The original scale in simplified Chinese was converted into traditional Chinese for use in the present investigation after the first author reviewed the items to confirm their clarity and comprehensibility to local participants.

Social Competence Inventory (SCI). The SCI is a 25-item inventory developed by Rydell et al. (1997) to measure two aspects of social competence, i.e., Prosocial Orientation (17 items) and Social Initiative (8 items). SCI is rated on a 5-point Likert scale with 1 indicating 'doesn't apply at all' and 5 indicating 'applies very well to the child'. Examples of Prosocial Orientation items are "has capacity for generosity to peers" and "helps peer tidy up/search for lost items". Examples of Social Initiative items are "makes contact easily with unfamiliar children" and "leads

play activities". The scale was reported to possess acceptable test-retest reliability and internal consistency with Cronbach's alphas reaching .88 for Prosocial Orientation subscale and .76 for Social Initiative subscale. The present investigation administered the SCI with both parents and teachers but used only the Social Initiative subscale as a measure of children's social competence. The scale was translated into traditional Chinese for use in the present study.

Child Behavior Checklist for Ages 1½-5 (CBCL/1½-5). The CBCL is a well-developed instrument from the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2000). The CBCL/1½-5 is rated by parents or any others who see the children of preschool age in family settings. This instrument measures seven syndrome scales: Emotionally Reactive, Anxious/Depressed, Somatic Complaints, Withdrawn, Sleep Problems, Attention Problems, and Aggressive Behavior. 99 Items are scored on a scale from 0 to 2 for 'Not True' (0), 'Somewhat or Sometimes True' (1), and 'Very True or Often True' (2). In addition, item 100 allows the respondent to describe any additional problems not listed, at most 3, and rate them on the same scale. The form also includes three open-ended items for respondent to describe any illnesses or disabilities that the child has, what concerns the respondent most about the child, and the best things about the child, respectively, so that the respondent may provide a picture of the child in his/her own words.

In addition to the seven syndrome scales, the CBCL/1½-5 provides three scores for groupings of syndromes. The Internalizing score is computed by summing the scores for the four internalizing syndromes, namely, the Emotionally Reactive (e.g., "disturbed by change"), Anxious/Depressed (e.g., "feeling hurt"), Somatic Complaints (e.g., "doesn't eat well") and Withdrawn (e.g., "avoids eye contact")

subscales. The Externalizing score is computed by summing the scores for two externalizing syndromes, namely, the Attention Problems (e.g., "can't concentrate"), and Aggressive Behavior (e.g., "hits others") subscales. Lastly, the Total Problems score is the sum of the scores on the 99 specific problem items, plus the highest score of item 100.

Moreover, the CBCL/1½-5 also provides 5 DSM-oriented subscales for Anxiety Problems, Affective Problems, Pervasive Developmental Problems, Attention Deficit/Hyperactivity Problems and Oppositional Defiant Problems.

Test-retest reliability of the CBCL/1½-5 were reported in the ASEBA manual as satisfactory with a mean test-retest correlation of .85 among all syndrome and DSM-oriented subscales as well as the Internalizing, Externalizing and Total Problems scales. In particular, the test-retest reliability correlations were .80, .85 and .90 for the Withdrawn syndrome, DSM Anxiety Problems subscale and Internalizing syndrome group, respectively, used in the present investigation. Internal consistency in Cronbach's alphas among all scales were reported to range from .63 to .95, with .75, .63, and .89 for the Withdrawn syndrome, DSM Anxiety Problems subscale and Internalizing syndrome group, respectively.

The present investigation used the CBCL/1½-5 to measure children's overall Internalizing Problems and the negative social outcomes of Withdrawal and Anxiety Problems, expected to be related to temperamental inhibition. The CBCL/1½-5 has been translated into traditional Chinese. This Chinese version was used in the present investigation.

Child Behavior Scale (CBS). The CBS is a teacher-rated instrument developed to measure children's and adolescents' behaviors and relations with peers within

classroom contexts (Ladd, 2010; Ladd, Herald-Brown, & Andrews, 2009; Ladd & Profilet, 1996). The constructs being measured include:

- Two forms of externalizing behavior, i.e., Aggressive with Peers (7 items) and Hyperactive-Distractible (4 items)
- Two forms of internalizing behavior, i.e., Asocial with Peers (6 items) and Anxious-Fearful (4 items)
- One form of social/behavior competence, i.e., Prosocial with Peers (7 items)
- One form of peer rejection, i.e., Excluded by Peers (7 items)

The CBS contains a total of 59 items. In addition to the 35 items for the above subscales, the remaining 24 items are "filler" items to discourage respondents from forming hypotheses about the scales' underlying constructs and attenuate such a potential response bias (Ladd, 2010). Each item is rated on a 3-point Likert scale with 1 being 'doesn't apply', 2 being 'applies sometimes', and 3 being 'certainly applies'.

The stability of the 6 subscales was found to be relatively stable over time and their internal consistency was found to be acceptable based on a study collecting data from two cohorts of 5-year-old children (Ladd & Profilet, 1996). Cronbach's alphas for the six subscales were .71 for Aggressive with Peers .65 for Prosocial with Peers, .59 for Asocial with Peers, .67 for Excluded by Peers, .68 for Anxious-Fearful, and .83 for Hyperactive-Distractible. Selected examples of items are "fights" (Aggressive with Peers), "cooperate with peers" (Prosocial with Peers), "prefers to play alone" (Asocial with Peers), "not chosen as playmate" (Excluded by Peers), "cries easily" (Anxious-Fearful), and "restless, doesn't keep still" (Hyperactive-Distractible).

The present investigation used the CBS to measure children's Internalizing Problems and the negative social outcome of Asocial with Peers. The CBS was translated into traditional Chinese for use in the present study.

Teacher-rated Behavior Academic Competence (TBAC). The TBAC was developed by Leung et al. (2012) based on the Behaviour Rating Scale for Presented Academic Self-Esteem in Young Children (Fuchs-Beauchamp, 1996). Only positive statements from the original scale were adopted and one of the statements was split into two items as it consisted of two concepts (preference of activities that stretch ability versus setting high goals). The original TBAC had 16 items to be rated on a 4-point Likert scale (1 = never, 2 = seldom, 3 = sometimes, 4 = always) about children's academically competent behavior. Examples are "eager to try new things" and "make good eye contact". Unidimensionality of the scale was confirmed using Rasch analysis with infit and outfit statistics found within recommended range (.60 – 1.40) for all items except one ("smiles readily, face not sad"). This exceptional item was dropped. The scale was validated with both parent-rating (PBAC-15) and teacher-rating (TBAC-15) data. In terms of reliability, the internal consistency estimates in Cronbach's alphas of both the PBAC-15 and TBAC-15 were above .80. Test-retest reliability (intraclass correlation) was found to be satisfactory reaching around .70. Both versions of the scale are recommended to be used with preschool-aged children. The scale is already in traditional Chinese. Only the TBAC was used in the present investigation.

Gumpel School Readiness Inventory (GSRI). The six-item GSRI was developed by Gumpel (1999) to measure the grade 1 readiness of kindergarten children. The six items are rated on a 4-point Likert scale. Internal consistency as reported by (Gumpel, 1999) is acceptable with an alpha of .86. Examples of items are "is able to

work independently without help from an adult" and "pays attention during class". This scale was translated into traditional Chinese and validated by Ho et al. (2013) for use in Hong Kong. This instrument was used as a teacher-rated scale in the present investigation.

Parent self-report measures

Parenting Styles and Dimensions Questionnaire – Short Form (PSDQ-SF). The Parenting Styles and Dimensions Questionnaire (PSDQ; Robinson et al., 2001) was used for parents to self-report her/his parenting styles and dimensions. The PSDQ measures the three parenting styles, namely, Authoritative, Authoritarian and Permissive parenting. Moreover, it also measures parenting dimensions under each style. The present investigation used the short form of the PSDQ (PSDQ-SF) validated and translated by Tse (2011) to measure the authoritative and authoritarian parenting styles and the parenting dimensions under these two styles.

The PSDQ-SF consists of 32 items measuring three dimensions under authoritative parenting (connection, 5 items, e.g., "encourages child to talk about the child's troubles"; regulation, 5 items, e.g., "gives child reasons why rules should be obeyed"; and autonomy granting, 5 items, e.g., "shows respect for child's opinions by encouraging child to express them"), three dimensions under authoritarian parenting (verbal hostility, 4 items, e.g., "yells or shouts when child misbehaves"; corporal punishment, 4 items, e.g., "spanks when our child is disobedient"; and nonreasoning/punitive strategies, 4 items, e.g., "uses threats as punishment with little or no justification"), and one dimension (indulgent, 5 items, e.g., "states punishments to child and does not actually do them") under permissive parenting. Each item is rated on a 5-point Likert scale with 1 being 'never', 2 being 'once in a while', 3

being ‘about half the time’, 4 being ‘very often’, and 5 being ‘always’, to indicate how often each behavior is exhibited. Both an authoritative rating and an authoritarian rating are computed as the mean of the three belonging dimensions under each scale. Cronbach’s alphas reported by Tse (2011) were .86 for the authoritative scale and .77 for the authoritarian scale.

Parent Overprotection Scale (POS). The 5-item Parent Overprotection Scale (POS; Coplan, Reichel, & Rowan, 2009) was used for parents to self-report overprotective parenting behavior. Each item is rated on a 5-point Likert scale with 1 being ‘never’, 2 being ‘once in a while’, 3 being ‘about half the time’, 4 being ‘very often’, and 5 being ‘always’, to indicate how often each of the five behaviors is exhibited (e.g., “I’ll readily intervene if there is a chance my child will fail at something”). The scale was used in a few previous studies with Cronbach’s alpha reaching .89 (Coplan et al., 2008; Coplan et al., 2004; Coplan et al., 2009). The POS was translated into traditional Chinese for use in the present investigation.

Scale translation method

The BIQ, BIS, SCI, CBS and POS were translated into traditional Chinese for use in the present investigation. All items were forward-translated into Chinese and back-translated into English by two Hong Kong Chinese translators fluent in both English and Chinese. To assure quality in the translation of the two scales, a panel with three members was established to review the translated items. All three reviewers were academics currently working in local universities with a Ph. D. in psychology. They were all fluent in both English and Chinese.

The reviewers were given detailed instructions on how to perform the review with the objective to assess the accuracy and appropriateness of the translation. For each

item, each panelist was asked to compare its original English version and its back-translated English version and rate their correspondence as either 'Excellent', 'Good', 'Fair', or 'Poor'. For any item that received a rating of either 'Fair' or 'Poor', the panelists were asked to provide specific comments and suggest a better Chinese translation. After receiving all reviewers' comments, the author conducted a final review by incorporating the suggestions in the final translation of these scales.

Internal consistency and stability

The internal consistency of all parent-rated and teacher-rated scales were assessed using Cronbach's alphas. Table 3.2 shows the alphas for all the variables used in the present investigation that were collected across all three time points.

As can be seen, most scales possessed either acceptable or satisfactory internal consistency with Cronbach's alphas reaching at least .65 with the majority in the range from .70 to .90 based on data collected in all three waves. The exceptions are the Physical Challenges subscale of the BIQ as rated by both teachers and parents with alphas ranging from .39 to .61 and the Non-reasoning, Punitive Strategies subscale of the PSDQ as rated by parents with alphas ranging from .50 to .52. The lower internal consistency indicates that the BIQ Physical Challenges subscale, in contrast to the original study with Western participants (Bishop et al., 2003), may not be as reliable for assessing children's behavioral inhibition among Chinese children but this subscale was retained for computing the overall level of BI for the children in the present investigation in order for the findings to be compared with Western studies. The Non-reasoning, Punitive Strategies subscale appears to be also not highly reliable for characterizing an aspect of authoritarian parenting among Chinese parents as expected in the original parenting theories (Baumrind, 1971; Robinson et

al., 1995). Further analyses to compare this finding with Tse's (2011) results are warranted in future studies.

Table 3.2. Internal consistency of questionnaire variables.

Variable	Variable Description	Cronbach's Alpha		
		Wave 1	Wave 2	Wave 3
TBIQ_ADULTS	Teacher-rated BI to unfamiliar adults	0.782	0.839	0.583
TBIQ_PEERS	Teacher-rated BI in unfamilier peers	0.734	0.711	0.761
TBIQ_PERF	Teacher-rated BI in performance situations	0.758	0.829	0.879
TBIQ_PHYS	Teacher-rated BI to physical challenges	0.614	0.596	0.592
TBIQ_SEPPRE	Teacher-rated BI in separation or preschool situations	0.845	0.813	0.858
TBIQ_UNFAM	Teacher-rated BI in unfamilier situations	0.839	0.837	0.863
TBIQ_TOTAL	Teacher-rated Total BIQ rating	0.874	0.890	0.909
TBIS_ADULT	Teacher-rated BI to unfamiliar adults	0.810	0.810	0.791
TBIS_CHILD	Teacher-rated BI to unfamiliar adults	0.789	0.792	0.794
TBIS_TOTAL	Teacher-rated Total BIS rating	0.875	0.885	0.890
CBS_AS	CBS - Asocial with Peers	0.828	0.831	0.847
CBS_INTERNAL	CBS - Internalizing Problems	0.690	0.586	0.674
TSCI_INITIATIVE	Teacher-rated Social Initative	0.820	0.828	0.839
TBAC	Teacher-rated Behavior Academic Competence	0.947	0.935	0.946
GSRI	Gumpel School Readiness Inventory	0.830	0.868	0.866
CSS_REGULATED	Chinese Regulated Shyness	0.882	0.788	0.903
CSS_ANXIOUS	Chinese Anxious Shyness	0.876	0.830	0.873
PBIQ_ADULTS	Parent-rated BI to unfamiliar adults	0.809	0.777	0.813
PBIQ_PEERS	Parent-rated BI in unfamilier peers	0.765	0.735	0.763
PBIQ_PERF	Parent-rated BI in performance situations	0.795	0.774	0.798
PBIQ_PHYS	Parent-rated BI to physical challenges	0.419	0.387	0.419
PBIQ_SEPPRE	Parent-rated BI in separation or preschool situations	0.849	0.846	0.845
PBIQ_UNFAM	Parent-rated BI in unfamilier situations	0.801	0.811	0.798
PBIQ_TOTAL	Parent-rated Total BIQ rating	0.814	0.794	0.786
PBIS_ADULT	Parent-rated BI to unfamiliar adults	0.803	0.767	0.799
PBIS_CHILD	Parent-rated BI to unfamiliar adults	0.790	0.751	0.743
PBIS_TOTAL	Parent-rated Total BIS rating	0.877	0.863	0.864
CBCL_WD	CBCL - Withdrawan	0.792	0.801	0.797
CBCL_INTERNAL	CBCL - Internalizing Problems	0.869	0.878	0.861
CBCL_ANXP	CBCL - DSM Anxiety Problems	0.707	0.740	0.727
PSCI_INITIATIVE	Parent-rated Social Initiative	0.731	0.753	0.748
PSDQ_CON	PSDQ - Connection	0.757	0.761	0.806
PSDQ_REG	PSDQ - Regulation	0.776	0.819	0.813
PSDQ_AUT	PSDQ - Autonomy Granting	0.723	0.747	0.772
PSDQ_PHY	PSDQ - Physical coercion	0.663	0.648	0.517
PSDQ_VER	PSDQ - Verbal hostility	0.658	0.776	0.732
PSDQ_NON	PSDQ - Non-reasoning, punitive strategies	0.501	0.500	0.523
PSDQ_AUTHORITATIVE	PSDQ - Authoritative Parenting	0.830	0.841	0.856
PSDQ_AUTHORITARIAN	PSDQ - Authoritarian Parenting	0.736	0.772	0.698
POS	Parental Overprotection Scale	0.728	0.750	0.751

The stability of all parent-rated and teacher-rated scales were assessed using Pearson's correlation. Table 3.3 shows the stability coefficients for all variables used in the present investigation that were measured between time point 1 and time point 2 over 6 months, between time point 2 and time point 3 over 6 months, and between time point 1 and time point 3 over 12 months, respectively.

Table 3.3. Stability of questionnaire variables.

Variable	Variable Description	Stability Coefficients		
		Wave 1 > Wave 2 (6 months)	Wave 2 > Wave 3 (6 months)	Wave 1 > Wave 3 (12 months)
TBIQ_ADULTS	Teacher-rated BI to unfamiliar adults	.705**	.562**	.501**
TBIQ_PEERS	Teacher-rated BI in unfamilier peers	.683**	.575**	.498**
TBIQ_PERF	Teacher-rated BI in performance situations	.573**	.536**	.432**
TBIQ_PHYS	Teacher-rated BI to physical challenges	.555**	.542**	.438**
TBIQ_SEPPRE	Teacher-rated BI in separation or preschool situations	.656**	.605**	.538**
TBIQ_UNFAM	Teacher-rated BI in unfamilier situations	.670**	.524**	.462**
TBIQ_TOTAL	Teacher-rated Total BIQ rating	.757**	.656**	.584**
TBIS_ADULT	Teacher-rated BI to unfamiliar adults	.589**	.473**	.448**
TBIS_CHILD	Teacher-rated BI to unfamiliar adults	.531**	.552**	.516**
TBIS_TOTAL	Teacher-rated Total BIS rating	.588**	.549**	.521**
CBS_AS	CBS - Asocial with Peers	.560**	.510**	.422**
CBS_INTERNAL	CBS - Internalizing Problems	.660**	.524**	.431**
TSCI_INITIATIVE	Teacher-rated Social Initative	.720**	.639**	.604**
TBAC	Teacher-rated Behavior Academic Competence	.639**	.482**	.432**
GSRI	Gumpel School Readiness Inventory	.571**	.556**	.578**
CSS_REGULATED	Chinese Regulated Shyness	.616**	.496**	.459**
CSS_ANXIOUS	Chinese Anxious Shyness	.617**	.561**	.476**
PBIQ_ADULTS	Parent-rated BI to unfamiliar adults	.602**	.706**	.538**
PBIQ_PEERS	Parent-rated BI in unfamilier peers	.612**	.668**	.590**
PBIQ_PERF	Parent-rated BI in performance situations	.588**	.628**	.539**
PBIQ_PHYS	Parent-rated BI to physical challenges	.507**	.491**	.410**
PBIQ_SEPPRE	Parent-rated BI in separation or preschool situations	.745**	.725**	.640**
PBIQ_UNFAM	Parent-rated BI in unfamilier situations	.615**	.701**	.553**
PBIQ_TOTAL	Parent-rated Total BIQ rating	.704**	.750**	.638**
PBIS_ADULT	Parent-rated BI to unfamiliar adults	.595**	.622**	.494**
PBIS_CHILD	Parent-rated BI to unfamiliar adults	.600**	.615**	.518**
PBIS_TOTAL	Parent-rated Total BIS rating	.647**	.668**	.539**
CBCL_WD	CBCL - Withdrawan	.566**	.565**	.496**
CBCL_INTERNAL	CBCL - Internalizing Problems	.633**	.579**	.472**
CBCL_ANXP	CBCL - DSM Anxiety Problems	.521**	.477**	.402**
PSCI_INITIATIVE	Parent-rated Social Initiative	.650**	.705**	.618**
PSDQ_CON	PSDQ - Connection	.530**	.636**	.542**
PSDQ_REG	PSDQ - Regulation	.536**	.625**	.495**
PSDQ_AUT	PSDQ - Autonomy Granting	.547**	.522**	.449**
PSDQ_PHY	PSDQ - Physical coercion	.591**	.507**	.485**
PSDQ_VER	PSDQ - Verbal hostility	.558**	.631**	.490**
PSDQ_NON	PSDQ - Non-reasoning, punitive strategies	.309**	.375**	.274**
PSDQ_AUTHORITATIVE	PSDQ - Authoritative Parenting	.594**	.662**	.546**
PSDQ_AUTHORITARIAN	PSDQ - Authoritarian Parenting	.571**	.608**	.502**
POS	Parental Overprotection Scale	.505**	.589**	.502**

Note. ** $p < .01$ level (2-tailed).

All scales possessed moderate stability across the different time points over 6 months and 12 months with correlation coefficients ranging from .40 to .76 except the Non-reasoning, Punitive Strategies subscale of the PSDQ with noticeably lower stability (r = .27 to .38). As also shown with the assessment of internal consistency, compared to other PSDQ measures, this subscale lacks the expected reliability. Caution should be taken in interpreting results related to this parenting dimension.

Temperamental Inhibition and Maternal Parenting Assessment

The lab observational method developed and implemented by the present research for Study 1 measures both child temperamental inhibition and maternal parenting behaviors in one procedure. The observational instrument assessing children's temperamental inhibition was named the Temperamental Inhibition Scale (TIS) while the observational instrument measuring maternal parenting behaviors is known as the Parental Warmth and Control Scale (PWCS) adapted with permission from Rubin and Cheah (2009).

In a 30-minute session, four episodes are created for the measurement of a number of behavioral variables observed in a mother-child dyad. The procedure is intended for a temperamental assessment of preschool children aged 3 to 5 years who should have acquired the ability to speak but have not yet attended formal schooling in primary education. At the same time, maternal parenting behaviors are coded based on the coding scheme defined by Rubin and Cheah (2009).

A child and his/her mother are invited to attend an assessment session comprised of four episodes administrated by a female assessor. The session takes place in an observational activity room and is videotaped with cameras and audiotaped with a sound recorder in the room for later coding of variables. The devices are controlled

behind a one-way mirror from an observation room where the procedure administrator may view the activities as they take place. In each episode, the child is assessed by measuring one or more observed behaviors that reflect his/her level of temperamental inhibition in terms of the amount of speech, the volume at which sounds are made or words and sentences are verbalized, and latency in verbal responses to questions and prompts. Embedded in the first episode are three activities involving both the child and mother, i.e., a free play activity, a cleanup time, and a simple teaching task activity for the observation of mother-child interactions. These three activities are used to measure the mother's parenting behaviors and also allow the child to get familiar with the environment before the assessor starts her one-on-one interactions with the child later.

In each episode, the child's mother is present. Except during the cleanup and teaching task activities, the mother is asked to take only a reactive role. In particular, during the free play activity when the assessor is not present, the mother is asked to allow the child to play alone freely. In the cleanup and teaching task activities, the mother is asked to jointly perform the tasks with the child. In all episodes except the cleanup time and tasked-based activities, the mother is asked to sit on a sofa on one side of the activity room, a few feet away from where the child sits as each activity takes place. Table 3.4 below summarizes the activities and the behavioral variables to be measured in each episode.

Time sampling is used to divide each observational session into 1-minute time blocks for coding. The coding instructions used in the present observational protocol largely resemble Rubin and Cheah's (2009) procedure. Each assessment requires a coder to view the video recording of the child's and the mother's behaviors during the observational session. The coder first previews the entire 30-minute recording

and then restarts to watch the video a second time when the coding is performed on coding sheets.

All maternal behavioral variables are coded for each 1-minute time sample unit using the observational taxonomy defined in Rubin and Cheah's (2009) manual. Each variable is rated concurrently on a 3-point scale for each one-minute unit observed. TIS variables for the target child behaviors are coded on a 5-point Likert scale for speech volume and measured in seconds for latency to speak as defined in Table 3.4.

Table 3.4. The temperamental inhibition and maternal parenting observational procedure.

Episode	Activities	Measures
1. Greeting, Free Play, Clean-up and Joint Task • To capture and arouse child's interest • To observe mother-child interaction during free play and teaching task activity times • To establish rapport between child and assessor • Lasts about 20 minutes	1. Assessor meets with mother and child. After introducing herself to mother and learning the child's name, assessor greets child by calling the child's name ("Hi, <child's name>?") with a smile and only brief eye-contact and does not deliberately wait for child's verbal response. 2. Assessor brings mother and child to the activity room and once they enter the room, assessor takes mother and child around for a brief walk through the whole room for child to get familiar with the place. A set of toys are spread out on the table at the center of the room. Assessor asks mother to sit on a sofa on one side of the room, a few feet away from the table. Magazines are placed on the sofa for mother to read. Assessor then asks child to sit on a chair and play with any toys on the table for about 10 minutes in the mother's company. Assessor instructs mother to sit and just oversee the child while he/she plays alone freely, just like what child usually does at home. If mother asks if she can sit with	T1: Whether child verbally responds to assessor's greeting (e.g., "Yes", "Hello", "Hi") and the volume at which the response is verbalized such as No Speech (5-N), Whispering (4-W), Low (3-L) Volume, or Normal/Average (2-A) Volume, High (1-H) Volume (perhaps due to excitement) FP_PO / FP_PA / FP_HA / FP_NA / FP_PC / FP_NC: Mother's behaviors during the 10-minute child free play will be rated for 6 behavioral variables following Rubin and Cheah's (2009) procedure, to be elaborated below, namely, Proximity and Orientation, Positive Affect, Hostile Affect, Negative Affect, Positive Control (and Guidance) and Negative Control

Episode	Activities	Measures
	child, assessor responds and says, "You can if you want to but let your child play freely just like what he/she does at home." 3. Assessor leaves the room. 4. Assessor returns to the room after 10 minutes and asks child to clean up for the next activity. Assessor tells mother she can help child but may let child clean up freely like he/she does at home. Assessor tries not to help for the first two minutes. 5. While mother and child clean up the toys, assessor takes out a Lego set and put it on the table while helping to remove other toys. Assessor asks mother and child to make a model with the Lego pieces (e.g., a small farm). Assessor tells mother and child that they can play for five minutes with the Lego set. 6. Assessor excuses herself and leaves the room. 7. Assessor returns to the room in five minutes and asks mother to sit on the sofa and tells mother that she herself will now play with child for a while.	JT_PO / JT_PA / JT_HA / JT_NA / JT_PC / JT_NC: Mother's behaviors within the 5-minute joint task activity time will be rated for 6 behavioral variables following Rubin and Cheah's (2009) procedure.
2. Initial interaction with Assessor • To establish direct interaction and initial verbal communications between child and assessor through play • Lasts about 5 minutes	1. Assessor then sits with child at an angle for child to be able to see her facial expressions. Assessor praises the work done by child. Assessor smiles to child whenever she speaks. She then picks one thing that child and mother have made in the lego model and asks child what it is. 2. Assessor asks child to assist in putting away the lego pieces. 3. Assessor presents a bag out of which she takes three animal puppets and places them on the table. Assessor asks child to pick one to play.	T2: Latency to answer assessor's question to name one thing he/she made with mother T3: Whether child responds to assessor's question to name one thing he/she made with mother and the highest volume at which it is said (5-N, 4-W, 3-L, 2-A, 1-H)

Episode	Activities	Measures
	4. Assessor directs child to put the chosen puppet on his/her hand and assessor puts on one of the other puppets. 5. Assessor starts making some funny sounds with her puppet, pretending to be the animal, to elicit child to do the same with his/her puppet, for about 30 seconds to give child the opportunity to respond. 6. Assessor starts talking at a different voice imitating her puppet to speak and ask, "What's your name?" Assessor may continue with some natural conversation with child if child is able to respond.	T4: Latency of any sounds made by child to imitate his/her puppet upon elicitation by the assessor T5: Highest volume at which the imitated sounds made by child (5-N, 4-W, 3-L, 2-A, 1-H) T6: Latency to respond to assessor's question about his/her puppet's name. "I don't know" is not counted as an answer but naming the animal incorrectly is counted as a valid response for measuring latency. T7: Whether child responds to the question assessor asks about his/her puppet's name and the highest volume at which it is said (5-N, 4-W, 3-L, 2-A, 1-H)
3. Active participation with simple verbal responses • Actively involve child in a game requiring simple but explicit verbal communication • Lasts about 5 minutes	1. Assessor asks child to help put away puppets and assessor gets a deck of cards from a box and spreads them on the table. Each card contains an easy question requiring a simple answer with associated pictures to illustrate what answer(s) are expected (e.g., a child's ear, a park, automobiles.) 2. Assessor and child take turns to draw a card, assessor reads the question, and assessor and child take alternate turns to answer each question. For each individual question selected, assessor also presents relevant pictures to hint and illustrate what answer(s) are expected. Assessor asks child to answer a question card three times while she also answers chosen questions alternately. 3. Assessor takes opportunity to ask child three times during the game, "Whose turn to draw now?"	T8: Shortest latency to answer to any question prompted by the question card T9: Highest volume at which any such answer is said (5-N, 4-W, 3-L, 2-A, 1-H) T10: Shortest latency to answer whose turn to draw by saying "you/yours" or "me/mine" T11: Highest volume at which any such answer is said (5-N, 4-W, 3-L, 2-A, 1-H)

Episode	Activities	Measures
4. Closing • Finishing up and saying Good-Bye • Lasts about 2 minutes	1. Assessor announces end of session and takes mother and child to the door. 2. After finishing any remaining conversations and answering any questions the mother might have about the research and next steps, assessor says Good-Bye to mother and then to child with eye-contact by calling his/her name with a smile.	T12: Whether child is able to say Good-Bye to assessor and volume at which it is spoken (5-N, 4-W, 3-L, 2-A, 1-H)

Twelve temperamental inhibition variables are measured in the assessment procedure across the four episodes. The first and the last variables are assessed by the assessor (and not the coder) during her encounter with the child since the two behaviors occur outside the activity room and cannot be video-recorded. The other 10 variables are coded by coders by viewing the video recording subsequently.

A variable measuring the volume of speech will be coded on a 5-point Likert scale for speech volume with 5 to indicate No Speech, 4 to indicate Whispering, with lips moving but can hardly be heard, 3 to indicate Low Volume, requiring some effort to hear, 2 to indicate Normal/Average Volume, requiring no extra effort to hear, or 1 to indicate High Volume, perhaps due to excitement. All latency measures are timed in seconds. However, each latency variable is converted into an ordinal variable with 1 for no latency in responding in 0 to 1 second, 2 for marked latency in responding in 2 to 4 seconds, 3 for extended latency in responding in 5 to 9 seconds, and 4 for no response at all. Thus, a higher rating for each variable indicates a higher level of inhibition in terms of speech volume and latency.

Factor structure of speech volume and latency variables

Based on the Asendorpf's (1993) conceptualization of social inhibition and Coplan et al.'s (2004) definition of shyness, the factor structure of all volume and latency variables measured during the interactions between the child and the assessor (a stranger with whom the child met for the first time) from the sample of 88 participants who had received the lab observation assessment was analyzed with an exploratory factor analysis (EFA). Since the first and last variables for greeting and farewell did not occur in the activity room and could not be taped and coded by coders, they were only captured for validation purposes. Principal Axis Factoring was used as the extraction method in the EFA as some variables were not normally distributed with skewness exceeding 2 and/or kurtosis exceeding 7 (Curran, West, & Finch, 1996; Fabrigar, Wegener, MacCallum, & Strahan, 1999) as shown in Table 3.5. Moreover, since the factors were expected to correlate, Promax as an oblique rotation was used with Kappa value defaulted to 4.

Table 3.5. Descriptive statistics for all TIS variables.

Variable	Variable Description	N	Mean	S.D.	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	S.E	Statistic	S.E.
GREET_V	Latency to greet	88	3.30	1.323	.318	.257	-1.686	.508
NAME1THING_L	Latency to name one thing	88	1.50	.971	1.774	.257	1.711	.508
NAME1THING_V	Speech Volume to name one thing	88	2.26	.652	2.988	.257	9.280	.508
NONVERBAL_L	Latency to make puppet sound	87	1.59	1.106	1.574	.258	.742	.511
NONVERBAL_V	Speech Volume to make puppet sound	87	2.29	.901	2.127	.258	4.375	.511
RESPPUPPET_L	Latency to respond to puppet	87	1.45	.962	2.038	.258	2.677	.511
RESPPUPPET_V	Speech Volume to respond to puppet	86	2.24	.750	2.983	.260	8.566	.514
RESPQ_L	Latency to respond to question	88	1.07	.450	6.517	.257	41.406	.508
RESPQ_V	Speech Volume to respond to question	88	2.07	.521	4.094	.257	22.676	.508
RESPTURN_L	Latency to respond to "Who's Turn?"	88	1.44	1.038	2.049	.257	2.370	.508
RESPTURN_V	Speech Volume to respond to "Who's Turn?"	88	2.43	1.003	2.113	.257	2.744	.508
BYE_V	Latency to bid farewell	86	2.63	1.169	1.404	.260	.267	.514

A factor was retained if the eigenvalue computed for the correlation matrix was greater than 1.0. At the same time, the scree plot as shown in Figure 3.3 was also examined to locate the last significant reduction of eigenvalues. To determine whether to retain a factor, a factor loading with a coefficient of at least .30 was used as the criterion (e.g., Maxwell & Cole, 2012). A three-factor solution was devised with items loaded with a coefficient higher than .30. The three factors accounted for 68.85% of item variance and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicated a satisfactory level of .763, which was higher than the .60 cutoff (Tabachnick & Fidell, 2013). Table 3.6 shows the pattern matrix with the rotation factor solution having the three factors extracted and Table 3.7 shows the corresponding structure matrix.

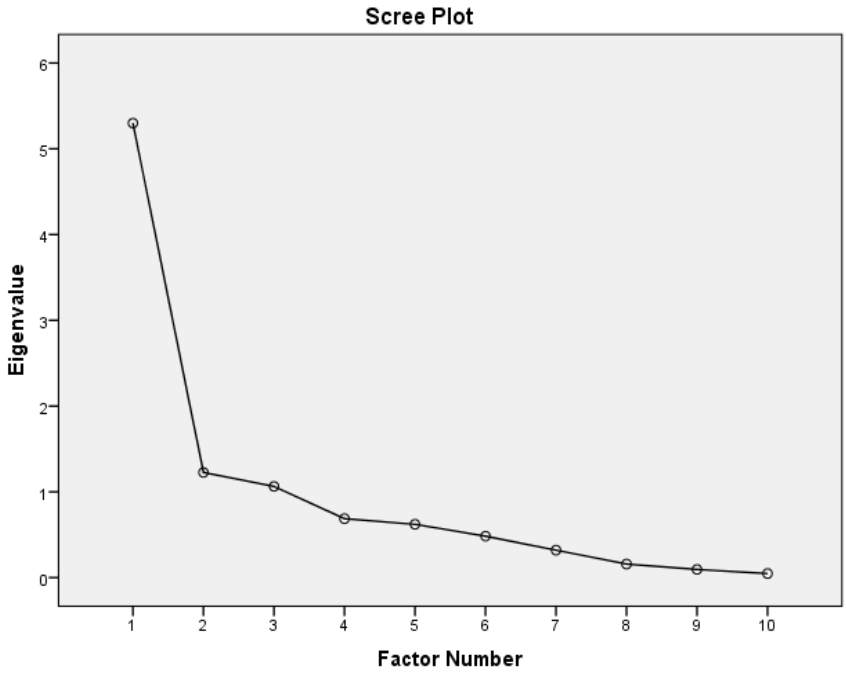

Figure 3.3. Scree plot for the initial EFA solution for the TIS.

Factor 1, known as *Temperamental Inhibition to Social Evaluation* (TI_EVALUATE) refers to children's level of inhibition when anticipating a

negative or an insufficiently positive evaluation from a stranger. Factor 2, known as *Temperamental Inhibition in Pretend Play* (TI_PRETEND), refers to children's level of inhibition when having to imitate an animal sound to a stranger during Pretend Play. Factor 3, known as *Temperamental Inhibition in Giving Directives in Conversation* (TI_DIRECTIVE), refers to children's level of inhibition when having to direct a stranger to action in a conversation. The various activities involve the child in confrontation with a stranger under such circumstances that the child is expected to experience social novelty and perceive social evaluation.

This factor structure largely supports the construct validity of the present measure of temperamental inhibition with its equivalence to Asendorpf's (1993) and Coplan et al.'s (2004) conceptual definitions of inhibition and shyness.

Table 3.6. Pattern Matrix with the rotated solution for the TIS.

Variable	Variable Description	Factor 1	Factor 2	Factor 3
NAME1THING_L	Latency to name one thing	**.362**	.291	.066
NAME1THING_V	Speech Volume to name one thing	**.614**	.070	.127
PUPPETSOUND_L	Latency to make puppet sound	-.143	**.792**	.027
PUPPETSOUND_V	Speech Volume to make puppet sound	-.016	**.944**	-.140
RESPPUPPET_L	Latency to respond to puppet	.242	**.403**	.126
RESPPUPPET_V	Speech Volume to respond to puppet	.374	**.445**	.121
RESPQ_L	Latency to respond to question	**.930**	-.024	-.068
RESPQ_V	Speech Volume to respond to question	**1.070**	-.156	-.063
RESPTURN_L	Latency to respond to "Who's Turn?"	-.031	-.009	**.960**
RESPTURN_V	Speech Volume to respond to "Who's Turn?"	.001	-.048	**1.018**

Note. Factor coefficients in bold represent the loadings on the respective factors.

Table 3.7. Structure Matrix with the rotated solution for the TIS.

Variable	Variable Description	Factor 1	Factor 2	Factor 3
NAME1THING_L	Latency to name one thing	.583	.552	.415
NAME1THING_V	Speech Volume to name one thing	.731	.520	.511
PUPPETSOUND_L	Latency to make puppet sound	.372	.715	.337
PUPPETSOUND_V	Speech Volume to make puppet sound	.501	.865	.318
RESPPUPPET_L	Latency to respond to puppet	.568	.618	.462
RESPPUPPET_V	Speech Volume to respond to puppet	.724	.741	.554
RESPQ_L	Latency to respond to question	.876	.529	.448
RESPQ_V	Speech Volume to respond to question	.936	.488	.467
RESPTURN_L	Latency to respond to "Who's Turn?"	.508	.446	.938
RESPTURN_V	Speech Volume to respond to "Who's Turn?"	.549	.456	.994

Based on the foregoing factor analysis, the three factor scores computed by SPSS were saved. A TIS Total Score (TIS_TOTAL) was computed as the mean of the three factor scores. Table 3.8 shows the factor correlation matrix. As expected, the three factors were highly correlated.

Table 3.8. Factor correlation matrix for the TIS.

Factor	1	2	3
1. TI_EVALUATE	1.000	.631	.568
2. TI_PRETEND	.631	1.000	.495
3. TI_DIRECT	.568	.495	1.000

Table 3.9 shows the correlation between the individual TIS variables and the parent-rated and teacher-rated BIQ and BIS variables. The two TIS variables on Inhibition to Greet (GREET_V) and Inhibition to Bid Farewell (BYE_V) rated by

the assessor (not the coders) were found to be moderately correlated with the Total TIS score, demonstrating acceptable criterion validity for the TIS. The correlations between the Total TIS measure and the parent- and teacher-rated Total BIQ and Total BIS measures across the three time points are mostly moderate to high, providing substantial support for convergent validity. Based on these psychometric properties, as a parsimonious measure, the TIS appears to be a promising observational instrument for assessing temperamental inhibition among preschool-aged children.

Inter-rater reliability analysis for Temperamental Inhibition Scale

To ensure the reliability of behavioral coding, a second coder coded 30% of the sample. Both coders were blind to the research hypotheses and were given training on the specific behavioral observations to be made before they started coding the target behaviors from the videos.

To assess inter-rater reliability, the intraclass correlation (ICC) was computed for all the volume and latency variables constituting the TIS. The reliability coefficients among the coded variables ranged from .82 to 1.00 with an average of .96 achieved, demonstrating substantial consistency between the two coders.

Observed maternal parenting scales

Maternal parenting variables are coded using the Parental Warmth and Control Scale (PWCS) developed by Rubin and Cheah (2009) in the present observational method. Mother's behaviors during the 10-minute child free play session and mother-child joint task session, as described in Table 3.3, are rated for six behavioral variables, namely, Proximity and Orientation (PO), Positive Affect (PA), Hostile

Affect (HA), Negative Affect (NA), Positive Control and Guidance (PC) and Negative Control (NC) using the defined taxonomy for each one-minute time unit divided by time sampling. Since the clean-up session is very short, found to be less than one minute in many cases of assessment, it has not been used to measure these variables unlike the Hane et al. study (2008). Each PWCS variable is computed as the mean of the individual ratings coded for each time unit observed from the two individual 10- and 5-minute sessions for free play and joint task activities, respectively. Each individual score ranges from 1 to 3 depending on the specific coding scheme as defined in the PCWS manual (Rubin & Cheah, 2009). Table 3.10 shows the descriptive statistics of the PCWS variables. Since maternal parenting characteristics are to be measured for the present study, eight caregivers who are not mother of the child were removed from the original sample, resulting in a sample size of 80 participants for the data analysis of this instrument.

Factor structure of the observed maternal parenting variables

From the descriptive statistics, as can be easily seen, a number of PWCS variables did not vary adequately (as highlighted in boldface in Table 3.10). Some variables (i.e., FP_NA, JT_PO and JT_NA) have such means as 1 or 3 constantly, indicating no variation at all, and others (i.e., FP_HA, FP_NC, JT_HA) have means ranging from 1.04 to 1.05 only, showing little variation across participants. These variables include Hostile Affect and Negative Affect in both the free play and joint task sessions. It is likely that mothers did not display such negative emotions because they were aware of being observed and recorded. Likewise, Negative Control during the free play session also did not vary much although Negative Control during the joint task session did show some variations. It may be that, during free play,

Table 3.9. Correlation between observational and parent- and teacher-rated inhibition variables.

Inhibition Variable	Variable Description	1	2	3	4	5	6	7	8	9	0	11	12	13	14	15	16	17
1. TIS_TOTAL	1. Total TIS																	
2. TI_EVALUATE	2. TI to social evaluation	.881**																
3. TI_PRETEND	3. TI in pretend play	.851**	.675**															
4. TI_DIRECT	4. TI to give directives	.826**	.580**	.518**														
5. GREET_V	5. TI to greeting	.329**	.237*	.405**	.205													
6. BYE_V	6. TI to farewell	.501**	.357**	.413**	.508**	.476**												
7. W1PBIQ_TOTAL	7. Wave 1 Parent-rated Total BIQ	.409**	.343**	.420**	.287**	.329**	.402**											
8. W1PBIS_TOTAL	8. Wave 1 Parent-rated Total BIS	.483**	.369**	.460**	.409**	.314**	.442**	.815**										
9. W1TBIQ_TOTAL	9. Wave 1 Parent-rated Total BIQ	.348**	.215*	.385**	.294**	.267*	.332**	.389**	.262*									
10. W1TBIS_TOTAL	10. Wave 1 Parent-rated Total BIS	.343**	.233*	.356**	.289**	.229*	.377**	.491**	.340**	.903**								
11. W2PBIQ_TOTAL	11. Wave 2 Parent-rated Total BIQ	.417**	.305**	.420**	.344**	.290**	.428**	.793**	.728**	.426**	.482**							
12. W2PBIS_TOTAL	12. Wave 2 Parent-rated Total BIS	.418**	.285**	.438**	.350**	.331**	.339**	.659**	.728**	.264*	.284**	.764**						
13. W2TBIQ_TOTAL	13. Wave 2 Teacher-rated Total BIQ	.322**	.190	.385**	.255*	.276**	.281**	.399**	.280**	.898**	.797**	.443**	.289**					
14. W2TBIS_TOTAL	12. Wave 2 Teacher-rated Total BIS	.317**	.170	.413**	.233*	.297**	.244*	.415**	.325**	.835**	.802**	.469**	.289**	.891**				
15. W3PBIQ_TOTAL	15. Wave 3 Parent-rated Total BIQ	.413**	.328**	.416**	.315**	.270*	.385**	.845**	.749**	.426**	.485**	.890**	.711**	.460**	.445**			
16. W3PBIS_TOTAL	16. Wave 3 Parent-rated Total BIS	.526**	.433**	.504**	.411**	.294**	.332**	.642**	.731**	.297**	.309**	.673**	.781**	.328**	.322**	.756**		
17. W3TBIQ_TOTAL	17. Wave 3 Teacher-rated Total BIQ	.300**	.252*	.321**	.198	.217*	.227*	.352**	.195	.776**	.696**	.361**	.239*	.851**	.728**	.411**	.268*	
18. W3TBIS_TOTAL	18. Wave 3 Teacher-rated Total BIS	.270*	.193	.313**	.189	.259*	.167	.319**	.194	.713**	.649**	.320**	.204	.782**	.742**	.379**	.223*	.908**

Note. * $p < .05$; ** $p < .01$ level (2-tailed).

Table 3.10. Descriptive statistics for PWCS variables.

	N	Minimum	Maximum	Mean	S.D.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	S.E.	Statistic	S.E.
FP_PO	80	1.10	3.00	2.0208	.47676	.395	.269	-.021	.532
FP_PA	80	1.00	2.00	1.5831	.33627	-.147	.269	-1.436	.532
FP_HA	80	1.00	1.70	**1.0388**	.10249	4.147	.269	22.148	.532
FP_NA	80	1.00	1.00	**1.0000**	0.00000				
FP_PC	80	1.00	2.33	1.3131	.33656	1.223	.269	.608	.532
FP_NC	80	1.00	1.60	**1.0475**	.11797	2.932	.269	8.746	.532
JT_PO	80	3.00	3.00	**3.0000**	0.00000				
JT_PA	80	1.00	2.20	1.8300	.29699	-1.597	.269	1.562	.532
JT_HA	80	1.00	2.00	**1.0475**	.13960	4.677	.269	27.802	.532
JT_NA	80	1.00	1.00	**1.0000**	0.00000				
JT_PC	80	1.00	3.00	1.8250	.35774	.529	.269	1.822	.532
JT_NC	80	1.00	3.00	1.4275	.46957	1.281	.269	1.644	.532

mothers did not have to use negative control to guide or influence the child's behavior. However, during the joint task session, mothers needed to apply at least some negative control to urge the child to promptly complete the task as expected under some time pressure. Meanwhile, Proximity and Orientation also did not vary during the joint task session, because when they were building blocks together, the mother always sat next to the child to provide guidance. Therefore, this score was always high (i.e., 3) for all participants. Due to their lack of variations, as what Rubin et al. (2001) also did, these variables were excluded from the factor analysis being performed on the maternal parenting variables.

The sample of data for the 80 participating mothers who had received the lab observation assessment with their children was analyzed with an exploratory factor analysis (EFA). The Maximum Likelihood extraction method was employed in the EFA as the skewness (ranging from -1.597 to 1.281) and kurtosis (ranging from -1.436 to 1.822) of the variables included in the analysis indicated adequate normality (Curran et al., 1996; Fabrigar et al., 1999), as shown in Table 3.10. Moreover, since

the factors were expected to correlate, Promax as an oblique rotation was used with Kappa value defaulted to 4.

To determine how many factors would be retained, both the size of the eigenvalues and the scree plot were used. A factor was retained if the eigenvalue computed for the correlation matrix was greater than 1.0. At the same time, the scree plot as shown in Figure 3.4 was examined to locate the last significant reduction of eigenvalues before the remaining eigenvalues level off horizontally to determine the appropriate number of factors for consideration as a solution.

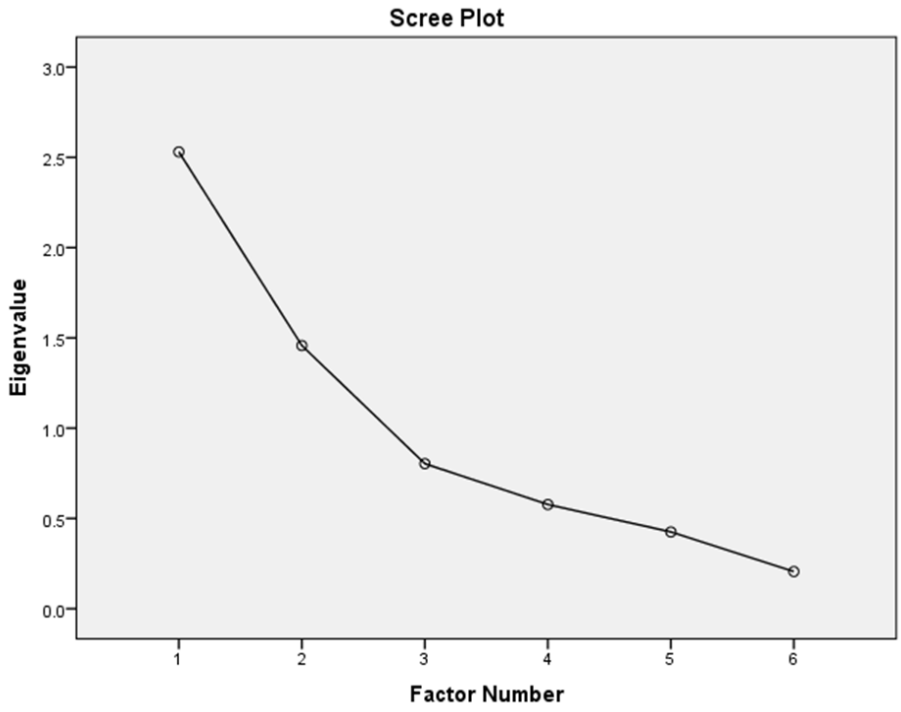

Figure 3.4. Scree plot for the initial EFA solution for Maternal Parenting.

To decide whether to retain a factor, a factor loading with a coefficient of at least .30 was used as the criterion (e.g., Maxwell & Cole, 2012). A two-factor solution was devised with items loaded with a coefficient higher than .30. The two

factors accounted for 52.85% of item variance and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicated an acceptable level of .608, meeting the .60 cutoff (Tabachnick & Fidell, 2013). The goodness of fit test with chi-square was χ^2 (4) = 6.74; χ^2/df = 1.685. Table 3.11 shows the pattern matrix with the rotation factor solution having the two factors extracted and Table 3.12 shows the corresponding structure matrix.

Table 3.11. Pattern Matrix with the rotated solution for the Maternal Parenting.

Variable	Variable Description	Factor 1	Factor 2
FP_PO	Free Play - Proximity & Orientation	**1.030**	-.142
FP_PA	Free Play - Positive Affect	**.654**	.201
FP_PC	Free Play - Positive Control	**.685**	-.066
JT_PA	Joint Task - Positive Affect	-.121	**.708**
JT_PC	Joint Task - Positive Control	-.072	**.447**
JT_NC	Joint Task - Negative Control	-.250	**-.615**

Note. Factor coefficients in bold represent the loadings on the respective factors.

Table 3.12. Structure Matrix with the rotated solution for Maternal Parenting.

Variable	Variable Description	Factor 1	Factor 2
FP_PO	Free Play - Proximity & Orientation	.990	.150
FP_PA	Free Play - Positive Affect	.710	.386
FP_PC	Free Play - Positive Control	.666	.128
JT_PA	Joint Task - Positive Affect	.080	.674
JT_PC	Joint Task - Positive Control	.055	.427
JT_NC	Joint Task - Negative Control	-.424	-.686

With the foregoing factor analysis, the two factor scores computed by SPSS were saved. Based on the underlying variables that constituted the two factors, the two factors were named *Maternal Positive Protection*, corresponding to Affectionate

Control during Free Play time, and *Maternal Positive Support*, corresponding to Affectionate Control during Joint Task time.

It should be noted that Maternal Positive Protection (MPP) resembles Rubin et al's (2001) measure of Free-Play Maternal Solicitousness (also used and known as Maternal Solicitousness in the study by Degnan et al. (2008)) except that Negative Control during the child free play episode was excluded from the underlying variables due to the inability of the current lab observational procedure to adequately measure this variable. MPP also differs in that it measures maternal positivity only, regardless of any negativity, as negative maternal behavior was minimally displayed by mothers during the child free play episode in the present investigation.

Moreover, Maternal Positive Support (MPS) also resembles Rubin et al's (2001) measure of Lego Maternal Solicitousness but is different in that the MPS scale measures the presence of Positive Control and the absence of Negative Control and not the accumulated degrees of both controls as in the latter instrument.

Meanwhile, the MPP and MPS scales measure positive parenting behaviors separately in the two different contexts, unlike Parental Positivity in the study by Hane et al. (2008), which is a measure of positive affect in maternal parenting behaviors aggregated across the two contexts. Table 3.13 summarizes these differences.

One notable difference between the MPP and the MPS as compared to the two measures for Maternal Solicitousness measures designed to observe maternal parenting behaviors in the two different contexts is that the MPP and the MPS were moderately correlated ($r = .291$; $p < .01$) but the two Maternal Solicitousness variables were unrelated ($r = -.04$, *ns*) as reported in Rubin et al's (2001) study. This

intriguing finding will be reviewed with other findings in the next chapter on Results.

Table 3.13. Observational Parenting Measures across studies.

Episode	Rubin et al., 2001	Degnan et al., 2008	Hane et al., 2008		Present Study
	Free-Play Maternal Solicitousness	***Maternal Solicitousness***	***Parental Positivity***	***Parental Negativity***	***Maternal Positive Protection***
Free Play – Unstructured Play	Proximity / Orientation, Positive Control, Negative Control, Positive Affect	Proximity / Orientation, Positive Control, Negative Control, Positive Affect	Positive Affect	Hostile Affect, Negative Control	Proximity / Orientation, Positive Control, Positive Affect
	Lego Maternal Solicitousness				***Maternal Positive Support***
Lego Task – Structured Play	Proximity / Orientation, Positive Control, Negative Control, Positive Affect		Positive Affect	Negative Affect, Negative Control	Positive Control, Negative Control (reverse), Positive Affect

Inter-rater reliability analysis for the observed maternal parenting scales

To ensure the reliability of behavioral coding, a second coder coded 30% of the sample for the PWCS instrument as was done for the TIS instrument. Both coders were blind to the research hypotheses and were given training on the specific behavioral observations to be made before they started coding the target behaviors from the videos.

To assess inter-rater reliability, the intraclass correlation (ICC) was computed for the six PWCS variables included in the factor solution. The reliability coefficients were .91, .91 and .86 for Proximity and Orientation (FP_PO), Positive Affect (FP_PA), and Positive Control (FP_PO), respectively, in the Free Play episode. The reliability coefficients were .80, .77, .63 for Positive Affect (JT_PA), Positive Control (JT_PC), and Negative Control (JT_NC), respectively, in the Joint Task episode. An overall average of .81 among all PCWS variables was achieved, demonstrating acceptable consistency between the two coders.

Data analysis plan

Different statistical methods were employed to test the research hypotheses in the three studies. In Study 1, in order to determine the additive and interactive effects of child temperamental inhibition and maternal parenting behaviors in predicting child development outcomes, a series of hierarchical regression analyses were conducted. Any child age and gender differences were controlled for as applicable in the individual analyses. The observed measures of child temperamental inhibition and maternal parenting behaviors were entered first in the procedure, followed by the product terms of each pair of child and parent predictors. Two regression analyses were performed for each child outcome variable, one for testing concurrent prediction using wave 2 child outcome data and another for testing prospective prediction using wave 3 child outcome data. This is conducted using the Conditional Process Analysis method with Model 1 and Model 3 as defined in by Hayes (2013). For any significant interaction between the child and parent variables, post-hoc probing was conducted using the Johnson-Neyman technique that comes with the Hayes' statistical package (Hayes & Matthes, 2009) as well as the traditional procedures recommended by Aiken and West (1991) and Holmbeck (2002) for verification purposes.

In Study 2, autoregressive cross-lagged panel analysis (CLPA) was employed to test any reciprocal effects between child temperament, child outcomes and parenting behaviors to determine any mutual influences between the variables over time. Contemporary research has found that parents and children interact dynamically over time to affect one another. These reciprocal relationships between children and parents and their mutual influence have been represented as transactional models

(Sameroff, 2009b). CLPA is a statistical tool commonly used to detect such transactional processes (Gershoff, Aber, & Clements, 2009).

A panel model is constructed with at least two variables measured at two time points in the simplest structure. In most applications in longitudinal research, 3 or more waves of data are collected and analyzed using CLPA. Figure 3.5 is the generalized transactional model for Study 2 constructed using data collected in three waves with 6 months apart between time points.

CLPA is used to examine how variables predict each other over time with effects at a prior time point controlled for. Selig and Little (2012) summarized the essential features of CLPA. A CLPA model is constructed with autoregressive (forward) and cross-lagged (diagonal) paths. Forward paths represent the autoregressive effect of a variable on itself at a later time point. A high autoregressive coefficient is important as it indicates the stability of the variable over time. Diagonal paths indicate the cross-lagged effects or the effect of a variable on another variable measured at a later time point. Variables at each time point are correlated with each other. Cross-lagged effects are estimated controlling for the prior level of the variable being predicted. This allows one to examine changes over time by ruling out the possibility that a cross-lagged effect is due simply to the fact that the two variables were correlated at the earlier time point. CLPA results can be used to determine whether cross-lagged effects occur in both directions, for instance, whether child behavior predicts parent behavior and parent behavior predicts child behavior as hypothesized in Study 2. Moreover, the relative strength of the cross-lagged effects or the degree to which the variables prospectively predict each other can be assessed and compared. This allows one to draw conclusions on potential causality and directionality (Martens & Haase, 2006). For example, using the data measured for

the parent-child dyads in Study 2, one can determine if child behavior affects the parent's subsequent behavior or the parent behavior affects the child's subsequent behavior and even to see which of the two cross-lagged effects is stronger.

In Study 3, to test the intervention effect, a mixed design repeated-measures ANOVA was conducted to examine the main effect of time and any interaction effect between group and time on each outcome variable using the pre-intervention and post-intervention child outcome data provided by teachers of the participating children.

All statistical analyses were performed using SPSS and AMOS version 22.

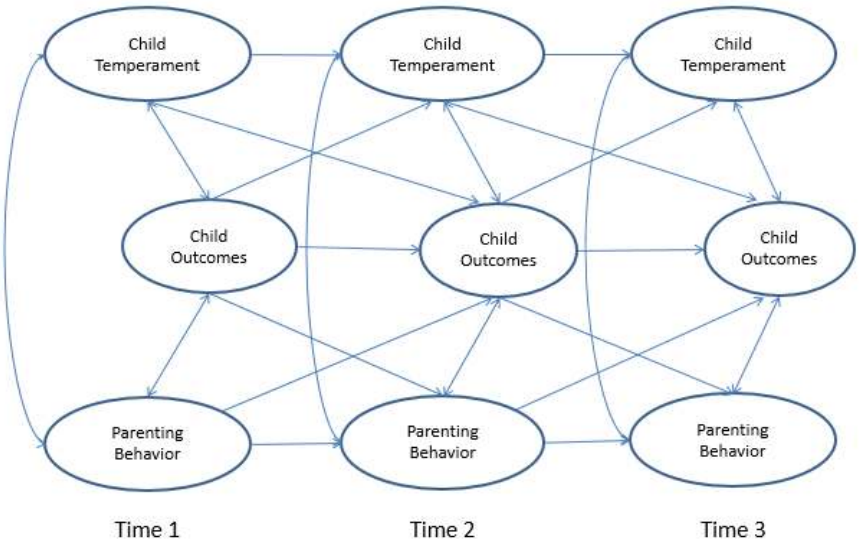

Figure 3.5. A transaction model to test reciprocal effects between child and parent.

Data reduction

To simplify the data analyses in Study 1 and Study 2, since the child temperament and outcome variables were rated by both parents and teachers using different measures, these variables were aggregated to create multisource assessment composites of temperamental inhibition, internalizing problems and social

withdrawal, as rather commonly practiced in some major studies in this line of research, (e.g., Degnan et al. (2008), Rubin et al. (2001)). These composites were to represent an overall measurement of children's varying but unique aspects of behaviors displayed in different contexts (i.e., school, home, other daily environments) and to different informants (i.e., teachers, peers, parents and family members), as assessed and reported by parents and teachers with the different instruments (Kiel & Buss, 2011). In Study 2, an aggregated measure of maladaptive parenting using selected parenting dimensions based on their individual results were also created for a synthesized interpretation of the findings. In all cases, correlations were reported among the individual measures that were aggregated to constitute the composites.

In Study 3, in order to more objectively detect subtle changes in children's levels of social withdrawal and internalizing problems to measure any intervention effects, only teacher-rated outcome variables were used. Therefore, the individual teacher-rated scales were used with no aggregation with parent-rated scales in the analyses.

Chapter 4

Results

Descriptive statistics of multi-wave study variables

As detailed in the last chapter, the larger sample with multi-wave data collected eventually consisted of 352 participants. This sample was composed of 199 boys (56.5%) and 153 girls (43.5%), of who 171 were in K1 class (48.6%) and 181 (51.4%) in K2 class at the start of the research program. The mean age of the children was 3.98 (*SD* = .59) ranging from 2.79 to 5.06 years. The kindergartens attended by the children were located in 5 different districts in Hong Kong, namely, Central and Western (2 schools with 61 participants or 17.33%), Kwai Tsing (3 schools with 118 participants or 33.52%), Tsuen Wan (1 school with 38 participants or 10.80%), Tuen Mun (2 schools with 59 participants or 16.76%), and Yuen Long (2 schools with 76 participants or 21.59%).

The parent questionnaires were filled out by 292 mothers (83.0%), 44 fathers (12.5%), 12 grandparents (3.4%), and 4 caregivers other than parents and grandparents (1.1%). The mean age of mothers during pregnancy with the child was 30.5 (*SD* = 5.0). Figure 4.1 shows the educational attainment of the parents of these children in comparison with adults aged 15 or above from the general Hong Kong population in the same year (Census and Statistical Department, The Government of the Hong Kong Special Administrative Region, 2013). The tertiary level of educational attainment of both the participating mothers and fathers were somewhat lower than those of the general population (21.28% vs. 26.44% for mothers; 20.59% vs. 31.59% for fathers). Comparatively, slightly more participating mothers attained the tertiary education level. The percentages of mothers and fathers reaching upper secondary level were comparable to those of the general population. The median level of attainment among participants in the sample was upper secondary for both mothers and fathers just like that of the general population.

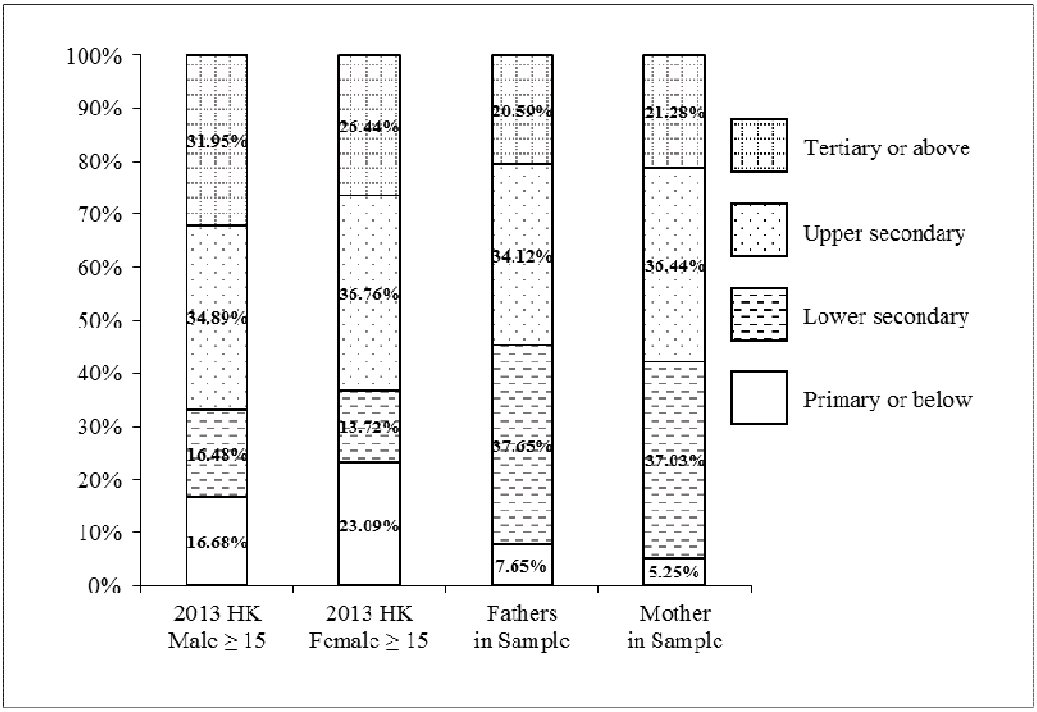

Figure 4.1. Levels of educational attainment of parents in sample (N = 352) vs. 2013 Hong Kong general population aged 15 or above (N = 6,304,700).

When asked how many weekly caregiving hours were spent with the child, among the informants, 169 (48.0%) participants reported 70 hours or longer, 26 (7.4%) reported 60-69 hours, 37 (10.5%) reported 50-59 hours, 31 (8.8%) reported 40-49 hours, 35 (9.9%) reported 30-39 hours, 22 (6.3%) reported 20-29 hours, 22 (6.3%) reported 10-19 hours, and 10 (2.8%) reported less than 10 hours.

Thirty-five teachers, all female, with 17 teaching a K1 class and 18 teaching a K2 class from the 10 kindergartens, participated to provide assessment data for the participating children. Years of teaching experience among the teachers ranged from 3 months to 30 years, with 12 teachers (34%) possessing up to 10 years of experience, 18 (51%) over 10 years and up to 20 years of experience, and 5 (15%) over 20 years of experience. Educational qualifications were basic Qualified Kindergarten Teacher status for 1 teacher (3%), Early Childhood Education

Certificate or Diploma for 28 teachers (80%), Bachelor's degree for 5 teachers (14%) and unknown for 1 teacher (3%). Their age ranges were less than 25 years for 9 teachers (26%), 26-30 for 1 teacher (3%), 31-35 for 3 teachers (9%), 36-40 for 9 teachers (26%), over 40 for 8 teachers (23%), and unknown for 5 teachers (14%).

Table 4.1 shows the descriptive statistics for all the teacher-rated and parent-rated study variables based on the data collected through questionnaires from this sample of 352 participants at three time points with 6 months apart between time points. The skewness and kurtosis of all the predictor and outcome variables used in the present investigation indicated acceptable normality, i.e., skewness < 2 and kurtosis < 7 (Curran et al., 1996; Fabrigar et al., 1999). There were few missing values in all measures except the teacher-rated BI subscale for Separation and Preschool Situations, with 48 missing observations in wave 1, 31 missing in wave 2 and 81 missing in wave 3. A detailed review of the 4 TBIQ items (i.e., 8, 10, 17 and 25 as listed below) under this context revealed that the four questions asked the teachers if the child was able to quickly adapt to separation with parents or caregivers or the new kindergarten environment:

- (8) Happily separates from parent(s) when left in new situations for the first time (e.g., kindergarten, preschool, childcare)
- (10) Quickly adjusts to new situations (e.g., kindergarten, preschool, childcare)
- (17) Gets upset at being left in new situations for the first time (e.g., kindergarten, preschool, childcare)
- (25) Takes many days to adjust to new situations (e.g., kindergarten, preschool, childcare)

Table 4.1. Descriptive Statistics for all questionnaire variables across three time points in the full sample ($N = 352$).

Variable	Variable Description	N			Mean			SD			Skewness			Kurtosis		
		Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
TBIQ_ADULTS	Teacher-rated BI to unfamiliar adults	352	352	349	4.394	4.240	4.073	1.180	1.161	1.134	0.180	0.107	0.155	-0.188	0.084	-0.089
TBIQ_PEERS	Teacher-rated BI in unfamilier peers	352	352	351	3.727	3.634	3.573	0.919	0.845	0.886	0.116	0.031	0.265	0.319	0.375	0.526
TBIQ_PERF	Teacher-rated BI in performance situations	352	352	350	3.769	3.734	3.663	1.081	1.098	1.236	0.218	0.126	0.397	0.219	-0.009	0.157
TBIQ_PHYS	Teacher-rated BI to physical challenges	352	352	351	3.780	3.747	3.698	0.876	0.802	0.847	0.436	-0.079	0.380	0.827	0.326	0.637
TBIQ_SEPPRE	Teacher-rated BI in separation or preschool situations	304	321	271	4.192	4.058	3.905	1.347	1.096	1.263	0.110	0.302	0.399	-0.332	0.559	-0.192
TBIQ_UNFAM	Teacher-rated BI in unfamilier situations	352	352	351	3.907	3.722	3.671	1.059	0.984	1.014	0.216	0.044	0.204	0.034	0.105	-0.208
TBIQ_TOTAL	Teacher-rated Total BIQ rating	352	352	351	3.953	3.850	3.752	0.877	0.819	0.887	0.165	-0.123	0.211	0.145	0.009	-0.010
TBIS_ADULT	Teacher-rated BI to unfamiliar adults	350	352	350	2.729	2.643	2.581	0.598	0.603	0.580	0.221	0.333	0.286	0.200	0.484	0.520
TBIS_CHILD	Teacher-rated BI to unfamiliar adults	350	352	350	2.419	2.335	2.389	0.584	0.567	0.551	0.231	0.130	0.030	0.901	0.561	0.934
TBIS_TOTAL	Teacher-rated Total BIS rating	350	352	350	2.574	2.489	2.485	0.550	0.552	0.542	0.240	0.173	0.105	0.774	0.546	0.635
CBS_AS	CBS - Asocial with Peers	352	352	349	1.290	1.251	1.211	0.370	0.337	0.319	1.576	1.379	1.636	2.450	1.150	1.793
CBS_INTERNAL	CBS - Internalizing Problems	352	352	350	1.393	1.328	1.304	0.368	0.330	0.329	1.152	1.008	1.150	1.071	0.093	0.544
TSCI_INITIATIVE	Teacher-rated Social Initative	352	351	351	3.082	3.186	3.238	0.646	0.632	0.614	-0.334	-0.086	-0.177	0.151	-0.119	0.083
TBAC	Teacher-rated Behavior Academic Competence	351	347	351	2.845	2.980	3.039	0.549	0.480	0.503	-0.057	-0.106	-0.146	-0.368	0.045	-0.403
GSRI	Gumpel School Readiness Inventory	352	348	351	3.110	3.279	3.316	0.557	0.517	0.528	-0.368	-0.738	-1.032	-0.142	0.491	1.327
CSS_REGULATED	Chinese Regulated Shyness	350	347	350	3.261	3.315	3.328	0.708	0.708	0.706	-0.286	0.339	-0.423	0.257	3.606	0.546
CSS_ANXIOUS	Chinese Anxious Shyness	350	347	350	2.509	2.461	2.431	0.779	0.689	0.707	0.417	0.136	0.474	-0.162	-0.076	0.376

Table 4.1. Descriptive Statistics for all questionnaire variables across three time points in the full sample (N = 352) (cont'd).

Variable	Variable Description	N			Mean			SD			Skewness			Kurtosis		
		Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
TBIQ_ADULTS	Teacher-rated BI to unfamiliar adults	352	352	349	4.394	4.240	4.073	1.180	1.161	1.134	0.180	0.107	0.155	-0.188	0.084	-0.089
TBIQ_PEERS	Teacher-rated BI in unfamilier peers	352	352	351	3.727	3.634	3.573	0.919	0.845	0.886	0.116	0.031	0.265	0.319	0.375	0.526
PBIQ_ADULTS	Parent-rated BI to unfamiliar adults	349	351	352	3.977	3.699	3.616	1.358	1.264	1.218	-0.027	0.030	0.104	-0.538	-0.003	-0.081
PBIQ_PEERS	Parent-rated BI in unfamilier peers	350	351	352	3.419	3.351	3.242	1.104	0.993	0.984	0.025	0.131	0.112	-0.248	-0.226	-0.091
PBIQ_PERF	Parent-rated BI in performance situations	349	351	350	3.677	3.540	3.575	1.366	1.231	1.244	0.178	0.243	0.097	-0.222	0.286	0.145
PBIQ_PHYS	Parent-rated BI to physical challenges	348	351	352	3.483	3.455	3.559	0.957	0.865	0.863	-0.202	0.094	0.026	-0.002	0.368	0.549
PBIQ_SEPPRE	Parent-rated BI in separation or preschool situations	348	351	351	3.938	3.637	3.535	1.560	1.471	1.365	0.166	0.231	0.275	-0.765	-0.664	-0.371
PBIQ_UNFAM	Parent-rated BI in unfamilier situations	350	351	352	3.724	3.497	3.455	1.000	0.941	0.893	0.094	0.114	0.084	0.289	0.052	0.236
PBIQ_TOTAL	Parent-rated Total BIQ rating	350	351	352	3.705	3.530	3.496	0.898	0.808	0.783	0.030	0.102	0.065	0.103	0.450	0.525
PBIS_ADULT	Parent-rated BI to unfamiliar adults	346	350	351	2.518	2.408	2.396	0.668	0.604	0.595	0.197	0.101	0.294	0.036	0.190	0.507
PBIS_CHILD	Parent-rated BI to unfamiliar adults	346	350	351	2.200	2.124	2.123	0.610	0.578	0.565	0.433	0.218	0.190	0.835	0.358	0.570
PBIS_TOTAL	Parent-rated Total BIS rating	346	350	351	2.360	2.266	2.259	0.597	0.554	0.537	0.334	0.197	0.280	0.509	0.392	0.660
CBCL_WD	CBCL - Withdrawan	350	351	352	2.969	2.493	2.256	2.682	2.486	2.407	1.151	1.248	1.435	1.530	1.588	2.675
CBCL_INTERNAL	CBCL - Internalizing Problems	350	351	352	12.414	10.712	9.528	9.284	8.828	8.008	1.735	1.621	1.491	6.024	4.000	3.856
CBCL_ANXP	CBCL - DSM Anxiety Problems	350	351	352	4.520	4.068	3.776	2.870	2.896	2.805	1.210	1.136	0.867	3.251	1.870	0.783
PSCI_INITIATIVE	Parent-rated Social Initiative	348	351	351	3.267	3.322	3.393	0.585	0.559	0.525	-0.218	-0.317	-0.332	0.544	0.677	1.301
PSDQ_CON	PSDQ - Connection	348	350	351	4.032	4.064	4.045	0.590	0.553	0.581	-0.565	-0.692	-0.341	0.368	2.081	-0.122
PSDQ_REG	PSDQ - Regulation	348	350	351	3.756	3.765	3.777	0.662	0.682	0.656	-0.578	-0.583	-0.265	0.467	0.996	-0.215
PSDQ_AUT	PSDQ - Autonomy Granting	348	350	351	3.564	3.635	3.650	0.665	0.648	0.621	-0.203	-0.387	-0.324	-0.001	0.431	0.505
PSDQ_PHY	PSDQ - Physical coercion	348	350	351	2.051	2.007	1.970	0.596	0.579	0.471	1.167	1.444	0.859	1.891	4.170	1.572
PSDQ_VER	PSDQ - Verbal hostility	348	349	351	2.339	2.283	2.294	0.672	0.689	0.634	0.605	0.782	0.548	0.678	0.934	0.827
PSDQ_NON	PSDQ - Non-reasoning, punitive strategies	348	350	351	1.865	1.892	1.903	0.613	0.634	0.617	0.846	0.572	0.486	1.061	0.534	0.019
PSDQ_AUTHORITATIVE	PSDQ - Authoritative Parenting	348	350	351	3.784	3.821	3.824	0.554	0.553	0.548	-0.395	-0.568	-0.291	0.360	1.828	0.113
PSDQ_AUTHORITARIAN	PSDQ - Authoritarian Parenting	348	350	351	2.085	2.060	2.056	0.503	0.525	0.455	1.065	1.095	0.704	2.014	2.678	1.063
POS	Parental Overprotection Scale	346	347	349	2.438	2.369	2.363	0.755	0.720	0.677	0.565	0.520	0.520	0.301	0.243	0.162

Since the teachers were asked to fill out the questionnaire three months into the school year at time point 1 and time point 3 to ensure they had sufficient time to observe the children before the assessment, they were probably unable to recall individual children's reactions when they initially attended the class at the beginning of each school year but might have started observing this in similar situations afterwards and were able to answer the items toward the end of the first school year at time point 2. To verify that these missing data did not significantly influence the overall BI assessment for children not rated on these TBIQ items, an independent samples *t* test was performed to test any significant differences in the TBIQ Total scores between the children who had been rated on these items and the children who had not been rated on these items. No statistical differences were found between the two groups at each time point (i.e., t (350) = -.970, *ns,* at time point 1; t (350) = -1.098, *ns,* at time point 2, t (349) = -1.780, *ns,* at time point 3).

Temperamental inhibition among Hong Kong Chinese preschoolers

Based on the wave 1 BIQ and BIS measures rated by teachers and parents at the beginning of this investigation, a comparison with the original Western studies developing the two scales were made on the BIQ Total and BIS Total scores. Both the mean BIQ Total and BIS Total scores obtained from the present sample were higher than the scores reported by the corresponding Western studies (Bishop et al., 2003; van Brakel & Muris, 2006). The mean BIQ Total scores for the Hong Kong Chinese preschoolers were 110.70 and 111.16 as rated by teachers and parents, respectively (derived from the sums instead of the means of individual subscale scores to be equivalent to the calculations used by the Western study), somewhat higher than the BIQ Total scores of 93.63 as rated by teachers and 90.85 as rated by

mothers for the preschool-aged Australian children (Bishop et al., 2003). Meanwhile, the mean BIS Total scores for the Hong Kong Chinese preschoolers were 20.59 and 18.82 as rated by teachers and parents, respectively (again derived from the sums of the individual item scores), also somewhat higher than the mean BIS Total score of 18.61 as rated by parents for the Dutch children aged 7 to 12 years in the corresponding Western study (van Brakel & Muris, 2006).

A series of independent samples *t* tests were conducted to determine any gender differences. Interestingly, in contrast with the original study that developed the BIQ instrument with Australian children (Bishop et al., 2003), in the present investigation, teachers rated boys and not girls as significantly more inhibited in Performance (t (350) = 2.78, $p < .01$), but also similar to the original study, rated girls as marginally more inhibited in Physical Activities (t (350) = -1.76, $p < .10$). Likewise, as opposed to the Australian participants in the original study, parents in the Hong Kong Chinese sample rated boys and not girls as significantly more inhibited in Performance (t (347) = 4.14, $p < .001$) and marginally more inhibited in Preschool/Separation Situations (t (346) = 1.67, $p < .10$), but similar to the Australian study, rated girls as significantly more inhibited in Adult Situations (t (347) = -2.05, $p < .05$) and marginally more inhibited in Physical Activities (t (346) = -1.70, $p < .10$). No gender differences were found in the BIQ Total scale or other BIQ subscales as rated by teachers and parents.

No gender differences were found in behavioral inhibition among the Hong Kong Chinese children as rated by teachers and parents using the BIS in the present investigation, the same result as the original study that tested the BIS with Dutch children (van Brakel & Muris, 2006).

Age differences were found in the teacher-rated BIQ Total score and subscale scores. In particular, age was found to be negatively and significantly correlated with teacher-rated BIQ Total score (r = -.23, p < .01) and all BIQ subscale scores (r = -.13, p < .05 in Adult Situations; r = -.24, p < .01 in Peers Situations; r = -.14, p < .01 for Performance; r = -.37, p < .01 for Preschool/Separation Situations; r = -.18, p < .01 for Unfamiliar Situations) except Physical Activities. Age was also found to be significantly and negatively correlated with parent-rated behavioral inhibition in Unfamiliar Situations (r = -.11, p < .05) and Separation/Preschool Situations (r = -.07, p < .05) but not the BIQ Total score and other BIQ subscale scores. No age differences were found in any BIS measures just like the original study (van Brakel & Muris, 2006).

From Table 4.1, it can be seen that on average, children's overall levels of temperamental inhibition as rated by teachers and parents using both the BIQ and BIS decreased over time across the 3 time points within the 12-month period.

Chinese shyness among Hong Kong Chinese preschoolers

Anxious Shyness, defined as anxious behaviors due to social evaluation, and Regulated Shyness defined as nonassertive behaviors in social interaction, were measured using the Chinese Shyness Scale (CSS; Xu et al., 2009; Xu et al., 2007) for the Hong Kong Chinese preschoolers in the present investigation. Based on the wave 1 CSS scores as rated by teachers for the Hong Kong Chinese preschoolers, the mean Regulated Shyness scores were 3.38 for girls and 3.17 for boys with a significant gender difference (t (348) = -2.80, p < .01), comparable to an earlier study by Xu et al. (2009) with first graders (with a mean age of 6.57) from Shanghai, China, reporting a mean Regulated Shyness score of 3.24 for girls and 2.84 for boys

also with a significant gender difference (t (206) = 2.62, $p < .01$), as rated by teachers. Meanwhile, the mean Anxious Shyness scores for Hong Kong Chinese preschoolers were 2.48 for girls and 2.53 for boys with no gender difference, whereas the Shanghai study reported a mean score of 1.91 for girls and 1.83 for boys also with no gender difference among the first graders. In summary, to compare and contrast the two studies, the mean scores of both Regulated Shyness and Anxious Shyness were higher for the Hong Kong Chinese preschoolers probably due to the younger ages of the children, and boys had a higher mean Anxious Shyness score than girls among the Hong Kong Chinese preschoolers but girls had a higher mean Anxious Shyness score than boys among the Shanghai first graders.

Significant age differences were found in Anxious Shyness (r = -.17, $p < 01$) but not Regulated Shyness (r = .03, *ns*) as rated by teachers at time point 1 for this sample of Hong Kong Chinese preschoolers.

From Table 4.1, it can be seen that on average, children's levels of Anxious Shyness as rated by teachers decreased over time but their levels of Regulated Shyness as rated by teachers increased over time, across the 3 time points within the 12-month period.

Social initiative among Hong Kong Chinese preschoolers

Social Initiative was measured using the Social Initiative subscale of the Social Competence Inventory (SCI; Rydell et al., 1997) for the Hong Kong Chinese preschoolers in the present investigation. Based on the wave 1 SCI scores derived for the Hong Kong Chinese preschoolers, the mean Social Initiative scores as rated by teachers were 3.10 for girls and 3.07 for boys and the mean scores as rated by parents were 3.23 for girls and 3.29 for boys, both with no significant gender

differences. A study conducted by the instrument developers for 519 first graders in Sweden with 51% boys and a mean age of 7 years and 9 months reported an overall mean score of 3.57 for Social Initiative as rated by teachers (Rydell, Hagekull, & Bohlin, n.d.), higher than the mean scores of 3.08 and 3.27 as rated by teachers and parents, respectively, for the Hong Kong Chinese preschoolers in the present investigation, likely due to the different ages of the children in the two studies.

Significant age differences were found in Social Initiative as rated by teachers (r = .18, p < 01) and parents (r = .11, p < *.05*) at time point 1 for this sample of Hong Kong Chinese preschoolers.

From Table 4.1, it can be seen that on average, children's levels of Social Initiative as rated by both teachers and parents increased over time across the 3 time points within the 12-month period.

Academic competence and school readiness among Hong Kong Chinese preschoolers

Academic Competence was measured using the teacher-rated Behavior Academic Competence scale (TBAC; Leung et al., 2012) for the Hong Kong Chinese preschoolers in the present investigation. Based on the wave 1 TBAC scores assessed for the Hong Kong Chinese preschoolers, the mean Academic Competence score was 2.85. This corresponds to a mean score of 42.75, if sums of item scores were used to compute the ratings instead of the means, somewhat lower than the mean score of 50.16 for 4-year-old Hong Kong Chinese preschoolers as reported by the original study developing this scale. Significant gender differences were found in Academic Competence (t (349) = -2.00, p < .05) with a higher mean score of 2.91 for girls than the mean score of 2.79 for boys in the present sample. Significant age

differences were also found in Academic Competence as rated by teachers (r = .11, p < 05) at time point 1 for this sample of Hong Kong Chinese preschoolers.

Meanwhile, School Readiness was measured using the Gumpel School Readiness Inventory (GSRI; Gumpel, 1999; Ho et al., 2013) also rated by teachers for the Hong Kong Chinese preschoolers in the present investigation. Based on the wave 1 GSRI scores, the mean School Readiness rating was 3.11. This corresponds to a mean score of 18.66, if sums of item scores were used to compute the ratings instead of the means as used in the present investigation, somewhat lower than the mean score of 20.73 for Hong Kong Chinese preschoolers aged 4 to 5 years as reported by a recent local study that translated and validated this scale (Ho et al., 2013). Significant gender differences were found in School Readiness (t (350) = -3.13, p < .01) with a higher mean score of 3.21 for girls than the mean score of 3.03 for boys in the present sample, similar to the Ho et al. (2013) study, which also found that teachers rated girls significantly higher than boys. Significant age differences were also found in School Readiness as rated by teachers (r = .11, p < 05) at time point 1 for this sample of Hong Kong Chinese preschoolers.

From Table 4.1, it can be seen that on average, children's levels of Academic Competence and School Readiness as rated by teachers both increased over time across the 3 time points within the 12-month period.

Internalizing problems among Hong Kong Chinese preschoolers

Internalizing problems among the Hong Kong Chinese preschoolers were rated by teachers using the Children Behavior Scale (CBS; Ladd, 2010) and by parents using the Child Behavior Checklist for Ages 1½ to 5 (CBCL; Achenbach & Rescorla, 2000) in the present investigation. Based on the wave 1 CBS scores

assessed for the Hong Kong Chinese preschoolers, the mean CBS Internalizing Problems score was 1.39 derived by averaging the mean scores of the CBS Anxious-Fearful scale of 1.49 and the CBS Asocial with Peers scale of 1.29. These scores were similar to the scores derived from a sample of 206 US children aged 5 years as reported by the original scale developer (Ladd, 2010), with the mean scores of 1.33 for teacher-rated CBS Internalizing Problems, 1.40 for Anxious-Fearful and 1.25 for Asocial with Peers. No significant gender differences but significant age differences were found in the CBS Internalizing Problems scores as rated by teachers (r = -.34, p < 01) at time point 1 for the present sample of Hong Kong Chinese preschoolers.

Based on the wave 1 CBCL scores assessed by parents for the Hong Kong Chinese preschoolers, the mean CBCL Internalizing Problems score was 12.41, whereas the mean scores of the CBCL Emotionally Reactive scale of 3.22, CBCL Anxious/Depressed scale of 3.57, CBCL Somatic Complaints scale of 2.66, and CBCL Withdrawn scale of 3.00 were derived. These scores were all higher than the corresponding scores derived from a US normative (non-referred) sample of 563 US children aged 18 to 71 months but lower than a matched US referred sample as reported by the instrument developers (Achenbach & Rescorla, 2000). The mean scores of the various scales from the US non-referred sample versus referred sample were 8.7 vs. 17.5 for Internalizing Problems, 2.4 vs. 4.7 for Emotionally Reactive, 3.0 vs. 4.1 for Anxious/Depressed, 1.9 vs. 4.9 for Somatic Complaints, and 1.7 vs. 3.9 for Withdrawn. Just like the CBS scores, no significant gender differences were found in CBCL Internalizing Problems but significant age differences were found in CBCL Internalizing Problems as rated by parents (r = -.11, p < 05) at time point 1 for the present sample of Hong Kong Chinese preschoolers.

The CBCL also provides a set of DSM-oriented scales, two of which are related to internalizing problems, namely, Affective Problems and Anxiety Problems. Based on the wave 1 CBCL scores assessed for the Hong Kong Chinese preschoolers, the mean CBCL Affective Problems and Anxiety Problems scores as rated by parents were 3.20 and 4.52, respectively. Similarly, these scores were higher than the corresponding mean scores from the above-mentioned US normative (non-referred) sample of children but lower than those from the matched US referred sample. The mean scores of the two scales from the US non-referred sample versus referred sample were 2.1 vs. 4.9 for Affective Problems and 3.5 vs. 4.9 for Anxiety Problems (Achenbach & Rescorla, 2000). Just like the CBS scores and the other CBCL Internalizing Problems scores, no significant gender differences were found in CBCL Affective and Anxiety Problems but significant age differences were found in CBCL Anxiety Problems (r = -.12, $p < 05$) but not CBCL Affective Problems, as rated by parents at time point 1 for the present sample of Hong Kong Chinese preschoolers.

The CBCL came with a multicultural supplement to the original manual which provides mean and cutoff scale scores for multicultural normative samples (Achenbach & Rescorla, 2010). Societies around the globe that have used the CBCL instrument in the past are assigned to three groups, e.g., US and China belong to Group 2, Taiwan belongs to Group 3, and Spain belongs to Group 1. After an initial review of the sample data collected by the present study, the instrument developer suggested that Hong Kong belongs to multicultural norm group 2 but is at the top end of the group (T. M. Achenbach, personal communication, August 20, 2015). According to the supplementary manual, the group 2 raw score cutoffs are 14 for borderline clinical range and 18 for clinical range for Internalizing Problems.

Meanwhile, the group 3 raw score cutoffs for the two ranges are 19 and 23, respectively. If group 2 cutoffs were used, the wave 3 CBCL data would indicate 96 children or 27.3% fell into the borderline clinical and clinical ranges. However, if group 3 cutoffs were used, assuming Hong Kong is more similar to Taiwan than China, only 41 children or 11.6% were in the borderline clinical and clinical ranges. This latter percentage is closer to the overall prevalence rate of 11.4% for internalizing problems among primary school children as reported in a previous local study by Siu (2008) based on a sample of 1,598 second to fourth graders with a mean age of 8.71. These data were later highlighted in the feedback provided to the Achenbach research group for re-evaluation. T. M. Achenbach further advised that since the mean Total Problems score for the present sample was very close to the cutoff for Group 3, the Group 3 norms could be elected for use (T. M. Achenbach, personal communication, May 25, 2016).

From Table 4.1, it can be seen that on average, children's levels of Internalizing Problems as rated by teachers using the CBS and their levels of Internalizing Problems and DSM-oriented Affective and Anxiety Problems as rated by parents using the CBCL all decreased over time across the 3 time points within the 12-month period.

General parenting styles and practices of Hong Kong Chinese parents

From the descriptive statistics, an examination of data collected with the Parenting Styles and Dimension Questionnaire (PSDQ) shows that Hong Kong Chinese parents are much more authoritative than authoritarian, consistent with the reports from recent studies on Chinese parenting (Chan et al., 2009; Meng, 2012; Tse, 2011). For instance, Chan et al. (2009) demonstrated this significant difference

between authoritative parenting and authoritarian parenting among the 189 participants in their study using a paired samples *t* test (i.e., t (188) = 19.63, $p <$ .001). Likewise, across the three waves of self-reported data in the present investigation, the mean scores of Authoritative Parenting were 3.78, 3.82 and 3.82, respectively, all above the mid-point of 3, in contrast to the much lower mean scores of Authoritarian Parenting at 2.09, 2.06 and 2.06, respectively, all much below the midpoint of 3. Paired samples *t* tests conducted with the three waves of data also showed significant differences between Authoritative Parenting and Authoritarian Parenting among the participating parents (i.e., t (347) = 39.78; $p < .001$ for wave 1 data; t (349) = 40.80 for wave 2 data; $p < .001$; t (350) = 42.95; $p < .001$ for wave 3 data).

Across the three waves of self-reported parenting data, the fine-grained parenting dimensions measured with the same instrument indicates that in their authoritative parenting practices, Hong Kong Chinese parents frequently maintain close connections with children by showing warmth and support in two-way communications (means = 4.03 to 4.06), regulate children's behavior by reasoning and induction (means = 3.76 to 3.77), and grant autonomy to children by respecting their opinions and allowing democratic participation in daily decision making (means = 3.56 to 3.65). In their authoritarian parenting practices, as expected, Chinese Hong Kong parents tend to use verbal hostility (means = 2.28 to 2.33) more frequently than physical coercion (means = 1.97 to 2.05) and non-reasoning, punitive strategies (means = 1.87 to 1.90) in disciplining non-compliant behaviors and demanding obedience.

Study 1 Results

Data sampling for Study 1

The sample of participants who had received the lab observational assessment consisted of 88 participants. However, 25 of such participants were selected for an immediate parenting intervention program. These participants were therefore excluded from the sample to be used for Study 1 because their wave 3 data would be influenced by the intervention as compared to the parents who did not receive the intervention. Meanwhile, the remaining 63 participants included 6 non-mother caregivers. Since the present study investigated maternal parenting behaviors only, these 6 participants were also excluded. Moreover, one participant did not successfully complete all parts of the observational assessment of temperamental inhibition and had to be also excluded. The final sample used for the present study therefore consisted of 56 participants from whom observational data on both child temperamental inhibition and maternal parenting behaviors were successfully collected. The observational assessment was conducted around the second time point when the wave 2 questionnaire data were collected. Wave 2 child outcome data were therefore used for concurrent prediction and wave 3 child outcome data collected 6 months later were used for prospective prediction in the present study. Moreover, not all 56 participants subsequently participated in the wave 3 questionnaire data collection. Ten participants dropped out. Wave 3 outcome data were only available for 46 of the 56 participants. Table 4.2 shows the descriptive statistics for the predictor and criterion variables in this sample. The skewness and kurtosis of all the predictor and outcome variables indicated acceptable normality, i.e., skewness < 2 and kurtosis < 7 (Curran et al., 1996; Fabrigar et al., 1999). In

addition to the overall measures of Internalizing Problems, Social Initiative, Anxious and Regulated Shyness, fine-grained subscales related to social withdrawal and anxiety from the CBCL and CBS were also selected for analyses and subsequent data aggregation. Lastly, self-reported measures of parenting styles, namely, authoritative, authoritarian and overprotective parenting, were also included for correlation analyses with the observed parenting scales.

Treatment of outliers and missing values

The standard scores of all predictor and criterion variables were generated for an examination of any outliners. Three outliers were identified in the wave 2 TIS variable with standard scores exceeding 2.58 and were imputed with the next higher raw score (i.e., .75).

Among the wave 2 variables, one missing value was found in teacher-rated Social Initiative and Academic Competence, respectively, two missing values were found in teacher-rated School Readiness, and three missing values were found in teacher-rated Chinese Anxious Shyness and Regulated Shyness. In addition, 2 missing values were found in parent-rated Anxiety Problems and 1 missing value was found each in parent self-reported Authoritative Parenting and Authoritarian Parenting. Missing value analysis indicated that these data were missing completely at random with a non-significant Little's MCAR test, χ^2 (95) = 106.13, p = .20 (*ns*). Given the small percentages of missing values in each individual measure, the Expectation-Maximization method was used to impute these missing wave 2 data.

Table 4.2. Descriptive Statistics for all observational predictors and wave 2 ($N = 56$) and wave 3 study variables ($N = 46$).

Variable	Variable Description	N	Mean	S. D.	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	S. E.	Statistic	S. E.
TIS_TOTAL	Observed Temperamental Inhibition	56	-0.232	0.362	1.914	.319	2.749	.628
MPP	Observed Maternal Positive Protection	56	0.111	1.009	.138	.319	-.338	.628
MPS	Observed Maternal Positive Support	56	0.144	0.661	-.833	.319	-.338	.628
W2TBIQ_TOTAL	Wave 2 Teacher-rated Total BIQ rating	56	3.755	1.016	.069	.319	-.411	.628
W2TBIS_TOTAL	Wave 2 Teacher-rated Total BIS rating	56	2.460	0.641	.131	.319	-.532	.628
W2CBS_INTERNAL	Wave 2 CBS - Internalizing Problems	56	1.330	0.407	1.210	.319	.430	.628
W2CBS_AS	Wave 2 CBS - Asocial with Peers	56	1.286	0.391	1.291	.319	0.657	.628
W2TSCI_INITIATIVE	Wave 2 Teacher-rated Social Initative	55	3.236	0.772	-.088	.322	-.871	.634
W2TBAC	Wave 2 Teacher-rated Behavior Academic Competence	55	3.019	0.480	-.660	.322	1.685	.634
W2GSRI	Wave 2 Gumpel School Readiness Inventory	54	3.265	0.461	-.955	.325	1.468	.639
W2CSS_REGULATED	Wave 2 Chinese Regulated Shyness	53	3.317	0.975	1.367	.327	6.300	.644
W2CSS_ANXIOUS	Wave 2 Chinese Anxious Shyness	53	2.464	0.883	.371	.327	.104	.644
W2PBIQ_TOTAL	Wave 2 Parent-rated Total BIQ rating	56	3.579	0.928	.328	.319	-.114	.628
W2PBIS_TOTAL	Wave 2 Parent-rated Total BIS rating	56	2.272	0.590	.201	.319	.594	.628
W2CBCL_INTERNAL	Wave 2 CBCL - Internalizing problems	56	11.857	9.443	1.611	.319	3.480	.628
W2CBCL_WD	Wave 2 CBCL - Withdrawan	56	2.696	2.579	1.292	.319	1.240	.628
W2CBCL_ANXP	Wave 2 CBCL - DSM Anxiety Problems	54	4.667	3.102	0.947	.325	0.910	.639
W2PSCI_INITIATIVE	Wave 2 Parent-rated Social Initiative	56	3.252	0.628	-.876	.319	1.830	.628
W2PSDQ_AUTHORITATIVE	Wave 2 Parent-rated Authoritative Parenting	55	3.825	0.529	.008	.322	-0.296	.634
W2PSDQ_AUTHORITARAIN	Wave 2 Parent-rated Authoritarian Parenting	55	2.201	0.543	.387	.322	0.406	.634
W2POS	Wave 2 Parent-rated Parental Overprotection	56	2.364	0.643	.358	.319	-.613	.628
W3TBIQ_TOTAL	Wave 3 Teacher-rated Total BIQ rating	46	3.629	1.126	.220	.350	-.722	.688
W3TBIS_TOTAL	Wave 3 Teacher-rated Total BIS rating	46	2.408	0.676	-.145	.350	.097	.688
W3CBS_INTERNAL	Wave 3 CBS - Internalizing Problems	45	1.265	0.335	1.462	.354	1.719	.695
W3CBS_AS	Wave 3 CBS - Asocial with Peers	45	1.207	0.318	1.480	.354	1.247	.695
W3TSCI_INITIATIVE	Wave 3 Teacher-rated Social Initative	46	3.356	0.798	-.391	.350	-.659	.688
W3TBAC	Wave 3 Teacher-rated Behavior Academic Competence	46	3.172	0.522	-.688	.350	.047	.688
W3GSRI	Wave 3 Gumpel School Readiness Inventory	46	3.370	0.463	-.916	.350	1.039	.688
W3CSS_REGULATED	Wave 3 Chinese Regulated Shyness	46	3.365	0.743	-.303	.350	1.284	.688
W3CSS_ANXIOUS	Wave 3 Chinese Anxious Shyness	46	2.339	0.878	.790	.350	.413	.688
W3PBIQ_TOTAL	Wave 3 Parent-rated Total BIQ rating	46	3.613	0.968	.032	.350	.301	.688
W3PBIS_TOTAL	Wave 3 Parent-rated Total BIS rating	46	2.313	0.653	.392	.350	.791	.688
W3CBCL_INTERNAL	Wave 3 CBCL - Internalizing problems	46	10.826	9.551	1.930	.350	5.494	.688
W3CBCL_WD	Wave 3 CBCL - Withdrawan	46	2.587	2.864	1.155	.350	.446	.688
W3CBCL_ANXP	Wave 3 CBCL - DSM Anxiety Problems	46	4.261	3.007	1.009	.350	1.238	.688
W3PSCI_INITIATIVE	Wave 3 Parent-rated Social Initiative	46	3.299	0.671	-.776	.350	2.206	.688
W3PSDQ_AUTHORITATIVE	Wave 3 Parent-rated Authoritative Parenting	46	3.839	0.523	-.179	.350	0.023	.688
W3PSDQ_AUTHORITARAIN	Wave 3 Parent-rated Authoritarian Parenting	46	2.101	0.519	.599	.350	-0.035	.688
W3POS	Wave 3 Parent-rated Parental Overprotection	45	2.351	0.684	.500	.354	-.189	.695

Among the wave 3 variables, one missing value was found each in teacher-rated Internalizing Problems and Asocial with Peers and one missing value was found in parent self-reported Parental Overprotection. Missing value analysis indicated that these data were missing completely at random with a non-significant Little's MCAR test, χ^2 (33) = 26.03, p = .80 (*ns*). Given the small percentage, the Expectation-Maximization method was used to impute these missing wave 3 values.

No differences in levels of significance were found in the results from the correlation analyses conducted with the original data versus the imputed data. Therefore, the results based on the imputed data with the treatments of outliers and missing values were used for subsequent data analyses to be reported.

Correlation analysis

Table 4.3 and Table 4.4 show the correlations between the observed predictor variables and the teacher- and parent-rated criterion variables in wave 2 and wave 3, respectively. Table 4.5 and Table 4.6 show the results of the same correlation analyses performed with the imputed data, which are used for reporting below. Among the wave 2 concurrent criterion variables, as anticipated, TIS was moderately correlated with the teacher-rated and parent-rated BIQ and BIS behavioral inhibition variables (r = .36 to .43), highly and negatively correlated with teacher-rated and parent-rated Social Initiative variables (r = -.45 and -.52, respectively), moderately correlated with Anxious Shyness (r = .44) but *not* Regulated Shyness (*ns*). However, TIS was not significantly correlated with teacher-rated measures of Academic Competence and School Readiness nor both teacher-rated and parent-rated overall Internalizing Problems, though it was significantly correlated with the teacher-rated Asocial with Peers (CBS_AS; r = .29). TIS was also not correlated

Table 4.3. Correlation between the observational predictors and wave 2 outcome variables ($N = 56$).

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. TIS_TOTAL	Observed Temperamental Inhibition																				
2. MPP	Observed Maternal Positive Protection	-.060																			
3. MPS	Observed Maternal Positive Support	.106	.209																		
4. W2TBIQ_TOTAL	Wave 2 Teacher-rated Total BIQ rating	.430**	-.208	.011																	
5. W2TBIS_TOTAL	Wave 2 Teacher-rated Total BIS rating	.426**	-.263*	-.031	.895**																
6. W2CBS_INTERNAL	Wave 2 CBS - Internalizing Problems	.257	-.091	.075	.615**	.574**															
7. W2CBS_AS	Wave 2 CBS - Asocial with Peers	.294*	-.122	-.040	.574**	.584**	.902**														
8. W2TSCI_INITIATIVE	Wave 2 Teacher-rated Social Initative	-.459**	.290*	.047	-.864**	-.844**	-.530**	-.629**													
9. W2TBAC	Wave 2 Teacher-rated Behavior Academic Competence	-.221	.255	.153	-.663**	-.562**	-.388**	-.400**	.663**												
10. W2GSRI	Wave 2 Gumpel School Readiness Inventory	-.101	.317*	.321*	-.281*	-.205	-.242	-.268*	.272*	.640**											
11. W2CSS_REGULATED	Wave 2 Chinese Regulated Shyness	.125	-.101	-.063	.285*	.192	-.042	-0.025	-.378**	-.032	0										
12. W2CSS_ANXIOUS	Wave 2 Chinese Anxious Shyness	.359**	-.177	-.018	.800**	.732**	.635**	.677**	-.821**	-.539**	-.213	0									
13. W2PBIQ_TOTAL	Wave 2 Parent-rated Total BIQ rating	.391**	-.011	.176	.516**	.535**	.302*	.268*	-.483**	-.244	.024	0.082	.390**								
14. W2PBIS_TOTAL	Wave 2 Parent-rated Total BIS rating	.356**	-.006	.050	.396**	.375**	.175	0.146	-.350**	-.209	.130	.135	0.223	.804**							
15. W2CBCL_INTERNAL	Wave 2 CBCL - Internalizing Problems	.088	.011	-.086	.144	.101	.146	.170	-.207	-.032	-.006	.059	0.182	.423**	.319*						
16. W2CBCL_WD	Wave 2 CBCL - Withdrawn	.057	.027	-.199	.151	.178	.121	.160	-.210	-.071	-.089	.016	0.186	.444**	.306*	.843**					
17. W2CBCL_ANXP	Wave 2 CBCL - DSM Anxiety Problems	.057	-.045	-.011	.168	.131	.120	.187	-.242	-.109	-.020	-.084	0.204	.348*	0	.879**	.671**				
18. W2PSCI_INITIATIVE	Wave 2 Parent-rated Social Initiative	-.517**	.126	-.129	-.445**	-.429**	-.328*	-.326*	.480**	.338*	.171	-0.115	-.353**	-.801**	-.767**	-.440**	-.436**	-.348**			
19. W2PSDQ_AUTHORITATIVE	Wave 2 Parent-rated Authoritative Parenting	-0.113	.194	.325*	-0.14	-0.172	0.08	-0.016	0.17	.048	.122	-0.045	-0.01	-0.033	0.011	0	-.222	-.141	.044		
20. W2PSDQ_AUTHORITARIAN	Wave 2 Parent-rated Authoritarian Parenting	-0.067	-.104	-.167	0.004	-0.055	-0.125	-0.17	-0.015	-.120	-.213	0.112	-0.032	0.189	0.152	.576**	.532**	.477**	-.224	-.162	
21. W2POS	Wave 2 Parent-rated Parental Overprotection	.013	-.096	-.075	.098	.022	.034	.049	-.068	.090	.017	.223	.009	0.209	.284*	.452**	.276*	.464**	-.231	-.005	.555**

Note. * $p < .05$; ** $p < .01$ level (2-tailed).

Table 4.4. Correlation between the observational predictors and wave 3 outcome variables ($N = 46$).

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. TIS_TOTAL	Observed Temperamental Inhibition																				
2. MPP	Observed Maternal Positive Protection	-.010																			
3. MPS	Observed Maternal Positive Support	.094	.205																		
4. W3TBIQ_TOTAL	Wave 3 Teacher-rated Total BIQ rating	.476**	-.232	.043																	
5. W3TBIS_TOTAL	Wave 3 Teacher-rated Total BIS rating	.404**	-0.227	-.050	.917**																
6. W3CBS_INTERNAL	Wave 3 CBS - Internalizing Problems	.670**	-.129	.022	.625**	.505**															
7. W3CBS_AS	Wave 3 CBS - Asocial with Peers	.605**	-.252	-.106	.568**	.458**	.895**														
8. W3TSCI_INITIATIVE	Wave 3 Teacher-rated Social Initiative	-.464**	0.264	.069	-.892**	-.833**	-.635**	-.631**													
9. W3TBAC	Wave 3 Teacher-rated Behavior Academic Competence	-.416**	.366*	.160	-.787**	-.603**	-.603**	-.563**	.773**												
10. W3GSRI	Wave 3 Gumpel School Readiness Inventory	-.195	.299*	0.146	-.359*	-.246	-.349*	-.396**	.441**	.613**											
11. W3CSS_REGULATED	Wave 3 Chinese Regulated Shyness	.196	.017	.012	.339*	.333*	.196	0.18	-.405**	-.110	0										
12. W3CSS_ANXIOUS	Wave 3 Chinese Anxious Shyness	.404**	-.234	-.051	.853**	.810**	.682**	.645**	-.898**	-.639**	-.284	.376*									
13. W3PBIQ_TOTAL	Wave 3 Parent-rated Total BIQ rating	.449**	-.232	.079	.464**	.383**	.457**	.371*	-.465**	-.455**	-.217	0.211	.353*								
14. W3PBIS_TOTAL	Wave 3 Parent-rated Total BIS rating	.419**	-.108	.143	.343*	0.26	.470**	.379*	-.367*	-.375*	-.101	.119	0.284	.800**							
15. W3CBCL_INTERNAL	Wave 3 CBCL - Internalizing Problems	.059	-.074	-.204	.059	-.015	.186	.223	-.120	-.130	-.123	-.019	0.133	.339*	.292*						
16. W3CBCL_WD	Wave 3 CBCL - Withdrawn	.119	-.147	-.321*	.187	.115	.335*	.362*	-.347*	-.303*	-.209	.066	.375*	.389**	.374*	.840**					
17. W3CBCL_ANXP	Wave 3 CBCL - DSM Anxiety Problems	.031	-.007	-.099	-.056	-.018	.034	.053	-.011	.021	.009	-.079	0.015	.310*	0	.693**	.472**				
18. W3PSCI_INITIATIVE	Wave 3 Parent-rated Social Initiative	-.523**	.229	-.084	-.442**	-.310*	-.459**	-.391**	.424**	.468**	.203	-0.232	-.377**	-.778**	-.754**	-.367*	-.446**	-.272			
19. W3PSDQ_AUTHORITATIVE	Wave 3 Parent-rated Authoritative Parenting	-0.226	.057	.394**	-0.032	-0.088	-0.098	-0.142	0.162	.137	-.119	-0.081	-0.178	-0.009	-0.065	0	-.236	.029	.120		
20. W3PSDQ_AUTHORITARIAN	Wave 3 Parent-rated Authoritarian Parenting	0.094	.011	-.184	0.101	0.079	0.091	0.15	-0.148	-.100	-.114	-0.114	0.184	0.264	0.202	.583**	.549**	.472**	-.331*	-.279	
21. W3POS	Wave 3 Parent-rated Parental Overprotection	.084	-.118	-.316*	.011	-.009	-.023	.087	-.103	-.150	-.082	.044	.021	0.192	0.077	.312*	.263	.356*	-.190	-.177	.581**

Note. * $p < .05$; ** $p < .01$ level (2-tailed).

Table 4.5. Correlation between the observational predictors and wave 2 outcome variables with data imputation ($N = 56$).

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. TIS_TOTAL	Observed Temperamental Inhibition																				
2. MPP	Observed Maternal Positive Protection	-.060																			
3. MPS	Observed Maternal Positive Support	.106	.209																		
4. W2TBIQ_TOTAL	Wave 2 Teacher-rated Total BIQ rating	.430**	-.208	.011																	
5. W2TBIS_TOTAL	Wave 2 Teacher-rated Total BIS rating	.426**	-.263*	-.031	.895**																
6. W2CBS_INTERNAL	Wave 2 CBS - Internalizing Problems	.257	-.091	.075	.615**	.574**															
7. W2CBS_AS	Wave 2 CBS - Asocial with Peers	.294*	-.122	-.040	.574**	.584**	.902**														
8. W2TSCI_INITIATIVE	Wave 2 Teacher-rated Social Initiative	-.450**	0.261	.035	-.865**	-.843**	-.529**	-.613**													
9. W2TBAC	Wave 2 Teacher-rated Behavior Academic Competence	-.249	.264*	.143	-.669**	-.571**	-.389**	-.413**	.671**												
10. W2GSRI	Wave 2 Gumpel School Readiness Inventory	-.123	.328*	.309*	-.292*	-.217	-.233	-.270*	.286*	.645**											
11. W2CSS_REGULATED	Wave 2 Chinese Regulated Shyness	.136	-.070	-.090	.278*	.198	-.031	-0.018	-.382**	-.026	0										
12. W2CSS_ANXIOUS	Wave 2 Chinese Anxious Shyness	.439**	-.132	-.053	.795**	.746**	.634**	.693**	-.831**	-.511**	-.225	.273*									
13. W2PBIQ_TOTAL	Wave 2 Parent-rated Total BIQ rating	.391**	-.011	.176	.516**	.535**	.302*	.268*	-.483**	-.258	.006	0.09	.420**								
14. W2PBIS_TOTAL	Wave 2 Parent-rated Total BIS rating	.356**	-.006	.050	.396**	.375**	.175	0.146	-.353**	-.213	.124	.141	0.24	.804**							
15. W2CBCL_INTERNAL	Wave 2 CBCL - Internalizing Problems	.088	.011	-.086	.144	.101	.146	.170	-.197	-.041	-.038	.083	0.206	.423**	.319*						
16. W2CBCL_WD	Wave 2 CBCL - Withdrawn	.057	.027	-.199	.151	.178	.121	.160	-.200	-.073	-.108	.057	0.222	.444**	.306*	.843**					
17. W2CBCL_ANXP	Wave 2 CBCL - DSM Anxiety Problems	.067	-.020	.005	.099	.085	.007	.057	-.148	.011	.048	-.028	0.142	.343**	0	.878**	.666**				
18. W2PSCI_INITIATIVE	Wave 2 Parent-rated Social Initiative	-.517**	.126	-.129	-.445**	-.429**	-.328*	-.326*	.478**	.352**	.182	-0.131	-.408**	-.801**	-.767**	-.440**	-.436**	-.328*			
19. W2PSDQ_AUTHORITATIVE	Wave 2 Parent-rated Authoritative Parenting	-0.113	.194	.324*	-0.14	-0.172	0.08	-0.017	0.166	.074	.146	-0.056	-0.079	-0.033	0.011	0	-.221	-.150	.044		
20. W2PSDQ_AUTHORITARIAN	Wave 2 Parent-rated Authoritarian Parenting	-0.056	-.096	-.176	-0.005	-0.055	-0.138	-0.189	-0.005	-.117	-.234	0.103	-0.021	0.167	0.151	.567**	.530**	.471**	-.216	-.159	
21. W2POS	Wave 2 Parent-rated Parental Overprotection	.013	-.096	-.075	.098	.022	.034	.049	-.076	.072	-.003	.213	.026	0.209	.284*	.452**	.276*	.469**	-.231	-.004	.564**

Note. * $p < .05$; ** $p < .01$ level (2-tailed).

Table 4.6. Correlation between the observational predictors and wave 3 outcome variables with data imputation ($N = 46$).

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. TIS_TOTAL	Observed Temperamental Inhibition																				
2. MPP	Observed Maternal Positive Protection	-.010																			
3. MPS	Observed Maternal Positive Support	.094	.205																		
4. W3TBIQ_TOTAL	Wave 3 Teacher-rated Total BIQ rating	.476**	-.232	.043																	
5. W3TBIS_TOTAL	Wave 3 Teacher-rated Total BIS rating	.404**	-0.227	-.050	.917**																
6. W3CBS_INTERNAL	Wave 3 CBS - Internalizing Problems	.660**	-.151	.034	.627**	.508**															
7. W3CBS_AS	Wave 3 CBS - Asocial with Peers	.593**	-.271	-.091	.571**	.462**	.896**														
8. W3TSCI_INITIATIVE	Wave 3 Teacher-rated Social Initiative	-.464**	0.264	.069	-.892**	-.833**	-.640**	-.637**													
9. W3TBAC	Wave 3 Teacher-rated Behavior Academic Competence	-.416**	.366*	.160	-.787**	-.603**	-.604**	-.564**	.773**												
10. W3GSRI	Wave 3 Gumpel School Readiness Inventory	-.195	.299*	0.146	-.359*	-.246	-.336*	-.381**	.441**	.613**											
11. W3CSS_REGULATED	Wave 3 Chinese Regulated Shyness	.196	.017	.012	.339*	.333*	.192	0.175	-.405**	-.110	0										
12. W3CSS_ANXIOUS	Wave 3 Chinese Anxious Shyness	.404**	-.234	-.051	.853**	.810**	.684**	.650**	-.898**	-.639**	-.284	.376*									
13. W3PBIQ_TOTAL	Wave 3 Parent-rated Total BIQ rating	.449**	-.232	.079	.464**	.383**	.461**	.377**	-.465**	-.455**	-.217	0.211	.353*								
14. W3PBIS_TOTAL	Wave 3 Parent-rated Total BIS rating	.419**	-.108	.143	.343*	0.26	.472**	.381**	-.367*	-.375*	-.101	.119	0.284	.800**							
15. W3CBCL_INTERNAL	Wave 3 CBCL - Internalizing Problems	.059	-.074	-.204	.059	-.015	.189	.227	-.120	-.130	-.123	-.019	0.133	.339*	.292*						
16. W3CBCL_WD	Wave 3 CBCL - Withdrawn	.119	-.147	-.321*	.187	.115	.340*	.367*	-.347*	-.303*	-.209	.066	.375*	.389**	.374*	.840**					
17. W3CBCL_ANXP	Wave 3 CBCL - DSM Anxiety Problems	.031	-.007	-.099	-.056	-.018	.042	.062	-.011	.021	.009	-.079	0.015	.310*	0	.693**	.472**				
18. W3PSCI_INITIATIVE	Wave 3 Parent-rated Social Initiative	-.523**	.229	-.084	-.442**	-.310*	-.458**	-.390**	.424**	.468**	.203	-0.232	-.377**	-.778**	-.754**	-.367*	-.446**	-.272			
19. W3PSDQ_AUTHORITATIVE	Wave 3 Parent-rated Authoritative Parenting	-0.226	.057	.394**	-0.032	-0.088	-0.097	-0.14	0.162	.137	-.119	-0.081	-0.178	-0.009	-0.065	0	-.236	.029	.120		
20. W3PSDQ_AUTHORITARIAN	Wave 3 Parent-rated Authoritarian Parenting	0.094	.011	-.184	0.101	0.079	0.097	0.156	-0.148	-.100	-.114	-0.114	0.184	0.264	0.202	.583**	.549**	.472**	-.331*	-.279	
21. W3POS	Wave 3 Parent-rated Parental Overprotection	.077	-.129	-.305*	.001	-.009	-.039	.071	-.097	-.135	-.082	.045	.018	0.197	0.086	.314*	.268	.353*	-.184	-.177	.587**

Note. * $p < .05$; ** $p < .01$ level (2-tailed).

with the two observed maternal positive parenting variables (i.e., MPP and MPS). Meanwhile, both MPP and MPS were moderately and positively correlated with teacher-rated School Readiness (r = .33 and .31) and MPP (only) was significantly correlated with teacher-rated Academic Competence (r = .26) though the effect size was relatively small. Unexpected, MPP was negatively correlated with teacher-rated BIS measure (r = -.26) but the correlation was of a relatively small effect size, and it had no correlations with the parent- and teacher-rated BIQ variables nor the parent-rated BIS variable. On the other hand, neither TIS, MPP nor MPS were correlated with parent-rated Parental Overprotection (POS) but MPS was significantly and moderately correlated with parent-rated Authoritative Parenting (r = .32) but not Authoritarian Parenting (*ns*). Lastly, parent self-reported Parental Overprotection was found to be highly and positively correlated with Authoritarian Parenting (r = .56) and both Parental Overprotection and Authoritarian Parenting were moderately to highly correlated with parent-rated Internalizing Problems (r = .45 and .57, respectively).

Among the wave 3 prospective criterion variables, as similarly anticipated, TIS was almost highly correlated with teacher-rated and parent-rated BIQ and BIS inhibition variables (r = .40 to .48), almost highly and negatively correlated with teacher-rated and parent-rated Social Initiative variables (r = -.46 and -.52, respectively), moderately correlated with Anxious Shyness (r = .40) but *not* Regulated Shyness (*ns*). Moreover, TIS was moderately and negatively correlated with teacher-rated Academic Competence (r = -.42) unlike the corresponding non-significant wave 2 correlation but still not significantly correlated with teacher-rated School Readiness (r = -.20, *ns*). On the other hand, TIS was highly correlated with teacher-rated Internalizing Problems (r = .66) unlike the non-significant wave 2

correlation, highly correlated with teacher-rated Asocial with Peers (r = .59) though still not significantly correlated with parent-rated Internalizing Problems (*ns*). TIS continued to have no correlations with the two maternal positive parenting variables (i.e., MPP and MPS). Meanwhile, MPP was moderately and positively correlated with both teacher-rated Academic Competence (r = .37) and School Readiness (r =.30) whereas MPS was not correlated with these variables. While MPP was still not correlated with parent-rated Parental Overprotection nor other parent self-reported parenting styles, MPS was moderately and negatively correlated with Parental Overprotection (r = -.31) and moderately and positively correlated with parent-rated Authoritative Parenting (r = .39) but not significantly correlated with Authoritarian Parenting (*ns*). Lastly, parent self-reported Parental Overprotection continued to be highly and positively correlated with Authoritarian Parenting (r = .59) and both Parental Overprotection and Authoritarian Parenting continued to be moderately to highly correlated with parent-rated Internalizing Problems (r = .31 and .58, respectively)

In summary, the observed measure of temperamental inhibition (TIS) was found to be not only positively correlated with teacher-rated and parent-rated behavioral inhibition variables (BIQ and BIS) but also negatively correlated with teacher-rated and parent-rated measures of Social Initiative consistently across the two waves of assessment data about Hong Kong Chinese preschool-aged children, demonstrating substantial support for convergent and criterion validity. Moreover, TIS was also consistently correlated with Anxious Shyness but *not* correlated with Regulated Shyness measured with the Chinese Shyness Scale, concurrently and prospectively, providing support for hypothesis (H1.2) on the culturally differences in perceived shyness among Hong Kong Chinese children. The inconsistent correlation of TIS

with only the prospective measure of teacher-rated Academic Competence but not the corresponding concurrent measure and not any measures of School Readiness showed that temperamental inhibition by itself may not be related to Hong Kong Chinese children's general academic abilities as perceived by teachers. Meanwhile, Maternal Positive Protection (MPP) was positively related both the concurrent and prospective measures of teacher-rated Academic Competence and School Readiness. These relations were further analyzed with regression analysis subsequently. The same relations with Maternal Positive Support (MPS) were less conclusive with only a significant correlation with the concurrent teacher-rated School Readiness but not the corresponding prospective measure. Lastly, parent self-reported Parental Overprotection with the POS was not correlated with MPP at all. Despite its satisfactory internal consistency, the POS instrument appears to be a different measure than the measure of context-based observational maternal protective parenting behavior as assessed with the MPP in the present study. In fact, the finding that Parental Overprotection measured with the POS was consistently and highly correlated with parent self-reported Authoritarian Parenting with the PSDQ indicates that the two instruments may overlap in measuring aspects of negative parenting among Hong Kong Chinese parents. On the other hand, MPS was consistently correlated with parent self-reported Authoritative Parenting with the PSDQ concurrently and prospectively, implying similar aspects of positive parenting were tapped with both the observational scale (MPS) and the self-report parenting scale (PSDQ) on Authoritative Parenting.

Data aggregation for regression analysis

With the consistently significant and moderate to high correlations between the teacher-rated and parent-rated measures of Behavioral Inhibition and Social Initiative, these measures were aggregated as two overall criterion variables for regression analysis. In particular, aggregated Behavioral Inhibition was computed as the mean of the standard scores of TBIQ, TBIS, PBIQ and PBIS. Likewise, aggregated Social Initiative was computed as the mean of the standard scores of TSCI and PSCI.

The teacher-rated measure of Internalizing Problems with the CBS and the parent-rated measure of Internalizing Problems with the CBCL were not significantly correlated in both wave 2 and wave 3 data despite the expected positive relations (i.e., r = .15 and .19, *ns*, respectively). However, on a theoretical basis, they were aggregated in the same way to create a multisource measure of Internalizing Problems, by averaging the standard scores of the two measures.

To devise an aggregated measure of Social Withdrawal that is more specific than the more general measure of Internalizing Problems, as rated by both teachers and parents, the Anxious Shyness subscale of the Chinese Shyness Scale and the fine-grained Asocial with Peers subscale of the CBS as assessed by teachers, and the DSM-oriented Anxiety Problems subscale and the Withdrawn syndrome subscale of the CBCL both assessed by parents, were selected. All four scales are composed of different test items. In particular, though they are subsets of the 100-item CBCL, the Anxiety Problems subscale and the Withdrawn syndrome subscale are made up of different items and do not overlap. Tested with the larger sample with 352 participants, the four variables loaded on two factors in an EFA accounting for 59.97% and 56.57% of item variance with the corresponding wave 2 and wave 3

outcome data, respectively. The two factors were found to be significantly and positively correlated in both the wave 2 and wave 3 data ($r = .19$, $p < .01$ and $r = .25$, $p < .001$, respectively). This multisource measure of Social Withdrawal among children was computed by taking the mean of the standard scores of the four scales.

The teacher-rated measures of Academic Competence (TBAC) and School Readiness (GSRI) were consistently and highly correlated in both wave 2 and wave 3 data (i.e., $r = .65$ and .61, respectively). They were aggregated by taking the average of the standard scores of the two measures.

These five aggregated measures were used as the criterion variables for an investigation of how the observed measures of temperamental inhibition (TIS) and positive parenting variables (MPP and MPS) predict them concurrently and prospectively as well as the moderating roles of the parenting variables in the predictive relations between temperamental inhibition and the outcome variables for a comparative investigation against the previous findings reported by other researchers from the extant literature (Coplan et al., 2008; Degnan et al., 2008; Hane et al., 2008; Rubin et al., 2002; Rubin et al., 2001). In addition, the Anxious Shyness measure was also included as an outcome variable for individual analysis as this instrument had demonstrated a unique culturally different measurement of perceived shyness among Chinese children in other studies as well as the present investigation (Xu et al., 2009; Xu et al., 2007).

Hierarchical regression analysis

Child age and gender were first tested for any significant relations with the criterion variables to determine if they needed to be controlled for in any regression analysis. Child age was found to negatively and significantly correlated with the

wave 2 aggregated measure of Internalizing Problems (r = -.30, p < .05) but not any other criterion variables from wave 2 and wave 3 data. Meanwhile, significant gender differences were found in the wave 2 aggregated measure of Academic Competence (t (54) = -2.04, p < .05) with a higher mean rating among girls (i.e., .30 vs. -.19), in the wave 3 aggregated measure of Internalizing Problems (t (44) = 2.31, p < .05) with a higher mean rating among boys (i.e., .20 vs. -.31), and in the wave 3 aggregated measure of Social Withdrawal (t (44) = 2.93, p < .01) with a higher mean rating among boys (i.e., .23 vs. -.35). Accordingly, child age and gender were included in step 1 of the hierarchical regression analyses for the prediction of these respective criterion variables.

A multi-step hierarchical regression analysis was conducted to examine the main effects of TIS, MPP and MPS to predict each wave 2 and wave 3 criterion variable, and evaluate any moderating effects of MPP and MPS on the relation between TIS and each criterion. In the first step, child age or gender is first entered if it is significantly related to the criterion as revealed in the prior correlation or independent samples t test. In the next step, TIS, MPP and MPS were simultaneously entered as a block into the model as predictors. In the final step, the interaction terms, TIS × MPP and TIS × MPS were entered as another block. To reduce multicollinearity, the three predictor variables were centered by subtracting each score from its mean before creating the interaction terms for the final step (Aiken & West, 1991). After the regression was computed, multicollinearity was checked through the Variance Inflation Factor (VIF) and tolerance values and no problems were identified (all VIF values less than 1.87 and all tolerance values greater than .53 among all models). Using the Hayes PROCESS macro, the above analyses were conducted based on Model 1 and Model 3 and the steps to mean-

center the predictor variables and generate the product items were automated. The Johnson-Neyman technique was selected for post-hoc probing (Hayes, 2016).

Table 4.7 shows the results of the hierarchical regression analyses conducted for the wave 2 criterion variables. The total effect sizes of the six predictive models ranged from .213 to .398 in R^2, corresponding to Cohen's f^2 from .30 to .66 or medium to large effect sizes (Cohen, 1992). These effect sizes achieved a statistical power of 79% to 99% with $n = 56$ and $\alpha = .05$ as calculated in a post-hoc power analysis using G*Power 3 (Faul et al., 2007).

Table 4.7. Hierarchical regression analysis to investigate concurrent prediction.

Predictor / Outcome	Teacher-Rated	Aggregated				
	CSS-Chinese Anxious	Behavioral Inhibtion	Internalizing Problems	Social Initiative	Social Withdrawal	Academic Competence
Concurrent Prediction - Total R^2 (N = 56)	**0.247**	**0.271**	**0.213**	**0.398**	**0.234**	**0.228**
Gender/Age Effect - R^2 Change	-	-	0.087*	-	-	0.07*
Sex	-	-	-	-	-	.264*
Age	-	-	-0.295*	-	-	-
Main Effect - R^2 Change	0.211*	0.248**	0.043	0.355***	0.113+	0.146*
Sex	-	-	-	-	-	0.189
Age	-	-	-0.282*	-	-	-
Observed Inhibition (TIS)	0.443*	0.471***	0.201	-0.547***	0.316*	-0.168
Maternal Positive Protection (MPP)	-0.088	-0.127	-0.007	0.201	-0.043	0.282*
Maternal Positive Support (MPS)	-0.081	0.039	-0.073	-0.039	-0.127	0.159
Interaction Effort - R^2 Change	0.036	0.023	0.083	0.043	0.120*	0.012
Sex	-	-	-	-	-	0.184
Age	-	-	-0.173	-	-	-
TIS	0.446*	0.473***	0.217	-0.55***	0.322*	-0.167
MPP	-0.092	-0.125	-0.015	0.211	-0.045	0.282*
MPS	-0.064	0.048	-0.036	-0.063	-0.1	0.168
TIS x MPP	0.195	0.154	0.314*	-0.199	0.357**	0.112
TIS x MPS	0.022	0.052	0.106	0.031	0.079	0.03

Note. * $p < .05$; ** $p < .01$, *** $p < .001$ level (2-tailed); "-" means variable/step not entered in regression.

Among the predictive models with wave 2 criterion variables, TIS was a significant predictor of higher teacher-rated Chinese Anxious Shyness and the aggregated measures of higher Behavioral Inhibition, lower Social Initiative, and higher Social Withdrawal but not Internalizing Problems and overall Academic

Competence. However, MPP was found to be a significant predictor of higher overall Academic Competence and MPP was also found to moderate the relation between TIS and Internalizing Problems despite a non-significant change in R^2 in the prediction, as well as to moderate the relation between TIS and Social Withdrawal with a significant change in R^2 in the prediction. The main effects of TIS, MPP and MPS in the concurrent predictive models significantly accounted for 21%, 25%, 36% and 11% of variance in teacher-rated Chinese Anxious Shyness ($F_{3,52} = 4.623$, $p < .01$, $R^2 = .21$), the aggregated measures of Behavioral Inhibition ($F_{3,52} = 5.718$, $p < .01$, $R^2 = .25$), Social Initiative ($F_{3,52} = 9.541$, $p < .001$, $R^2 = .36$), and (marginally) Social Withdrawal ($F_{3,52} = 2.218$, $p < .10$, $R^2 = .11$), respectively. Meanwhile, the main effects of TIS, MPP and MPS accounted for 15% of variance in overall Academic Competence ($F_{3,51} = 3.168$, $p < .05$, $R^2 = .15$). The interaction effects between TIS and MPP/MPS accounted for another 12% of variance in the aggregated measure of Social Withdrawal.

The significant interactions between MPP and TIS in concurrently predicting the aggregated measure of Internalizing Problems and Social Withdrawal were further analyzed using the Johnson-Neyman post-hoc probing technique and verified using traditional post-hoc probing procedures recommended by Aiken and West (1991) and Holmbeck (2002). In the latter procedure, simple regression equations were generated for each outcome variable at low (i.e., 1 SD below the mean) versus high (i.e., 1 SD above the mean) levels of MPP. Upon a theoretical basis, MPP was expected to moderate TIS in predicting Internalizing Problems and Social Withdrawal. The regression lines were plotted for Internalizing Problems as shown in Figure 4.2 and the regression lines were plotted for Social Withdrawal as shown in Figure 4.3 based on the output of the Hayes PROCESS macro (Hayes, 2016).

The interaction pattern in Figure 4.2 shows that Temperamental Inhibition was only significantly related to Internalizing Problems in children whose mothers exhibited high levels of Maternal Positive Protection. Temperamental Inhibition had no significant effect on Internalizing Problems in children whose mothers exhibited low levels of Maternal Positive Protection. The Johnson-Neyman output showed a cutoff Maternal Positive Protection value of .1386, above which the moderation effect was significant. To further verify this finding, a median split was conducted on the Internalizing Problems scores to divide the sample into two sub-samples, i.e., low MPP and high MPP. As expected, the aggregated measure of Internalizing Problems was significantly correlated with Temperamental Inhibition among only the children whose mothers exhibited high levels of Maternal Positive Protection (r = .45, p < .05, N = 28) but not the children whose mothers exhibited low levels of Maternal Positive Protection (r = -.09, *ns*, N = 28).

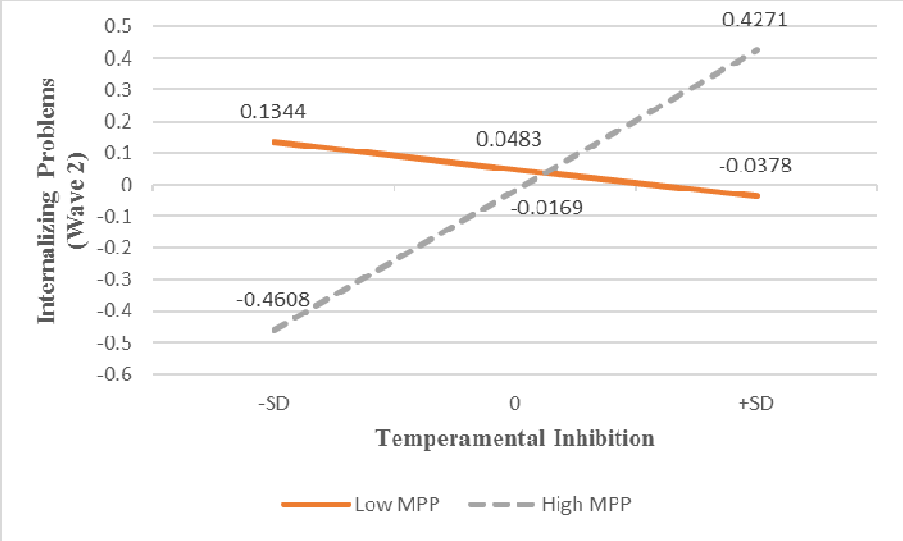

Figure 4.2. Regression lines showing relations between Temperamental Inhibition and concurrent (wave 2) Internalizing Problems as moderated by Maternal Positive Protection.

The regression lines in Figure 4.3 show a similar interaction pattern. Temperamental Inhibition was only significantly related to Social Withdrawal in children whose mothers exhibited high levels of Maternal Positive Protection. Likewise, Temperamental Inhibition had no significant effect on Social Withdrawal in children whose mothers exhibited low levels of Maternal Positive Protection. The Johnson-Neyman output showed a cutoff Maternal Positive Protection value of -.1841, above which the moderation effect was significant. To further verify this finding, a median split on the Social Withdrawal scores to divide the sample into two sub-samples, i.e., low MPP and high MPP, also provided the expected results. The aggregated measure of Social Withdrawal was significantly correlated with Temperamental Inhibition among only the children whose mothers exhibited high levels of Maternal Positive Protection ($r = .51$, $p < .01$, $N = 28$) but not children whose mothers exhibited low levels of Maternal Positive Protection ($r = .06$, *ns*, $N = 28$).

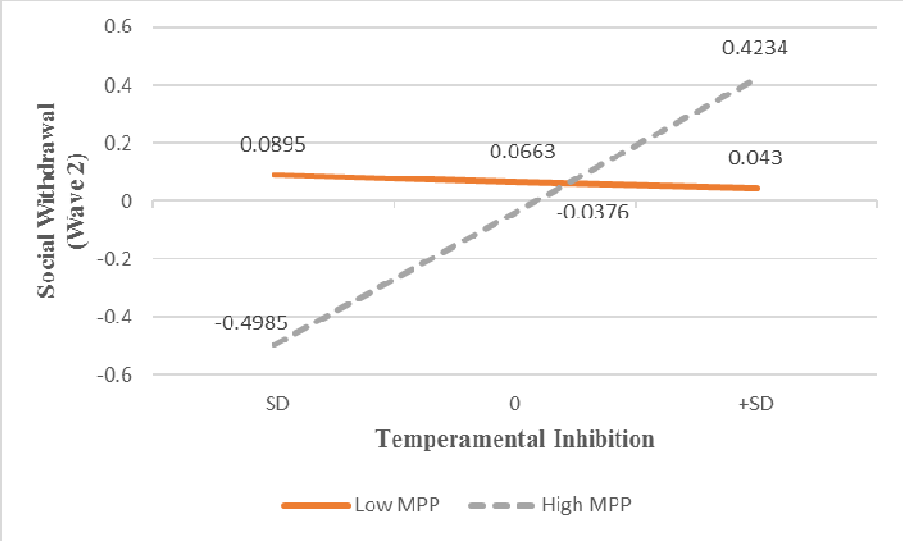

Figure 4.3. Regression lines showing relations between Temperamental Inhibition and concurrent (wave 2) Social Withdrawal as moderated by Maternal Positive Protection.

Table 4.8 shows the results of the hierarchical regression analyses conducted for the wave 3 criterion variables. The total effect sizes of the six predictive models ranged from .231 to .497 in R^2, corresponding to Cohen's f^2 from .30 to .99 or medium to large effect sizes (Cohen, 1992). These effects achieved a statistical power from 77% to 99% with $n = 46$ and $\alpha = .05$ as calculated in a post-hoc analysis using G*Power 3 (Faul et al., 2007). In particular, the total effect sizes of the prediction models for Internalizing Problems and Social Withdrawal were .497 and .427 in R^2, corresponding to large effects in Cohen's f^2 of .99 and .75, respectively, both achieving a statistical power of .99.

Table 4.8. Hierarchical regression analysis to investigate prospective prediction.

Predictor / Outcome	Teacher-Rated	Aggregated				
	CSS-Chinese Anxious	Behavioral Inhibtion	Internalizing Problems	Social Initiative	Social Withdrawal	Academic Competence
Prospective Prediction -Total R^2 (N = 46)	**0.231**	**0.38**	**0.497**	**0.430**	**0.427**	**0.285**
Gender/Age Effect - R^2 Change	-	-	0.108*	-	0.164**	-
Sex	-	-	-0.329*	-	-0.404**	-
Main Effect - R^2 Change	0.218*	0.359***	0.193*	0.424***	0.182*	0.267**
Sex			-0.227		-0.308*	
Observed Inhibition (TIS)	0.406**	0.534***	0.426**	-0.58***	0.356**	-0.35*
Maternal Positive Protection (MPP)	-0.22	-0.257*	-0.126	0.289*	-0.205	0.339*
Maternal Positive Support (MPS)	-0.044	0.069	-0.086	-0.014	-0.139	0.134
Interaction Effort - R^2 Change	0.014	0.02	0.196**	0.06	0.081+	0.017
Sex	-	-	-0.229+	-	-.0.309*	-
TIS	0.392**	0.517***	0.37**	-0.572***	0.251+	-0.359*
MPP	-0.175	-0.207	0.024	0.258	-0.112	0.324*
MPS	-0.037	0.085	-0.032	-0.016	-0.111	0.173
TIS x MPP	0.148	0.186	0.579***	-0.091	0.373*	0.085
TIS x MPS	0.136	0.146	0.432**	-0.095	0.291+	-0.069

Note. * $p < .05$; ** $p < .01$, *** $p < .001$ level (2-tailed); "-" means variable/step not entered in regression.

As was done for the concurrent regression analyses, using the Hayes PROCESS macro, the same analyses were completed based on Model 1 and Model 3 and the steps to mean-center the predictor variables and generate the product items were

automated. The Johnson-Neyman technique was selected for post-hoc probing (Hayes, 2016).

TIS was found to be a significant predictor of all criterion variables for teacher-rated Chinese Anxious Shyness and the aggregated measures of higher Behavioral Inhibition, lower Social Initiative, higher Internalizing Problems, (marginally) higher Social Withdrawal, and lower overall Academic Competence. Moreover, MPP was found to be a significant predictor of higher overall Academic Competence as in the wave 2 model. Further, both MPP and MPS were found to significantly moderate the relation between TIS and Internalizing Problems and the relation between TIS and Social Withdrawal.

In particular, the main effects of TIS, MPP and MPS in the prospective predictive models accounted for 22%, 36%, 19%, 42%, 18% and 27% of variance in teacher-rated Chinese Anxious Shyness ($F_{3,42} = 3.900$, $p < .05$, $R^2 = .22$) and the aggregated measures of Behavioral Inhibition ($F_{3,42} = 7.846$, $p < .001$, $R^2 = .36$), Internalizing Problems ($F_{3,41} = 3.767$, $p < .05$, $R^2 = .19$), Social initiative ($F_{3,42} = 10.300$, $p < .001$, $R^2 = .42$), Social Withdrawal ($F_{3,41} = 3.811$, $p < .05$, $R^2 = .19$), overall Academic Competence ($F_{3,42} = 5.110$, $p < .01$, $R^2 = .27$), respectively. Meanwhile, the interaction effects between TIS and MPP/MPS accounted for another 20% and 8% of variance in the aggregated measures of Internalizing Problems and (with marginal significance) Social Withdrawal, respectively.

The significant interactions between MPP and TIS and between MPS and TIS in prospectively predicting the aggregated measures of Internalizing Problems and Social Withdrawal were further analyzed using the Johnson-Neyman post-hoc probing technique and verified using the traditional post-hoc probing procedures recommended by Aiken and West (1991) and Holmbeck (2002). Likewise, in the

latter procedures, simple regression equations were generated for aggregated Internalizing Problems at low (i.e., 1 SD below the mean) versus high (i.e., 1 SD above the mean) levels of MPP and MPS, respectively. MPP and MPS were expected to moderate TIS in predicting Internalizing Problems and the regression lines were plotted as shown in Figures 4.4 and 4.5, respectively. The same moderating effects of MPP and MPS on the relation between TIS and Social Withdrawal were plotted as regression lines shown in Figures 4.6 and 4.7 based on the output of the Hayes PROCESS macro (Hayes, 2016).

Similar to the wave 2 model, the interaction pattern in Figure 4.4 shows that Temperamental Inhibition was significantly related to Internalizing Problems among only children whose mothers exhibited high levels of Maternal Positive Protection. Temperamental Inhibition had no significant effect on Internalizing Problems among children whose mothers exhibited low levels of Maternal Positive Protection. The Johnson-Neyman output showed a cutoff Maternal Positive Protection value of -.3172, above which the moderation effect was significant. To further verify this finding, a median split was conducted on the Internalizing Problems scores to divide the sample into two sub-samples, i.e., low MPP and high MPP. As expected, the aggregated measure of Internalizing Problems was significantly correlated with Temperamental Inhibition among only children whose mothers exhibited high levels of Maternal Positive Protection ($r = .68$, $p < .001$, $N = 23$) but not children whose mothers exhibited low levels of Maternal Positive Protection ($r = .25$, *ns*, $N = 23$).

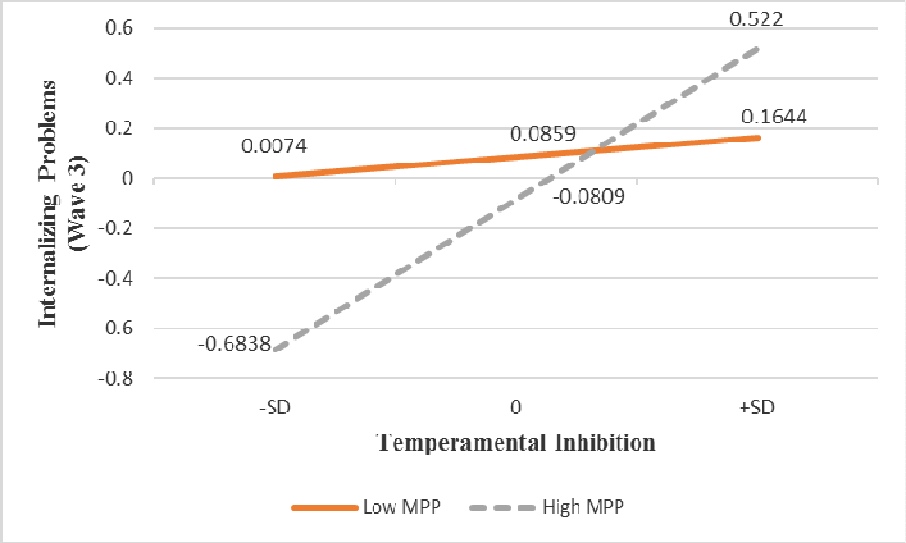

Figure 4.4. Regression lines showing relations between Temperamental Inhibition and prospective (wave 3) Internalizing Problems as moderated by Maternal Positive Protection.

The interaction between Temperamental Inhibition and Maternal Positive Support depicted in Figure 4.5 shows an unexpected pattern. Temperamental Inhibition was significantly and positively related to Internalizing Problems among children whose mothers exhibited high levels of Maternal Positive Support. Temperamental Inhibition had no significant effect on Internalizing Problems among children whose mothers exhibited low levels of Maternal Positive Support. The Johnson-Neyman output showed a cutoff Maternal Positive Support value of -.5283, above which the moderation effect was significant. To further verify this finding, a median split was again conducted on the Internalizing Problems scores to divide the sample into two sub-samples, i.e., low MPS and high MPS. The aggregated measure of Internalizing Problems was significantly related with Temperamental Inhibition among only children whose mothers exhibited high levels of Maternal Positive Support (r = .60, p < .01, N = 23) but not children whose mothers exhibited low levels of Maternal Positive Support (r = .31, *ns*, N = 23). This moderating effect is actually similar to the interaction between MPP and TIS but appears to be not as strong as the effect of

the MPP moderator, as can be visually compared with the simple slope shown in Figure 4.4.

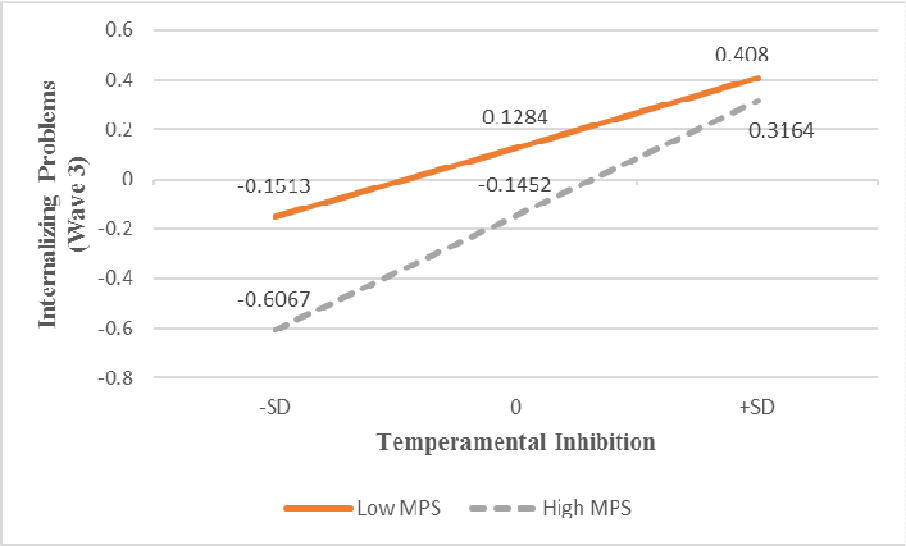

Figure 4.5. Regression lines showing relations between Temperamental Inhibition and prospective (wave 3) Internalizing Problems as moderated by Maternal Positive Support.

The interactions between MPP and TIS and between MPS and TIS in prospectively predicting the aggregated measures of Social Withdrawal were similar to those with Internalizing Problems except that the interaction effect between MPS and TIS was only marginally significant. Similar to the corresponding wave 2 model, the interaction patterns in Figure 4.6 show that Temperamental Inhibition was only significantly related to Social Withdrawal among children whose mothers exhibited high levels of Maternal Positive Protection. Temperamental Inhibition had no significant effect on Social Withdrawal among children whose mothers exhibited low levels of Maternal Positive Protection. The Johnson-Neyman output showed a cutoff Maternal Positive Protection value of -.2065, above which the moderation effect was significant. To further verify this finding, a median split was further conducted on the Social Withdrawal scores to divide the sample into two sub-

samples, i.e., low MPP and high MPP, to verify this regression lines. As expected, the aggregated measure of Social Withdrawal was significantly related with Temperamental Inhibition among only children whose mothers exhibited high levels of Maternal Positive Protection ($r = .50$, $p < .05$, $N = 23$) but not children whose mothers exhibited low levels of Maternal Positive Protection ($r = .32$, *ns*, $N = 23$).

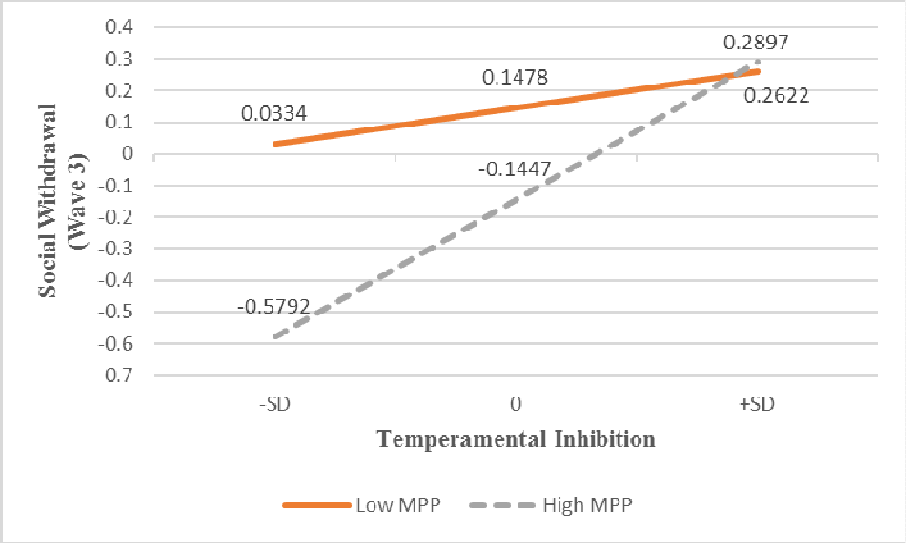

Figure 4.6. Regression lines showing relations between Temperamental Inhibition and prospective (wave 3) Social Withdrawal as moderated by Maternal Positive Protection.

Figure 4.7 shows the interaction patterns between TIS and MPS in predicting Social Withdrawal. Temperamental Inhibition was significantly and positively related to Social Withdrawal among children whose mothers exhibited high levels of Maternal Positive Support. Temperamental Inhibition had no significant effect on Social Withdrawal among children whose mothers exhibited low levels of Maternal Positive Support. The Johnson-Neyman output showed a cutoff Maternal Positive Protection value of -.3606, above which the moderation effect was significant. To verify this finding, a median split was again conducted on the Social Withdrawal scores to divide the sample into two sub-samples, i.e., low MPS and high MPS. The

aggregated measure of Social Withdrawal was significantly related with Temperamental Inhibition among only children whose mothers exhibited high levels of Maternal Positive Support ($r = .56$, $p < .01$, $N = 23$) but not children whose mothers exhibited low levels of Maternal Positive Support ($r = .23$, *ns*, $N = 23$). Again, this moderating effect was unexpected and it appears to be not as strong as that of the MPP moderator.

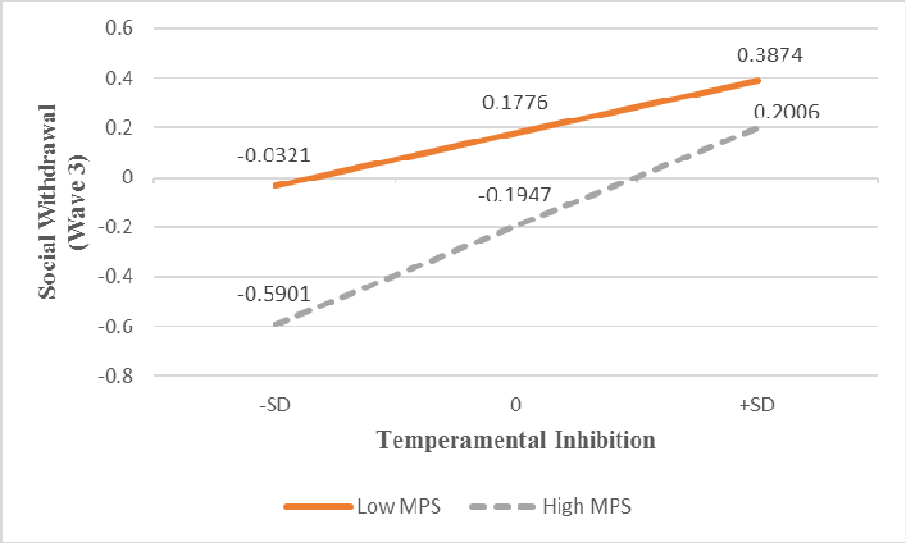

Figure 4.7. Regression lines showing relations between Temperamental Inhibition and prospective (wave 3) Social Withdrawal as moderated by Maternal Positive Support.

It is noteworthy that in the initial step of the prospective regression analysis, MPP was a significant predictor of the wave 3 aggregated measures of Behavioral Inhibition and Social Initiative. The level of significance diminished when the interaction items were entered in the second step of the regression analysis. A further analysis indicated that MPP was marginally correlated with aggregated Behavioral Inhibition ($r = -.25$, $p = .096$, $N = 46$) and significantly correlated with aggregated Social Initiative ($r = .29$, $p = .049$, $N = 46$). To understand the earlier significant predictions, a tertile split was conducted using TIS to divide the sample

into three sub-samples, i.e., low TIS, moderate TIS and high TIS for analyzing the correlations in each sub-sample. The results showed that the aggregated measure of Behavioral Inhibition was marginally and negatively correlated with MPP among the children with low level of Temperamental Inhibition (r = -.49, p = .063, N = 16) but not among children with moderate levels (r = -.31, *ns*, N = 15) nor high levels (r = .002, *ns*, N = 16) of Temperamental Inhibition. Meanwhile, the aggregated measure of Social Initiative was significantly and positively correlated with MPP among the children with low level of Temperamental Inhibition (r = .71, p < .01, N = 16) but not among children with moderate levels (r = .29, *ns*, N = 15) nor high levels (r = .12, *ns*, N = 16) of Temperamental Inhibition. The underlying interaction between TIS and MPP in prospectively predicting children's Social Initiative among temperamentally *uninhibited* children seems to indicate that Maternal Positive Protection may play a role in improving these children's levels of Social Initiative. This finding is intriguing but is not the scope of the present study to further investigate. The underlying interaction between TIS and MPP in prospectively predicting lower Behavioral Inhibition among temperamentally uninhibited children is less easy to explain but the relation was only marginally significant and given the small sample size, a convincing conclusion could not be drawn from the result.

A summary of Study 1 findings from correlation and regression analyses

From the correlation analyses, TIS was confirmed to be correlated with parent- and teacher-rated measures of Behavioral Inhibition demonstrating convergent validity as well as correlated with such development outcome variables of Anxious Shyness and Social Initiative providing support for criterion validity. Moreover, as detailed in the last chapter, the factor analysis of the TIS variables provided a three-

factor solution demonstrating adequate construct validity. Taken together, these results showed that it is valid to measure preschool-aged children's temperamental inhibition by observing characteristics of their social speech, largely supporting hypothesis (H1.1). The reliability of this newly developed observational measure of temperamental inhibition needs to be confirmed with future studies to administer this instrument with a larger sample of participants for repeated assessments to further verify its internal consistency and demonstrate acceptable test-retest reliability.

From the foregoing series of regression analyses, a number of major findings in support of the research hypotheses were empirically evidenced. First, TIS was found to be a significant concurrent predictor of higher Anxious Shyness, lower Social Initiative, higher Social Withdrawal but not Internalizing Problems and Academic Competence. However, TIS was confirmed to be a significant prospective predictor of higher Anxious Shyness, higher Internalizing Problems, lower Social Initiative, (marginally) higher Social Withdrawal, and lower Academic Competence. Meanwhile, TIS was not correlated with Regulated Shyness. These findings especially with the prospective prediction largely support hypothesis (H1.2).

Moreover, MPP was found to concurrently and prospectively predict higher Academic Competence, supporting hypothesis (H1.3). MPP was also found to moderate the concurrent and prospective relations between TIS and the outcomes of higher Internalizing Problems and higher Social Withdrawal, though not the outcomes of higher Anxious Shyness and lower Social Initiative. These findings, replicating those from Western studies, largely support hypothesis (H1.4) that higher maternal protective parenting would exacerbate the negative effects of temperamental inhibition on social development outcomes but not lower maternal protective parenting.

On the other hand, MPS was not a significant predictor, concurrently or prospectively, of higher Academic Competence, thus hypothesis (H1.5) is not supported. Moreover, unexpectedly, MPS was not found to moderate the relation between TIS and the negative social development outcomes such that lower maternal supportive parenting would exacerbate the negative effects of temperamental inhibition on children's social outcomes. Rather, MPS, much like MPP, was found to moderate the perspective (though not the concurrent) relation between TIS and child outcomes such that higher Internalizing Problems and higher Social Withdrawal resulted from temperamentally inhibition children with mothers who exhibited high level of maternal supportive parenting behavior but not children with mothers who exhibited low level of maternal supportive parenting behavior. Moreover, MPS was found to moderate the prospective but not the concurrent relation between TIS and the outcomes of higher Internalizing Problems and (marginally) higher Social Withdrawal. These findings therefore do not support hypothesis (H1.6) that lower maternal supportive parenting would exacerbate the negative effects of temperamental inhibition on social development outcomes. These unanticipated results will be discussed in the last chapter.

Study 2 Results

As mentioned before, the full sample with multi-wave data consisted of 352 participants. However, since 25 participants were selected for an immediate parenting intervention program after the first wave of data were collected, they were excluded from the larger sample for use in Study 1 and Study 2. Meanwhile, 6 out of the 25 parenting intervention participants eventually did not provide questionnaire data at time point 3 anyways. Therefore, the final sample to be used for Study 2 consisted of 333 participants only (i.e., 352 – (25-6) = 333).

Table 4.9 shows the descriptive statistics for all the teacher-rated and parent-rated variables based on the data collected from this sample of 333 participants through questionnaires at three time points with 6 months apart between time points. The skewness and kurtosis of all the predictor and outcome variables used in the present study indicated acceptable normality, i.e., skewness < 2 and kurtosis < 7 (Curran et al., 1996; Fabrigar et al., 1999). As with the full sample, though most variables had only few missing values, there were larger numbers of missing values for the teacher-rated BI subscale for Separation and Preschool Situations, with 45 missing observations in wave 1, 28 missing in wave 2 and 76 missing in wave 3. To verify that these missing data did not significantly influence the overall BI assessment for children not rated on these TBIQ items, an independent samples *t* test was performed to test any significant differences in the TBIQ Total scores between the children who had been rated on these items and the children who had not been rated on these items. No significant differences were found between the two groups at each time point (i.e., t (331) = 1.215, *ns,* at wave 1; t (331) = 1.861, *ns,* at wave 2, t (330) = 1.710, *ns,* at wave 3).

Table 4.9. Descriptive Statistics for all questionnaire variables across three time points in the Study 2 sample (N = 333).

Variable	Variable Description	N			Mean			SD			Skewness			Kurtosis		
		Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
TBIQ_ADULTS	Teacher-rated BI to unfamiliar adults	333	333	330	4.302	4.163	4.004	1.135	1.126	1.105	0.212	0.097	0.151	0.029	0.196	-0.031
TBIQ_PEERS	Teacher-rated BI in unfamilier peers	333	333	332	3.659	3.570	3.511	0.887	0.802	0.853	0.123	-0.106	0.244	0.561	0.344	0.717
TBIQ_PERF	Teacher-rated BI in performance situations	333	333	331	3.700	3.673	3.593	1.056	1.086	1.210	0.263	0.170	0.413	0.439	0.046	0.229
TBIQ_PHYS	Teacher-rated BI to physical challenges	333	333	332	3.712	3.708	3.648	0.844	0.795	0.822	0.514	-0.056	0.337	1.333	0.403	0.605
TBIQ_SEPPRE	Teacher-rated BI in separation or preschool situations	288	305	257	4.123	4.019	3.852	1.330	1.084	1.239	0.157	0.313	0.432	-0.241	0.699	-0.076
TBIQ_UNFAM	Teacher-rated BI in unfamilier situations	333	333	332	3.824	3.661	3.593	1.019	0.961	0.969	0.251	0.036	0.182	0.268	0.151	-0.144
TBIQ_TOTAL	Teacher-rated Total BIQ rating	333	333	332	3.878	3.792	3.689	0.836	0.794	0.853	0.185	-0.126	0.177	0.480	0.157	0.014
TBIS_ADULT	Teacher-rated BI to unfamiliar adults	331	333	331	2.689	2.605	2.542	0.581	0.583	0.557	0.245	0.323	0.241	0.390	0.694	0.655
TBIS_CHILD	Teacher-rated BI to unfamiliar adults	331	333	331	2.374	2.298	2.357	0.554	0.545	0.531	0.137	0.035	-0.133	1.101	0.566	0.804
TBIS_TOTAL	Teacher-rated Total BIS rating	331	333	331	2.531	2.452	2.449	0.524	0.530	0.521	0.184	0.112	0.004	1.006	0.673	0.618
CBS_AS	CBS - Asocial with Peers	333	333	330	1.264	1.232	1.192	0.347	0.322	0.305	1.665	1.470	1.776	2.984	1.510	2.327
CBS_INTERNAL	CBS - Internalizing Problems	333	333	331	1.370	1.310	1.289	0.351	0.317	0.320	1.169	1.066	1.257	1.191	0.254	0.946
TSCI_INITIATIVE	Teacher-rated Social Initative	333	332	332	3.136	3.230	3.281	0.616	0.610	0.593	-0.366	-0.059	-0.163	0.465	-0.056	0.143
TBAC	Teacher-rated Behavior Academic Competence	332	328	332	2.875	3.007	3.062	0.542	0.462	0.497	-0.091	-0.011	-0.174	-0.339	-0.161	-0.345
GSRI	Gumpel School Readiness Inventory	333	329	332	3.135	3.290	3.326	0.548	0.515	0.527	-0.415	-0.790	-1.061	0.005	0.641	1.435
CSS_REGULATED	Chinese Regulated Shyness	331	328	331	3.264	3.311	3.314	0.707	0.711	0.706	-0.245	0.349	-0.456	0.206	3.807	0.556
CSS_ANXIOUS	Chinese Anxious Shyness	331	328	331	2.451	2.425	2.385	0.751	0.676	0.682	0.473	0.132	0.460	0.066	-0.012	0.366

Table 4.9. Descriptive Statistics for all questionnaire variables across three time points in the Study 2 sample (N = 333) (cont'd).

Variable	Variable Description	N			Mean			SD			Skewness			Kurtosis		
		Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
PBIQ_ADULTS	Parent-rated BI to unfamiliar adults	331	333	333	3.918	3.658	3.570	1.322	1.238	1.194	-0.016	-0.011	0.109	-0.504	-0.025	-0.082
PBIQ_PEERS	Parent-rated BI in unfamilier peers	331	333	333	3.391	3.325	3.207	1.082	0.972	0.959	-0.017	0.068	0.006	-0.397	-0.306	-0.368
PBIQ_PERF	Parent-rated BI in performance situations	330	333	331	3.657	3.510	3.549	1.352	1.211	1.237	0.160	0.187	0.046	-0.236	0.295	0.045
PBIQ_PHYS	Parent-rated BI to physical challenges	330	333	333	3.445	3.435	3.531	0.950	0.854	0.853	-0.201	0.052	0.028	0.010	0.387	0.631
PBIQ_SEPPRE	Parent-rated BI in separation or preschool situations	330	333	332	3.920	3.622	3.518	1.554	1.467	1.359	0.169	0.250	0.324	-0.761	-0.640	-0.316
PBIQ_UNFAM	Parent-rated BI in unfamilier situations	331	333	333	3.692	3.473	3.429	0.982	0.932	0.881	0.026	0.105	0.021	0.188	0.073	0.108
PBIQ_TOTAL	Parent-rated Total BIQ rating	331	333	333	3.672	3.504	3.466	0.882	0.795	0.764	-0.059	0.014	-0.027	-0.088	0.238	0.378
PBIS_ADULT	Parent-rated BI to unfamiliar adults	327	331	332	2.491	2.387	2.371	0.650	0.591	0.585	0.198	0.076	0.244	0.102	0.154	0.461
PBIS_CHILD	Parent-rated BI to unfamiliar adults	327	331	332	2.173	2.110	2.105	0.593	0.565	0.552	0.345	0.128	0.078	0.741	0.212	0.239
PBIS_TOTAL	Parent-rated Total BIS rating	327	331	332	2.332	2.248	2.238	0.580	0.542	0.528	0.288	0.131	0.176	0.566	0.266	0.367
CBCL_WD	CBCL - Withdrawan	331	333	333	2.961	2.468	2.243	2.706	2.504	2.445	1.186	1.287	1.450	1.591	1.665	2.642
CBCL_INTERNAL	CBCL - Internalizing Problems	331	333	333	12.420	10.745	9.580	9.345	8.920	8.129	1.774	1.637	1.490	6.190	3.996	3.771
CBCL_ANXP	CBCL - DSM Anxiety Problems	331	333	333	4.489	4.075	3.784	2.869	2.933	2.821	1.269	1.156	0.881	3.514	1.850	0.811
PSCI_INITIATIVE	Parent-rated Social Initiative	329	333	332	3.288	3.345	3.412	0.570	0.549	0.512	-0.093	-0.299	-0.253	0.369	0.745	1.363
PSDQ_CON	PSDQ - Connection	329	332	332	4.035	4.066	4.051	0.585	0.536	0.583	-0.506	-0.378	-0.360	0.191	0.498	-0.090
PSDQ_REG	PSDQ - Regulation	329	332	332	3.758	3.771	3.779	0.662	0.678	0.662	-0.522	-0.450	-0.245	0.300	0.460	-0.249
PSDQ_AUT	PSDQ - Autonomy Granting	329	332	332	3.570	3.635	3.653	0.654	0.638	0.622	-0.219	-0.250	-0.347	0.032	-0.119	0.552
PSDQ_PHY	PSDQ - Physical coercion	329	332	332	2.045	2.008	1.966	0.591	0.582	0.460	1.229	1.498	0.928	2.143	4.331	1.910
PSDQ_VER	PSDQ - Verbal hostility	329	331	332	2.329	2.288	2.283	0.637	0.686	0.623	0.419	0.817	0.539	0.204	1.024	0.948
PSDQ_NON	PSDQ - Non-reasoning, punitive strategies	329	332	332	1.870	1.892	1.899	0.620	0.636	0.618	0.854	0.594	0.522	1.047	0.603	0.078
PSDQ_AUTHORITATIVE	PSDQ - Authoritative Parenting	329	332	332	3.788	3.824	3.828	0.548	0.540	0.549	-0.307	-0.278	-0.291	0.125	0.466	0.121
PSDQ_AUTHORITARIAN	PSDQ - Authoritarian Parenting	329	332	332	2.081	2.062	2.049	0.498	0.527	0.452	1.098	1.168	0.748	2.253	2.800	1.267
POS	Parental Overprotection Scale	327	329	331	2.427	2.373	2.361	0.742	0.720	0.677	0.485	0.490	0.549	0.099	0.197	0.228

Data reduction

In the present study, autoregressive cross-lagged panel analysis (CLPA) was employed to test any reciprocal effects between child temperamental inhibition, child outcomes and parenting behaviors to determine any mutual influences between these variables over time across the three time points. Figure 3.5 in the last chapter shows the generalized transactional model constructed using data collected in three waves with 6 months apart between time points in the present study.

To simplify analysis, the composites aggregated from multisource measures used in Study 1 were used to represent the child temperamental inhibition and child social development outcome constructs. On the other hand, as observational data were unable to be obtained at multiple time points, the self-reported parenting styles and dimensions provided by parents from all three waves of data collection were used as the parent behavior construct in each CLPA model. To represent maladaptive parenting to test the hypotheses, after the primary analyses were completed, a composite measure was proposed and devised from the lower-order parenting dimensions for further analysis.

Treatment of missing values

Table 4.10 shows the full listing of parent- or teacher-rated variables that were selected to assess child temperamental inhibition, child social development outcomes and parenting behaviors. Missing value analysis showed the missing values by number and percentage and indicated data were missing completely at random with a non-significant Little's MCAR test, χ^2 (1967) = 1826.315, p = .99, *ns*. The Expectation-Maximization method was used to impute the missing data, since

complete data is required for AMOS to produce certain model fit indices such as the Standardized Root Mean-squared Residual (SRMR) for analysis.

Table 4.10. Missing value analysis for study variables for CLPA.

Variable	Variable Description	N	Mean	SD	Missing	
					Count	Percent
W1TBIQ_TOTAL	Wave 1 Teacher-rated Total BIQ rating	333	3.878	0.83552	0	0
W1TBIS_TOTAL	Wave 1 Teacher-rated Total BIS rating	331	2.5313	0.52414	2	0.6
W1CBS_AS	Wave 1 CBS - Asocial with Peers	333	1.2642	0.34704	0	0
W1CBS_INTERNAL	Wave 1 CBS - Internalizing Problems	333	1.3703	0.35087	0	0
W1TSCI_INITIATIVE	Wave 1 Teacher-rated Social Initative	333	3.1359	0.61575	0	0
W1TBAC	Wave 1 Teacher-rated Behavior Academic Competenc	332	2.8745	0.5415	1	0.3
W1GSRI	Wave 1 Gumpel School Readiness Inventory	333	3.1352	0.54822	0	0
W1CSS_ANXIOUS	Wavw 1 Chinese Anxious Shyness	331	2.4511	0.75146	2	0.6
W1PBIQ_TOTAL	Wave 1 Parent-rated Total BIQ rating	331	3.6722	0.88235	2	0.6
W1PBIS_TOTAL	Wave 1 Parent-rated Total BIS rating	327	2.3323	0.5797	6	1.8
W1CBCL_WD	Wave 1 CBCL - Withdrawan	331	2.9607	2.70605	2	0.6
W1CBCL_INTERNAL	Wave 1 CBCL - Internalizing Problems	331	12.4199	9.34468	2	0.6
W1CBCL_ANXP	Wave 1 CBCL - Somatic Complaints	331	4.4894	2.86923	2	0.6
W1PSCI_INITIATIVE	Wave 1 CBCL - DSM Anxiety Problems	329	3.2879	0.57002	4	1.2
W1PSDQ_CON	Wave 1 PSDQ - Connection	329	4.0351	0.58484	4	1.2
W1PSDQ_REG	Wave 1 PSDQ - Regulation	329	3.7578	0.66218	4	1.2
W1PSDQ_AUT	Wave 1 PSDQ - Autonomy Granting	329	3.5697	0.65417	4	1.2
W1PSDQ_PHY	Wave 1 PSDQ - Physical coercion	329	2.0451	0.59147	4	1.2
W1PSDQ_VER	Wave 1 PSDQ - Verbal hostility	329	2.3285	0.63684	4	1.2
W1PSDQ_NON	Wave 1 PSDQ - Non-reasoning, punitive strategies	329	1.8698	0.61957	4	1.2
W1PSDQ_AUTHORITATIVE	Wave 1 PSDQ - Authoritative Parenting	329	3.7875	0.54826	4	1.2
W1PSDQ_AUTHORITARIAN	Wave 1 PSDQ - Authoritarian Parenting	329	2.0811	0.49845	4	1.2
W1POS	Wave 1 POS - Overprotective Parenting	327	2.4267	0.74157	6	1.8
W2TBIQ_TOTAL	Wave 2 Teacher-rated Total BIQ rating	333	3.7925	0.79433	0	0
W2TBIS_TOTAL	Wave 2 Teacher-rated Total BIS rating	333	2.4517	0.53039	0	0
W2CBS_AS	Wave 2 CBS - Asocial with Peers	333	1.2322	0.32151	0	0
W2CBS_INTERNAL	Wave 2 CBS - Internalizing Problems	333	1.3097	0.31742	0	0
W2TSCI_INITIATIVE	Wave 2 Teacher-rated Social Initative	332	3.2299	0.61017	1	0.3
W2TBAC	Wave 2 Teacher-rated Behavior Academic Competenc	328	3.0075	0.46201	5	1.5
W2GSRI	Wave 2 Gumpel School Readiness Inventory	329	3.2901	0.51471	4	1.2
W2CSS_ANXIOUS	Wavw 1 Chinese Anxious Shyness	328	2.425	0.67637	5	1.5
W2PBIQ_TOTAL	Wave 2 Parent-rated Total BIQ rating	333	3.5035	0.79476	0	0
W2PBIS_TOTAL	Wave 2 Parent-rated Total BIS rating	331	2.2479	0.54172	2	0.6
W2CBCL_WD	Wave 2 CBCL - Withdrawan	333	2.4685	2.50356	0	0
W2CBCL_INTERNAL	Wave 2 CBCL - Internalizing Problems	333	10.7447	8.91987	0	0
W2CBCL_ANXP	Wave 2 CBCL - Somatic Complaints	333	4.0751	2.93254	0	0
W2PSCI_INITIATIVE	Wave 2 CBCL - DSM Anxiety Problems	333	3.3454	0.5494	0	0
W2PSDQ_CON	Wave 2 PSDQ - Connection	332	4.0664	0.53574	1	0.3
W2PSDQ_REG	Wave 2 PSDQ - Regulation	332	3.7712	0.67814	1	0.3
W2PSDQ_AUT	Wave 2 PSDQ - Autonomy Granting	332	3.6349	0.63845	1	0.3
W2PSDQ_PHY	Wave 2 PSDQ - Physical coercion	332	2.0078	0.5818	1	0.3
W2PSDQ_VER	Wave 2 PSDQ - Verbal hostility	331	2.2878	0.68562	2	0.6
W2PSDQ_NON	Wave 2 PSDQ - Non-reasoning, punitive strategies	332	1.8923	0.63581	1	0.3
W2PSDQ_AUTHORITATIVE	Wave 2 PSDQ - Authoritative Parenting	332	3.8242	0.54024	1	0.3
W2PSDQ_AUTHORITARIAN	Wave 2 PSDQ - Authoritarian Parenting	332	2.0621	0.52665	1	0.3
W2POS	Wave 2 POS - Overprotective Parenting	329	2.3733	0.7196	4	1.2
W3TBIQ_TOTAL	Wave 3 Teacher-rated Total BIQ rating	332	3.6891	0.85273	1	0.3
W3TBIS_TOTAL	Wave 3 Teacher-rated Total BIS rating	331	2.4494	0.52104	2	0.6
W3CBS_AS	Wave 3 CBS - Asocial with Peers	330	1.1924	0.30546	3	0.9
W3CBS_INTERNAL	Wave 3 CBS - Internalizing Problems	331	1.2889	0.32017	2	0.6
W3TSCI_INITIATIVE	Wave 3 Teacher-rated Social Initative	332	3.2811	0.5929	1	0.3
W3TBAC	Wave 3 Teacher-rated Behavior Academic Competenc	332	3.0623	0.49744	1	0.3
W3GSRI	Wave 3 Gumpel School Readiness Inventory	332	3.3261	0.52672	1	0.3
W3CSS_ANXIOUS	Wavw 1 Chinese Anxious Shyness	331	2.3855	0.68209	2	0.6
W3PBIQ_TOTAL	Wave 3 Parent-rated Total BIQ rating	333	3.4656	0.76439	0	0
W3PBIS_TOTAL	Wave 3 Parent-rated Total BIS rating	332	2.2383	0.52793	1	0.3
W3CBCL_WD	Wave 3 CBCL - Withdrawan	333	2.2432	2.44537	0	0
W3CBCL_INTERNAL	Wave 3 CBCL - Internalizing Problems	333	9.5796	8.1287	0	0
W3CBCL_ANXP	Wave 3 CBCL - Somatic Complaints	333	3.7838	2.82119	0	0
W3PSCI_INITIATIVE	Wave 3 CBCL - DSM Anxiety Problems	332	3.4125	0.51234	1	0.3
W3PSDQ_CON	Wave 3 PSDQ - Connection	332	4.0508	0.58345	1	0.3
W3PSDQ_REG	Wave 3 PSDQ - Regulation	332	3.7793	0.66166	1	0.3
W3PSDQ_AUT	Wave 3 PSDQ - Autonomy Granting	332	3.6527	0.62227	1	0.3
W3PSDQ_PHY	Wave 3 PSDQ - Physical coercion	332	1.9664	0.45978	1	0.3
W3PSDQ_VER	Wave 3 PSDQ - Verbal hostility	332	2.2834	0.62266	1	0.3
W3PSDQ_NON	Wave 3 PSDQ - Non-reasoning, punitive strategies	332	1.8986	0.61804	1	0.3
W3PSDQ_AUTHORITATIVE	Wave 3 PSDQ - Authoritative Parenting	332	3.8276	0.54917	1	0.3
W3PSDQ_AUTHORITARIAN	Wave 3 PSDQ - Authoritarian Parenting	332	2.0494	0.45157	1	0.3
W3POS	Wave 3 POS - Overprotective Parenting	331	2.3615	0.67741	2	0.6

Correlation analysis

Table 4.11 shows the correlations between the composites of BI, Internalizing Problems, Social Withdrawal, and Social Initiative. BI was positively correlated with Internalizing Problems and Social Withdrawal with moderate to high correlation coefficients (r = .33 to .59), and negatively correlated with Social Initiative with high correlation coefficients (r = -.56 to -.81).

To determine how the social development outcome variables were associated with parenting behaviors, correlations between Internalizing Problems, Social Withdrawal and Social Initiative aggregated from the teacher and parent ratings in all three waves and the variables for all parenting styles and dimensions as self-reported by parents at each time point were analyzed. Tables 4.12-4.14 show the correlation matrices for first wave, second wave and final wave Internalizing Problems and the parenting variables at time points 1, 2, and 3, respectively. Tables 4.15-4.17 show the corresponding matrices for Social Withdrawal. And Tables 4.18-4.20 show the corresponding matrices for Social Initiative.

It can be seen from the correlation matrices, among the three parenting styles, Authoritarian Parenting consistently had the highest correlations with Internalizing Problems and Social Withdrawal across all three waves (r = .17 to .32, $p < 0.01$ with Internalizing Problems; and r = .15 to .28, $p < 0.01$ with Social Withdrawal). However, Authoritarian Parenting was not correlated with Social Initiative in almost all cases except one case in wave 1 and one case in wave 3 with a small correlation coefficient (r = -.15, $p < .01$ and r = -.12, $p < .05$, respectively). In the lower order, Verbal Hostility much more often than not had higher and consistently significant correlations with Internalizing Problems and Social Withdrawal than Physical Coercion and Non-reasoning, Punitive Strategies.

Table 4.11. Correlations between Behavioral Inhibition and Social Outcome Variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_BI	Wave 1 BI Composite											
2. W2AGGREG_BI	Wave 2 BI Composite	.774**										
3. W3AGGREG_BI	Wave 3 BI Composite	.680**	.773**									
4. W1AGGREG_INTERNAL	Wave 1 Internalizing Problems Composite	.468**	.350**	.330**								
5. W2AGGREG_INTERNAL	Wave 2 Internalizing Problems Composite	.394**	.423**	.374**	.661**							
6. W3AGGREG_INTERNAL	Wave 3 Internalizing Problems Composite	.338**	.344**	.444**	.447**	.619**						
7. W1AGGREG_SOCIAL_WITHDRAW	Wave 1 Social Withdrawal Composite	.590**	.486**	.441**	.890**	.627**	.460**					
8. W2AGGREG_SOCIAL_WITHDRAW	Wave 2 Social Withdrawal Composite	.463**	.511**	.450**	.566**	.863**	.568**	.642**				
9. W3AGGREG_SOCIAL_WITHDRAW	Wave 3 Social Withdrawal Composite	.417**	.428**	.538**	.424**	.557**	.854**	.519**	.627**			
10. W1AGGREG_SOCIAL_INITIATIVE	Wave 1 Social Initiative Composite	-.792**	-.680**	-.616**	-.482**	-.407**	-.336**	-.620**	-.530**	-.468**		
11. W2AGGREG_SOCIAL_INITIATIVE	Wave 2 Social Initiative Composite	-.674**	-.809**	-.671**	-.391**	-.498**	-.404**	-.528**	-.610**	-.504**	.747**	
12. W3AGGREG_SOCIAL_INITIATIVE	Wave 3 Social Initiative Composite	-.561**	-.673**	-.744**	-.307**	-.381**	-.444**	-.437**	-.483**	-.572**	.680**	.746**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.12. Correlations between Internalizing Problems and wave 1 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_INTERNAL	Wave 1 Internalizing Problems Composite											
2. W2AGGREG_INTERNAL	Wave 2 Internalizing Problems Composite	.661**										
3. W3AGGREG_INTERNAL	Wave 3 Internalizing Problems Composite	.447**	.619**									
4. W1POS	Wave 1 Parental Overprotection Scale	.295**	.186**	.189**								
5. W1PSDQ_AUTHORITATIVE	Wave 1 PSDQ - Authoritative Parenting	-.169**	-.149**	-.037	-0.053							
6. W1PSDQ_AUTHORITARIAN	Wave 1 PSDQ - Authoritarian Parenting	.316**	.282**	.256**	.420**	-.179**						
7. W1PSDQ_CON	Wave 1 PSDQ - Connection	-.166**	-.155**	-.049	-0.06	.868**	-.231**					
8. W1PSDQ_REG	Wave 1 PSDQ - Regulation	-.138*	-0.102	-.016	-0.055	.862**	-.127*	.632**				
9. W1PSDQ_AUT	Wave 1 PSDQ - Autonomy Granting	-.136*	-.132*	-.033	-0.025	.867**	-.115*	.650**	.593**			
10. W1PSDQ_PHY	Wave 1 PSDQ - Physical coercion	.215**	.245**	.181**	.249**	-.067	.795**	-0.094	-0.029	-.05		
11. W1PSDQ_VER	Wave 1 PSDQ - Verbal Hostility	.261**	.213**	.253**	.467**	-.092	.837**	-.134*	-.059	-.053	.522**	
12. W1PSDQ_NON	Wave 1 PSDQ - Non-reasoning, punitive	.288**	.227**	.183**	.295**	-.272**	.794**	-.328**	-.218**	-.170**	.428**	.493**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.13. Correlations between Internalizing Problems and wave 2 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_INTERNAL	Wave 1 Internalizing Problems Composite											
2. W2AGGREG_INTERNAL	Wave 2 Internalizing Problems Composite	.661**										
3. W3AGGREG_INTERNAL	Wave 3 Internalizing Problems Composite	.447**	.619**									
4. W2POS	Wave 2 Parental Overprotection Scale	.216**	.227**	.186**								
5. W2PSDQ_AUTHORITATIVE	Wave 2 PSDQ - Authoritative Parenting	-0.051	-0.093	-.088	-0.061							
6. W2PSDQ_AUTHORITARIAN	Wave 2 PSDQ - Authoritarian Parenting	.217**	.309**	.251**	.431**	-.168**						
7. W2PSDQ_CON	Wave 2 PSDQ - Connection	-.052	-.129*	-.083	-0.046	.867**	-.229**					
8. W2PSDQ_REG	Wave 2 PSDQ - Regulation	-0.055	-0.082	-.096	-0.055	.876**	-0.07	.640**				
9. W2PSDQ_AUT	Wave 2 PSDQ - Autonomy Granting	-.027	-.040	-.051	-0.059	.881**	-.160**	.682**	.626**			
10. W2PSDQ_PHY	Wave 2 PSDQ - Physical coercion	.152**	.256**	.206**	.277**	-.119*	.841**	-.183**	-0.024	-.123*		
11. W2PSDQ_VER	Wave 2 PSDQ - Verbal Hostility	.241**	.318**	.293**	.422**	-.122*	.845**	-.165**	-.039	-.130*	.598**	
12. W2PSDQ_NON	Wave 2 PSDQ - Non-reasoning, punitive	.141**	.190**	.121*	.365**	-.177**	.805**	-.223**	-.109*	-.145**	.532**	.477**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.14. Correlations between Internalizing Problems and wave 3 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_INTERNAL	Wave 1 Internalizing Problems Composite											
2. W2AGGREG_INTERNAL	Wave 2 Internalizing Problems Composite	.661**										
3. W3AGGREG_INTERNAL	Wave 3 Internalizing Problems Composite	.447**	.619**									
4. W3POS	Wave 3 Parental Overprotection Scale	0.105	.139*	.223**								
5. W3PSDQ_AUTHORITATIVE	Wave 3 PSDQ - Authoritative Parenting	-0.059	-.125*	-.127*	-.123*							
6. W3PSDQ_AUTHORITARIAN	Wave 3 PSDQ - Authoritarian Parenting	.166**	.223**	.245**	.432**	-.191**						
7. W3PSDQ_CON	Wave 3 PSDQ - Connection	-.040	-.135*	-.097	-0.094	.882**	-.238**					
8. W3PSDQ_REG	Wave 3 PSDQ - Regulation	-0.067	-0.088	-.101	-.130*	.872**	-.134*	.637**				
9. W3PSDQ_AUT	Wave 3 PSDQ - Autonomy Granting	-.049	-.112*	-.137*	-0.1	.893**	-.139*	.720**	.648**			
10. W3PSDQ_PHY	Wave 3 PSDQ - Physical coercion	.027	.117*	.166**	.254**	-.093	.736**	-.174**	-0.001	-.08		
11. W3PSDQ_VER	Wave 3 PSDQ - Verbal Hostility	.205**	.236**	.279**	.389**	-.184**	.821**	-.205**	-.140*	-.145**	.436**	
12. W3PSDQ_NON	Wave 3 PSDQ - Non-reasoning, punitive	.137*	.163**	.133*	.366**	-.164**	.817**	-.185**	-.151**	-.099	.430**	.468**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.15. Correlations between Social Withdrawal and wave 1 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_SOCIAL_WITHDRAW	Wave 1 Social Withdrawal Composite											
2. W2AGGREG_SOCIAL_WITHDRAW	Wave 2 Social Withdrawal Composite	.642**										
3. W3AGGREG_SOCIAL_WITHDRAW	Wave 3 Social Withdrawal Composite	.519**	.627**									
4. W1POS	Wave 1 Parental Overprotection Scale	.267**	.184**	.191**								
5. W1PSDQ_AUTHORITATIVE	Wave 1 PSDQ - Authoritative Parenting	-.192**	-.163**	-.144**	-0.053							
6. W1PSDQ_AUTHORITARIAN	Wave 1 PSDQ - Authoritarian Parenting	.279**	.230**	.233**	.420**	-.179**						
7. W1PSDQ_CON	Wave 1 PSDQ - Connection	-.194**	-.154**	-.131*	-0.06	.868**	-.231**					
8. W1PSDQ_REG	Wave 1 PSDQ - Regulation	-.156**	-.143**	-.135*	-0.055	.862**	-.127*	.632**				
9. W1PSDQ_AUT	Wave 1 PSDQ - Autonomy Granting	-.152**	-.128*	-.109*	-0.025	.867**	-.115*	.650**	.593**			
10. W1PSDQ_PHY	Wave 1 PSDQ - Physical coercion	.181**	.189**	.145**	.249**	-.067	.795**	-0.094	-0.029	-.05		
11. W1PSDQ_VER	Wave 1 PSDQ - Verbal Hostility	.228**	.190**	.222**	.467**	-.092	.837**	-.134*	-.059	-.053	.522**	
12. W1PSDQ_NON	Wave 1 PSDQ - Non-reasoning, punitive	.266**	.180**	.195**	.295**	-.272**	.794**	-.328**	-.218**	-.170**	.428**	.493**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.16. Correlations between Social Withdrawal and wave 2 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_SOCIAL_WITHDRAW	Wave 1 Social Withdrawal Composite											
2. W2AGGREG_SOCIAL_WITHDRAW	Wave 2 Social Withdrawal Composite	.642**										
3. W3AGGREG_SOCIAL_WITHDRAW	Wave 3 Social Withdrawal Composite	.519**	.627**									
4. W2POS	Wave 2 Parental Overprotection Scale	.193**	.218**	.147**								
5. W2PSDQ_AUTHORITATIVE	Wave 2 PSDQ - Authoritative Parenting	-.116*	-.140*	-.202**	-0.061							
6. W2PSDQ_AUTHORITARIAN	Wave 2 PSDQ - Authoritarian Parenting	.195**	.280**	.203**	.431**	-.168**						
7. W2PSDQ_CON	Wave 2 PSDQ - Connection	-.115*	-.175**	-.182**	-0.046	.867**	-.229**					
8. W2PSDQ_REG	Wave 2 PSDQ - Regulation	-.117*	-.134*	-.211**	-0.055	.876**	-0.07	.640**				
9. W2PSDQ_AUT	Wave 2 PSDQ - Autonomy Granting	-.073	-.067	-.137*	-0.059	.881**	-.160**	.682**	.626**			
10. W2PSDQ_PHY	Wave 2 PSDQ - Physical coercion	.133*	.230**	.178**	.277**	-.119*	.841**	-.183**	-0.024	-.123*		
11. W2PSDQ_VER	Wave 2 PSDQ - Verbal Hostility	.224**	.289**	.223**	.422**	-.122*	.845**	-.165**	-.039	-.130*	.598**	
12. W2PSDQ_NON	Wave 2 PSDQ - Non-reasoning, punitive	.120*	.174**	.101	.365**	-.177**	.805**	-.223**	-.109*	-.145**	.532**	.477**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.17. Correlations between Social Withdrawal and wave 3 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_SOCIAL_WITHDRAW	Wave 1 Social Withdrawal Composite											
2. W2AGGREG_SOCIAL_WITHDRAW	Wave 2 Social Withdrawal Composite	.642**										
3. W3AGGREG_SOCIAL_WITHDRAW	Wave 3 Social Withdrawal Composite	.519**	.627**									
4. W1POS	Wave 1 Parental Overprotection Scale	.128*	.141*	.220**								
5. W3PSDQ_AUTHORITATIVE	Wave 3 PSDQ - Authoritative Parenting	-.121*	-.165**	-.184**	-.123*							
6. W3PSDQ_AUTHORITARIAN	Wave 3 PSDQ - Authoritarian Parenting	.150**	.187**	.213**	.432**	-.191**						
7. W3PSDQ_CON	Wave 3 PSDQ - Connection	-.098	-.161**	-.156**	-0.094	.882**	-.238**					
8. W3PSDQ_REG	Wave 3 PSDQ - Regulation	-.117*	-.134*	-.165**	-.130*	.872**	-.134*	.637**				
9. W3PSDQ_AUT	Wave 3 PSDQ - Autonomy Granting	-.102	-.143**	-.165**	-0.1	.893**	-.139*	.720**	.648**			
10. W3PSDQ_PHY	Wave 3 PSDQ - Physical coercion	.029	.108*	.120*	.254**	-.093	.736**	-.174**	-0.001	-.08		
11. W3PSDQ_VER	Wave 3 PSDQ - Verbal Hostility	.195**	.213**	.235**	.389**	-.184**	.821**	-.205**	-.140*	-.145**	.436**	
12. W3PSDQ_NON	Wave 3 PSDQ - Non-reasoning, punitive	.111*	.116*	.140*	.366**	-.164**	.817**	-.185**	-.151**	-.099	.430**	.468**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.18. Correlations between Social Initiative and wave 1 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_SOCIAL_INITIATIVE	Wave 1 Social Initiative Composite											
2. W2AGGREG_SOCIAL_INITIATIVE	Wave 2 Social Initiative Composite	.747**										
3. W3AGGREG_SOCIAL_INITIATIVE	Wave 3 Social Initiative Composite	.680**	.746**									
4. W1POS	Wave 1 Parental Overprotection Scale	-.198**	-.136*	-.155**								
5. W1PSDQ_AUTHORITATIVE	Wave 1 PSDQ - Authoritative Parenting	.201**	.172**	.189**	-0.053							
6. W1PSDQ_AUTHORITARIAN	Wave 1 PSDQ - Authoritarian Parenting	-.148**	-.092	-.093	.420**	-.179**						
7. W1PSDQ_CON	Wave 1 PSDQ - Connection	.161**	.160**	.170**	-0.06	.868**	-.231**					
8. W1PSDQ_REG	Wave 1 PSDQ - Regulation	.193**	.121*	.168**	-0.055	.862**	-.127*	.632**				
9. W1PSDQ_AUT	Wave 1 PSDQ - Autonomy Granting	.168**	.167**	.153**	-0.025	.867**	-.115*	.650**	.593**			
10. W1PSDQ_PHY	Wave 1 PSDQ - Physical coercion	-.080	-0.049	-0.05	.249**	-.067	.795**	-0.094	-0.029	-.05		
11. W1PSDQ_VER	Wave 1 PSDQ - Verbal Hostility	-.135*	-.089	-.113*	.467**	-.092	.837**	-.134*	-.059	-.053	.522**	
12. W1PSDQ_NON	Wave 1 PSDQ - Non-reasoning, punitive	-.143**	-.083	-.061	.295**	-.272**	.794**	-.328**	-.218**	-.170**	.428**	.493**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.19. Correlations between Social Initiative and wave 2 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_SOCIAL_INITIATIVE	Wave 1 Social Initiative Composite											
2. W2AGGREG_SOCIAL_INITIATIVE	Wave 2 Social Initiative Composite	.747**										
3. W3AGGREG_SOCIAL_INITIATIVE	Wave 3 Social Initiative Composite	.680**	.746**									
4. W2POS	Wave 3 Parental Overprotection Scale	-.128*	-.134*	-.122*								
5. W2PSDQ_AUTHORITATIVE	Wave 3 PSDQ - Authoritative Parenting	.158**	.144**	.213**	-0.061							
6. W2PSDQ_AUTHORITARIAN	Wave 3 PSDQ - Authoritarian Parenting	-.068	-.055	-.103	.431**	-.168**						
7. W2PSDQ_CON	Wave 3 PSDQ - Connection	.147**	.143**	.188**	-0.046	.867**	-.229**					
8. W2PSDQ_REG	Wave 3 PSDQ - Regulation	.141**	.122*	.217**	-0.055	.876**	-0.07	.640**				
9. W2PSDQ_AUT	Wave 3 PSDQ - Autonomy Granting	.127*	.115*	.152**	-0.059	.881**	-.160**	.682**	.626**			
10. W2PSDQ_PHY	Wave 3 PSDQ - Physical coercion	-.068	-0.07	-0.106	.277**	-.119*	.841**	-.183**	-0.024	-.123*		
11. W2PSDQ_VER	Wave 3 PSDQ - Verbal Hostility	-.046	-.045	-.068	.422**	-.122*	.845**	-.165**	-.039	-.130*	.598**	
12. W2PSDQ_NON	Wave 3 PSDQ - Non-reasoning, punitive	-0.057	-.025	-.087	.365**	-.177**	.805**	-.223**	-.109*	-.145**	.532**	.477**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Table 4.20. Correlations between Social Initiative and wave 3 parenting variables.

Variable	Variable Description	1	2	3	4	5	6	7	8	9	10	11
1. W1AGGREG_SOCIAL_INITIATIVE	Wave 1 Social Initiative Composite											
2. W2AGGREG_SOCIAL_INITIATIVE	Wave 2 Social Initiative Composite	.747**										
3. W3AGGREG_SOCIAL_INITIATIVE	Wave 3 Social Initiative Composite	.680**	.746**									
4. W3POS	Wave 3 Parental Overprotection Scale	-0.095	-.101	-.160**								
5. W3PSDQ_AUTHORITATIVE	Wave 3 PSDQ - Authoritative Parenting	.164**	.111*	.247**	-.123*							
6. W3PSDQ_AUTHORITARIAN	Wave 3 PSDQ - Authoritarian Parenting	-.075	-.064	-.124*	.432**	-.191**						
7. W3PSDQ_CON	Wave 3 PSDQ - Connection	.132*	.096	.188**	-0.094	.882**	-.238**					
8. W3PSDQ_REG	Wave 3 PSDQ - Regulation	.138*	0.078	.241**	-.130*	.872**	-.134*	.637**				
9. W3PSDQ_AUT	Wave 3 PSDQ - Autonomy Granting	.163**	.121*	.222**	-0.1	.893**	-.139*	.720**	.648**			
10. W3PSDQ_PHY	Wave 3 PSDQ - Physical coercion	-.035	-0.041	-0.063	.254**	-.093	.736**	-.174**	-0.001	-.08		
11. W3PSDQ_VER	Wave 3 PSDQ - Verbal Hostility	-.086	-.053	-.125*	.389**	-.184**	.821**	-.205**	-.140*	-.145**	.436**	
12. W3PSDQ_NON	Wave 3 PSDQ - Non-reasoning, punitive	-0.051	-.056	-.099	.366**	-.164**	.817**	-.185**	-.151**	-.099	.430**	.468**

Note. * $p < .05$; ** $p < .01$ level; *** $p < .001$ level (2-tailed).

Meanwhile, Parental Overprotection was also significantly correlated with Internalizing Problems and Social Withdrawal across all three waves with one exception (i.e., wave 1 Internalizing Problems was not significantly correlated with wave 3 Parental Overprotection, with $r = .11$, *ns*) but the correlations were noticeably lower that those with Authoritarian Parenting. However, Parental Overprotection was correlated with Social Initiative in almost all cases with 2 exceptions in wave 3 Parental Overprotection, similar to the corresponding correlation between Social Initiative with wave 3 Authoritarian Parenting. In Study 1, it was also reported that Authoritarian Parenting was highly correlated with Parental Overprotection ($r = .56$ and .58, $p < .01$). Also, while the parent-rated measure of Parental Overprotection was unrelated with the observed Maternal Positive Protection with close to zero correlation ($r = .01$ and .08, *ns*), the high correlation between Parental Overprotection and Authoritarian Parenting seemed to indicate that the two measures might be overlapping in measuring similar aspects of negative parenting behaviors.

Lastly, Authoritative Parenting was found to be inconsistently correlated with Internalizing Problems (e.g., correlations between wave 2 Authoritative Parenting and Internalizing Problems at all time points were insignificant with $r = -.05$ to $-.09$, *ns*), although it was correlated with Social Withdrawal across all three waves with smaller coefficients than Authoritarian Parenting and Parental Overprotection. Authoritative Parenting was also significantly and positively correlated with Social Initiative consistently across all three waves ($r = .11$, $p < .05$ to $r = .25$, $p < .01$). The lower-order dimensions under Authoritative Parenting were inconsistent in their correlations with Internalizing Problems and Social Withdrawal, (e.g., wave 1 Connection had the highest correlations with Internalizing Problems but wave 3

Autonomy Granting had highest correlations with Internalizing Problems; wave 1 Connection had the highest correlations with Social Withdrawal, wave 2 Regulation had the highest correlations with Social Withdrawal, while all three parenting dimensions at wave 3 had similar correlations with Social Withdrawal.) Meanwhile, the lower-order dimensions of Authoritative Parenting were also inconsistently in their correlations with Social Initiative (e.g., wave 1 Regulation had highest correlations, wave 2 Connection had highest correlations but wave 3 Autonomy Granting had highest correlations with Social Withdrawal.)

Cross-lagged panel analysis (CLPA)

To investigate any reciprocal relationships between child temperamental inhibition, child social outcomes and parenting behaviors and any mutual influence between these constructs over time with potential causality, cross-lagged panel analyses were conducted on a number of models representing the relationships longitudinally based on the child and parent data collected at three time points in the present study. With each combination of child outcome variables and parenting variables, a baseline model with only cross-sectional and autoregressive paths was first tested. This autoregressive model was to determine the stability of the constructs over time controlling for prior standings of the constructs. Next, a full cross-lagged model with reciprocal paths added among the three constructs across the three time points was tested for reciprocally predictive relationships between the constructs over time.

The CLPA models were evaluated for model fit using five common fit indices: Chi Square of model fit with smaller values indicating better fit; Tucker-Lewis index (TLI) greater than .90 for fit adequacy (Bentler & Bonett, 1980); the comparative fit index (CFI) greater than .95 as the common cutoff for adequacy (Hu & Bentler, 1998); the root mean square error of approximation (RMSEA) less than .08 (Browne & Cudeck, 1993) or preferably less than .06 (Kline, 2010), representing reasonable error of approximation; the standardized root mean square residual (SRMR) less than .08 (Hu & Bentler, 1998).

We started by using the Behavioral Inhibition composite, Internalizing Problems composite, and Authoritarian Parenting variable as the three constructs, since Authoritarian Parenting had the highest correlation with Internalizing Problems as revealed in the foregoing correlation analysis. The variables with data collected at the three time points were first used to test the baseline model with only cross-sectional and autoregressive paths. This was followed by testing the full reciprocal model with the cross-lagged paths added among the three constructs. The same analyses were then conducted also with Social Withdrawal and Authoritarian Parenting, and Social Initiative and Authoritarian Parenting, as the social outcome construct and parenting construct, respectively. Table 4.21 shows the fit indices resulted from the six models. It can be seen that the full cross-lagged models consistently had better model fit to the data than the corresponding baseline models for all social outcome constructs. Also, the fit indices for the two models with Social Initiative as the child outcome construct did not meet the expected requirements adequately for two fix indices, with CFI much less than .95 and RMSEA much greater than .08.

Table 4.21. Fit indices for cross-lagged panel models with Child Temperamental Inhibition, Authoritarian Parenting and Internalizing Problems, Authoritarian Parenting and Social Withdrawal, and Authoritarian Parenting and Social Initiative, respectively.

		Constructs in Model			Fit Indices						
	Test Model	Chid Inhibition	Social Outcome	Parenting	$\chi 2$	df	p	TLI (> .90)	CFI (> .95)	RMSEA (< .06 or <.08)	SRMR (<.08)
1	Baseline	Behavioral Inhibition	Internalizing Problems	Authoritarian Parenting	64.723	23.000	0.000	0.955	0.971	0.074	0.064
2	Full	Behavioral Inhibition	Internalizing Problems	Authoritarian Parenting	39.301	15.000	0.001	0.960	0.983	0.070	0.031
3	Baseline	Behavioral Inhibition	Social Withdrawal	Authoritarian Parenting	79.513	23.000	0.000	0.942	0.963	0.086	0.074
4	Full	Behavioral Inhibition	Social Withdrawal	Authoritarian Parenting	47.884	15.000	0.000	0.949	0.979	0.081	0.036
5	Baseline	Behavioral Inhibition	Social Initiative	Authoritarian Parenting	144.862	23.000	0.000	0.942	0.909	0.126	0.080
6	Full	Behavioral Inhibition	Social Initiative	Authoritarian Parenting	80.568	15.000	0.000	0.970	0.928	0.115	0.043

Note. TLI = Tucker-Lewis index; CFI = comparative fix index; RMSEA = root mean square error of approximation; SRMR = standardized root mean-squared residual; cutoffs for adequate fit are in brackets under the indices.

Figures 4.8 and 4.9 depict the two full cross-lagged models graphically with Internalizing Problems and Social Withdrawal as the child social outcome constructs, respectively. In both models, the autoregressive paths were all significant ($p < .001$) with high regression weights, indicating the three constructs in each model were very stable over time. Meanwhile, in both models, Child Temperamental Inhibition potentially caused the child social outcomes over time but not conversely. This was evidenced with the significant cross-lagged paths from Child Temperamental Inhibition at time points 1 and 2 to each social outcome variable at time points 2 and 3, respectively. In the reverse direction, however, only the cross-lagged path from Social Withdrawal at time 2 to Child Inhibition at time 3 was marginally significant ($p = .07$) and all other cross-lagged paths were insignificant.

The model with Internalizing Problems as the child social outcome construct in Figure 4.8 shows that Authoritarian Parenting potentially caused Internalizing Problems in children over time as the cross-lagged paths from Authoritarian Parenting at time 1 to Internalizing Problems at time 2 and from Authoritarian Parenting at time 2 to Internalizing Problems at time 3 were significant and marginally significant (p = .09), respectively, but not in the reverse direction. That is, Internalizing Problems in children did not evoke Authoritarian Parenting practiced by parents.

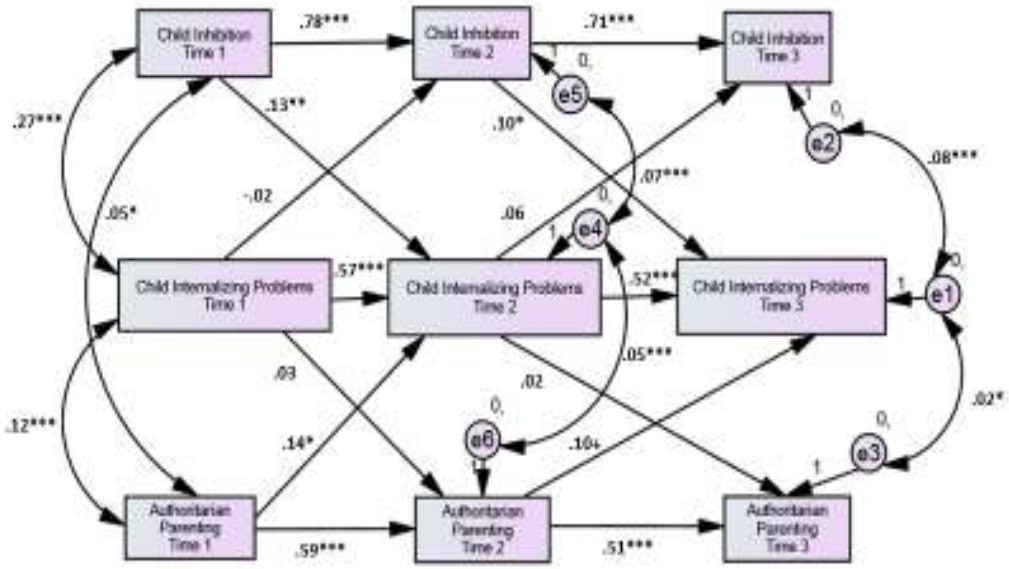

Figure 4.8. Full cross-lagged model analysis of child Temperamental Inhibition, child Internalizing Problems and Authoritarian Parenting longitudinally across 3 time points.

The model with Social Withdrawal as the child social outcome construct in Figure 4.9 was less conclusive since only one cross-lagged path from Authoritarian Parenting at time 1 to Social Withdrawal at time 2 was marginally significant (p = .053) but all other cross-lagged paths between the two constructs were insignificant.

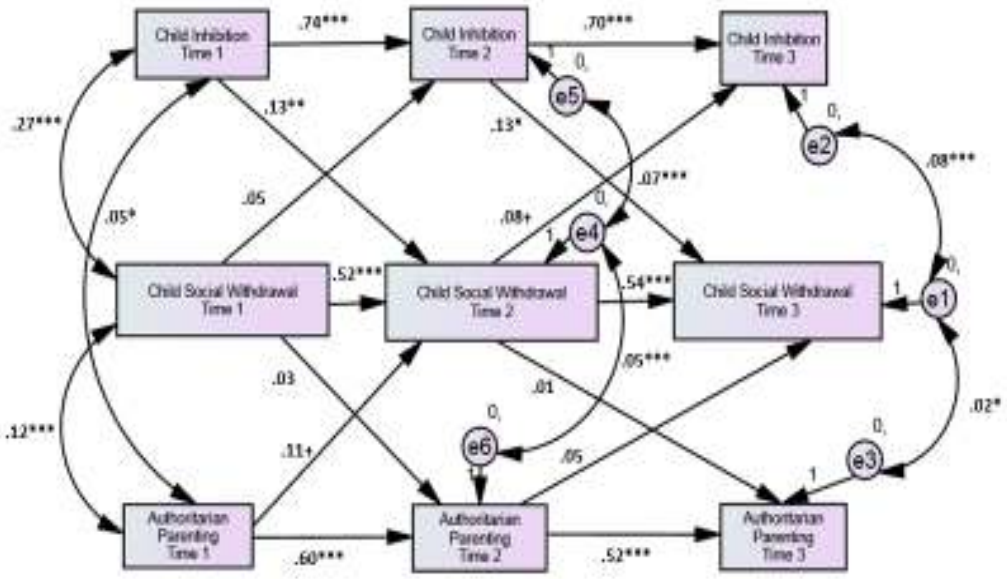

Figure 4.9. Full cross-lagged model analysis of child Temperamental Inhibition, child Social Withdrawal and Authoritarian Parenting longitudinally across 3 time points.

A full cross-lagged model was further tested with each combination of Authoritative Parenting and Parental Overprotection on the one hand, and Internalizing Problems and Social Withdrawal on the other, as shown in Figures 4.10 through 4.13. These models did not demonstrate adequate requirement for one of the fit indices, namely, RMSEA = .09, > .08. While the cross-lagged paths were similar to those in the corresponding models with Authoritarian Parenting as the parenting behavior construct, with significant paths from Child Temperamental Inhibition at time points 1 and 2 to child social outcomes at time points 2 and 3, respectively, but not in the reverse direction, the cross-lagged paths between the parenting behavior construct and child social outcomes were all insignificant with only two exceptions, Authoritative Parenting at time 2 to Social Withdrawal at time 3 was significant with a negative regressive weight ($p < .05$) and Social Withdrawal at time 2 to

Authoritative Parenting at time 3 was marginally significant with a negative regression weight ($p < .10$), as shown in Figure 4.11.

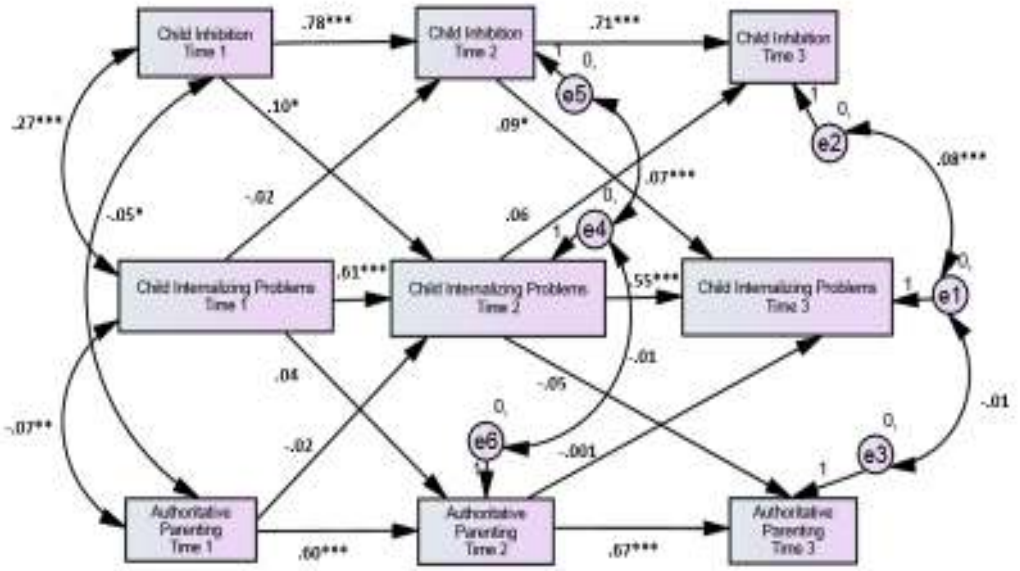

Figure 4.10. Full cross-lagged model analysis of child Temperamental Inhibition, child Internalizing Problems and Authoritative Parenting longitudinally across 3 time points.

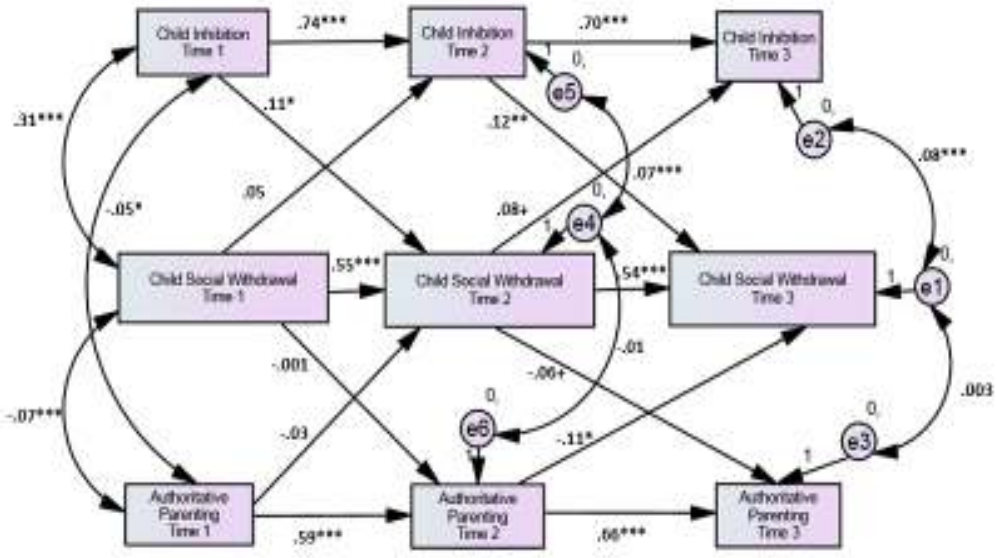

Figure 4.11. Full cross-lagged model analysis of child Temperamental Inhibition, child Social Withdrawal and Authoritarian Parenting longitudinally across 3 time points.

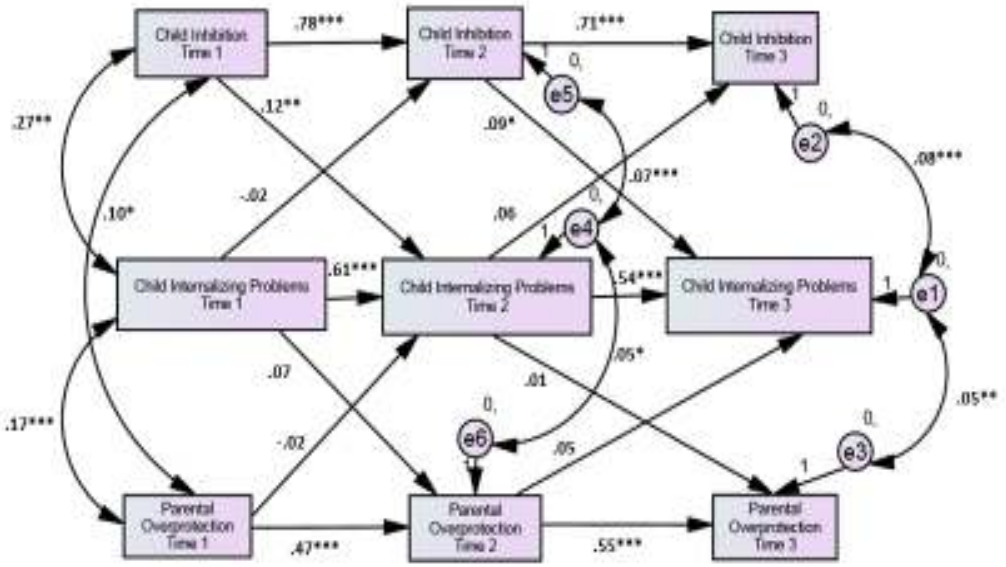

Figure 4.12. Full cross-lagged model analysis of child Temperamental Inhibition, child Internalizing Problems and Parental Overprotection longitudinally across 3 time points.

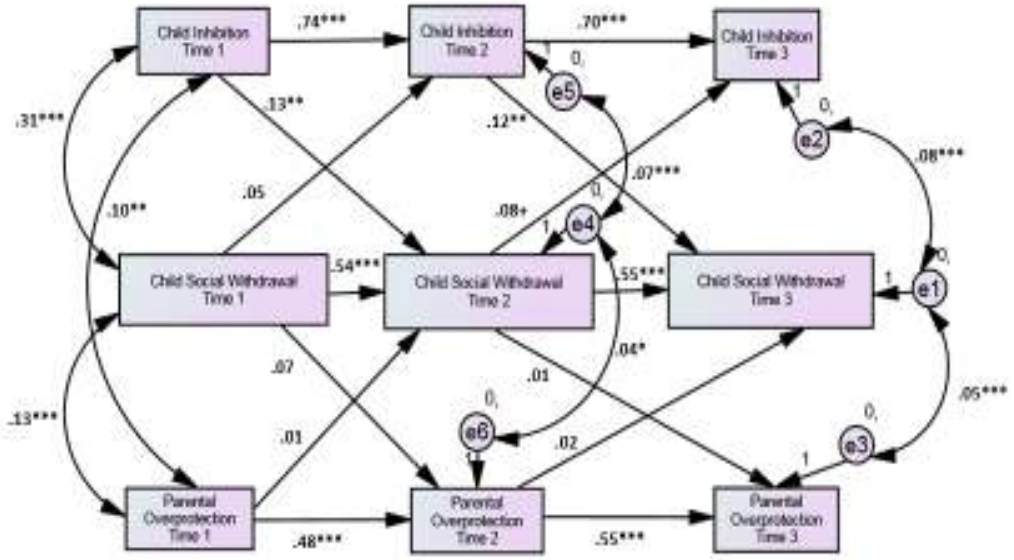

Figure 4.13. Full cross-lagged model analysis of child Temperamental Inhibition, child Social Withdrawal and Parental Overprotection longitudinally across 3 time points.

Table 4.22. Fit indices for full cross-lagged panel models with Child Temperamental Inhibition, Internalizing Problems and Social Withdrawal as child outcomes for all parenting styles and dimensions.

Constructs in Model			Fit Indices						
Chid Inhibition	**Social Outcome**	**Parenting**	χ^2	**df**	***p***	**TLI (> .90)**	**CFI (> .95)**	**RMSEA (< .06 or <.08)**	**SRMR (<.08)**
Behavioral Inhibition	Internalizing Problems	Authoritarian Parenting	39.301	15.000	0.001	0.960	0.983	0.070	0.031
Behavioral Inhibition	Social Withdrawal	Authoritarian Parenting	47.884	15.000	0.000	0.949	0.979	0.081	0.036
Behavioral Inhibition	Internalizing Problems	Parental Overprotection	55.179	15.000	0.000	0.932	0.972	0.090	0.037
Behavioral Inhibition	Social Withdrawal	Parental Overprotection	59.191	15.000	0.000	0.929	0.970	0.094	0.040
Behavioral Inhibition	Internalizing Problems	Authoritative Parenting	57.384	15.000	0.000	0.931	0.971	0.092	0.046
Behavioral Inhibition	Social Withdrawal	Authoritative Parenting	56.809	15.000	0.000	0.936	0.973	0.092	0.043
Behavioral Inhibition	Internalizing Problems	Verbal Hostility	41.890	15.000	0.000	0.956	0.982	0.073	0.032
Behavioral Inhibition	Social Withdrawal	Verbal Hostility	51.205	15.000	0.000	0.944	0.976	0.085	0.038
Behavioral Inhibition	Internalizing Problems	Physical Coercion	44.630	15.000	0.000	0.949	0.979	0.077	0.032
Behavioral Inhibition	Social Withdrawal	Physical Coercion	50.482	15.000	0.000	0.942	0.976	0.084	0.036
Behavioral Inhibition	Internalizing Problems	Non-reasoning & Punitive	27.349	15.000	0.026	0.976	0.990	0.050	0.031
Behavioral Inhibition	Social Withdrawal	Non-reasoning & Punitive	36.186	15.000	0.002	0.961	0.984	0.065	0.036
Behavioral Inhibition	Internalizing Problems	Authoritative - Connection	73.510	15.000	0.000	0.902	0.959	0.108	0.053
Behavioral Inhibition	Social Withdrawal	Authoritative - Connection	74.269	15.000	0.000	0.907	0.961	0.109	0.051
Behavioral Inhibition	Internalizing Problems	Authoritative - Regulation	55.935	15.000	0.000	0.931	0.971	0.091	0.044
Behavioral Inhibition	Social Withdrawal	Authoritative - Regulation	57.870	15.000	0.000	0.931	0.971	0.093	0.041
Behavioral Inhibition	Internalizing Problems	Authoritative - Autonomy	43.345	15.000	0.000	0.950	0.979	0.075	0.039
Behavioral Inhibition	Social Withdrawal	Authoritative - Autonomy	44.146	15.000	0.000	0.951	0.980	0.077	0.038

Note. TLI = Tucker-Lewis index; CFI = comparative fix index; RMSEA = root mean square error of approximation; SRMR = standardized root mean-squared residual; cutoffs for adequate fit are in brackets under the indices.

Meanwhile, the same analyses were conducted with a full model using the six lower-order parenting dimensions under Authoritarian Parenting and Authoritative Parenting as the parenting behavior construct. The fit indices for all full cross-lagged models are provided in Table 4.19 for a comparison.

As shown in Table 4.22, the models that demonstrated the best fit with the data using the lower-order parenting dimensions as the parenting construct were Non-reasoning, Punitive Strategies followed by Verbal Hostility under Authoritarian Parenting, and Autonomy Granting under Authoritative Parenting.

In an attempt to synthesize these findings and delineate how maladaptive parenting practices and children's social outcomes would influence each other reciprocally over time, an aggregated construct was devised to represent *Negative Parental Control* by combining the authoritarian parenting dimension of Verbal Hostility and the authoritative parenting dimension of (lack of) Autonomy Granting This variable was computed by taking the mean of the standard scores of Verbal Hostility and reverse Autonomy Granting.

Verbal Hostility was selected instead of Non-reasoning, Punitive Strategies because the latter did not meet adequate internal consistency and had lower test-retest reliability as pointed out in the last chapter, with Cronbach's alphas of .50 to .52 only across the three waves as shown in Table 3.2 and the lowest stability coefficients of .27 to .38 only among all scales across the multiple time points as shown in Table 3.3 in the last chapter. Meanwhile, Verbal Hostility and Autonomy Granting were significantly correlated with wave 2 and wave 3 data as tested with the full sample (i.e., r = -.13 and -.15, $p < .05$).

Two full models were tested with Negative Parental Control as the parenting behavior construct and Internalizing Problems and Social Withdrawal as child outcome variables, respectively, as shown in Figures 4.14 and 4.15. The fit indices for the two models were most adequate and represent the best fits to the data among all models reviewed thus far.

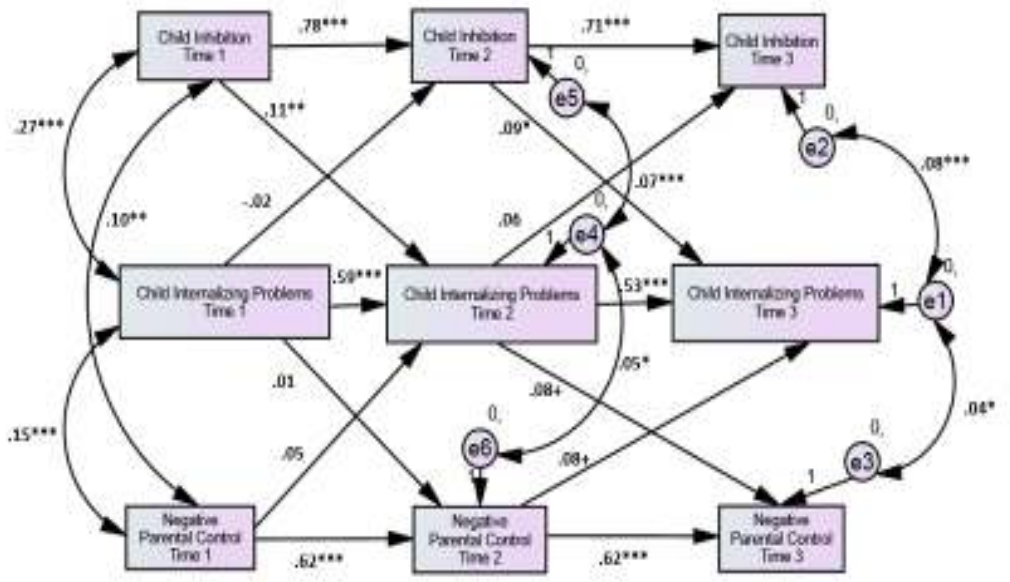

Figure 4.14. Full cross-lagged model analysis of child Temperamental Inhibition, child Internalizing Problems and Negative Parental Control longitudinally across 3 time points.

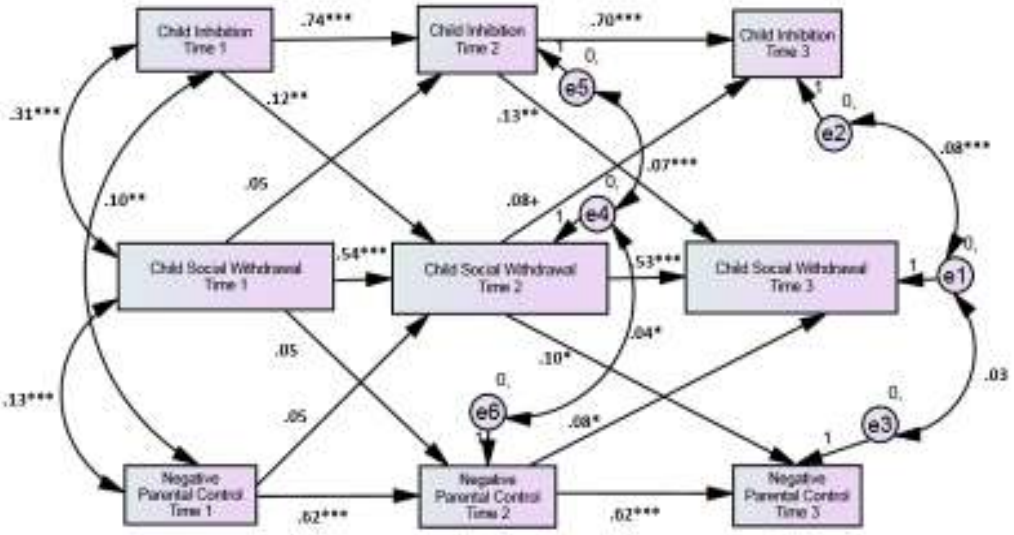

Figure 4.15. Full cross-lagged model analysis of child Temperamental Inhibition, child Social Withdrawal and Negative Parental Control longitudinally across 3 time points.

The fit indices derived for the first model with Internalizing Problems as the child social outcome included χ^2 (15) = 28.331; χ^2/df = 1.889, p = .02; TLI = .98 (>.90);

CFI = .99 (>.95); RMSEA = .05 (<.06); SRMR = .02 (<.08). The fit indices for the second model with Social Withdrawal included χ^2 (15) = 34.934; χ^2/df = 2.329, p = .003; TLI = .97 (>.90); CFI = .99 (>.95); RMSEA = .06 (<.08); SRMR = .03 (<.08).

A summary of Study 2 findings from cross-lagged panel analyses

In both of the final models, the cross-lagged paths from Child Temperamental Inhibition at time points 1 and 2 to the child social outcome construct at time points 2 and 3, respectively, were both significant, indicating children's temperamental inhibition potentially caused children's social outcomes over time. In the reverse direction, except that the path from Child Social Withdrawal at time 2 to Child Temperamental Inhibition at time 3 was marginally significant (p = .065), all other cross-lagged paths were insignificant. These findings partially support hypothesis (H2.1) that children's temperamental inhibition and negative child social outcomes would influence with reciprocal effects on one other over time.

Meanwhile, in both models, although the cross-lagged paths between Negative Parental Control and child social outcomes at time points 1 and 2 were not significant, the paths from Negative Parent Control at time 2 to Child Internalizing Problems at time 3 and to Child Social Withdrawal at time 3 were marginally significant (p = .062) and significant, respectively. Moreover, the path from Internalizing Problems at time 2 to Negative Parental Control at time 3 was marginally significant (p = .056) and the path from Social Withdrawal at time 2 to Negative Parental Control at time 3 was significant. These findings partially support hypothesis (H2.2) that maladaptive parenting practices and negative child social outcomes would influence one and other with reciprocal effects over time.

It should be noted that the foregoing cross-lagged panel analyses were unable to test the transactions between Positive Parental Control and child social outcomes due to the inadequate validity of the POS instrument to capture such parenting behaviors of temperamentally inhibited children. Despite this, the preliminary findings on the transactional nature of the relations between child social outcomes and maladaptive parenting practices in terms of Negative Parental Control are illuminating due to the scarcity of similar studies. *Negative Parental Control* in the present study can be defined as parenting practices characterized with controlling behaviors using verbal hostility toward children and granting little autonomy to children.

Study 3 Results

Data analysis

Study 3 was a Randomized Controlled Trial (RCT) to test the efficacy and evaluate the feasibility of the parent intervention program implemented for Hong Kong Chinese parents of preschool-aged children rated by teachers as temperamentally inhibited. As detailed in Chapter 3, both pre- and post-intervention assessment data were eventually collected for 29 children from the intervention group and 20 children from the control group for Intention-to-Treat (ITT) analyses. From the ITT sample, 45 out of the 49 children had received the lab observational assessment of temperamental inhibition using the TIS. To confirm the children selected by teachers from the top 20% in Total BIQ rating for participation in the RCT were indeed highly temperamentally inhibited as compared to those participants selected from the bottom 20% (18 participants) and the middle 60% (25 participants) for receiving only the observational assessment, an independent samples *t* test was conducted to find any differences in the observed temperamental inhibition in Total TIS rating between the inhibited group and the non-inhibited group. The result showed a significant difference in TIS between the two groups with $t(86) = -3.976$, $p < .001$. This triangulated measurement ensured that the parenting intervention was delivered to only families in need for the parent training.

Program attendance for the intervention group and control group is summarized below. From the intervention group of 29 participants, parents of 4 children declined to attend. Both parents of 5 children attended the training program together. Parents of 13 (52%) children attended all sessions; parents of 8 (32%) children missed 1 or 2 sessions; and parents of 4 (16%) children missed 3 sessions. From the control group

of 28 participants, parents of 8 children did not attend. Both parents of 2 children attended the training program together. Parents of 6 (30%) children attended all sessions; parents of 5 (25%) children missed 1 or 2 sessions; and parents of 9 (45%) children missed 3 sessions.

To prepare for the ITT analysis, the data from the sample of 49 participants with 29 boys and 20 girls, with a mean age of 3.88 ranging from 3.01 to 5.29, and with 29 children from the intervention group and 20 children from the control group as shown in Figure 3.2 in the last chapter, was first examined. Table 4.23 shows the descriptive statistics for the wave 1 and wave 2 outcomes variables. The skewness and kurtosis of all the outcome variables indicated acceptable normality, i.e., skewness < 2 and kurtosis < 7 (Curran et al., 1996; Fabrigar et al., 1999). The wave 1 measures were rated by teachers 3 months before the intervention and the wave 2 measures were rated by the same teachers 3 months after the intervention. The parent self-rated parenting variables were also listed for an analysis of the overall parenting styles of this sample of parents. Just as observed with the larger sample, these parents of temperamentally inhibited children were more authoritative than authoritarian in their parenting with higher mean scores of Authoritative Parenting (i.e., both 3.0 above the mid-point of 3) than the mean scores of Authoritarian Parenting (i.e., 2.2 and 2.1, respectively, both below the mid-point of 3) as reported at time points 1 and 2.

There was one missing value for each of the three post-intervention outcome variables for Anxious Shyness, Regulated Shyness and Social Initiative from wave 2. Missing value analysis indicated data were missing completely at random with a non-significant Little's MCAR test, χ^2 (29) = 30.507, p = .39. Given the small percentages, the Expectation-Maximization method was used to impute the missing

data. Similar results were found when the original data were used so the results based on the imputed data are reported below.

Table 4.23. Descriptive statistics of outcome and parenting variables.

Variable	Variable Description	N	Mean	S. D.	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	S. E.	Statistic	S. E.
W1TBIQ_TOTAL	Wave 2 Teacher-rated Total BIQ rating	49	5.277	0.465	.456	.340	-.784	.668
W1TBIS_TOTAL	Wave 2 Teacher-rated Total BIS rating	49	3.347	0.438	.183	.340	-1.359	.668
W1CSS_ANXIOUS	Wave 2 Chinese Anxious Shyness	49	3.510	0.580	.340	.340	-.907	.668
W1CSS_REGULATED	Wave 2 Chinese Regulated Shyness	49	3.408	0.727	-0.260	.340	1.060	.668
W1TSCI_INITIATIVE	Wave 2 Teacher-rated Social Initative	49	2.219	0.447	-.152	.340	-.678	.668
W1CBS_INTERNAL	Wave 2 CBS - Internalizing Problems	49	1.824	0.411	0.018	.340	-.664	.668
W1PSDQ_AUTHORITATIVE	Wave 2 Parent-rated Authoritative Parenting	48	3.770	0.631	-.553	.343	0.564	.674
W1PSDQ_AUTHORITARAIN	Wave 2 Parent-rated Authoritarian Parenting	48	2.185	0.545	1.155	.343	1.928	.674
W2TBIQ_TOTAL	Wave 2 Teacher-rated Total BIQ rating	49	4.778	0.635	.201	.340	-.215	.668
W2TBIS_TOTAL	Wave 2 Teacher-rated Total BIS rating	49	3.094	0.488	.144	.340	-.738	.668
W2CSS_ANXIOUS	Wave 2 Chinese Anxious Shyness	48	3.208	0.646	.400	.343	-.273	.674
W2CSS_REGULATED	Wave 2 Chinese Regulated Shyness	48	3.483	0.740	.052	.343	0.478	.674
W2TSCI_INITIATIVE	Wave 2 Teacher-rated Social Initative	48	2.526	0.610	.665	.343	1.526	.674
W2CBS_INTERNAL	Wave 2 CBS - Internalizing Problems	49	1.633	0.376	0.089	.340	-1.033	.668
W2PSDQ_AUTHORITATIVE	Wave 2 Parent-rated Authoritative Parenting	41	3.798	0.662	-1.681	.369	6.419	.724
W2PSDQ_AUTHORITARAIN	Wave 2 Parent-rated Authoritarian Parenting	41	2.140	0.575	.722	.369	2.682	.724

To assess the effectiveness of the randomization, a series of independent samples *t* tests were performed to determine any differences between the intervention and control groups on child age and the pre-intervention measures of behavioral inhibition and outcome variables. No significant difference was found between the two groups on child age, t (47) = .94, *ns*; Behavioral Inhibition, t (47) = -.72, *ns*; Anxious Shyness, t (47) = -.60, *ns*; Regulated Shyness, t (47) = .02, *ns*; Social Initiative, t (47) = .23, *ns*; and Internalizing Problems, t (47) = .29, *ns*.

Meanwhile, a number of independent samples *t* tests were also performed and determined no significant gender differences in the pre- and post-intervention

outcome variables: Anxious Shyness, t (47) = .50 and .25, *ns*; Regulated Shyness, t (47) = -.89 and .20, *ns*; Social Initiative, t (47) = 1.23 and .97, *ns*; and Internalizing Problems, t (47) = -1.35 and -1.24, *ns*. Therefore, child gender was not considered a covariate in the analysis.

Per Protocol (PP) analyses were also conducted by including only those participants who not only intended to participate but also indeed received the parenting intervention (n = 20) for comparing the results.

Outcome evaluation

A mixed design repeated-measures ANOVA was conducted to examine the main effect of time and any interaction effect between group and time on each outcome variable. Table 4.21 shows the means and standard deviations for the outcome variables at pre- and post-training assessments between the intervention group and the control group from both the ITT and PP analyses presented side by side for comparison.

The ITT analyses found a significant main effect of time (F (1, 47) = 9.05, η_p^2 = .16, p < .01) and a significant group × time interaction (F (1, 47) = 5.82, η_p^2 = .11, p < .03) on Anxious Shyness, as depicted in Figure 4.16. This interaction effect achieved a statistical power of 99% with n = 49 and α = .05 as calculated in a post-hoc power analysis using G*Power 3 (Faul et al., 2007), corresponding to a medium to large effect size with Cohen's f reaching .35 (Cohen, 1992). As expected, however, no significant main effect of time (F (1, 47) = .56, η_p^2 = .01, p = .46) and no significant group × time interaction (F (1, 47) = .12, η_p^2 = .00, p = .74) on Regulated Shyness were detected. These results fully support hypothesis (H3.1) that temperamentally inhibited children of the parents assigned to the intervention group

would reduce in anxious shyness but not regulated shyness relative to the children of parents in the waitlist control group.

However, although a significant main effect of time was found (F (1, 47) = 15.17, η_p^2 = .24, p < .001), there was no significant group × time interaction on Social Initiative (F (1, 47) = .31, η_p^2 = .01, p = .58). Likewise, there was a significant main effect of time (F (1, 47) = 15.16, η_p^2 = .25, p < .001) but no significant group × time interaction on children's Internalizing Problems (F (1, 47) = 1.11, η_p^2 = .02, p = .30). Therefore, hypothesis (H3.2) that the same children would increase in social initiative with peers and reduce in internalizing problems in comparison with children from the control group was not supported.

As also shown in Table 4.24, the results from both the ITT and PP samples are similar in the levels of significance for all outcome variables.

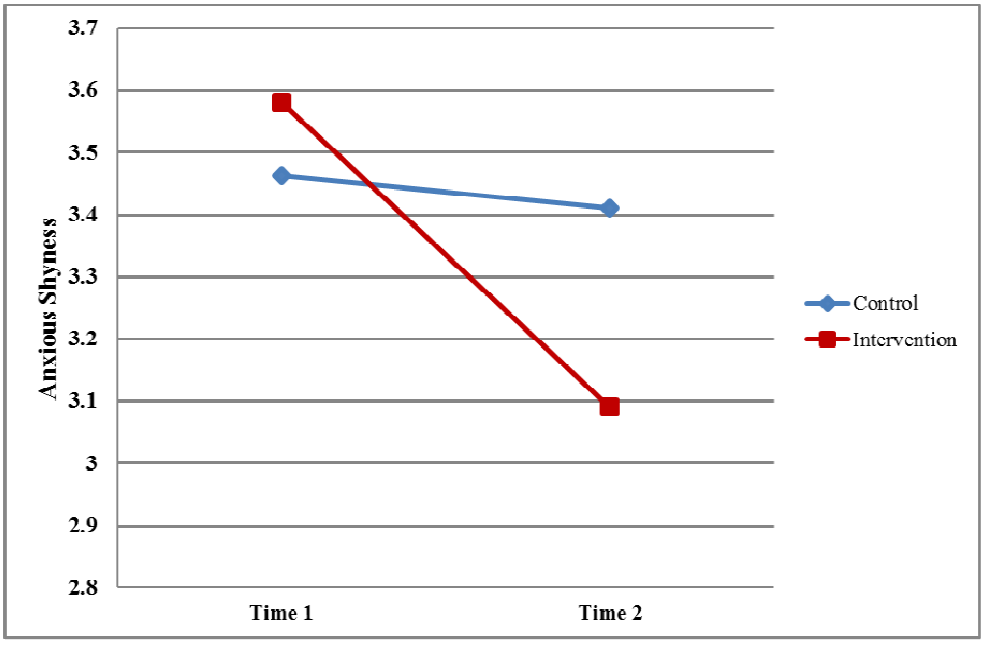

Figure 4.16. Teacher-rated Child Anxious Shyness at baseline and 6 months later post training across intervention and control groups.

Table 4.24. Means and SDs on Outcome Variables at pre- and post-intervention time points (Intention-to-Treat vs. Per Protocol).

	Intention-to-Treat (ITT)						Per Protocol (PP)					
	Intervention		Control		Level of Significance		Intervention		Control		Level of Significance	
	Time 1	Time 2	Time 1	Time 2	Main Effect	Group x Time	Time 1	Time 2	Time 1	Time 2	Main Effect	Group x Time
	N Mean (SD)	Mean (SD)	N Mean (SD)	Mean (SD)	of Time	Interaction	N Mean (SD)	Mean (SD)	N Mean (SD)	Mean (SD)	of Time	Interaction
Teacher-rated												
CSS-Anxious Shyness	29 3.55 (.54)	3.08 (.61)	20 3.45 (.64)	3.40 (.65)	.004**	.020*	25 3.58 (.55)	3.09 (.59)	20 3.45 (.64)	3.40 (.65)	.005**	.022*
CSS-Regulated Shyness	29 3.41 (.75)	3.51 (.75)	20 3.41 (.71)	3.45 (.73)	.459	.736	25 3.42 (.80)	3.54 (.79)	20 3.41 (.71)	3.45 (.73)	.433	.688
SCI-Social Initiative	29 2.21 (.42)	2.55(.61)	20 2.24 (.50)	2.49 (.60)	<.001***	.583	25 2.19 (.41)	2.54 (.63)	20 2.24 (.50)	2.49 (.60)	.001**	.550
CBS-Internalizing Problems	29 1.81 (.39)	1.66 (.38)	20 1.85 (.45)	1.59 (.38)	<.001***	.297	25 1.83 (.41)	1.67 (.38)	20 1.85 (.45)	1.59 (.38)	<.001***	.367

Note. CSS = Chinese Shyness Scale; SCI – Social Competence Inventory; CBS = Child Behavior Scale; SD = standard deviations.

* $p < .05$ level, ** $p < .01$ level, *** $p < .001$ level.

Since the training was delivered by two trainers, an independent samples *t* test was performed to determine any significant differences in children's changes in Anxious Shyness among the two groups trained by the two individual trainers. No significant difference was found between the two groups (t (43) = .36, p = .72).

Process evaluation

Process evaluation for the intervention program was conducted by collecting quantitative and qualitative feedback from the participants at the end of each program delivery. A feedback form was distributed to each participating parent at the last training session which asked him or her to rate a number of program aspects on a 5-point Likert scale, with 1 for 'completely disagree', 2 for 'disagree', 3 for 'neither agree nor disagree', 4 for 'agree' and 5 for 'completely agree'. Ten such questions were asked on what program components the participant was most satisfied with. Twenty-three participants from the intervention group and 13 participants from the control group filled out and handed back the form. Table 4.25 is a summary of the average score for each program aspect rated by the two groups. The mean overall satisfactory ratings among the 36 participants was 4.63 (SD = .37). Parents were specifically asked to provide feedback on the usefulness of the parenting skills taught in the training in Question 4. As can be seen from the mean ratings (ranging from 4.39 to 4.85), the participants were in agreement that these skills were useful in helping their temperamentally inhibited children.

Since the training was delivered by two trainers, an independent samples *t* test was performed to determine any group differences in parents' overall satisfactory rating among the participants trained by the two individual trainers. No significant difference was found between the two groups (t (34) = .65, p = .52).

Table 4.25. Summary of participants' feedback on the parent training program.

Question No.	Question	Intervention Group Mean Rating (SD)	Control Group Mean Rating (SD)
1	This program has helped me gain a better understanding of my child's temperament.	4.61 (0.58)	4.54 (0.52)
2	This understanding has allowed me to more effectively parent my child.	4.61 (0.58)	4.54 (0.66)
3	The skills and knowledge taught by this program can help my child overcome his/her anxiety due to shy temperament.	4.65 (0.57)	4.54 (0.66)
4	I think the following skills taught by this program are very useful.	4.51 (0.55)	4.73 (0.26)
	a) Graded Exposure	4.39 (0.84)	4.62 (0.51)
	b) The principle of using attention, rewarding and praising	4.52 (0.59)	4.85 (0.38)
	c) Observe my child's fearful reactions in different daily situations and how I respond to him or her.	4.48 (0.73)	4.69 (0.48)
	d) Remind myself not to overprotect my child or intervene with what he or she does too early.	4.65 (0.57)	4.77 (0.44)
5	I think the number of sessions and the length of time required by this training program is appropriate.	4.41 (0.5)	4.54 (0.66)
6	I am satisfied with the training contents and arrangements of this program.	4.61 (0.5)	4.62 (0.51)
7	Homework tasks and practices have helped me learn how to apply the parenting skills effectively.	4.52 (0.59)	4.62 (0.51)
8	I am satisfied with the trainer's overall performance in this program.	4.86 (0.35)	4.85 (0.38)
9	The trainer was able to use examples to explain the skills and knowledge taught in this program.	4.65 (0.57)	4.85 (0.38)
10	The trainer could answer my questions about the training contents and parenting skills covered in this program	4.83 (0.49)	4.69 (0.48)

Note. SD = standard deviations.

Meanwhile, positive qualitative feedback was also received on the program. Primarily, participants appreciated the practicality of the parenting skills taught in the program and their effectiveness in helping their children in daily life. On the other hand, some parents suggested further improvement on the training materials, such as more examples to illustrate how the parenting skills could be applied under different circumstances and multi-media materials, e.g., videos to show examples of how to practically apply the parenting skills with children.

Taken together, the training program was well received by the participants and its high degrees of feasibility and receptivity for implementation in the Hong Kong Chinese context as confirmed in the present study supports a wider dissemination in the future.

Chapter 5

Discussion and Conclusion

Four research goals achieved with three inter-related studies

We began the present investigation with a few basic but important research questions. First and foremost, are temperamentally inhibited children at risk for social development? If so, what is the best way to measure temperamental inhibition among preschool-aged young children?

The more complicated questions then followed. Does maladaptive parenting, in particular, overprotective and over-controlling parenting, have an effect on how temperamental inhibition is related to negative development outcomes among children? Does maladaptive parenting maintain adverse social development outcomes of temperamentally inhibited children in a transactional manner such that the expression of child temperamental inhibition as social withdrawal and internalizing problems elicits maladaptive parenting behavior and in turn maladaptive parenting behavior negatively influences child social outcomes over time?

Even further, questions about early intervention were pursued. How much can an early intervention program help alleviate the negative effects of temperamental inhibition on children's social development outcomes through parent training? How should such an early intervention program for parents of temperamentally inhibited children be evaluated?

Lastly, questions about cultural differences and the Hong Kong context had to be addressed. Are there any cultural differences in the perception of temperamental inhibition? How do such cultural differences affect parenting practices? If so, how do cultural differences distinguish the relations examined with the previous questions? More specifically, how do the answers to the foregoing research questions apply to Hong Kong Chinese families?

In response to these questions, we started a research program by recruiting a sizeable sample of 352 Hong Kong Chinese preschoolers aged 3 to 5 years from 10 local kindergartens and inviting their parents and teachers to provide data about them. Data were collected from this sample of participants at three time points with 6 months apart between measurements to facilitate the present research with multi-wave and multisource assessment data for a short-term longitudinal research design. With this sample, we conducted three inter-related studies to answer the above research questions with four research goals.

As informed by a review of the extant literature, temperamental inhibition has been identified with extensive research of the last two to three decades as a developmental risk, drawing the attention of child psychology researchers, clinicians and practitioners. Instruments have been developed to measure children's temperamental inhibition with parent and teacher rating scales as well as observational protocols. While both questionnaire and observational methods have their own strengths and weaknesses, a triangulated measurement employing both types of instruments would serve as the most complete assessment. In the present investigation with Hong Kong Chinese children, the first research goal was therefore to develop a parsimonious observational measure and use it with well-validated and reliable parent and teacher rating scales adapted from Western studies to identify temperamentally inhibited Hong Kong Chinese young children who are at-risk for later developmental difficulties. This was largely achieved with the development, implementation and evaluation of the Temperamental Inhibition Scale (TIS), an observational protocol newly designed by the present research to measure preschool-aged children's levels of temperamental inhibition by assessing their characteristics of social speech with an unfamiliar adult conversational partner in a lab setting. This

observational measure was complemented with the administration of the commonly used Behavioral Inhibition Questionnaire (BIQ) and Behavioral Inhibition Scale (BIS) adapted from Western studies (Bishop et al., 2003; van Brakel & Muris, 2006) for the measurement of children's temperamental inhibition. To the author's knowledge, this is the very first assessment tool set developed for measuring temperamental inhibition among Hong Kong Chinese children. The TIS was evaluated positively with satisfactory construct, criterion and convergent validity while the BIQ and BIS were evaluated favorably with adequate internal consistency and acceptable temporal stabilities.

With this assessment tool set, Study 1 selected a subsample of children and parents to receive the triangulated measurement of children's temperamental inhibition as well as an observational assessment of parenting behaviors. To meet the second research goal of the present investigation, these assessment data were used to test the effects of temperamental inhibition on children's social withdrawal, internalizing problems and academic competence as well as the interactive effects between child temperamental inhibition and maternal parenting practices in predicting these child developmental outcomes. This methodology matched the methods used by a number of well-known Western studies investigating the same or similar predictive relationships between temperamental inhibition, parenting behaviors and children's social development outcomes (Degnan et al., 2008; Hane et al., 2008; Rubin et al., 2002; Rubin et al., 2001).

To meet the third research goal to examine the transactions between temperamental inhibition and parenting practices, Study 2 made use of the questionnaire data collected from parents and teachers for 333 preschool-aged children at three time points to conduct a short-term longitudinal investigation.

Cross-lagged panel analyses (CLPA) were used to test how child temperamental inhibition, child development outcomes and parenting practices influenced each other over time across the three time points. To the author's knowledge, no other CLPA studies have been conducted to specifically investigate these relations in one model.

Lastly, to fulfill the fourth research goal to verify the positive effects of early intervention on the developmental outcomes of temperamentally inhibited children, Study 3 implemented and evaluated the *Cool Little Kids* parent training program adapted from an Australian nation-wide program (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, Clifford, et al., 2011; Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011) for temperamentally inhibited Hong Kong Chinese children and their parents using a randomized controlled trial (RCT) design. Both Intention-to-Treat and Per-Protocol analyses were conducted to assess whether and how much socially anxious behaviors were alleviated for an intervention group of children whose parents participated in the parent training program relative to a control group of children whose parents had not. To the author's knowledge, this was the first RCT of the *Cool Little Kids* program ever conducted with the participation of Chinese children and parents.

Table 5.1 provides a summary relating the explicit research questions with the research goals achieved in the three studies and whether the corresponding research hypotheses were supported by the study findings.

Table 5.1. A summary of study findings relating the research questions, research goals and research hypotheses in the present investigation.

Research Question	Research Goal	Study Hypothesis	Finding
1. Can temperamental inhibition among preschool-aged Hong Kong Chinese children be measured by observing their social speech with an unfamiliar adult?	The first goal was to develop and implement observational protocols to assess children's temperamental inhibition and maternal parenting behaviors.	(H1.1) Temperamental inhibition could be measured by observing preschool-aged children's inhibition to speak to an unfamiliar conversational partner.	H1.1 supported
2. Is temperamental inhibition related to social withdrawal, internalizing problems, anxious shyness and regulated shyness, and social initiative significantly and in the same direction among Hong Kong Chinese children as it is among children in the Western culture?	The second goal was to test the predictive relationships between maternal parenting behaviors and children's academic develoopment, and to test the additive and interactive effects of child temperamental inhibition and maternal parenting behaviors on children's development outcomes of internalizing problems and social withdrawal both concurrently and prospectively, using the instruments developed in the first goal.	(H1.2) Temperamental inhibition would positively predict preschool-aged children's internalizing problems, social withdrawal and anxious shyness, and negatively predict their social initiative and academic competence, but not regulated shyness.	H1.2 supported
3. Do protective and supportive parenting practices predict children's academic competence among Hong Kong Chinese families?		(H1.3) Maternal protective parenting would positively predict children's academic competence. (H1.5) Maternal supportive parenting would positively predict children's academic competence.	H1.3 supported H1.5 not supported
4. Do protective parenting and supportive parenting moderate the predictive relations between Hong Kong Chinese children's temperamental inhibition and their social developmental outcomes such that the relations are significant only for children of highly protective and highly supportive parents?		(H1.4) Maternal protective parenting would moderate the relation between temperamental inhibition and internalizing problems, social withdrawal, anxious shyness and (lower) social initiative among Hong Kong Chinese preschool-aged children such that higher maternal protective parenting would exacerbate the negative effects of temperamental inhibition on these developmental outcomes but not lower maternal protective parenting. (H1.6) Maternal supportive parenting would moderate the relation between temperamental inhibition and internalizing problems, social withdrawal, anxious shyness and (lower) social initiative among Hong Kong Chinese preschool-aged children such that lower maternal supportive parenting would exacerbate the negative effects of temperamental inhibition on these developmental outcomes but not higher maternal supportive parenting.	H1.4 supported H1.6 not supported
5. Do child inhibition, child social outcomes and maladaptive parenting relate with reciprocal effects on each other over time in a transactional manner among Hong Kong Chinese parents and children?	The third goal was to investigate the transactional nature of the relationships between child temperament inhibition, child social development outcomes, and parenting behaviors. Their reciprocal effects on each other would be evaluated longitudinally.	(H2.1) Child temperamental inhibition and negative child social outcomes would operate in a transactional manner with reciprocal effects on one another over time. (H2.2) Maladaptive parenting practices and negative child social outcomes would influence one and other in a transaction manner over time.	H2.1 partially supported H2.2 partially supported
6. If negative child social outcomes and maladaptive parenting practices influence each other in an unfavorable course over time, can an early intervention program help temperamentally inhibited Hong Kong Chinese preschool-aged children alleviate their socially anxious behaviors by training their parents to be less overprotective in parenting and to develop children's confident behaviors by rewarding, essentially breaking the vicious inhibition-overprotection cycle between children and parents?	The fourth goal was to adapt and implement an early intervention program from Western studies for Hong Kong Chinese families. A randomized controlled trial of the program was conducted to test its efficacy in alleviating preschool-aged children's social anxiety and internalizing problems in the local context.	(H3.1) Temperamentally inhibited children of the participating parents randomly assigned to the intervention group would reduce in anxious shyness but not regulated shyness relative to children of parents in the waitlist control group, as rated repeatedly by their teachers after the parents participated in the program. (H3.2) Children from the intervention group would increase in social initiative with peers and reduce in internalizing problems in comparison with children from the control group.	H3.1 suported H3.2 not supported

A summary of key findings in the present investigation

As revealed in Study 1, the moderating effects of Maternal Positive Protection (MPP) as a measure of maternal protective parenting on the relations between Temperamental Inhibition and Internalizing Problems and between Temperamental Inhibition and Social Withdrawal largely replicated the findings of a number of Western studies (Coplan et al., 2007; Degnan et al., 2008; Hane et al., 2008; Rubin et al., 2002). The relations between Temperamental Inhibition and concurrent and prospective Internalizing Problems and Social Withdrawal were found to be significant for children whose mothers exhibited high levels of Maternal Positive Protection but non-significant for those children whose mothers exhibited low levels of Maternal Positive Protection. Thus, a major finding of Study 1 is that Maternal Positive Protection, despite being a positive and affectionate parenting practice, did exacerbate the effect of Temperamental Inhibition on Hong Kong Chinese children's Internalizing Problems and Social Withdrawal (Coplan et al., 2007).

On the other hand, unexpectedly, Maternal Positive Support (MPS) as a measure of maternal supportive parenting did not moderate the relations between Temperamental Inhibition and the child outcomes of Internalizing Problems and Social Withdrawal such that lower maternal supportive parenting would exacerbate the negative effects of Temperamental Inhibition on children's social outcomes, as were demonstrated in some Western studies (Coplan et al., 2007; Hane et al., 2008; Rubin et al., 2001). In other words, as a positive and affectionate parenting behavior exhibited supposedly in the appropriate context, in this case, during a task-based activity which may induce some level of stress on the child, Maternal Positive Support did not serve as a buffer (Coplan et al., 2007) to reduce the unfavorable effect of Temperamental Inhibition on such social development outcomes.

Conversely, high levels (and not low levels) of Maternal Positive Support was found to even exacerbate the effect of Temperamental Inhibition on children's Internalizing Problems and Social Withdrawal prospectively (though not concurrently), similar to but to a lesser extent than Maternal Positive Protection was found to do. As pointed out in Chapter 3, Maternal Positive Protection and Maternal Positive Support were correlated in this study ($r = .291$; $p < .01$) in contrast to the finding reported in the Western study by Rubin et al's (2001) that the two Maternal Solicitousness measures in the free play and teaching task episodes were unrelated ($r = -.04$, *ns*).

A plausible explanation of this unexpected finding is that mothers who had been affectionately protective in the free play episode just carried the same parenting behavior forward to the joint task episode that occurred immediately afterwards despite their contextual differences. Moreover, it may also be possible that the requirement of the task assigned for the joint task episode was unable to sufficiently produce the intended stress level for the mother-child dyads for the measurement of supportive parenting expected during a challenging time. In essence, the measure of Maternal Positive Support turned out to be a slightly reduced version of Maternal Positive Protection in this study.

Another possible explanation of this intriguing finding related to an emerging strand in the goodness of fit theory is that children might have viewed their mothers' supportive parenting as protective parenting and their continuous dependence on maternal protection led to similar negative social outcomes. From a theoretical perspective, therefore, the combination of Temperamental Inhibition and low levels of Maternal Positive Support (i.e., maternal supportive parenting), at least under mildly stressful situations as in this case, did not constitute an effect adverse enough to bring about negative social outcomes in the Hong Kong Chinese children. In fact,

this combination seems to be a good fit; that is, low levels of Maternal Positive Support actually buffered the adverse effect of Temperamental Inhibition on the social development outcomes. Indeed, one Western study by Lengua (2008) found that parenting practices that allowed more frustrating experience (similar to lack of supportive parenting) for young boys with high fearfulness led to lower levels of internalizing problems. This unexpected finding of the present study may contribute as additional empirical support for the pattern of fearful children developing lower levels of internalizing problems when their parents allow them to experience more rather than less frustration, which currently has yet been well-established with only few studies demonstrating affirmative evidences (Bates et al., 2012).

In Study 2, to assess parenting practices, parent self-report scales were employed. The commonly used Parenting Styles and Dimension Questionnaire (PSDQ; Robinson et al., 2001) was administered to measure the global parenting styles of Authoritative Parenting and Authoritarian Parenting, as well as the fine-grained parenting dimensions of Connection, Regulation and Autonomy Granting under Authoritative Parenting, and Verbal Hostility, Physical Punishment and Non-reasoning, Punitive Strategies under Authoritarian Parenting. Meanwhile, Overprotective Parenting was measured using a self-report 5-item scale known as the Parental Overprotection Scale (POS) developed by Coplan et al. (2009).

A series of Cross-Lagged Panel Analyses (CLPA) revealed two major findings. First, in the various models, the cross-lagged paths from Temperamental Inhibition to the child social outcomes of Internalizing Problems and Social Withdrawal were found to be significant but not in the reverse direction. In other words, although the paths from Time 1 Temperamental Inhibition to Time 2 child social outcomes and from Time 2 Temperamental Inhibition to Time 3 child social outcomes were

significant, the paths from Time 1 child social outcomes to Time 2 Temperamental Inhibition and from Time 2 child social outcomes to Time 3 Temperamental Inhibition were found to be insignificant, as shown in Figures 4.7 through 4.14. This evidenced that children's Temperamental Inhibition, being an innate, biologically-based disposition, predicts and potentially causes the future behavioral expression of the temperament trait in the form of such social outcomes as Internalizing Problems and Social Withdrawal over time across a 12-month early childhood period. However, conversely, the expression of Temperamental Inhibition as maladaptive social behaviors, has little additive effect on the continuity and stability of Temperamental Inhibition itself over time as shown in this study. Temperament, in this case inhibition, therefore is a more stable psychological construct than its expression as the corresponding behavior (e.g., social withdrawal). This understanding is attuned with studies that showed the moderate stability of temperament. In particular, behavioral inhibition has been found to be considerably stable and resistant to change from childhood to adulthood as evidenced in the longitudinal studies reported by Kagan and Fox (2006) and Kagan (2012).

Second, with the final CLPA model based on the maladaptive parenting dimension of negative parental control, as depicted in Figures 4.13 and 4.14, the reciprocal cross-lagged paths between maladaptive parenting and child social outcomes from time point 2 to time point 3 were found to be both significant. Although the corresponding cross-lagged paths were non-significant between time point 1 and time point 2, this finding provided support for the premise that maladaptive parenting behavior and child social outcome influence one another reciprocally over time. More exactly, negative parental controlling behaviors, exhibited as verbal hostility and lack of autonomy granting on the part of parents,

and the child social outcomes of Internalizing Problems and Social Withdrawal, reciprocally influence one another over time, and thus maintain each other in a cyclical manner, as hypothesized and supported by some Western studies (Coplan et al., 2008; Degnan et al., 2008; Hane et al., 2008; Rubin et al., 2002; Rubin et al., 2001). This finding provided preliminary empirical evidence to support the lasting presence of a parent-child interaction cycle between a temperamentally inhibited child and his/her controlling parent among Hong Kong Chinese families.

In Study 3, an efficacious parent training program evaluated with Australian participants in earlier studies was implemented using a randomized controlled trial design in the Hong Kong Chinese context for temperamentally at-risk children who possessed an inhibited profile. Process and outcome evaluations were conducted to examine the feasibility, receptivity and effectiveness of the program.

The results provided empirical support for the efficacy of the *Cool Little Kids* early intervention program in alleviating temperamentally inhibited Hong Kong Chinese children's anxious shyness. Compared to the control group, children from the intervention group were found to have significantly reduced in anxious shyness as measured with the Chinese Shyness Scale (CSS) after their parents participated in the parent training program. Moreover, as expected, these children did not decrease in regulated shyness as measured with the CSS. This finding lent some support for the cultural differences in perceived shyness under the Chinese tradition, namely, nonassertive and modest behaviors among Chinese may be approved and understood as a non-competitive way of social interaction rather than an anxious behavioral style and therefore not being viewed negatively (Xu et al., 2009; Xu et al., 2007).

The instruments used for assessing children's Social Initiative and Internalizing Problems were unable to detect any significant changes in such outcomes among

children from the intervention group despite their satisfactory internal consistency. A closer look at the Social Initiative subscale of the Social Competence Inventory revealed that out of the 8 test items, the scale contains 3 positive items tapping certain children's behaviors atypical of temperamentally inhibited children, i.e., "often suggests activities and games to play with peers", "is often a leader in games or activities", "easily makes contacts with unfamiliar children" (Rydell et al., 1997). Thus, although this instrument may be useful for measuring the degrees of social initiative among children in a general population, these positive items may have diluted the sensitivity of the instrument in detecting subtle changes in reduced shyness among the temperamentally inhibited children as investigated in the study.

The Internalizing subscale of the Child Behavior Scale (CBS) was unable to find any significant outcomes in children's more general internalizing problems from the intervention group. The CBS subscales constituting the overall Internalizing Problems measure young child's degrees of unsociability (i.e., Asocial with Peers) and emotional distress (i.e., Anxious-Fearful). On the one hand, the Asocial with Peers subscale assesses not only children's withdrawn and avoidant behaviors but also their non-anxious unsocial behaviors (e.g., "prefers/likes to play alone", "solitary child"). The latter, however, are not necessarily maladaptive (Rubin et al., 2009). On the other, the Anxious-Fearful subscale taps not only children's propensity to worry and be fearful but also such depressive mood and tendency as feeling miserable and crying easily. These non-anxious aspects of internalizing problems being measured are not immediately equivalent to children's shyness and anxiety that the *Cool Little Kids* program aims to address. Internalizing problems, moreover, have been predicted to exhibit only during middle childhood in the transactional model of social withdrawal proposed by Rubin et al. (2009).

Consequently, significant differences in internalizing problems may take time to manifest but not shortly after a relatively brief intervention.

Consistent with this interpretation, Rapee et al. (2005) suggested that some prevention effects of the *Cool Little Kids* program might take several years to realize. Indeed, a recent study by Rapee (2013) that followed up on children whose parents received the *Cool Little Kids* intervention at their preschool years provided empirical support for long-term program effects especially for girls in terms of significantly fewer anxiety and depressive symptoms when they reached adolescence.

This non-significant finding therefore also prompts for the needs to enhance the present intervention program with follow-up assessments to monitor longer-term changes in future implementation. The enhanced program should also include other follow-up actions such as phone call reminders to parents after the initial training to reinforce adaptive parenting practices and maximize sustainable effectiveness of the intervention for longer-term impact just as demonstrated in the study by Kennedy et al. (2009).

The process evaluation through participants' feedback has confirmed that both the delivery mode and the adaptive parenting skills transferred to participants through the training sessions were well received. This brief, selective, parenting intervention was originally designed with program sustainability and feasibility in mind (Rapee et al., 2005). It was intended to be least intrusive to participants in terms of time investment, and to be economical in terms of the relatively low cost of delivery. These two design considerations were to attract participants to committed attendance and policymakers to extended support. The program effectiveness demonstrated in this study serves as an initial but convincing supportive reference for wider dissemination in the local community.

Instrumentation enhancement

Despite the strengths of the multi-methods implemented for triangulated measurement in the present research, two instruments were inadequate in measuring the anticipated constructs and their respective effect sizes. First, as mentioned before, the observational protocol of Maternal Positive Support (MPS) was originally intended to measure supportive parenting practices but appeared to be a reduced version of Maternal Positive Protection (MPP) with similar predictive and interactive relations as found with the latter measure. There is a possibility that mothers who participated in the child free play episode exhibiting protective behavior seemed to have carried forward the same or similar parenting behavior into the joint task episode that occurred shortly afterwards. The two episodes were originally designed to create two different contexts in which parenting behaviors were expected to vary according to the different situational demands, namely, the free play time requires no or little parental guidance but the joint task activity requires the mother to teach, guide or help the child to complete the task within the time constraint. When a Hong Kong Chinese mother goes through the observational procedure, perhaps she may not consciously adjust her parenting behavior when one situation shifts to another because of two possible reasons. First, the two situations take place in the same physical location thus there is no explicit indication that the context has changed and should demand very different parenting practices when the first episode ends and the second episode begins. Second, Hong Kong Chinese mothers may be insensitive to the situational demands because the criticality of the assessment protocol is not evident. Thus, a protective mother may continue to be controlling and an easy-going mother may continue to be relaxing just as usual even when the first episode transitions into the second episode. In order to sensitize the

mother in making a situational adjustment, one minor enhancement to the protocol that can be easily made in the future is to inform the mother that the Lego model to be built jointly with the child will be rated by the assessor when she returns in five minutes at the end of the session. This would effectively hint to the mother that her originally passive role in the first free play episode should imminently become active in the second joint task episode, because her active role is crucial to the child's "success" in completing the assessment with positive results. Also, such a change may increase the stressfulness of the second episode so as to further validate the interpretation mentioned earlier about the intriguing finding whether low levels (and not high levels) of Maternal Positive Support actually constituted a buffering effect only under mildly stressful situations as tested in the present investigation but not in highly stressful situations. This will further qualify the context in which the pattern of low levels of supportive parenting and child temperamental inhibition would serve as a good fit in shaping children's developmental outcomes (Bates et al., 2012; Lengua, 2008).

The self-report Parental Overprotection Scale (POS) used to tap overprotective parenting among parents did not prove to distinctively measure such a parenting practice and failed to demonstrate its relations with and direct and interactive effects on children's social development outcomes. An examination of the scale revealed that the five items are rather general statements to assess a parent's anxious and guilty feelings toward the child's failure as evaluated by others and a parent's tendency to intervene with what the child does to prevent the anticipated difficulty or failure. The scores derived from this measure were found to be correlated with the measure of Authoritarian Parenting and present similar effects to Authoritarian Parenting on the relations being investigated in Study 1 and Study 2. If parental

overprotection is conceptualized as a parenting tendency of contextually insensitive controlling behavior, an operationally effective measure may assess parental protective responses in specific scenarios. One measure more recently developed for assessing overprotective parenting exactly did tap into such scenario-based differences, namely, the New Friends Vignettes (NFV) designed by McShane and Hastings (2009). This instrument uses two hypothetical vignettes in which the target child is to be imagined to meet new friends. To each vignette, the parent is asked to select a number of responses to show the levels of overprotection. However, to ensure culturally appropriate scenarios are used for Chinese parents, the NFV may not be directly administered. Rather, Hong Kong Chinese parents would have to be interviewed in focus groups to devise common scenarios to develop an equivalent instrument similar to the NFV for the local participants. Such a scale development for Chinese parents in the future would prove fruitful in complementing observational methods for the measurement of overprotecting parenting behavior.

A parenting dilemma

In Study 1, what is the most perplexing finding is that, while Maternal Positive Protection was found to exacerbate the effects of Temperamental Inhibition on Internalizing Problems and Social Withdrawal, it was also a significant predictor of higher overall Academic Competence among Hong Kong Chinese children. The latter predictive relationship may not be too surprising given the participants of the present investigation were Chinese parents, and mainly Hong Kong Chinese mothers in particular. Chinese parents are well known to be controlling and maternal controlling behavior in parenting has been found to be associated with children's positive academic achievements in prior studies (Cheung & Pomerantz, 2011; Ng et

al., 2014; Tsang, 2012; Wang & Chang, 2010). While the previous studies were conducted on older children's academic competence, the present investigation has extended this relationship to early childhood years.

Hong Kong Chinese parents therefore face a parenting dilemma given these conflicting consequences. Should parents practice the usual positive control and protection with children to enable a more favorable development of academic competence as perceived by teachers or should parents refrain from such parenting practices to dampen any potentially negative effect on children's social development? To answer this question, parents need to first consider if their child has a temperamentally inhibited profile. Since social withdrawal and internalizing problems are more of a concern for temperamentally inhibited children, children who are *not* inhibited may be less susceptible to the effects of positive protection used in Hong Kong Chinese parenting that prioritizes the development of academic competence for these children. However, for temperamentally inhibited children, parents are likely to benefit from reduced protective parenting practices to first help their children to alleviate the unfavorable effect of temperamental inhibition in the early years before they actively guide them to progress in academic development when they have overcome social difficulties. It should also be noted that the measurement of academic competence in the present study was applicable to preschool children only. Longer-term academic competence may require improved social skills that temperamentally inhibited children lack at their kindergarten ages. Striking a balance for the functional needs between social development and academic development at this age may call for parents of temperamentally inhibited children to focus on the former before the latter. All in all, the author resonates the observation and recommendation made by Shek and Sun (2013) that Hong Kong

Chinese parents would fare better to enable holistic development for their children than to parent with an imbalanced focus on academic success. Moreover, as advocated by Pomerantz, Ng, Cheung, and Qu (2014), Hong Kong Chinese parents are recommended to take caution to avoid over-emphasizing academic functioning at the expense of emotional functioning in children's development.

Inhibition-overprotection cycle

The findings from Study 1 and Study 2 on the interactive and reciprocal relations between children's social outcomes and maladaptive parenting among Hong Kong Chinese parent-child dyads are important to the understanding of the inhibition-overprotection cycle across cultures. In particular, even if temperamental inhibition or shyness may be more accepted among Chinese parents due to the indigenous Chinese cultural tradition of viewing shyness as sometimes socially appropriate (Xu, Zhang, & Hee, 2013), the culturally independent but negative effect of the inhibition-overprotection cycle itself is likely to stifle Chinese children's social development or perhaps even more severely since the accommodating Chinese parents do not see the pressing need to stop this cycle. If their parents continue to be unknowingly overprotective, the same outcome would result whether their temperamentally inhibited children are raised in a Chinese or Western culture. In other words, their inhibited children would be deprived of the opportunities to learn and overcome social difficulties in novel situations, maintaining their social withdrawal condition. Therefore, to ameliorate the negative social outcomes of temperamental inhibition, this vicious cycle of interactions between an inhibited child and an overprotective parent has to be discontinued. Parents of

temperamentally inhibited children have to be advised to reduce overprotective and over-controlling parenting behaviors.

Parental awareness of the maladaptive cycle of parent-child interactions may be raised through parent training. Interestingly, while an inhibited child with internalizing problems may elicit protective parenting behavior which in turn encourages continuous child dependence, forming the inhibition-overprotection cycle over time (Rubin et al., 2002; Williams et al., 2009), in parallel, a disruptive child with externalizing problems may elicit harsh parenting behavior which in turn evokes continuous child aggression, forming the coercive parent-child cycle (Scaramella & Leve, 2004). Parents need to discontinue such cycles of parent-child interactions by applying effective parenting strategies. When perceiving an inhibited child's needs for help in social situations prematurely, the parent has to refrain from his/her habitual intervention but reinforce child confident behavior. This is a major adaptive parenting skill trained in the *Cool Little Kids* program (Rapee et al., 2005). Similarly, when facing a disruptive child's non-compliance, the parent has to refrain from using verbal hostility but give clear instructions to guide child compliant behavior. This is a key adaptive parenting skill covered in the *Helping the Non-compliant Child* program (McMahon, Long, & Forehand, 2010).

What is adaptive parenting?

Researchers and practitioners have discussed parenting in connection with the theory of goodness of fit and used such terms as *responsive parenting* (McClowry, 2003) and *sensitive parenting* (Kristal, 2005) to refer to parenting strategies and practices that take into account of children's temperamental differences and environmental demands to help children attain a good fit with the environment.

Maladaptive parenting is usually used to refer to parenting practices that contribute to the developmental risk of temperamentally vulnerable children in the literature (Hastings et al., 2010). Meanwhile, *adaptive parenting* is occasionally used to refer to parenting adjustments required under unfavorable conditions (Osofsky & Thompson, 2000), for example, parenting practices for highly stressed military families after deployment (Gewirtz, Erbes, Polusny, Forgatch, & DeGarmo, 2011), families with parent or child disabilities (Eccleston, Fisher, Law, Bartlett, & Palermo, 2015). Based on the insights gained from the present investigation, *adaptive parenting* is conceptualized in this research in a different way than its current usage in the literature.

As reviewed in Chapter 2, overprotective parenting, which contributes to the negative developmental outcomes of temperamentally inhibited children, may be defined as parenting behaviors that are over-controlling, restrictive and directive in situations where such actions are not warranted. Conversely, then, adaptive parenting may be conceptualized as parenting practices with contextual fluidity whereby parents adjust their parenting strategies appropriately in accordance with the temperamental differences of their child and the demands of the particular situations.

A recent local study cited in Chapter 2 found that authoritative parenting was used more often by Hong Kong Chinese mothers who wanted children to learn and maintain harmonious relationships with others when the goal of socioemotional development was pursued, whereas authoritarian and psychologically controlling parenting styles were more frequently used by mothers when the goal of respecting parental authority to fulfill filial piety was emphasized (Chan et al., 2009). Such parenting practices may not vary substantially across situations, however, if they

become habitual when a particular parenting goal is always the priority of a parent. For instance, if one's parenting goal is predominantly academic success, a frequently pursued childrearing objective of Hong Kong Chinese parents, controlling parenting behaviors may always be the norm regardless of situations. This seemed to be what might have happened in the two observational episodes used in Study 1 to assess Maternal Positive Protection and Maternal Positive Support. Chinese Hong Kong mothers might have just carried the same parenting behaviors from the first episode to the second episode without consciously realizing the two situations actually called for different parenting strategies. In addition, as suggested earlier, temperamentally inhibited children would likely benefit if their parents first try to help them overcome social challenges in the early years and only begin exerting more control over their academic activities to pursue educational achievement in later childhood. Thus, during early childhood, these parents need to apply specific parenting strategies to help their temperamentally inhibited children, for instance, by intervening less to provide more opportunities for children to self-regulate their emotions and overcome difficulties in the face of social novelty and encouraging confident child behaviors with positive reinforcement in challenging social situations. This suggestion requires adaptive parenting to have not only situational specificity but also temporal flexibility. In terms of contextual fluidity, an adaptive parent has to assess the demands of specific situation to apply the most appropriate parenting strategies for his/her temperamentally vulnerable child. In terms of temporal appropriateness, an adaptive parent has to also wait for the right time or the suitable child age to apply the most effective parenting strategies, just as in the case of active guidance on academic achievements. To add another dimension to this complexity, a parent with two or more children who are likely endowed with different temperamental profiles,

need also to alternate his/her parenting strategies to suit each individual child. In sum, adaptive parenting requires a parent to adjust his/her parenting behaviors to the different combinations of the three dimensions of *who*, *when* and *where*, in order to attain goodness of fit for each unique child's optimal development.

This conceptual definition may be operationalized with the development of instruments to measure the profile of a parent with the assessment of adaptive parenting characteristics. Such instruments would be useful for identifying maladaptive parenting practices requiring intervention. Intervention programs based on parent training may also be designed and enhanced to incorporate training elements to teach parenting skills to promote adaptive parenting practices.

To reiterate, based on the findings of the present investigation, the parenting advice recommended for Hong Kong Chinese parents of temperamentally inhibited children is threefold. First, parental love is important to the long-term development of positive parent-child relationships. However, for temperamentally inhibited children, parents should be cautious that their affectionate parenting practices may easily become overprotection that will not help their children in overcoming social novelty but only maintain their condition of social anxiety. Parents therefore are reminded of maintaining self-awareness of offering help too early and refraining from intervening prematurely in social situations where their children can learn to overcome tolerable distress. Second, parents are encouraged to allow their temperamentally inhibited children more exposure to different social settings and guide them to develop confident social behaviors using positive reinforcement. Graded exposure would be a parenting skill parents have to regularly apply to train their children on adaptive skills to cope with distress from social anxiety over the childhood years. Third, although academic competence is an important

developmental task for children, parents of temperamentally inhibited children are encouraged to give priority to their children's social development beginning in early childhood especially when academic attainment is less demanding and maintain a long-term balance between academic success and socioemotional functioning as their children grow older.

Strengths and limitations

The present investigation has a number of major strengths. First, the triangulation of measurement using both multisource and multi-method instrumentation has substantially enhanced the confidence in interpreting the research findings. In particular, the assessment of temperamental inhibition has demonstrated validity and reliability using both observational and parent / teacher rating scales. Second, data collection at three time points has allowed the assessment of the stability and reliability of instruments across the 12-month period as a rigorous evaluation of key psychometric properties of the full set of measures adapted for and adopted by the present research. This multi-wave assessment data has also enabled the assessment of reciprocal relations between children's temperament and social outcomes and parenting practices over time. Third, a randomized controlled trial (RCT) highly compatible with the CONSORT standards (Moher et al., 2012; Moher et al., 2005) has been commissioned to test the efficacy of the selective early intervention program for temperamentally inhibited Hong Kong Chinese children, providing empirical support for the effectiveness of this parent training program among a representative Chinese population for the first time.

The present investigation, just like many other studies, do have some limitations. First, the findings derived from Study 1 and Study 3 must be qualified by the

relatively small sizes of the two subsamples. Although the samples for the two studies met the minimum sample size requirements and allowed detection of the expected medium to large effects, small effects could not be identified with these relatively small samples. As emphasized by Rapee (2013), even small effects are very valuable when an intervention program applies to entire populations. For example, one possible reason why a significant intervention effect in Social Initiative was unable to be found among children from the intervention group relative to the control group in Study 3 could be due to its very small effect size. In order to detect a small effect size, a minimum sample size of 100 participants in the RCT would have been required as estimated with G*Power 3 (Faul et al., 2007).

Second, the assessment of children's development outcomes to validate the program intervention effects in Study 3 was conducted using only a questionnaire method. Observational assessment was not employed to collect both pre-intervention and post-intervention data for complementing the validation of program effects due to restriction of resources.

Third, the continuous assessment of children's temperament and social development outcomes and parents' parenting practices only lasted for a 12-month period. A multi-year assessment program would enable a longer-term longitudinal study to investigate children's developmental trajectories across the preschool years. Longer-term intervention effects could also be validated with such a program.

Last, two instrumentation choices, namely, the use of POS to measure parental overprotection and the use of the Social Initiative scale to measure intervention effects, suffered from some validity issues, and did not substantially supplement other instruments in supporting the findings. Future studies should adopt a scenario-based measure to replace the POS and select an instrument that taps typical

behaviors of temperamentally inhibited children that the intervention is expected to change to more accurately assess the effectiveness of the intervention.

Research gaps addressed in the present investigation

Despite the foregoing limitations, the research gaps summarized in Chapter 1 have been mostly addressed to the extent as anticipated. First, in Study 1, the observational protocol developed to assess children's temperamental inhibition by observing their social speech with an unfamiliar adult has proven to be a valid measurement. This instrument is unique in its parsimony, complementing parent or teacher rating scales based on the same conceptualization that temperamental inhibition in young children is manifested mostly in the social domain and measuring characteristics of children's social speech with unfamiliar people will demonstrate adequate validity. This instrumentation has extended the conception of temperamental inhibition among young children further with empirical evidence. Moreover, the implementation and validation of the various questionnaire and observational instruments for measuring preschool-aged children's levels of temperamental inhibition have established an effective assessment tool set to be used for the local community in future research. This assessment package may also be considered for adoption in other Chinese communities such as the China Mainland and Taiwan due to the cultural similarities.

Second, Study 1 also replicated findings from Western studies with Hong Kong Chinese participants on the interactive effects between temperamental inhibition and overprotective parenting. This has provided support that overprotective parenting behaviors among Hong Kong Chinese mothers, though often displayed positively, indeed interact with child temperamental inhibition to predict differential outcomes

in children's social development. On the other hand, Hong Kong Chinese mothers of temperamentally inhibited children, unlike their Western counterparts, appeared to be overprotective in parenting regardless of different contexts. That is, these mothers were almost as protective in the free play episode as they are in the joint task episode, as demonstrated by the similar effects of their positively controlling parenting behaviors in the two contexts in predicting children's social development outcomes. These findings have extended the current literature still lacking replicated studies on the patterns of temperament × parenting interaction (Bates et al., 2012) and highlighted for the first time how Hong Kong Chinese temperamentally inhibited children may benefit from adaptive parenting practices by their mothers or parents to reduce their habitual overprotection in parental socialization.

Third, in Study 2, initial findings were produced on the transactions between child temperamental inhibition, child social developmental outcomes and parenting practices among Hong Kong Chinese parent-child dyads. These findings provided support for the reciprocal effects between negatively controlling parenting behaviors and children's social outcomes over time that have not been tested in past research with participants in the Chinese culture. Thus, this study has added new evidence to the literature about the transactional nature of child and parent effects on one another over time, even during early childhood, in particular.

Fourth, in Study 3, the first-time implementation of the *Cool Little Kids* program with Hong Kong Chinese parents and children has confirmed the efficacy and feasibility of this program in a Chinese community. This study has expanded the literature on the effectiveness of early intervention programs in general and the *Cool Little Kids* program in particular. The positive results from the outcome and process evaluations and the implementation experience gained from this RCT have

demonstrated the *Cool Little Kids* program to be a promising intervention for reducing social anxiety among Hong Kong Chinese temperamentally inhibited children.

Future directions

The findings from the present investigation provide support for an enhanced research program to be established for the Hong Kong Chinese community. Future directions of such a research program may include the development of a self-report scenario-based measure of parental overprotection based on the conceptual definition of adaptive parenting as detailed earlier, the wider dissemination of the *Cool Little Kids* program to the local community, the development of a new parenting program to promote adaptive parenting, and a longer-term longitudinal study with a larger sample of participants from whom data are collected across the three-year preschool period.

Any future implementation of the *Cool Little Kids* program should also consider administering observational assessments at both pre-intervention and post-intervention times to more comprehensively measure the program effects on children's development. Moreover, to cater for the investigation of longer-term impact, a participant follow-up plan should be incorporated in the program requirements for a complete cost-benefit analysis to support a community-based program implementation.

Significant contributions of the present investigation

To conclude, the present investigation has made four major unique contributions to the evolving field of temperament research, particularly for the Chinese

communities. First, the development and implementation of the observational method and the validation and administration of parent and teacher rating scales for the measurement of children's temperamental inhibition have not only established the first screening tool set for identifying temperamentally vulnerable children in a Chinese community at risk for developmental difficulties but also demonstrated the benefits of using multi-method measurement in research. It is the author's hope to see that more multi-method studies are conducted by researchers in the field.

Second, the replicated findings from Study 1 on the interactions between temperamental inhibition and social development outcomes have expanded the literature on this line of research to cover a Chinese community. Above and beyond this expansion, the findings from Study 2 on the transactions between temperamental inhibition, child social outcomes and parenting practices have provided empirical support for the presence of a parent-child interactive cycle over time, a behavioral pattern among dysfunctional parent-child dyads that are at risk for children's longer-term negative developmental outcomes. The attention of researchers and practitioners should be heightened to the crucial intervention required to discontinue this vicious cycle of maladaptive parent-child interactions, that is, the *inhibition-overprotection cycle*. It is the author's hope that this line of research may be further extended with more replications in other Chinese communities.

Third, the intriguing finding from Study 1 that low levels of supporting parenting actually served as a buffer to alleviate the negative effect of temperamental inhibition on children's social development outcomes provided support for one pattern of temperament × parenting interaction currently in need for more empirical evidence in the goodness of fit theory (Bates et al., 2012). That is, temperamentally inhibited children may benefit from less supportive parenting under mildly stressful

situations that allows a tolerable level of frustration for them to learn adaptive skills to cope with distress from social novelty.

Fourth and last, the confirmation of the efficacy of the *Cool Little Kids* early intervention program for temperamentally inhibited young children by an RCT and the positive evaluation of its feasibility for implementation in a Chinese community support the wider dissemination of this preventive parenting program. A community-wide rollout of this program is expected to lower the treatment costs of unaddressed childhood impairment due to social anxiety and internalizing problems. It is the author's hope that this program can first be implemented for a larger local population and further expanded to overseas populations in the China Mainland, Taiwan and other overseas Chinese communities in the future.

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Appendix I – A Glossary of Key Terms and Concepts

Term / Concept	Definition	Page(s) in Thesis
Temperamental Inhibition	In the literature, a generalized term that encompasses the notions of behavioral inhibition and shyness is Temperamental Inhibition (Bayer, Rapee, Hiscock, Ukoumunne, Mihalopoulos, & Wake, 2011). In the present thesis, Temperamental Inhibition is adopted to refer to social inhibition observable in children during preschool years and expressed as shy or socially withdrawn behaviors, signifying a BI profile.	24
Behavioral Inhibition	Behavioral Inhibition is a behavioral profile referring to the individual differences in infants, toddlers and young children in their tendency to exhibit fearfulness, restraint and withdrawal in the face of novelty. These inhibited behaviors manifest when the individual encounters such new and novel objects, events and situations as unfamiliar rooms, toys, peers and adults, reflecting a low threshold of reactivity in the amygdala (Kagan, 1997). Behavioral Inhibition is a more general construct in that it encompasses inhibition in both non-social domains (e.g., novel objects and places) and social domains (e.g., encounters with strangers, novel social situations). When inhibited children reach young childhood (3-5 years), their inhibition is primarily manifest in social domains only. This corresponds to how the present thesis conceptualize temperamental inhibition.	21
Shyness-Inhibition	Shyness-Inhibition was introduced by Chen and French (2008) to refer to wary, vigilant, and sensitive behavior due to internal anxiety in social-evaluative situations, thus essentially social inhibition.	51
Parenting Style	Parenting Style as defined by Darling and Steinberg (1993) refers to parental attitude toward the child and not the child's behavior and therefore encompass both goal-directed parenting behavior as well as parent-child interactions that may not always be goal-directed, such as explaining the reasoning for a parental demand with an open line of communication.	31, 32

Term / Concept	Definition	Page(s) in Thesis
Parenting Practice	Parenting Practice as defined by Darling and Steinberg (1993) refers to domain-specific parenting behaviors and is the means by which parents influence specific child behavior to achieve certain socialization goals, thus are expected to have direct effect on child outcomes.	33
Anxious Shyness	Anxious Shyness or social evaluative shyness as defined by Xu, Farver, Chang, Zhang, and Yu (2007) refers to inhibition toward negative or insufficiently positive social evaluation.	52
Regulated Shyness	Regulated shyness, newly introduced by Xu, Farver, Chang, Zhang, and Yu (2007), refers to modest, nonassertive and unassuming shy behavior observable in Chinese children intended to minimize social approval and is differentiated from anxiously shy behavior.	52
Social Withdrawal	Social Withdrawal was defined by Rubin et al. (2009) as an umbrella term to describe a particular behavioral profile of solitude caused by fearfulness, wariness and anxiety as children interact with peers.	29
Social Reticence	Social Reticence was defined by Coplan et al. (1994) to represent a behavioral construct comprising the watching of others from a distance, remaining unoccupied in social company, and hovering near but not engaging others in interaction, and reflects internalized feelings of social anxiety and an approach-avoidance conflict.	29
Internalizing and Externalizing Problems	Internalizing and Externalizing Problems are common difficulties in early childhood. Internalizing problems take the form of anxiety, depression, low self-esteem, and loneliness, whereas externalizing problems manifest as aggression, hyperactivity, and defiance (Bowen, Vitaro, Kerr, & Pelletier, 1995; Gilliom & Shaw, 2004).	28

Appendix II – Invitation Letters and Information Sheet

Invitation letter to participating organization at start of research

致 仁濟醫院董事局副行政總裁xxx先生

親愛的x先生:

學前兒童氣質及社交能力訓練計劃

您好！

在社交群體中的適應能力及朋輩關係對於幼童健康發展至關重要，同時亦影響他們日後適應學校生活以及語言和學業的發展。因此，我們正開展一項關於學前兒童氣質及社交能力研究計劃，盼望邀請貴機構屬下幼稚園及幼兒中心參與。

本研究是香港首次進行建基於兒童氣質的家長訓練計劃，訓練內容設計參考國際上實證依據的數種課程，為了在本地促進因應兒童氣質的育兒方法。此研究是現時香港理工大學仁愛堂歐雪明兒童資優發展中心的項目之一，由本人督導研究進程。

本計劃的目標是要幫助家長、老師和兒童工作者透過了解孩子的氣質，判斷出個別孩童在發展上的風險和防衛因素。掌握這方面的知識非常重要，因它讓我們有機會及早防範，既幫助小孩建立面對逆境的能力，也幫助他們克服限制，可以健康成長。

為達成上述目的，我們誠意邀請貴機構屬下幼稚園兒童的母親和教師參與此研究計劃。母親和教師將會被邀請填寫關於兒童日常行為及氣質的問卷。所提供的全部資料僅作為研究之用，絕對保密。對於被認定為格外害羞及內向的兒童，我們亦會邀請他們的家長參加培訓，學習如何幫助孩子克服成長及社會技能方面的困難。

貴機構的協助對此研究計劃非常重要。我們衷心謝謝你的支持！

香港理工大學應用社會科學系
陳清海博士 敬啓
二零一三年八月六日

Invitation letter to participating kindergartens at start of research

致 xxxx幼稚園xxx校長

親愛的x校長:

學前兒童氣質及社交能力研究計劃

你好！

在社交群體中的適應能力及朋輩關係對於幼童健康發展至關重要，同時亦影響他們日後適應學校生活以及語言和學業的發展。因此，我們正開展一項關於學前兒童氣質及社交能力研究計劃，盼望邀請貴校參與。

本研究是香港首次進行建基於兒童氣質的家長訓練計劃，訓練內容設計參考國際上實證依據的數種課程，為了在本地促進因應兒童氣質的育兒方法。此研究將會由本人督導研究進程及陸洋先生負責所有訓練課程和講座。

本計劃的目標是要幫助家長、老師和兒童工作者透過了解孩子的氣質，判斷出個別孩童在發展上的風險和防衛因素。掌握這方面的知識非常重要，因它讓我們有機會及早防範，既幫助小孩建立面對逆境的能力，也幫助他們克服限制，可以健康成長。

為達成上述目的，我們誠意邀請貴校兒童的母親和教師參與此研究計劃。母親和教師將會被邀請填寫關於兒童日常行為及氣質的問卷。所提供的全部資料僅作為研究之用，絕對保密。所有參與此研究的家長及教師亦會獲邀參加一些關於兒童氣質及有效教養的講座，以幫助有針對性地照顧兒童。每位母親將會收到關於孩子氣質的詳細報告。對於被認定為格外害羞及內向的兒童，我們亦會邀請他們的家長參加培訓，學習如何幫助孩子克服成長及社會技能方面的困難。同時，參與計劃的老師亦會獲邀參加我們安排的老師諮詢日，幫助他們了解學生的氣質特徵和解答家長對子女有關氣質的問題。

貴校的協助對此研究計劃非常重要。我們衷心謝謝你的支持！

香港理工大學應用社會科學系
陳清海博士 敬啓
二零一三年八月十九日

Information Sheet to introduce the research

學前兒童氣質及社交能力研究計劃

在社交群體中的適應能力及朋輩關係對於幼童健康發展至關重要，同時亦影響他們日後適應學校生活以及語言和學業的發展。近年心理學的兒童發展研究確認了兒童氣質及父母教養行為對於兒童社會發展和適應的作用。

本研究是香港首次進行建基於兒童氣質的家長訓練計劃，訓練內容設計參考國際上實證依據的數種課程，為了在本地促進因應兒童氣質的育兒方法。此研究是現時香港理工大學兒童發展中心的項目之一，由陸洋先生負責所有兒童氣質及親子特徵的評估和家長培訓課程，陳清海博士督導研究進程。

心理學家定義氣質為個體反應傾向和自我調節的個別差異之特徵。氣質是指那些由遺傳決定的生理特質。個人的氣質亦受到後天環境的影響從而形成成人性格。氣質是家長必須接受的反映兒童特性的不可分割的部分。氣質沒有好壞之分，每個兒童都擁有獨特的氣質特徵，並各有優勢和限制。掌握兒女氣質的特點，能夠幫助父母更有效地與兒童在日常生活上相處及應對可能存在的行為及情緒困難，這可以讓父母有機會鍛鍊孩子，在他們還小的時候，幫助他們自我管理，長遠有助他們日後的成長。

本計劃的目標是要幫助家長、老師和兒童工作者透過了解孩子的氣質，判斷出個別孩童在發展上的風險和防衛因素。掌握這方面的知識非常重要，因它讓我們有機會及早防範，既幫助小孩建立面對逆境的能力，也幫助他們克服限制，可以健康成長。

為達成上述目的，我們邀請香港幼稚園兒童的母親和教師參與此研究。母親和教師將會被邀請填寫關於兒童日常行為及氣質的問卷。母親和孩子亦將被邀請到我們的研究中心接受一項約三十分鐘的觀察評估。對於被認定為格外害羞及內向的兒童，我們亦會邀請他們的家長參加培訓，學習如何幫助孩子克服成長及社會技能方面的困難。所有參加此研究的家長及教師都會獲邀參加一些關於兒童氣質及有效教養的講座，以幫助有針對性地照顧兒童。

Appendix III – Consent forms for parents and teachers

Consent form for teachers participating in the research

參與研究同意書
學前兒童氣質及社交能力研究計劃

本研究是由香港理工大學應用社會科學系陳清海博士督導，博士研究生陸洋先生開展。

本研究計劃的目標是要幫助家長和老師透過了解孩子的氣質，判斷出個別孩童在發展上的風險和防衛因素。掌握這方面的知識非常重要，因它讓我們有機會及早防範，既幫助小孩建立面對逆境的能力，也幫助他們克服限制，可以健康成長。

我們誠意邀請你參與此研究，將會在貴校為家長及老師提供一系列有關兒童氣質的講座，以幫助有針對性地照顧兒童，並解釋本研究的主要目標，邀請你在此研究的三個階段中各為你班內負責的學童填寫一份關於他／她的氣質及行為的問卷，每份需時大約二十分鐘。在計劃的每一個階段結束時，參與計劃的老師會獲邀參加我們安排的老師諮詢日，幫助你了解學生的氣質特徵和解答家長平日可能詢問對子女有關氣質的問題。

此研究不牽涉任何所知的風險。研究所得的資料是絕對保密的。除了負責這項研究的研究員和校方職員以外，其他人將不會知道參加者的身份和回答的內容，請你放心參與。

你的參與屬自願性質, 你有權在研究中途離開或終止研究，且不須因而承擔任何後果。

如對是次研究有任何疑問或查詢，請隨時聯絡陳嘉勵小姐（聯絡電話：xxxx xxxx）、陸洋先生（聯絡電話：xxxx xxxx）或陳清海博士（聯絡電話：xxxx xxxx）。

謝謝你對本研究的支持和參與。

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姓名（中文或英文全名）：_____

聯絡電話：_____

簽署：_____

日期：_____年_____月_____日

Consent form for parents participating in the research

參與研究同意書
學前兒童氣質及社交能力研究計劃

本研究是由香港理工大學應用社會科學系陳清海博士督導，博士研究生陸洋先生開展。

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我們誠意邀請你參與此研究，已向你家小朋友就讀的幼稚園建議在家長會中提供一系列有關兒童氣質及有效教養的講座，以幫助有針對性地照顧兒童，並解釋本研究的主要目標，邀請你在三個階段中各填寫一份關於你家小朋友及母親的問卷，需時大約一小時。在計劃的每一個階段結束時，每位母親將會收到關於孩子氣質及社交能力的詳細報告。

此研究不牽涉任何所知的風險。研究所得的資料是絕對保密的。除了負責這項研究的研究員以外，其他人將不會知道參加者的身份和回答的內容，請你放心參與。

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謝謝你對本研究的支持和參與。

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姓名（中文或英文全名）：_____

聯絡電話：_____

簽署：_____

日期：_____年_____月_____日

Consent form for parents participating in observational assessment and training

參與研究同意書（二）
學前兒童氣質及社交能力研究計劃

本研究是由香港理工大學應用社會科學系陳清海博士督導，博士研究生陸洋先生開展。

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你較早前已同意參與這項研究，在這項研究計劃的三個階段中填寫一份調查問卷。現在，你已經被選中參加我們的家長培訓。除了為你提供培訓，在研究計劃的三個階段中，我們將在我們的研究中心使用一個觀測程序，為你的孩子進行一個單獨的詳細評估，每次過程將需要大約30分鐘來完成此程序。在30分鐘的過程中，我們的評估人員將陪伴你的孩子遊戲15分鐘左右，你也將被要求陪伴你的孩子遊戲15分鐘左右。你和你的孩子將被錄像，讓我們隨後觀看及進行個別評估。這些錄像是絕對保密的。除了負責這項研究的研究員以外，其他人將不會知道參加者的身份和觀看內容，請你放心參與。為感謝你的參與，我們將在每次完成程序後贈送你價值$100的超市禮券。你有權在研究中途離開或終止研究，且不須因而承擔任何後果。

如對是次研究有任何疑問或查詢，請隨時聯絡，陳嘉勵小姐（聯絡電話：xxxx xxxx）、陸洋先生（聯絡電話：xxxx xxxx）或陳清海博士（聯絡電話：xxxx xxxx）。

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聯絡電話：_____

簽署：_____

日期：_____年_____月_____日

Appendix IV – A sample training checklist for fidelity assurance

Objectives of Lesson	
The aim of this session is for parents to understand the role of overprotection and control in increasing their child's anxiousness and to learn different methods of handling their child.	
Re-emphasize the importance of home practice exercises and get their commitment to it.	
Essential points to cover	**Covered**
Review practice task from last lesson and ask parents to share what they have learned from the exercise (Anxiety Awareness Record Form) - likely to be able to point out child's beliefs and avoidance behaviors.	√
Praise parents for work completed and ask parents who did not do the exercise, why and what barriers got in the way - brainstorm how to overcome the barriers in future weeks and get commitment from parents to do it next time. Set the tone again regarding how important it is to do home practice in this program.	√
After covering Unhelpful Ways, get parents to discuss what methods apply to them with recent examples - making sure they feel comfortable to share and let them know they are not to blame.	√
Emphasize the question: When I do that, what does my child learn?	√
After covering Building Brave Behaviors, get parents to discuss if they are doing any of these and ways that they might increase use of these strategies - these are general strategies and parents are expected to easily share what they use.	√
Spend most time discussing the importance of and ways of the last three methods: not helping too quickly; modeling brave behaviors; and keeping emotions in check.	√
Activity: Replacing Unhelpful Strategies - encourage parents to share their responses and suggest parents to help each other if necessary to come up with more helpful strategies.	√
Activity: Rewards my child would like; Three brave behaviors.	√
Explain Home Practice: Jumping in Too Soon - remind parents of the importance of home practice and overcoming barriers, and get their commitment to it.	√

Appendix V – Sample training worksheets

A worksheet to illustrate how to apply graded exposure:

目標: 與褓姆留在家中，不會因媽媽外出了而恐懼或擔憂。

步驟	恐懼指數 (0 – 5)	獎勵
1. 當媽媽外出 10 分鐘時，與爸爸留在家裏	1	額外多看 10 分鐘電視
2. 當媽媽外出 30 分鐘時，與旅旅留在家裏	1	一條朱古力條
3. 當媽媽外出一個下午時，與爸爸留在家裏	2	媽媽帶一份驚喜的禮物回來
4. 當媽媽外出一天時，與旅旅留在家裏	3	一袋糖果
5. 當媽媽抖出數小時時，與褓姆留在家裏	4	額外的睡前故事時間
6. 當媽媽外出一個下午時，與褓姆留在家裏	4	與家人玩一個自選的遊戲
7. 當媽媽外出一個傍晚時，與爸爸留在家裏	5	挑選晚餐的食物
8. 當媽媽(與爸爸)外出一個晚上時，與旅旅留在家裏	5	選擇一套家庭電影
9. 當媽媽(與爸爸)外出一個傍晚時，與褓姆留在家裏	5	額外的睡前故事時間
10. 當媽媽與爸爸外出一個晚上時，與褓姆留在家裏	5	全家去野餐

A take-home worksheet for parents to record ineffective strategies such as overcontrolling behavior or unnecessary reassurance in parenting and to rethink what effective strategies may be established and employed:

家長練習: 建立有用的策略

沒有用的策略	那些擔憂/行為促使了這些沒有用的策略?	那些比較有效的方法可以取代這些策略?
給予過多保證		
過度操控/指導		
容許/鼓勵逃避行為		
失去耐性		