

THE LONGITUDINAL RELATIONS OF  
DISCIPLINARY AND NON-DISCIPLINARY  
PARENTAL PRACTICES TO CHILD BEHAVIOR AND  
ACADEMIC PERFORMANCE AND THE UNIQUE  
CONTRIBUTION OF PARENT-CHILD SYNCHRONY

By

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Title of Study: THE LONGITUDINAL RELATIONS OF DISCIPLINARY AND NON-DISCIPLINARY PARENTAL PRACTICES TO CHILD BEHAVIOR AND ACADEMIC PERFORMANCE AND THE UNIQUE CONTRIBUTION OF PARENT-CHILD SYNCHRONY

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**Abstract:** This dissertation contains two studies. The first study investigated the relations between parenting practices and child social and academic outcomes. This study adopted a comprehensive approach that examined the longitudinal relations of three types of disciplinary and non-disciplinary tactics (power-assertion, positive parenting, derogatory practices) to child psychosocial adjustment and academic performance from kindergarten to second grade. Five hundred and eighty-five children (281 girls, 304 boys) and their parents (581 mothers, 577 fathers) from the Child Development Project served as the sample of this study. Results from parallel growth curve models showed that a higher level of derogatory practices was associated with a slower decrease of social competence, perhaps because children with parents who used more derogatory practices already started with a low level of social competence (the initial levels of parent derogatory practices and child social competence were negative correlated). Results from propensity score matching analysis indicated that high level, in comparison to a low level, of mother disciplinary tactics at first grade predicted lower levels of child social competence and academic performance at second grade. The second study explored the unique contribution of parent-child synchrony in child development. This study examined the construct continuity of synchrony from early childhood (kindergarten year) to middle adolescence (16 years old) and construct validity of synchrony in child social competence and academic performance after taking into account the influences of parenting practices. A subsample ( $N=157$ ) of Child Development Project was included in the current study. Results indicated that mother positive synchrony at kindergarten positively predicted child social competence and academic performance at first grade whereas mother non-synchrony negatively predicted child academic performance. In regard to the father sample positive synchrony at kindergarten positively predicted both child social competence and academic performance at first grade. On the contrary, father non-synchrony positively predicted child externalizing problems. The continuity of the construct synchrony was also established such that mother positive synchrony at the kindergarten year was positively correlated with mother connectedness/balance at child age 16 but mother nonsynchrony in kindergarten was negatively correlated with mother connectedness/balance at age 16.

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## CHAPTER I

### MANUSCRIPT ONE INTRODUCTION

#### **Background of the Study**

Parental discipline is a subject undergoing intense debate not only in the popular press but also among academic circles. The discussion has been centered on the effectiveness of different disciplinary practices in children's upbringing that result in favorable outcomes. Opinions and views have largely been divided into two distinct schools with one upholding positive parenting that advises against the use of firm disciplinary practices (Grolnick, 2003; Gershoff, 2002; Grusec, Goodnow, & Kuczynski, 2000; Straus, 2001) and the other advocating the use of some power assertion to exercise control (Barber & Xia, 2013; Baumrind, 2012; Larzelere, Gunnoe, Roberts & Ferguson, 2016). These perspectives can be explored by comparing child "outcomes" (later behavioral and developmental patterns) associated with different parenting practices.

#### **Statement of the Problem and Purpose**

Much parenting research in the past has been split by two isolated perspectives on disciplinary practice (i.e., positive parenting versus power assertive parenting) and this split persists in a considerable portion of the field. This ongoing division will hinder our understanding of optimal parenting practices because as reviewed above both perspectives have received empirical support for those disciplinary practices they advocate. In addition, this academic schism will do no good for practitioners and parents as they are left unadvised

about the most effective practice in children's upbringing. The goal of this study is to resolve this issue by adopting a more comprehensive lens that includes disciplinary tactics recommended by both perspectives and compares their effectiveness in promoting competence and reducing problems of children. Based on previous findings, the following three hypotheses were developed that link disciplinary tactics and child outcomes: Tactics advocated by positive parenting perspective (i.e., warmth, supportiveness, reasoning, positive reinforcement) are effective in promoting children's positive outcomes (viz., competence, academic achievement) whereas tactics advocated by the power assertive parenting perspective (i.e., TO, privilege withdrawal, simple command, coercive order, extra-work penalty, threatening) are effective in reducing children's problematic (internalizing and externalizing) behaviors. It is further hypothesized that non-physical derogatory practices including verbal hostility (yell or scold, raise voice) and shaming are associated with the worst child outcomes (i.e., low level of positive outcomes and high level of negative outcomes). The potential moderators include parental and child gender, and gender match, but no specific hypothesis will be given because of the limited evidence and mixed findings.

## CHAPTER II

### MANUSCRIPT ONE REVIEW OF LITERATURE

#### **Advocacy of Positive Parenting**

Positive parenting has been generally labeled as loving guidance (Markham, 2015). Previous studies have highlighted several defining attributes including warmth (Kulkarni, 2010; McKee et al., 2007), support (van Aken & Riksen-Walraven, 1992), and praise (Pfiffner & Kaiser, 2010). Although positive parenting researchers focus on different facets of positive parenting, they commonly eschew the use of any firm disciplinary tactics. According to this perspective, gentle and mild disciplinary practices such as reasoning and induction can be employed in a noncoercive way but forceful and power assertive acts such as verbal reprimands and physical punishment should be avoided. The advocacy of positive parenting is primarily based on the evidence that documented the link between positive-reinforcement types of parenting and desired child outcomes (Davalos, Chavez, & Guardiola, 2005; Day & Padilla-Walker, 2009; Eamon & Mulder, 2005). Because positive parenting is a general concept which subsumes a wide range of tactics, it would be helpful to examine specific forms of parenting practice and their associated effects on child development.

#### **Warmth**

In child development or family studies, warmth is a construct that depicts the positive emotionality within parent-child relationships (MacDonald, 1992). Several other

terms including affection and acceptance also have been applied to this construct. A parenting style characterized by high levels of warmth and responsiveness is known to promote children's well-being in various aspects (Bornstein & Tamis-LaMonda, 1989; Parpal & Maccoby, 1985). For example, parenting was shown to impact child physical health: the display of parental warmth and support lowered the chance of child obesity (Berge et al., 2010; Rhee et al., 2010) and increased the odds of treatment success in weight loss and weight control if children were in fact obese (Rhee et al., 2016). To assess social-cognitive development, Smith, Landry and Swank (2000) followed 364 children from 6 months to 40 months and found the optimal social and cognitive outcomes assessed at 40 months were predicted by their mothers' high levels of warmth over time with only slight increases in restrictiveness. The least desirable parenting style showed low levels of warmth but dramatic increases of restrictiveness as children aged.

The positive influences of warm parenting are probably due to the recognition of child needs and interests which sends the message to the child that he or she is important. Moreover, the consistent immersion in a warm climate helps children form a positive outlook with respect to interpersonal relationships and therefore facilitates an inclination to pursue these relationships in the future (Sroufe, 2005). Parental warmth seems to be particularly salutary in promoting children's positive development rather than reducing negative outcomes. For example, Davidov and Grusec (2006) found that parental warmth predicted children's ability to express positive affect and greater peer acceptance but not the ability to regulate negative emotions. Notably, Davidov and Grusec in their study distinguished parental warmth from parental responsiveness and noted that the latter contributed independently to children's negative emotion regulation.

Several child factors can moderate the positive relation between parental warmth and child outcomes and temperament is one of them. Parenting effects may vary (i.e., attenuate or amplify) depending on child temperament and the interaction between child temperament and parenting (Bates & Pettit, 2007). As one example, the relation between maternal warmth and child externalizing problems was qualified by child effortful control such that maternal warmth offered a buffer against externalizing problems only among children with low levels of effortful control (Pluess & Belsky, 2013). This finding highlights the important role of parenting in overcoming the risks of some heritable psychological traits. Another possible moderating factor to consider is gender. Both child and parent gender as well as the constellation of these two matters in terms of child outcomes associated with parental warmth. Drawing data from a national survey, Anderson (2016) found that the positive association between parental warmth from childhood and physical health during adulthood followed a sex-matching pattern; that is, the benefits associated with paternal warmth seemed to be male-specific whereas the benefits of maternal warmth tended to be female-specific. This sex-matching pattern could be due to a mutual selection process in which same-sex parent-child bonds are more likely to form, thereby becoming more salient to children (Anderson, 2016). Of course, more studies need to be conducted in order to corroborate this speculation. It is also unclear whether this sex-matching pattern also extends to psychosocial outcome domains such as depression, anxiety, social competence, and self-esteem.

Two forms of parental warmth—verbal and physical affection—have been studied in relation to child development. For verbal affection, the evidence has convergently documented a longitudinal relation between early exposure of verbal affection and

subsequent socio-emotional well-being of children (Floyd & Morman, 2000; Park, Vo, & Tsong, 2009; Polcari, Rabi, Bolger, & Teicher, 2014) as well as the deleterious consequences of verbal aggression (Belsky & de Haan, 2011; Iwaniec, Larkin, & McSherry, 2007; Teicher, Samson, Polcari, & McGreenery, 2006). However, verbal affection, if used too frequently and without any substantial basis, can be harmful. An example of inappropriate use of verbal affection is inflated praise such as the phrase, “You made an incredibly beautiful drawing!” (Brummelman, Crocker, & Bushman, 2016; Brummelman, Thomaes, Orobio de Castro, Overbeek, & Bushman, 2014) when, in fact, the drawing is ordinary. Inflated praise, while intended to raise children’s self-esteem, offers exorbitant compliments that are ungrounded in reality. In other words, children are praised not based on their actual performance. These exaggerated commendations are intended to boost children’s self-confidence but may inadvertently convey an implicit message to the children that they are expected to live up to the same standard in the future (Brummelman, Crocker, & Bushman, 2016). This may backfire if children fail to maintain an exceptional performance in the future, thereby decreasing children’s tendency to seek challenges and learning opportunities, particularly if the child has low-self-esteem to begin with (Brummelman et al., 2014).

The findings on physical affection similarly convey a message of beneficial effects on child outcomes. For example, Bornstein, Haynes, and O'Reilly (1996) found that the expressions of physical affection by mothers such as tactile behaviors signaling warmth and sensitivity could facilitate children’s collaborative play. Barber and Thomas (1986) reported positive correlations between parents’ physical affection and child self-esteem worth and this association was particularly salient among father-daughter dyads.

Although verbal and physical affection are two major components of parental warmth, most previous studies did not investigate their respective influences on child development but instead aggregated them into a global measure (e.g., “positive involvement”, Schluderman & Schluderman, 1970; “parental acceptance”, Coopersmith, 1967). This aggregation practice therefore leaves the independent contributions of the two specific affectionate behaviors unknown. Furthermore, very few studies have explored the role of parent verbal and physical affection in non-social domains such as academic performance and it thus becomes an area of interest for the present study.

### **Advocacy of Power-Assertive Disciplinary Practices**

Since Baumrind (1966) proposed three types of parenting styles in her seminal work, an enormous amount of studies have been conducted to compare and contrast the effects of these three styles on child and adolescent development. Among these three, authoritative parenting style is recognized as the optimal parenting practice (Baumrind, 1966). Parents with authoritative parenting styles have high levels of responsiveness and demandingness, two components that underlie Baumrind’s parenting typology. However, much of research attention and emphasis is placed on the importance of responsiveness with the role of demandingness in authoritative parenting being downplayed, if not completely ignored, by many positive parenting researchers (see Grolnick, 2003; Kochanska, 1995; Smith, 2010). The use of power-assertive techniques is an ongoing subject of debate among parents, practitioners, and scholars. Controversies have tended to concentrate on three power assertive parenting tactics in particular: physical and verbal punishment, time out, and privilege removal (Baumrind, Larzelere, & Owens, 2010; Durrant, 2007; Markham, 2015; Siegel & Bryson, 2014).



## **Physical and Verbal Power Assertion**

Physical and verbal power assertion, as two subsets of punitive disciplinary practices, are ways of providing negative consequences for children's misbehavior. Many parents resort to physical and verbal power assertion in hopes that such unpleasant disciplinary experiences can halt or decrease child undesirable behaviors in the future (Committee on Psychosocial Aspects of Child and Family Health, 1998). Although physical and verbal power assertion can be well-intended disciplinary techniques, the legitimacy of their use has been questioned, particularly in western cultures (Gershoff, 2002; Grusec, Danyliuk, Kil, & O'Neill, 2017). On the other hand, advocates of "parental management" (Eyberg et al., 2008; Patterson, 1982) which emphasizes both positive reinforcement and limit setting endorse the use of power assertion under appropriate conditions. For example, Baumrind (2012) made a distinction between coercive and confrontive power assertion and posited that while the former was characterized by arbitrary and peremptory power implementation, the latter was considered as negotiable and reasoned parental regulation. Making this distinction is critical in terms of contrasting the type of power assertion used by authoritarian parents (mainly coercive) versus authoritative parents (mainly confrontive). This difference may be substantive but it could also be attributed to children's internal representations of parenting. Lee et al. (2016) showed that children's perceived authoritative parenting buffered against negative effects of physical and verbal punishment. Perhaps children with this positive representation do not regard parental punishment as purposefully punitive but rather as an instrumental practice conducted for the good of the children themselves. As a result, this power assertion, if embedded in a harmonious context, is less likely to arouse resentment

and resistance from children. In addition to the different characteristics of power enforcement, the condition under which power is asserted also matters. Coercive power assertion is often proactive, carried out irrespective of children's preceding behaviors. In contrast, confrontive power assertion is typically reactive, implemented when the child is disobedient (Baumrind et al., 2010).

One of the most heavily debated forms of physical punishment is spanking. Spanking and other forms of physical punishment are clearly correlated with negative child outcomes (Boutwell, Franklin, Barnes, & Beaver, 2011; Gershoff & Grogan-Kaylor, 2016; Jackson, Preston, & Franke, 2010; Regev, Gueron-Sela, & Atzaba-Poria, 2012; Straus, Douglas, & Medeiros, 2014). However, the causal impact of spanking remains a heated scientific dispute primarily because (a) data are correlational given that spanking cannot be examined in a randomized experimental setting, and (b) divergent interpretations have been made of empirical findings analyzed through meta-analyses and other critical reviews (see Gershoff, 2002, 2016; Ferguson, 2013; Larzelere, Gunnoe, Roberts & Ferguson, 2016; Horn, Joseph, & Cheng, 2004; Paolucci & Violato, 2004). With so much research attention having been focused on the "spanking debate," far less has been paid to alternative disciplinary tactics to physical discipline. Because of this and given the current international trend that advocates bans against physical punishment by parents (e.g., Global Summit on Ending Corporal Punishment held in 2011), there is a need to investigate the effectiveness of other non-physical disciplinary tactics. Some initial evidence has pointed out the reductions (albeit non-significant) of child externalizing problems over time associated with parents' use of alternative disciplinary tactics including grounding, privilege removal, and sending to room (Larzelere, Cox, &

Smith, 2010). This finding is encouraging because it at least offers some alternatives that parents can adopt when physical punishment is not an option.

The use of power assertive disciplinary tactics could vary by ethnicity. Because not many studies have been conducted with respect to alternative disciplinary tactics, relevant evidence is thus drawn from ones that focused on physical and verbal punishment. Insofar as the interaction between physical punishment and demographic factors is concerned, ethnic background seems to be more important than socioeconomic status. For example, African American parents have been shown to a higher frequency of physical punishment than White parents (Regalado et al., 2004; Slade & Wissow, 2004). This difference holds even when family income served as a covariate (Berlin et al., 2009). The authors of these studies speculated that more frequent use of physical punishment perhaps reflected African American parents' mindset that conceived of strict discipline as a way to keep their children from involving in some risk behaviors when living a dangerous neighborhood. Latino parents have shown either no difference from (Regalado et al., 2004; Wissow, 2001) or a lower level (Slade & Wissow, 2004) of spanking than White parents. The level of acculturation could be factored in when considering the relatively low level of spanking among Latino parents. As an example, Berlin et al. (2009) found that less acculturated Mexican American mothers spanked their children less than White and African American parents.

The role of ethnicity in verbal punishment is even less clear: whereas some studies (e.g., Smith & Brooks-Gunn, 1997) reported more frequent use of verbal punishment by African American mothers than White mothers, others (e.g., Regalado et al., 2004; Wissow, 2001) showed no ethnic differences. One possible reason of these

discrepant findings can be attributed to the equivocal definitions of verbal punishment. For example, Smith and Brooks-Gunn (1997) defined verbal punishment as the use of humiliating phrases towards children such as scolding and derogation but Regolado et al. (2004) and Wissow (2001) classified verbal punishment as acts that were negative in tone but non-derogatory in nature (e.g., yelling). Although these acts were emotionally aversive, they were not abusive remarks that operated as personal attacks against children. The use of derogatory verbal punishment by African American is somewhat in line with their higher levels of physical punishment, perhaps due to the heightened concerns of these parents to establish firm control that keep their children away from trouble.

### **Time-out**

Time-out (TO) is defined as “a period of time in a less reinforcing environment made contingent on a behavior” (Brantner & Doherty, 1983, p. 87). TO is a popular parent management tactic that is often used as an alternative to physical and verbal punishment. Although TO has been recommended as an effective parenting technique by interventionists to deal with child misbehaviors when other techniques often fail to work (Delaney, 1996), it is a misunderstood and understudied research topic.

TO is considered as a necessary strategy in many behavioral interventions (Everett, Hupp, & Olmi, 2010). The implementation of TO often results in an inaccessibility to some desired items or activities and therefore (theoretically) abates the rates of children’s inappropriate behaviors. Classified as a mild form of restrictive punishment, it remains to be a popular technique for behavioral modification purposes. In reviewing 30 years of studies that investigated parental use of TO, Everett et al. (2010)

showed that TO was a widely-used behavioral intervention by parents in treating children's noncompliance (71% of the cases), with over half of the TO sessions (58.4%) lasting for about 2 to 3 minutes. When the functional value of TO was assessed, Everett and colleagues demonstrated the effectiveness of TO in reducing attention-maintained (e.g., seeking attention from parents to get access to toys) and escape-maintained (e.g., avoiding unwanted demands such as a work task) behaviors.

The benefits of TO are maximized when used in combination with other management methods, mostly positive reinforcement tactics including praise, rewards, instructional representation, and social skills training (for reviews, see Everett et al., 2010; Morawska et al., 2011). These benefits have been found among children during different developmental stages (e.g., 1-year-old infants, Mathews et al. 1987; toddlers, Larzelere et al., 1996; Morawska & Sanders, 2006; preschoolers, Sanders et al., 2000; primary school children, Webster-Stratton, 1993) and across different settings (e.g., behavioral outpatient service program, Warzak & Floress, 2009; psychiatric settings, Crespi 1988, Joshi et al., 1988; summer camp for children with ADHD, Fabiano et al. 2004).

In order for TO to be effective, it is imperative that parents be consistent in their responses to children's misconduct. In dealing with child oppositional behaviors, the reaction from parents is crucial. Delaney (1996) described how verbal battles between a child and parent over an expectation (e.g., to pick up a toy) can easily escalate if these prolonged verbal exchanges are intentionally used by the child to delay complying with the expectation. As a result, the child is likely to adopt the same aversive pattern of interactions in the future given the "successful" experience of stalling an undesired

demand from the parent in the past. If TO is meant to break this cycle of continuous fighting, it needs to be delivered every time the argument occurs without exception.

Some coercive parameters that can add to the effectiveness of TO include a verbalized warning prior to the implementation of TO (Roberts, 1982), a barrier-enforced prevention of escape (e.g., bolt the door), and even a follow-up spanking enforcement in response to escape (Day & Roberts, 1983; Roberts, 1988). In spite of their usefulness in reducing child noncompliance and problematic behaviors, these forceful “add-ons” can escalate TO into child abuse and are thus not recommended by many parenting experts and professional associations (e.g., Council for Children with Behavioral Disorders, 1990; Delaney, 1996; Herbert, 1981).

### **Privilege Removal**

In addition to TO, privilege removal (PR) is another commonly used noncoercive disciplinary technique. It functions as a punishment technique that imposes a consequence to child inappropriate behaviors by taking away the activities or belongings he/she enjoys. In surveying parental discipline practices for children 2 to 11 years old from a national sample, Barkin, Scheindlin, Richardson, Ip, and Finch (2007) found that 41% of parents reported their use of PR in the past month, ranked only second to TO (Barkin et al., 2007). The prevalent use of PR could be a result of parents’ own experience as children: 31.4% of the parents reported privilege removal as the most commonly experienced discipline in childhood. Despite its popularity, the pros and cons of PR have not been studied extensively. And among those handful of investigations, most lumped PR into a broader category that included other noncoercive practices such as TO (see, e.g., Chamberlain et al., 2008; Forgatch & DeGarmo, 1999; Forgatch,

Patterson, & DeGarmo, 2005). As a result, it is difficult to identify the independent contributions of PR to child outcomes.

## CHAPTER III

### MANUSCRIPT ONE METHODOLOGY

#### **Sample**

Participants in this study were drawn from a large multi-site longitudinal study (Child Development Project; Dodge, Bates, & Pettit, 1990), which included 585 children (281 girls, 304 boys). Children were approximately 5 years old ( $M = 4.61$  years,  $SD = .59$ ) when they completed the first assessment prior to or early in kindergarten. Children participated in this study reflect a diverse background of ethnicity (80% European American, 18% African American, and 2% other ethnic groups) and socioeconomic status (9%, 17%, 25%, 33%, and 16% classified into five lowest-to-highest classes according to Hollingshead's Four Factor Index of Social Status, (Hollingshead, 1975).

#### **Procedure**

##### **Child Development Project (CDP)**

The CDP is a longitudinal project that was launched in April 1987 at three geographical regions in the US (Nashville, Tennessee; Knoxville, Tennessee; Bloomington, Indiana). Children in this project were recruited from the years before they entered kindergarten (1987, 1988) and followed to their adulthoods. During kindergarten pre-registration, parents of matriculating children were approached in person or by mail to solicit their involvements in the longitudinal study. Interested parents were further



contacted by research staff to obtain their signed permissions for data collection at all phases of the project (Dodge et al., 1990).

Information pertinent to the present study was collected by interviews and observations during home visits (Table 3.1 summarizes measures used for manuscript one at different time points). Both interviews and observations were conducted by research staff who previously went through a 4-week training session. Before conducting any real interviews, interviewers were trained to reach a reliability of .80 or higher based on the percentage agreement with a supervisor's scores across all items. Reliability of scores from actual interviews were calculated by the independent ratings of 56 randomly selected families (9.6% of total) made by a second research staff who was present when the interview was conducted. A 90-minute audio-recorded interview including both open-ended and structured questions was conducted by one research staff with the mother and father (if he was available). During the time when one parent was interviewing, the other parent filled out some questionnaires that were relevant to the project. The other research staff member conducted an interview with the child during this time.

Table 3.1. Measures Used for Manuscript One at Three Time Points.

<b>Measures</b>	<b>Assessment</b>	<b>Informant</b>	<b>Time points</b>
Disciplinary Tactics	Changes and Adjustments Questionnaire	Parent	Kindergarten, First grade, Second grade
Positive Parenting	Post-visit Inventory	Research staff	Kindergarten, First grade, Second grade
Child Social Competence and Problematic Behaviors	TCPR, TRF, CBCL/4-16	Teacher, Parent	Kindergarten, First grade, Second grade
Child Academic Performance	Current School Performance by Teacher report	Teacher	Kindergarten, First grade, Second grade

Research staff conducting the parent and child home interviews had opportunities to observe the interaction between the parent and child from greeting to the end of the visit. After the home visit, each research staff independently completed a post-visit inventory to summarize their impressions of parent-child interactions.

## Measures

### Disciplinary Tactics

Disciplinary tactics were measured by the home interview (kindergarten year) and parent report (first and second grade). During the home visit, parents were asked about their disciplinary experience (either through interview or self-report) in regard to child misbehaviors during the past year. Using the Changes and Adjustments Questionnaire (Dodge et al., 1994), the interviewer recorded and coded parents' use of particular disciplinary tactics on a 3-point scale (0=never mentioned, 1=mentioned, 2=emphasized). In the first and second grade, parents reported their use of particular disciplinary tactics on a 5-point scale (0=never, 1=less than once a month, 2=about once a month, 3=about once a week, 4=about every day). The coding was different for the kindergarten year because during the interview at kindergarten parents were allowed to freely mention any disciplinary tactics they used and "2" was coded if specific disciplinary tactic from the list was by chance mentioned. The interviewers followed up by prompting parents those tactics that were not mentioned from the list and "1" was coded if parents responded in the affirmative and "0" otherwise. For parent report in first and second grade, parents were not given the chance to express freely their disciplinary tactics but rather were asked about their frequencies of using specific disciplinary tactics listed on the questionnaire. The listed tactics included TO, privilege withdrawal, simple command, reasoning, verbal hostility (yell or scold, raise voice), physical punishment (grabbing, shaking, spanking with hand or objects), coercive order (get child to apologize; make amends), extra-work penalty (give child extra chores), threatening, shaming, and positive reinforcement (promise treat for good behavior). Scores from TO, privilege withdrawal, simple

command, coercive order, extra-work penalty, and threatening were summed in the current study to create a composite measure of *power-assertive disciplinary tactics* for mothers and fathers<sup>1</sup> respectively within kindergarten year, first and second grade (descriptive statistics for each category of the composite measure are presented in Table 3.2). The composite measure of *derogatory disciplinary practices* was created similarly by summing scores from verbal hostility and shaming with each era (see Table 3.2). Both the individual scores of specific disciplinary tactics and the composite scores of power-assertive disciplinary tactics and derogatory disciplinary practices were standardized for use in the statistical analysis. The interrater agreement was high ( $r = 0.80$ ) at the kindergarten year<sup>2</sup> and internal consistencies of the disciplinary tactic measure across the three time points are shown in Table 3.3.

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<sup>1</sup> Data regarding fathers' disciplinary tactics were only available for fathers at the kindergarten year

<sup>2</sup> Interrater agreement was only available at the kindergarten year because in subsequent years, data were self-reported on a questionnaire

Table 3.2. Descriptive Statistics for Unstandardized Disciplinary Tactics and Positive Parenting Measures.

Informant	Measure	Item	Kindergarten		First grade		Second grade	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mother	Power-assertive Disciplinary Tactics	Time out	1.09	0.75	2.00	1.09	1.92	1.07
		Privilege withdrawal	0.86	0.80	1.69	1.11	1.72	1.05
		Simple command	1.17	0.48	3.06	1.05	3.03	1.01
		Coercive order	0.93	0.39	2.17	1.11	2.10	1.00
		Extra-work penalty	0.24	0.51	0.69	0.94	0.83	1.05
		Threatening	0.51	0.60	1.96	1.35	2.05	1.27
		Verbal hostility	1.12	0.50	2.63	1.18	2.64	1.12
		Shaming	0.28	0.47	0.30	0.67	0.27	0.64
		Speaking with a positive tone	0.07	0.25	0.08	0.27	0.07	0.25
		Expressing a positive attitude	0.20	0.40	0.10	0.30	0.08	0.28
	Positive Parenting	Gives attention	1.80	3.27	0.40	0.86	0.31	0.46
		Initiates positive physical contact	0.51	0.50	0.48	0.50	0.50	0.50
		Accepts positive physical contact	0.12	0.33	0.26	0.44	0.12	0.33

Father	Disciplinary Tactics	Time out	0.99	0.73	-	-	-	-
		Privilege withdrawal	0.78	0.75	-	-	-	-
		Simple command	1.24	0.47	-	-	-	-
		Coercive order	0.92	0.37	-	-	-	-
		Extra-work penalty	0.15	0.39	-	-	-	-
		Threatening	0.52	0.63	-	-	-	-
		Verbal hostility	1.16	0.47	-	-	-	-
		Shaming	0.21	0.43	-	-	-	-
		Speaking with a positive tone	0.01	0.11	0.10	0.31	0.10	0.31
	Positive Parenting	Expressing a positive attitude	0.18	0.39	0.13	0.34	0.08	0.28
		Gives attention	0.33	0.47	0.46	0.50	0.43	0.50
		Initiates positive physical contact	0.42	0.50	0.54	0.50	0.55	0.50
		Accepts positive physical contact	0.01	0.10	0.34	0.48	0.10	0.31

## Positive Parenting

Parents' use of positive parenting tactics was captured by a post-visit inventory completed by two visitors (the parent interviewer and the child assessor) to assess parental warmth and supportiveness toward the child during their naturally-observed interactions (i.e., interactions observed when setting up and concluding the interviews). Items from the post-visit inventory were adopted from the HOME scale (Caldwell & Bradley, 1984). The two visitors each coded parental warmth and supportiveness (for mother and father separately) by noting the occurrence: 0=occured, 1=did not occur. Three items evaluated parental warmth which is defined as an emotion-laden construct (a measure of verbal affection) in the present study: "mother/father speaks to child with a positive tone", "mother/father expresses a positive attitude when speaking of the child", and "mother/father gives attention when child talked". Additionally, parental supportiveness as a behavioral-oriented construct (a measure of physical affection) was assessed by two items: "mother/father initiates positive physical contact with the child" and "mother/father accepts positive physical contact from the child". The two visitors had substantial agreement on the sum of their ratings at the kindergarten year<sup>3</sup> ( $r = .49$ ,  $p < .01$ ); internal consistencies across the three time points are presented in Table 3.3. Scores from corresponding items were summed to create two composite measures—*verbal* and *physical affection*—for mothers and fathers. respectively. Standardized scores were used for subsequent analysis.

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<sup>3</sup> Interrater agreement was assessed during the kindergarten year

Table 3.3. Internal Consistency of Measures Used in Manuscript One

	Mother disciplinary tactics	Father disciplinary tactic	Mother positive parenting	Father positive parenting	CBCL/4-16 Externalizing problem	CBCL/4-16 Internalizing problem	Oppositional defiant disorder	TCPR	Child academic performance
Kindergarten	0.55	0.57	0.68	0.6	0.92	0.86	0.69	0.85	0.82
First Grade	0.81	-	0.78	0.82	0.93	0.89	0.72	0.88	0.92
Second Grade	0.82	-	0.74	0.86	0.94	0.9	0.73	0.88	0.88



### **Child Social Competence and Behavioral Problems**

To assess social competence, classroom teachers completed the Teacher Checklist of Peer Relationships (TCPR; Dodge, 1986). The TCPR is a 5-point scale (from 1=never true to 5 = almost always true) that evaluates child social behaviors and peer relationships in the school setting. Six items that measured child social competence were drawn from the TCPR: “gets along well with peers of the same sex”, “gets along well with peers of the opposite sex”, “isolates him/herself from the peer group” (reverse coded), “accepted by the peer group”, “other children actively dislike this child and reject him or her from their play” (reverse coded) and “other children like this child and seek him or her out for play”. A composite score of *social competence* was created by summing the scores from these six items, which then will be standardized for use in the data analysis. Inter-item reliability is reported in Table 3.3.

To assess *externalizing behavior problems* (i.e., aggression, delinquency), teachers also completed the Teacher's Report Form (TRF) of the Achenbach Child Behavior Checklist (Achenbach & Edelbrock, 1986) for each child. TRF is a 118-item scale that assesses a range of children’s adaptive functioning and behavioral problems, with a scoring system from 0=not true, 1=somewhat or sometimes true, to 2=very true or often true. The TRF externalizing subscale include 51 items that assess child aggressive and delinquent behaviors. The scores from these items were summed to form a composite *externalizing behavior problem* score which was standardized to be used in subsequent analysis. Reliability scores are presented in Table 3.3.

Child Behavior Checklist (CBCL/4-16) completed by mothers was used to measure child internalizing problems (50 items). CBCL/4-16 contains 112 items on

which the child is rated on a 3-point scale (0=not true, 1=somewhat or sometimes true, 2=very true or often true) for various emotional and behavioral problems (Achenbach & Edelbrock, 1983). A composite score was created for *internalizing problems* by summing the corresponding items. Again, standardized scores were computed and used in the data analysis.

### **Child Academic Performance**

Teachers reported child academic performance in the current year for four common subjects (reading, writing, spelling, and math) using a 4-point scale (0=Failing, 1=Below Average, 2=Average, 3=Above Average). The internal consistency of this measure is presented in Table 3.3. A composite assessment of child *academic performance* was created by summing the scores across all four subjects and standardized scores will be used in further analysis.

### **Analytic Plan**

Given the longitudinal nature of the data in manuscript one, latent growth modeling was used for the analysis. Latent growth modeling is appropriate for this study because it allows one to estimate the growth trajectories of both parental practices and child outcomes (Bollen & Curran, 2006). And more importantly, it permits an examination of the association between the intercept of independent variables (parental practices in this study) and both the intercept and slope of dependent variables (both positive and negative child outcomes in this study). In other words, it offers an opportunity to answer the question: how does the initial level of parental practices influence both the initial level and the rate of change of child outcomes (both positive and negative) across time (see Figures 1, 2 and 3; dotted lines are the paths not examined in

this study)? Moreover, to reduce the chance of drawing causal inference from other observed covariates (e.g., family socioeconomic status, oppositional defiant disorder, problematic behaviors, social competence, academic performance) rather than the variables of interest (parental practices in this study), a propensity score matching approach (Haviland, Nagin, & Rosenbaum, 2007; Haviland, Nagin, Rosenbaum, & Tremblay, 2008) was used as a supplementary analysis to create balance on these observed covariates for different groups in order to level out the effects of these matched covariates on the outcome variables (child social and academic outcomes in this study). To put it in another way, through matching propensity scores individuals from different groups appear comparable on some observed but theoretically irrelevant covariates, thereby rendering the causal effects attributable to the variables of interest. Missing data were handled by multiple imputation approach.

*Figure 3.1.* Latent Growth Model for the Association between Power-Assertive Disciplinary Tactics and Specific Child Outcomes.

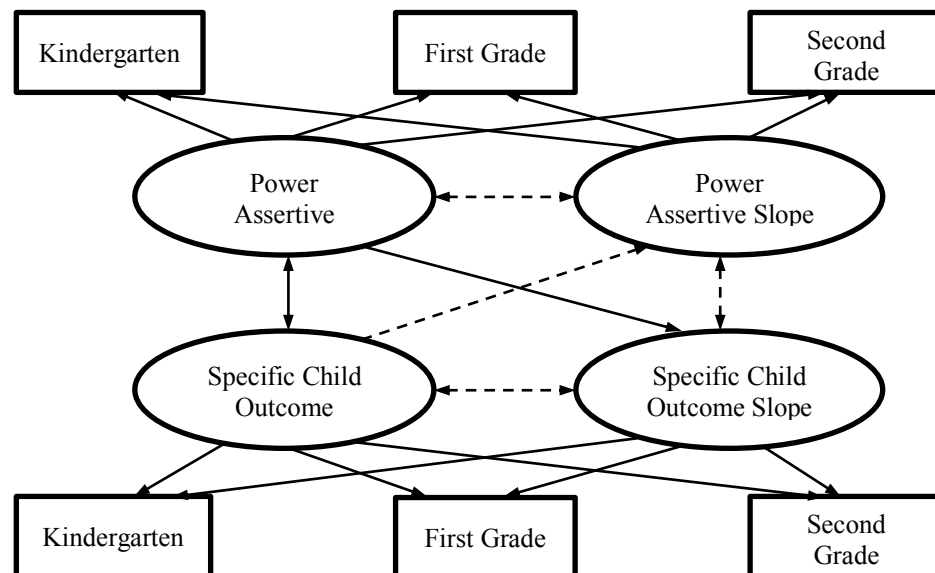


Figure 3.2. Latent Growth Model for the Association between Derogatory Parenting Practices and Specific Child Outcomes.

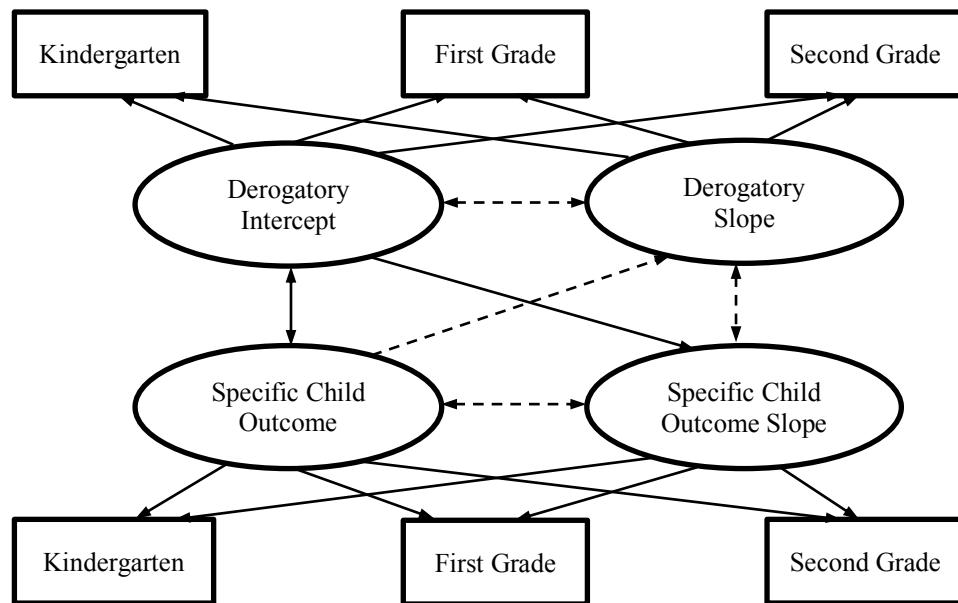
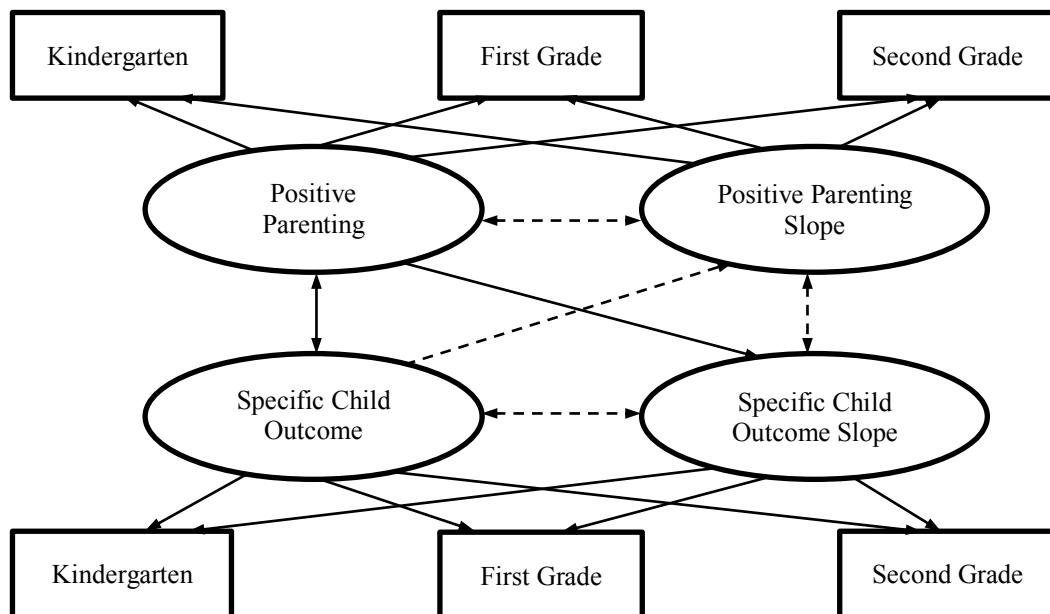


Figure 3.3. Latent Growth Model for the Association between Positive Parenting Practices and Specific Child Outcomes.



## CHAPTER IV

### MANUSCRIPT ONE FINDINGS

#### **Model Fit for Growth Curve of Predictors and Outcomes**

The first step was to determine the shape of growth curve that best fitted each predictor and outcome (i.e., straight line, quadratic curve). The current study adopted the criteria for fit indexes proposed by Hu and Bentler (1999) who recommended that a good fitting model should follow the combinational rules of Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) above .95, Standardized Root Mean Square Residual (SRMR) below .08, and Root Mean Square Error of Approximation (RMSEA) below .06. For parental practices, linear curve models fit well to the data for mother verbal and physical affection whereas quadratic curve models had better fit for the rest of parenting variables: mother physical affection increased over the three years whereas mother verbal affection generally decreased across time, all other parenting variables first increased from kindergarten year to first grade and then decreased from first grade to second grade (see Table 4.1 for the change in mean scores). Linear curve models also had good fit with respect to all four child outcomes: externalizing problems, internalizing problems, academic performance, and social competence: both externalizing and internalizing problems increased from kindergarten to second grade while social competence decreased over the three years and academic performance remained relatively stable across time (see Table 4.1 for the change in mean scores across time and see Table 4.2

for the fit statistics for the linear and/quadratic models). Models with shapes that had better fit were included in subsequent analyses.

Table 4.1. Change of Mean Scores Across Time for Variables of Interest in Manuscript One.

<b>Variables of Interest</b>	<b>Kindergarten</b>	<b>First Grade</b>	<b>Second Grade</b>
Externalizing Problems	12.60	18.50	19.86
Internalizing Problems	4.68	6.16	6.32
Academic Performance	6.60	6.47	6.66
Social Competence	24.63	24.49	22.49
Mother Disciplinary Tactics	4.82	11.57	9.52
Mother Derogatory Tactics	0.68	2.93	2.91
Mother Verbal Affection	0.60	0.55	0.56
Mother Physical Affection	0.58	0.84	1.00
Father Verbal Affection	0.48	0.86	0.67
Father Physical Affection	0.54	1.17	0.97

Table 4.2. Fit Statistics of Linear and Quadratic Growth Curve Models for Each Predictor and Outcome.

Variable	Linear Model							Quadratic Model				
	$\chi^2$	df	CFI	TLI	RMSEA	SRMR	$\chi^2$	df	CFI	TLI	RMSEA	SRMR
Mother Disciplinary Tactics	562.19	1.00	0.00	-3.89	0.98	0.71	347.46	3.00	1.00	1.00	0.00	0.00
Mother Derogatory Tactics	346.45	1.00	0.00	-3.25	0.77	0.39	0.00 <sup>†</sup>	0.00 <sup>†</sup>	1.00	1.00	0.00	0.00
Mother Physical Affection	1.93	1.00	0.98	0.92	0.04	0.02	-	-	-	-	-	-
Mother Verbal Affection	0.52	1.00	1.00	1.03	0.00	0.01	-	-	-	-	-	-
Father Physical Affection	79.64	1.00	0.00	-72.48	0.37	0.14	0.00 <sup>†</sup>	0.00 <sup>†</sup>	1.00	1.84	0.00	0.01
Father Verbal Affection	47.42	1.00	0.00	-2.06	0.28	0.10	0.00 <sup>†</sup>	0.00 <sup>†</sup>	0.92	0.77	0.08	0.03
Externalizing Problems	11.59	1.00	0.98	0.94	0.14	0.03	-	-	-	-	-	-
Internalizing Problems	5.89	1.00	0.97	0.90	0.09	0.03	-	-	-	-	-	-
Social Competence	0.00 <sup>†</sup>	0.00 <sup>†</sup>	1.00	1.00	0.00	0.00	-	-	-	-	-	-
Academic Performance	5.16	1.00	0.99	0.97	0.09	0.02	-	-	-	-	-	-

<sup>†</sup>The model is just-identified with zero degree of freedom and model fit cannot be assessed in this case.

\* $p < 0.5$

\*\*\* $p < .001$

### **Latent Growth Curve Modeling for Full Sample**

With the full sample, 14 of 16 models (2 models did not converge) that linked disciplinary tactics and positive parenting with different child outcomes had excellent fit to the data (see Table 4.3). A parallel latent growth curve modeling was then preformed to estimate the intercept-slope relationship between parenting variables and child outcomes in two aspects: first, the intercepts of parenting variables and child outcomes were correlated to see whether the initial levels of the former were related to the initial levels the latter; second, the slope of each child outcome was regressed onto the intercept of all parenting variables to determine whether initial level of the latter predicted the change of the former.



Child Outcome	$\chi^2$	df	CFI	TLI	RMSEA	SRMR
Externalizing Problems	30.30	7.00	0.98	0.95	0.08	0.05
	14.88	7.00	0.99	0.98	0.04	0.02
	18.04	8.00	0.98	0.97	0.05	0.03
	16.46	8.00	0.99	0.97	0.04	0.02
Internalizing Problems	12.83	7.00	0.99	0.98	0.04	0.03
	13.22	7.00	0.98	0.97	0.04	0.03
	9.68	8.00	0.99	0.98	0.02	0.02
	10.33	8.00	0.99	0.98	0.02	0.02
Social Competence	21.32	7.00	1.00	0.99	0.06	0.06
	6.14	7.00	1.00	1.00	0.00	0.01
	7.83	7.00	1.00	1.00	0.01	0.03
	14.22	9.00	0.99	0.98	0.03	0.03
Academic Performance	13.60	8.00	0.99	0.99	0.04	0.02
	11.81	8.00	0.99	0.99	0.03	0.03
	8.51	8.00	1.00	1.00	0.01	0.02
	12.46	8.00	0.99	0.98	0.03	0.02

### **Predicting the Change in Child Outcomes**

No parenting variables were found to significantly predict the change in child externalizing problems over time (power-assertive disciplinary tactics:  $\beta = -0.04, p = 0.68$ ; derogatory tactics:  $\beta = 0.17, p = 0.29$  parent verbal affection:  $\beta = 0.12, p = 0.33$ ; parent physical affection:  $\beta = 0.23, p = 0.26$ ). None of the intercepts from parenting variables significantly predicted the slope of child internalizing problems (power-assertive disciplinary tactics:  $\beta = 0.09, p = 0.63$ ; derogatory disciplinary practices:  $\beta = -0.19, p = 0.64$ ; parent verbal affection:  $\beta = 0.52, p = 0.28$ ; parent physical affection:  $\beta = 0.34, p = 0.61$ ). The intercept of derogatory practices positively predicted the change of child social competence ( $\beta = 0.05, p = 0.05$ ), meaning a higher initial level of mother derogatory practices was associated with a slower decrease of child social competence. No significant predictions were found from other parenting variables (power-assertive disciplinary tactics:  $\beta = 0.02, p = 0.12$ ; derogatory disciplinary practices:  $\beta = 0.42, p = 0.16$ ; the models for parent verbal and physical affection did not converge because of problems in iterations). None of the intercepts from parenting variables significantly predicted the slope of child academic performance (power-assertive disciplinary tactics:  $\beta = -0.06, p = 0.46$ ; derogatory disciplinary practices:  $\beta = -0.06, p = 0.69$ ; parent verbal affection:  $\beta = 0.00, p = 1.00$ ; parent physical affection:  $\beta = 0.17, p = 0.35$ ).

### **Predicting the Initial Level of Child Outcomes**

Intercepts of child outcomes were predicted by parenting variables at the same time point to understand the relationship between their initial levels. The intercept of child externalizing problems was positively predicted by parent derogatory practices ( $\beta = 0.27, p = 0.04$ ), meaning that children had a high level of externalizing problems at the

kindergarten year if their parents used a high level of derogatory practices at that time (or vice versa). No other parent variable intercepts significantly predicted the intercept of the child externalizing problem (power-assertive disciplinary tactics:  $\beta = 0.11, p = 0.09$ ; parent verbal affection:  $\beta = 0.12, p = 0.33$ ; parent physical affection:  $\beta = 0.23, p = 0.26$ ). The intercept of child internalizing problems was not predicted by any of the parenting variables intercepts (power-assertive disciplinary tactics:  $\beta = -0.07, p = 0.67$ ; derogatory disciplinary practices:  $\beta = 0.06, p = 0.71$ ; parent verbal affection:  $\beta = 0.12, p = 0.30$ ; parent physical affection:  $\beta = -0.20, p = 0.35$ ). For child social competence, the intercept was negatively correlated with derogatory practices ( $\beta = -0.37, p = 0.01$ ). The prediction was not significant by parent power-assertive disciplinary tactics ( $\beta = -0.07, p = 0.29$ ), and the models for parent verbal and physical affection did not converge because of problems in iterations. Lastly for child academic performance, the intercept was negatively predicted by the intercept of parent verbal affection ( $\beta = -0.33, p < 0.01$ ) and physical affection ( $\beta = -0.52, p < 0.01$ ) whereas it was not significantly predicted by power-assertive disciplinary tactics:  $\beta = 0.01, p = 0.89$ ) nor derogatory practices ( $\beta = -0.06, p = 0.58$ ).

In summary, 5 of the 16 predictions (31.25%) were significant at  $p < .05$  (and one was marginally significant at  $p < .10$ ), suggesting findings greater than would be expected by chance. Four concurrent predictions on the initial levels of child outcomes were significant: the initial level of parent derogatory practices was positively correlated with child externalizing problems and negatively correlated with social competence, and the initial level of child academic performance was negatively correlated with both parent verbal and physical affection. One significant intercept-slope prediction was found: The

intercept of derogatory practices positively predicted the change of child social competence, meaning a higher initial level of mother derogatory practices was associated with a slower decrease of child social competence.

### **Latent Growth Curve Modeling for Mothers versus Fathers**

Two separate analyses of growth curve modeling were conducted for data collected for mothers and fathers respectively. The models that linked parenting variables and different child outcomes all had good fit to the data (see Table 4.4).

Table 4.4. Fit Statistics for Growth Curve Models with Data from Mothers (N=581) and Fathers (N=577)

Parent Gender	Predictor	$\chi^2$	df	CFI	TLI	RMSEA	SRMR
Mother	Disciplinary Tactics	33.12	7.00	0.97	0.94	0.08	0.05
	Derogatory Tactics	12.98	7.00	0.99	0.98	0.04	0.02
	Physical Affection	17.66	8.00	0.98	0.97	0.05	0.03
	Verbal Affection	21.07	8.00	0.98	0.96	0.05	0.03
	Disciplinary Tactics	18.44	8.00	0.98	0.96	0.05	0.03
	Derogatory Tactics	16.06	8.00	0.98	0.96	0.04	0.03
	Physical Affection	14.88	8.00	0.96	0.93	0.04	0.03
	Verbal Affection	13.59	8.00	0.97	0.95	0.04	0.03
	Disciplinary Tactics	22.02	7.00	1.00	0.99	0.06	0.06
	Derogatory Tactics	5.74	7.00	1.00	1.00	0.00	0.01
	Physical Affection	15.91	8.00	1.00	1.00	0.00	0.02
	Verbal Affection	10.50	8.00	1.00	1.00	0.02	0.02
	Disciplinary Tactics	13.35	8.00	0.99	0.99	0.03	0.02
	Derogatory Tactics	13.02	8.00	0.99	0.99	0.03	0.03
Father	Physical Affection	9.25	8.00	1.00	1.00	0.02	0.02
	Verbal Affection	18.21	8.00	0.98	0.97	0.05	0.02
	Physical Affection	19.83	10.00	0.98	0.97	0.04	0.03
	Verbal Affection	18.31	8.00	0.98	0.97	0.05	0.03
	Physical Affection	14.23	10.00	0.97	0.96	0.03	0.03
	Verbal Affection	15.23	8.00	0.96	0.93	0.04	0.03
	Physical Affection	14.92	9.00	1.00	1.00	0.03	0.03
	Verbal Affection	7.38	7.00	1.00	1.00	0.01	0.02
	Physical Affection	16.83	10.00	0.98	0.98	0.03	0.03
	Verbal Affection	9.77	8.00	1.00	0.99	0.02	0.02

### **Predicting the Change of Child Outcomes: Mothers**

No significant regression was found for any of the parenting variable intercepts in predicting the slope of child externalizing problems for mothers (power-assertive disciplinary tactics:  $\beta = 0.04, p = 0.71$ ; derogatory disciplinary practices:  $\beta = 0.07, p = 0.65$ ; parent verbal affection:  $\beta = 0.16, p = 0.17$ ; parent physical affection:  $\beta = 0.13, p = 0.40$ ). Nor did any parenting variable intercepts predict child internalizing problem slope (power-assertive disciplinary tactics:  $\beta = 0.12, p = 0.63$ ; derogatory disciplinary practices:  $\beta = -0.50, p = 0.39$ ; parent verbal affection:  $\beta = 0.41, p = 0.34$ ; parent physical affection:  $\beta = 0.20, p = 0.58$ ). The intercept of mother derogatory practices positively predicted the change of child social competence ( $\beta = 0.05, p = 0.04$ ), meaning a higher initial level of mother derogatory practices was associated with a slower decrease of child social competence. No significant prediction was found for child social competence (marginally significant for power-assertive disciplinary tactics:  $\beta = 0.02, p = 0.08$ ; parent verbal affection:  $\beta = -0.01, p = 0.60$ ; parent physical affection:  $\beta = -0.01, p = 0.58$ ) nor for child academic performance (power-assertive disciplinary tactics:  $\beta = -0.11, p = 0.31$ ; derogatory disciplinary practices:  $\beta = 0.03, p = 0.84$ ; parent verbal affection:  $\beta = 0.02, p = 0.85$ ; parent physical affection:  $\beta = -0.12, p = 0.41$ ).

### **Predicting the Initial Level of Child Outcomes: Mothers.**

For child externalizing problems, the intercept of mother verbal affection positively predicted the initial level of child externalizing problems ( $\beta = 0.24, p = 0.01$ ). The intercept of mother derogatory practices also positively predicted the initial level of child externalizing problems, although it was only marginally significant ( $\beta = 0.22, p = 0.06$ ). No significant prediction was found for mother power-assertive disciplinary tactics ( $\beta =$

0.11,  $p = 0.17$ ) but the prediction was marginally significant for derogatory practices ( $\beta = 0.22, p = 0.06$ ). None of the intercepts of mother parenting variables significantly predicted the initial level of child internalizing problems (power-assertive disciplinary tactics:  $\beta = -0.06, p = 0.52$ ; derogatory practices:  $\beta = 0.18, p = 0.26$ ; verbal affection:  $\beta = 0.13, p = 0.27$ ; physical affection:  $\beta = 0.10, p = 0.54$ ). However, the intercept of mother derogatory tactics and verbal affection both significantly negatively predicted the initial level of child social competence ( $\beta = -0.30, p = 0.01$ ;  $\beta = -0.19, p = 0.04$ , respectively). No significant predictions were found for other mother parenting variables (power-assertive disciplinary tactics:  $\beta = -0.06, p = 0.45$ ; physical affection:  $\beta = -0.17, p = 0.13$ ). For child academic performance, the intercept of mother verbal and physical affection negatively predicted the initial level ( $\beta = 0.04, p = 0.61$ ;  $\beta = -0.03, p = 0.74$ ).

### **Predicting the Change of Child Outcomes: Fathers.**

For fathers, growth curve models were only run for positive parenting variables (i.e., parental verbal and physical affection) because no data were collected for father disciplinary tactics in first and second grade. The intercepts of father verbal and physical affection did not significantly predict the change of child externalizing problems ( $\beta = -0.04, p = 0.71$ ;  $\beta = 0.18, p = 0.48$ , respectively), internalizing problems ( $\beta = 0.59, p = 0.42$ ;  $\beta = 0.25, p = 0.43$ , respectively), social competence ( $\beta = 0.02, p = 0.44$ ;  $\beta = 0.00, p = 0.98$ , respectively), nor academic performance ( $\beta = 0.19, p = 0.44$ ;  $\beta = 0.02, p = 0.84$ , respectively).

### **Predicting the Initial Level of Child Outcomes: Fathers**

For father parenting variables, the intercepts of verbal and physical affection did not predict the initial level of child externalizing problems ( $\beta = -0.09, p = 0.21$ ;  $\beta = -0.03,$

$p = 0.86$ , respectively). Nor did father verbal and physical affection intercepts predict the initial level of child internalizing problems ( $\beta = 0.06$ ,  $p = 0.55$ ;  $\beta = -0.33$ ,  $p = 0.19$ , respectively), child social competence ( $\beta = -0.12$ ,  $p = 0.12$ ;  $\beta = -0.02$ ,  $p = 0.92$ , respectively), or child academic performance ( $\beta = -0.03$ ,  $p = 0.68$ ;  $\beta = -0.25$ ,  $p = 0.17$ , respectively).

To summarize, 4 of the 24 predictions (12.5%) were significant at  $p < .05$  (and three were marginally significant at  $p < .10$ ), with the findings again greater than would be expected by chance. Three concurrent predictions were found: The intercept of mother derogatory tactics and physical affection both significantly negatively predicted the initial level of child social competence whereas the intercept of mother verbal affection positively predicted the initial level of child externalizing problems. One intercept-slope prediction was found: The intercept of mother derogatory practices positively predicted the change of child social competence, meaning a higher initial level of mother derogatory practices was associated with a slower decrease of child social competence.

### **Latent Growth Curve Modeling for Boys versus Girls**

Similar to the analyses conducted for mothers and fathers, growth curve models were run separately for boys and girls. All models had good fit to the data (see Table 4.5).



Table 4.5 Fit Statistics for Growth Curve Models with Data from Boys (N=186) and Girls (N=395)

Child Gender	Child Outcome	Predictor	$\chi^2$	df	CFI	TLI	RMSEA	SRMR
Boy	Externalizing Problems	Disciplinary Tactics	14.74	7.00	0.97	0.94	0.08	0.06
		Derogatory Tactics	9.74	7.00	0.99	0.97	0.05	0.04
		Physical Affection	11.83	8.00	0.97	0.95	0.05	0.04
	Internalizing Problems	Verbal Affection	11.70	9.00	0.98	0.97	0.04	0.05
		Disciplinary Tactics	19.39	7.00	0.93	0.86	0.10	0.07
		Derogatory Tactics	14.55	7.00	0.93	0.86	0.08	0.05
	Social Competence	Physical Affection	4.00	7.00	1.00	1.14	0.00	0.03
		Verbal Affection	7.97	7.00	0.98	0.96	0.03	0.03
		Disciplinary Tactics	12.74	7.00	0.99	0.98	0.07	0.06
	Academic Performance	Derogatory Tactics	6.29	7.00	1.00	1.00	0.00	0.03
		Physical Affection	4.90	7.00	1.00	1.01	0.00	0.03
		Verbal Affection	11.53	7.00	0.99	0.99	0.06	0.06
Girl	Externalizing Problems	Disciplinary Tactics	7.37	8.00	1.00	1.01	0.00	0.03
		Derogatory Tactics	7.44	8.00	1.00	1.01	0.00	0.03
		Physical Affection	16.22	8.00	0.94	0.89	0.07	0.04
	Internalizing Problems	Verbal Affection	8.81	8.00	0.99	0.99	0.02	0.03
		Disciplinary Tactics	18.24	8.00	0.99	0.97	0.06	0.05
		Derogatory Tactics	11.75	8.00	0.99	0.99	0.03	0.02
	Social Competence	Physical Affection	12.92	8.00	0.99	0.98	0.04	0.03
		Verbal Affection	7.00	8.00	1.00	1.00	0.00	0.02
		Disciplinary Tactics	11.21	8.00	0.99	0.98	0.03	0.03
	Academic Performance	Derogatory Tactics	13.15	8.00	0.98	0.97	0.04	0.03
		Physical Affection	7.22	8.00	1.00	1.01	0.00	0.03
		Verbal Affection	6.35	10.00	1.00	1.04	0.00	0.02
Girl	Externalizing Problems	Disciplinary Tactics	16.60	7.00	1.00	0.99	0.06	0.05
		Derogatory Tactics	5.70	7.00	1.00	1.00	0.00	0.02
		Physical Affection	7.06	7.00	1.00	1.00	0.01	0.02
	Internalizing Problems	Verbal Affection	5.53	7.00	1.00	1.00	0.00	0.02
		Disciplinary Tactics	9.42	8.00	1.00	1.00	0.02	0.02
		Derogatory Tactics	10.59	8.00	1.00	0.99	0.03	0.03
	Social Competence	Physical Affection	7.20	8.00	1.00	1.00	0.00	0.02
		Verbal Affection	12.85	8.00	0.99	0.98	0.04	0.03
		Disciplinary Tactics						
	Academic Performance	Derogatory Tactics						
		Physical Affection						
		Verbal Affection						

### **Predicting the Change of Child Outcomes: Boys**

The change of externalizing problems was not predicted by any of the intercepts of parenting variables (power-assertive disciplinary tactics:  $\beta = 0.11$ ,  $p = 0.39$ ; derogatory tactics:  $\beta = 0.21$ ,  $p = 0.25$ ; parent verbal affection:  $\beta = 0.14$ ,  $p = 0.53$ ; the coefficient for parent physical affection could not be calculated because the variable covariance matrix was not positive definite). The intercepts of parenting variables did not predict the change of internalizing problems (power-assertive disciplinary tactics:  $\beta = 0.14$ ,  $p = 0.36$ ; derogatory tactics:  $\beta = -0.16$ ,  $p = 0.52$ ; parent verbal affection:  $\beta = -0.04$ ,  $p = 0.87$ ; the coefficient for parent physical affection could not be calculated because the variable covariance matrix was not positive definite). No significant prediction was found for the change of child social competence (power-assertive disciplinary tactics:  $\beta = 0.02$ ,  $p = 0.63$ ; derogatory tactics:  $\beta = 0.10$ ,  $p = 0.06$ ; the coefficient for parent verbal and physical affection could not be calculated because the variable covariance matrix was not positive definite). Also, no parenting variables significantly predicted the change of academic performance (power-assertive disciplinary tactics:  $\beta = -0.03$ ,  $p = 0.85$ ; derogatory tactics:  $\beta = -0.18$ ,  $p = 0.46$ ; parent verbal affection:  $\beta = 0.09$ ,  $p = 0.73$ ; the coefficient for parent physical affection could not be calculated because the variable covariance matrix was not positive definite).

### **Predicting the Initial Level of Child Outcomes: Boys.**

For externalizing problems, no intercepts of parenting variables predicted the initial level (power-assertive disciplinary tactics:  $\beta = 0.16$ ,  $p = 0.16$ ; derogatory tactics:  $\beta = 0.25$ ,  $p = 0.12$ ; parent verbal affection:  $\beta = 0.11$ ,  $p = 0.55$ ; the coefficient for parent physical affection could not be calculated because the variable covariance matrix was not

positive definite). The intercept of parent verbal affection did, however, positively predict the initial level of internalizing problems ( $\beta = 0.47, p = 0.05$ ) but no significant prediction was found for the other parenting variables (power-assertive disciplinary tactics:  $\beta = -0.19, p = 0.13$ ; derogatory tactics:  $\beta = -0.14, p = 0.48$ ; the coefficient for parent verbal and physical affection could not be calculated because the variable covariance matrix was not positive definite). The intercept of derogatory tactics negatively predicted the initial level of social competence ( $\beta = -0.39, p = 0.02$ ) whereas no other significant predictions were found (power-assertive disciplinary tactics:  $\beta = -0.16, p = 0.17$ ; the coefficient for parent verbal and physical affection could not be calculated because the variable covariance matrix was not positive definite). No other significant predictions of the initial level of academic performance were found (power-assertive disciplinary tactics:  $\beta = -0.05, p = 0.58$ ; derogatory tactics:  $\beta = 0.03, p = 0.83$ ; verbal affection:  $\beta = -0.29, p = 0.08$ ; the coefficient for parent physical affection could not be calculated because the variable covariance matrix was not positive definite).

### **Predicting the Change of Child Outcomes: Girls.**

The change of externalizing problems was not predicted by any of the intercepts of parenting variables (power-assertive disciplinary tactics:  $\beta = -0.07, p = 0.61$ ; derogatory tactics:  $\beta = -0.15, p = 0.61$ ; parent verbal affection:  $\beta = 0.15, p = 0.47$ ; parent physical affection:  $\beta = 0.07, p = 0.76$ ). The coefficients could not be calculated for internalizing problems because the variable covariance matrix for the slope was not positive definite. The change of social competence was not predicted by any of the intercepts of parenting variables (power-assertive disciplinary tactics:  $\beta = 0.01, p = 0.40$ ; derogatory tactics:  $\beta = 0.02, p = 0.29$ ; parent verbal affection:  $\beta = 0.01, p = 0.46$ ; parent

physical affection:  $\beta = -0.01, p = 0.50$ ), nor was any significant prediction found for academic performance (power-assertive disciplinary tactics:  $\beta = -0.08, p = 0.40$ ; derogatory tactics:  $\beta = 0.09, p = 0.61$ ; parent verbal affection:  $\beta = -0.03, p = 0.80$ ; parent physical affection:  $\beta = 0.16, p = 0.34$ ).

### **Predicting the Initial Level of Child Outcomes: Girls.**

For externalizing problems, the intercept of parenting verbal affection significantly positively predicted the initial level ( $\beta = 0.21, p = 0.03$ ) but no significant predictions were found for other parenting variables (power-assertive disciplinary tactics:  $\beta = 0.12, p = 0.08$ ; derogatory tactics:  $\beta = 0.24, p = 0.13$ ; parent physical affection:  $\beta = 0.06, p = 0.60$ ). The intercepts of parenting variables did not predict the initial level of internalizing problems (power-assertive disciplinary tactics:  $\beta = 0.07, p = 0.48$ ; derogatory tactics:  $\beta = 0.12, p = 0.58$ ; parent verbal affection:  $\beta = -0.05, p = 0.71$ ; parent physical affection:  $\beta = -0.21, p = 0.34$ ). The initial level of social competence was not predicted by the intercept of any parent variables (power-assertive disciplinary tactics:  $\beta = -0.08, p = 0.30$ ; derogatory tactics:  $\beta = -0.30, p = 0.12$ ; parent verbal affection:  $\beta = -0.17, p = 0.08$ ; parent physical affection:  $\beta = -0.06, p = 0.60$ ). Finally, for academic performance, both the intercepts of parent verbal and physical affection significantly negatively predicted the initial level ( $\beta = -0.34, p < 0.01, \beta = -0.46, p < 0.01$ , respectively) whereas the predictions were not significant for power-assertive disciplinary tactics ( $\beta = 0.03, p = 0.71$ ) and derogatory tactics ( $\beta = -0.14, p = 0.27$ ).

In summary, 5 out of 40 predictions (12.5%) were significant at the .05 and .01 level (and two were marginally significant at  $p < .10$ ): for boys, the intercept of parent verbal affection positively predicted the initial level of internalizing problems, and the

intercept of derogatory tactics negatively predicted the initial level of social competence. For girls, the intercept of parent verbal affection positively predicted the initial level of externalizing problems, and the intercepts of parent verbal and physical affection negatively predicted the initial level of academic performance.

### **Supplementary Analysis: Propensity Score Matching.**

Despite the effort to unravel the longitudinal relationship between the predictor and the outcome, parallel latent growth curve modeling at times provides weak causal evidence because of two reasons. First, it fails to take into account the influences of selection process on the outcome and as a result the findings could be confounded by selection biases. The second source of bias could be due to random measurement errors in the pretest covariates. These measurement errors are an artifact of latent constructs created in the model building process and for this reason the problem of unreliability could emerge because rarely are observed covariates used to determine how participants are selected into different conditions (Steiner, Cook & Shadish, 2011). Given these two reasons, propensity score matching technique was used as an alternative approach to reduce the effects resulted from these two sources of bias. The results of using propensity scores to match groups with different levels of parenting practices on a series of covariates are shown in Appendix A. In summary, findings showed that a high level of mother power-assertive disciplinary tactics at first grade, compared with a low level, was associated with lower levels of child social competence and academic performance at second grade.

## CHAPTER V

### MANUSCRIPT ONE DISCUSSION AND CONCLUSION

#### **Discussion of Findings**

With longitudinal data across multiple time points, this study investigated the effects of different parenting practices on child development during early and middle childhood. Using the parallel process growth curve modeling technique, this study is able to capture the longitudinal growth of both the parenting predictors and child outcomes, and more importantly how the initial levels of different parental practices correlate with the initial levels and subsequent changes of the child variables. The findings highlight the differential roles of non-physical disciplinary tactics and positive parenting in child social and academic development, especially in consideration of the different developmental trajectories of child outcomes—both externalizing and internalizing problems were increasing and social competence was decreasing but academic performance was generally stable over time. The results of concurrent predictions in kindergarten showed that parent's use of derogatory tactics was associated positively with child externalizing problems and but negatively with social competence. Child academic performance was negatively correlated with parent verbal and physical affection. When mother and father samples were examined separately, significant predictions were only found for mothers: mother physical affection was positively linked with child externalizing problems whereas both mother physical affection and derogatory tactics was negatively related to

child social competence. Two significant intercept-slope predictions were found: For both the full sample and mother subsample, the intercept of derogatory practices positively predicted the change of child social competence ( $\beta = 0.05$ ,  $p = 0.05$ ), meaning a higher initial level of mother derogatory practices was associated with a slower decrease of child social competence. Longitudinal results from a propensity score matching analysis showed that a high level, in comparison to a low level, of mother power-assertive (but non-physical) disciplinary tactics at first grade predicted lower levels of child social competence and academic performance at second grade.

Parenting is a heavily researched topic and although many studies have investigated the associations between specific parenting and child outcomes, very few have actually taken a comprehensive approach to examining simultaneously the influences of both disciplinary tactics and non-disciplinary positive parenting on multiple developmental outcomes. With the use of growth curve modeling, this study further adds to the literature about the contribution of different parenting approaches to the changes of developmental outcomes. In determining the trajectories of children's developmental outcomes, there are evincing signs of increased psychosocial problems and decreased social competence over time. The compromised competence during this period could be due to the transition from kindergarten to elementary school experienced by the children since the new interpersonal environment may appear rather daunting and challenging as they are now surrounded by more peers than they were in kindergartens. This supposition is confirmed by the fact that the subdued development is evident in the interpersonal domain but not academic area. Furthermore, the consequences of such plight could echo for several years because the school-entry period serves as the fundamental part of

subsequent development (Entwisle & Alexander, 1993). Although it is reasonable to associate the decline of social competence with the escalation of adjustment problems, there are likely other markers of social competence that were not included in this study. For example, social competence in the current study was measured by six items that focused on peer acceptance and preference and yet another important component to be considered is prosocial behaviors. Certainly, prosocial behaviors and peer acceptance/preference are closely interwoven such that children with prosocial reputations are often liked and sought as playmates by peers because of their socially appropriate behaviors (Rey, 2003), but children with high prosocial behaviors sometimes also possess other competent characteristics such as emotion regulation that may or may not be directly related to peer relationships. Examining the trend of other dimensions of social competence thus remains to be an important question worth further investigation.

In addition to capturing the developmental changes over time, the “add-on” technique of latent growth curve modeling–parallel process estimation allows one to make predictive inferences on the features of growth trajectories in terms of both the initial level and the rate of change of the outcome variables. Causal effects can be estimated by the prediction of the initial level (i.e., intercept) on the rate of change (i.e., slope) for the variables of interest (Pakpahan, Hoffmann & Kröger, 2015). In the current study, the estimation of causal effects via parallel process latent growth curve modelling pertains to using the intercepts of parenting variables to predict the slopes of child variables. In this regard, most of the findings in this study are counter to the hypotheses wherein causal effects are not established. There are several possible reasons for this. First, the conceptualization of the parenting measures is somewhat arbitrary. This could



result in misclassification of some parenting variables. For example, this study categorized threat into power-assertive disciplinary tactics which were hypothesized to reduce externalizing problems. Some parenting scholars (e.g., Kochanska & Aksan, 1995), however, have discouraged the use of threats as it has been negatively associated with child compliance and positively related to child defiance. Threatening could nonetheless fall into the category of derogatory tactics because like verbal hostility and shaming it is also psychologically aggressive. These derogatory tactics can be as aversive, if not more, as physical punishment such that they may leave a psychological scar in children, creating a faulty self-image that could last lifelong (Loader, 1998). In addition to threat, simple command could be another misplaced power-assertive disciplinary tactic. Kochanska and Aksan (1995) distinguished between direct commands as a gentle parental control and direct commands accompanied by a negative comment, harsh physical intervention, or threat as negative parental control, and it was the latter that was linked to adverse child outcomes (high defiance and low compliance) whereas the former was correlated with favorable outcomes (low defiance and high compliance). Apart from these two “problematic” items, other parenting variables might still be effective discipline tactics worth advocating. For example, Lindhiem, Shaffer, and Kolko (2014) showed that parents became more likely to use time-out and privilege removal as two nonaggressive discipline strategies in substitution for aggressive strategies after participating in an interventional program that aimed to promoting effective parenting. The second reason for the non-significant predictions could be due to the low event frequency in the current study. For example, the use of some disciplinary tactics by the study sample were so infrequent (e.g., extra-work penalty, shaming) that the significant

associations, even if they may exist, failed to emerge. A related issue for the positive parenting variable is the dichotomized coding of the measures, a practice that lowers the power for statistical analysis. Although dichotomization eases the coding and interpretation of the results, it essentially loses a large proportion of information. As an example, splitting a variable at the median reduces power by the amount equivalent to discarding a third of the data (MacCallum, Zhang, Preacher, & Rucker, 2002).

Dichotomization in general may subsume considerable variability within each group (Altman & Royston, 2006) and therefore it is a strategy that should be used with caution.

Despite these non-significant findings, the current study did find one significant linkage between a parenting variable intercept and a child outcome slope: parents' high level of derogatory practices at kindergarten was associated with a slower decrease in social competence over time. This somewhat unexpected finding could be due to the limited room for the decline of social competence among children with parents who use a high level of derogatory practices, as indicated by the negative association on the initial levels of parent derogatory practices and child social competence. In other words, these children already start with a low level of social competence and not much potential is left for social competence to continuously decrease.

The intercepts of parenting predictors and child outcomes were correlated in current study, although it is not possible to draw any causal conclusions from these correlations. For example, the positive correlation between parent derogatory tactics and child externalizing problems at kindergarten year could be due to the increasing problematic behaviors of children as a result of parent derogatory tactics, or parent's use of derogatory practices in response to child misconduct at this age. Similarly, the

negative association between parent verbal/physical affection and child academic performance might be attributed to the intention of parents to assist their children in case of poor academic performance, or children's academic ineptness because of their dependence on parental supports. Without further evidence, overextrapolating these correlational findings is not warranted. Stronger causal evidence, however, does come from propensity score matching analysis. In the realm of non-randomized control studies, a propensity score matching approach, when used appropriately, can adequately reduce or eliminate confounding effects (Austin, 2011). When matched on a series of covariates including pretest or proxy-pretest variables (viz., child externalizing problems, internalizing problems, social competence, academic performance, oppositional defiant disorder) and demographic measure (viz., family socioeconomic status), the results suggest mother's excessive use of power-assertive disciplinary tactics at first grade is counterproductive to optimal child outcomes in terms of social competence and academic performance at second grade. The negative side of power-assertive disciplinary tactics emerges only when the high level of use is compared with the low level of use, with no difference found between the medium and low level. This illustrates that power-assertive disciplinary tactics, perhaps similar to physical punishment, can be damaging when overly used (Ferguson, 2013; Lansford, Wager, Bates, Pettit, & Dodge, 2012; Larzelere, Gunnoe, Roberts & Ferguson, 2017). Moreover, the effectiveness of power-assertive tactics is context-specific, depending on the type of child noncompliance. Larzelere and colleagues (2018) showed that power assertive and punishment tactics were least effective in reducing the severity of child noncompliance when responding to parent-oriented noncompliance (negotiating and whining) but most effective when dealing with

parent-opposing noncompliance (defiance and hitting). They further found that moderate use of punishment was accompanied by the decrease of behavioral problems in the long term. This finding is similar to the propensity score matching result in current study which showed the trend of fewer child externalizing problems at second grade was associated with the medium level of power-assertive disciplinary tactics used by mothers at first grade, although this association was not significant. It follows that power-assertive disciplinary tactics may be needed to impose and administer clear and consistent behavioral rules that help bring down children's conduct problems, to which end a medium usage is more optimal than a severe or minimal usage, where the former can be too intrusive to the autonomy of children and therefore compromises their competence and the latter is simply ineffective in curtailing children's misbehaviors.

## **Limitations**

The present study is limited in several ways. First, although parent's self-reports of their use of specific disciplinary tactics at the first and second grade have high internal consistencies and are thus reliable measurements, the results may suffer from social desirability bias which can cause some parents to underreport their use of certain disciplinary tactics. As an example, the frequencies of extra-work penalty and shaming were much lower than other disciplinary tactics. Admittedly, parents may rarely use these two disciplinary practices in reality, but reliance on self-reports can not rule out the possibility that parents overreport desirable behaviors while underreport undesirable ones. Future studies need to replicate the self-report findings of this study with other methods, preferably home or laboratory observations. Second, the limited number of time points in this study makes it difficult to estimate longer term trajectories of both the parenting variables and child outcomes. Although the three time points of this study enable the option of exploring nonlinear trends, the statistical power for these models is low: three out of four quadratic models were just identified for which the fit statistics were not available. Also, because the time points are confined to the period from kindergarten to second grade, it is unknown whether there would be any change of trajectories before kindergarten or after second grade. It is possible, for instance, children's initial level of social competence will reinstate after two years' adjustment in the elementary school. Examining the developmental trend and longitudinal relationship between parenting and child outcomes beyond early childhood and at other important points of environmental and biological transitions (e.g., the entry from elementary school to middle school, the onset of puberty) will further our understanding on this topic.

## **Conclusion**

In conclusion, the findings of the current study highlight the potential benefits of power-assertive disciplinary tactics which as alternative strategies to physical punishment have been understudied in the past. These firm disciplinary practices with judicious use rather than heavy reliance appear to be useful in keeping children's behavioral problems in check. When it comes to child rearing, these findings suggest that best parenting practices should not be deemed as exclusively positive parenting. After all, given the desire of children to continually assume autonomy and their relative lack of self-control, parenting without any use of firm discipline may do more harm than good.

## CHAPTER VI

### MANUSCRIPT TWO INTRODUCTION

#### **Background of the Study**

Parenting is not unidirectional; it is embedded in a dyadic parent-child relationship. Relationships constitute an important part of our lives. In the early few years, we develop attachment with our parents, later we build companionship with peers, and still later we establish intimate relationship with romantic partners. How the influences of one relationship transfer to another remains as a central research theme in developmental science and family study. The present study aims to explore the distinct contributions of parent-child synchrony to children's social development after taking into consideration the effects of parenting practices. In other words, how do parent-child synchronized interactions differ from—or add to, or interact with--parenting practices in relation to children's social development? In the following literature review, theories and empirical findings that point out the unique features of parent-child synchrony are summarized and then testable hypotheses are developed to examine the influences of parent-child synchrony on children's social development after controlling for the contributions of parenting practices.

#### **Statement of the Problem and Purpose**

Although parent-child synchrony has been demonstrated to be a conducive factor in the positive socialization of children, previous studies with a few exceptions (e.g.,

Mize & Pettit, 1997) have not empirically explored the possibility of parent-child synchrony (or parent-child interaction in general) being a distinct construct from parenting practices. Given disparate orientations of the interaction (parenting as being vertical versus parent-child synchrony as being horizontal), it is likely that parent-child synchrony would have significant contributions to children's social development above and beyond the influences of parenting practices. Specifically, based on the findings from Harrist et al. (1994), it is expected that children from positively synchronous parent-child dyads would have the optimal social outcomes (i.e., higher levels of social competence and academic performance but lower levels of problematic behaviors such as aggression and social withdrawal) compared with children from negatively synchronous dyads or non-synchronous dyads, even after controlling for the effects of parenting practices. Another property to be examined is stability, with parent-child synchrony expected to be a relatively stable construct. Specifically, it is hypothesized that rank-order consistency will be shown across the two time points: positive, negative and non-synchrony at kindergarten will be highly correlated with positive, negative and non-synchrony, respectively, at age 16, even after controlling for the effects of parenting practices.



## CHAPTER VII

### MANUSCRIPT TWO REVIEW OF LITERATURE

#### **The Definition of Synchrony**

In a seminal review by Harrist and Waugh (2002), synchrony is described as “a type of interaction between two people (in particular a child and caregiver) ... that is mutually regulated, reciprocal, and harmonious” (p. 557). The notion of synchrony has largely been raised from the infancy literature. In observing mother-infant face-to-face interactions, Tronick and colleagues (Als, Tronick, & Brazelton, 1979; Brazelton, Tronick, Adamson, Als, & Wise, 1975; Tronick, Als, & Brazelton, 1980) proposed a model—the dyadic-states model—that describes the sequential structure of a certain type of mother-infant interaction: Interactions begin with the mother's positively eliciting her infant's attention, followed by the onset of infant's positive expression, which further sustains mother's positive expression until the infant becomes disengaged. This model greatly inspired subsequent research and since then many new terms have been proposed to describe the positively coordinated interaction between the mother and infant, for example, “mutual responsiveness” (Kochanska, 1997), “joint attention” (Moore & Dunham, 1995), “dyadic affect regulation” (Hann, Osofsky, Barnard, & Leonard, 1994), “affect attunement” (Haft & Slade, 1989), and “behavior-state matching” (Field, Healy, Goldstein, & Guthertz, 1990). While all these terminologies share some commonalities

with synchrony—that is, the interaction needs to be bidirectional and reciprocal—there are also significant differences.

First, since most of the studies from which these other terminologies originated focused on the period of infancy or toddlerhood, the effort to strike a balance of power on the part of children has been overly emphasized, given the fundamentally asymmetric relationship they are in. In other words, because adult parents are naturally equipped with more power and authority, the contributions of children to their interactions with parents during the first few years are more heavily valued. For example, Kochanska (1997) proposed the term “mutual responsiveness” based on mother’s orientation towards less power assertion and more children’s internalization of maternal rules. A similar assumption underlies adoption of the terms “dyadic affect regulation” and “affect attunement” in which the burden is placed on adult parents to encourage and elicit positive affect from infants who have limited ability to regulate their own affect. In the process of regulating and attuning to infant’s affect, caregivers need to first recognize and then accommodate an infant’s emotional needs, with the purpose of reaching a more reciprocal and balanced interaction later on. “Joint attention” and “behavior-state matching” are terms consistent with the social contingency framework which suggests that infant’s attentions and behaviors are “contingent” upon those of the caregivers. This social contingency, however, relies on infant’s development of self and intersubjectivity. Caregivers play an important role in this developmental process in terms of actively scaffolding the verbal and behavioral exchanges with infants (Rochat, 2001).

Secondly, the notion of synchrony has been applied beyond the period of infancy to describe a horizontal interaction between parent and child where both parties have

more equal contributions (e.g., Russell, Pettit, & Mize, 1998). This more symmetric and power balanced interaction has indeed been documented in early and middle childhood. For example, in a study that examined the relation between dyadic synchrony and toddler compliance, Rocissano et al. (1987) defined synchrony as a dyadic exchange between mother and toddler, with the interaction being broken into a turn-by-turn sequence during which both the mother and toddler can lead or follow. Notably, in cases where toddlers diverged from the joint topic by which synchronous interaction was maintained, mothers often followed the child's lead in order to restore the out-of-sync interaction back into synchrony. Harrist et al. (1994) studied synchrony with a sample of kindergarteners and their mothers. Synchrony was captured by evaluating the dyadic quality of parent-child interaction (i.e., engagement, affective tone, connectedness) instead of individual behaviors from either side. Studies conducted in middle childhood adopted similar measures of synchrony that emphasized reciprocity, interconnectedness, mutuality, and shared affect on the dyadic level (Criss et al., 2003; Lindsey et al., 2008).

A third difference between synchrony and other terminologies pertains to the quality of interaction. Whereas other terminologies tend to reduce the quality of interaction to individual behaviors, synchrony highlights an optimal state of interaction achieved by children and caregivers (Harrist & Waugh, 2002). As mentioned above, the operationalization of synchrony in research typically involves ratings on the connectedness, reciprocity, and shared affect, all of which can be seen as an assessment that evaluates the degree of harmony of the interaction. Unlike other measures that used individual behaviors to infer the state of the interaction, the measure of synchrony assesses the transactional nature of the interaction (Harrist et al., 1994). Although global

evaluation necessarily leaves more room for subjective interpretation compared to molecular assessment, studies have demonstrated that good reliability could be achieved by sufficient training on observational coding (see Ambrose & Rosanne Menna, 2013; Bureau et al., 2014; Criss et al., 2003; Harrist et al., 1994; Kirsh, Crnic, & Greenberg, 1995; Lindsey & Caldera, 2015; Lindsey et al., 2008; Rocissano et al., 1987). Synchrony thus may be considered a valid proxy that measures the interactional quality of parent-child dyads. Given these differences, the term synchrony is used in this study. These are not just semantic differences but also differences with theoretical implications: For example, synchrony can potentially serve as a bridge that links parent-child interaction and the development of child-peer relationships.

### **The Uniqueness and Stability of Parent-Child Synchrony**

In a description of children's interpersonal experience with parents, Hartup (1989) categorized parent-child interactions into a "vertical" versus "horizontal" distinction. Vertical interaction is characterized by an asymmetrical structure of power and authority, one often found in parent-child dyads during the early years. The interaction is vertical in the sense that parents are expected to contribute more in order to initiate and maintain the interaction simply because they are more powerful, competent, knowledgeable, and skillful. Horizontal interaction, on the other hand, assumes an equal distribution of power and authority, indicating a pattern of exchanges that is more egalitarian and reciprocal (Russell et al., 1998). In this sense, parenting *practices*, given the directionality of the influences and power differences embedded in the relationship, are hierarchical, whereas parent-child *interactions*, due to its bidirectional nature and power egalitarian assumption, are horizontal.

Horizontal interaction is more frequently observed between child and peers where no asymmetrical balance of power is assumed. Nevertheless, it can also take place in parent-child dyads especially when children become more competent and are granted with more autonomy. In fact, it is reasonable to expect more and more horizontal interactions occurred from the period of toddlerhood. This is indicated by the evolved perspective held by parents that “inducted the child into a system of reciprocity” (Kochanska, 1997, p. 94), an orientation that begins to emerge during toddlerhood. Kochanska also noted that this orientation that enables parents to value more mutuality and resort less to power and coercion is conducive to children’s social development in that a benign mutually responsive system can be created to elicit children’s willingness to cooperate and prevent the development of hostility and aggression (Kochanska, 1997; Kochanska, & Aksan, 2004; Kochanska, Aksan, Prisco, & Adams, 2008). Around the age of kindergarten and first grade when children reach the concrete operational stage of cognitive development, the pattern of horizontal interaction should become more conspicuous because children are more capable of internalizing rules and taking the perspectives of others. This is accompanied by parent’s active invitation of power sharing and deliberate consideration of children’s viewpoints, with the goal of transiting to a co-regulated interactional system (Russell et al., 1998). This co-regulated system can promote children’s cognitive expectation and behavioral tendency to reciprocate which are particularly needed in their interactions with peers.

Several theoretical models have been proposed to characterize the dyadic nature of parent-child interactions. Probably the first theoretical model is the control system approach presented by Bell (1968). Although greater emphasis was still placed on the

responsibility of parents in socializing children, Bell started to recognize the effects of children on activating different behavioral repertoires of parents. Of course, the degree of child effects depends on several other factors such as child gender, age, and temperament (or the term “congeniality” used by Bell), socioeconomic status of parents, and family structure including birth order, family size, and density, and yet the contributions of children should not be dismissed. This reminder raised by Bell attempts to reinterpret, if not completely reject, traditional models. More recent theoretical development builds upon Bell’s framework with an emphasis to factor in the role of children in parent-child interactions. For example, the transactional model (Dumas, LaFreniere, & Serketich, 1995) recasts children as active agents who can influence the dyadic exchanges of behaviors with their caregivers. Instead of defining the pattern of interaction purely from a childrearing perspective such as the characterization of four parenting styles (i.e., authoritarian, authoritative, neglectful, and permissive), this model calls attention to the transactional process that underlines parent-child interactions. A balance of power is stressed between mothers and children in their ongoing relationship and any destruction of this balance can result in dysfunctional interactions which in turn pose some threats to children’s development. Several studies have been designed to test this model, with a lens that focused on controlling behaviors between mothers and children (Dumas, LaFreniere, & Serketich, 1995; Dumas, LaFreniere, Beaudin, & Verlaan, 1992; LaFreniere & Dumas, 1992). Findings from these studies lend support to the model and demonstrate the efficacy of examining the coercive pattern of power exchange in mother-child interactions. Specifically, a balanced exchange of power has been shown to be an indicator of positive mother-child relationships and also as a promotor of children’s

social competence. Interactions with this pattern can benefit children given the abundant opportunities for them to exercise appropriate control but not at the expense of their mothers. An imbalanced power exchange, however, where control is more heavily used by one side, will compromise children's social development as children are either unable to adopt more socially appropriate strategies for interactions (in the case of aggressive children who initiate and maintain excessive control over their mothers) or fail to assert the degree of autonomy that is needed at their developmental level (in the case of anxious children who have little control over their mothers). In sum, the interactional patterns that children learn from the dyadic exchanges with their parents can be transferred to subsequent social encounters with other peers. In other words, parent-child interactions function as a relational milieu for children to develop their social skills, in contrast to the vertical-oriented parenting practices which imply the use of power and control by parents to transmit their socialization values (Lollis & Kuczynski, 1997). In this regard, synchronous interactions between parent and child may play a prominent role in promoting children's optimal development of peer relationships (see Harrist et al., 1994).

Empirical findings have also evinced the positive effects of parent-child synchrony in other areas of child development (such as communicative competence and self-control: Lindsey et al., 2009; cognitive ability: Kirsh, Crnic, & Greenberg, 1995; behavioral and emotional adjustment: Barber, Bolitho, & Bertrand, 2001; Deater-Deckard & Petrill, 2004). Moreover, the synchronized interaction pattern remains conducive in other developmental stages beyond early childhood (such as adolescence: Lindsey et al. 2008; Criss, Shaw, & Ingoldsby, 2003; youth: Davis, Bilms, & Suveg, 2017).

Despite the unique role of parent-child synchrony in children's socialization, no previous studies have been found that investigated the stability associated with this construct. Stability, however, is an important component of any proposed theoretical concepts within family system because families are assumed to possess some self-stabilizing properties that sustain their own habitual patterns of interaction (Maccoby, 1984; Radke-Yarrow, Zahn-Waxier, & Chapman, 1983). Dysfunctional families can be distinguished from healthy families in that they often engage in problematic interactions which over time contribute substantially to pathological relationships and negative child outcomes (Loeber & Stouthamer-Loeber, 1986; Patterson, DeBaryshe, & Ramsey, 1989). Understanding family interactions can thus aid in probing the cause of dysfunctional family and child deviance. If synchrony is a valid categorization of parent-child interaction, examining the longitudinal properties of the synchrony construct allows one to further evaluate the reliability and the legitimacy of it being used as a proxy indicator of relationship quality between parent and child. Since no studies on this topic can be located, relevant evidence from parenting practices and child rearing research is reviewed here.

There are two types of stability: relative stability and absolute stability. This distinction was first made by Alder and Scher (1994) to illustrate the different ways of measuring consistency of a particular construct. Whereas relative stability focuses on the consistency of relative position that individual locates within a group across time, absolute stability concerns the absolute changes occurred at either the individual and group level across time. For example, the question, "Do authoritarian parents maintain higher levels of demandingness across time compared with authoritative parents?" is a



measure of relative stability, whereas, “Do authoritarian parents use the same level (i.e., frequency and extent) of physical punishment when their child is in adolescence as when their child was in kindergarten years?” is a measure of absolute stability. Relative stability is usually indexed by test-retest correlation coefficients that calculate the rank-order consistency of individual within a group across two time points; in contrast, absolute stability typically uses analyses of variance (ANOVAs) or *t* tests to assess the change in the mean level.

Existing stability tests of parenting behaviors show better relative stability than absolute stability (Asselmann et al., 2015; Forehand & Jones, 2002; Jacob et al., 2000; Roberts, Block, & Block, 1984). Specific parenting dimensions such as warmth and communication appear to be more stable than others including strict control and punishment (Asselmann et al., 2015; Carrasco, Rodríguez, Barrio, & Holgado, 2011; Jacob et al., 2000; Rimehaug, Wallander, & Berg-Nielsen, 2011). The varying degrees of consistency further indicate the fluidity of certain parenting behaviors. Indeed, as pointed out by Holden and Miller (1999) in their meta-analysis study of parents’ child rearing, relative stability is a more appropriate measure of consistency because rarely do parents maintain the exact same type of behaviors across time due to the need to modify their behaviors based on the situation and the development level of children. Unlike parenting behaviors that are more parent-centered, parent-child synchrony pays more attention to the interaction that may better reflect the dyadic relationship between parent and child. Nevertheless, it remains unknown whether this synchrony construct will manifest relative stability across time after controlling for the effect of parenting practices.

## CHAPTER VIII

### MANUSCRIPT TWO METHODOLOGY

#### **Sample and Procedure**

Participants in manuscript two were a subsample of the Child Development Project, which included 157 children (67 girls, 90 boys). Data used in this study were collected from home observations and laboratory tasks. To be more specific, parents' use of disciplinary tactics and positive parenting practices were assessed by home observations; child social behaviors were measured by Achenbach Child Behavior Checklist (TRF, CBCL/4-16; Achenbach & Edelbrock, 1986) and Teacher Checklist of Peer Relationships (TCPR; Dodge, 1986) completed by the teachers (for a detailed description, see Measures of manuscript one). Parents' and children' interactions were observed naturally at home during the kindergarten year and during a structured laboratory-based task when the child was age 16.

#### **Measures**

##### **Disciplinary Tactics and Positive Parenting.**

The measures of disciplinary tactics and positive parenting are the same as Manuscript One (see Manuscript One methods for details).

##### **Parent-child Synchrony at Kindergarten.**

Two naturalistic observations with each lasting 2 hours were conducted at each participant's home prior to (summer) or during (early fall) the kindergarten year. The

observation and coding process used in this study largely adopted the Social Events System approach developed by Harrist and Pettit (2000). In this approach, observers were asked to write down a narrative that depicted all ongoing social interactions involving the target participant. This narrative was then segmented into interactional episodes that were of interests to the researcher (i.e., social events). Although some degrees of inference by the observer were required, this approach enabled observers to pay more attention to behaviors that were of social nature than those purely based on some objective units such as time. This in turn will exclude some irrelevant information, thereby potentially improving reliability for subsequent coding. After receiving sufficient training, observers are able to retrieve the meaning of behaviors with a low-level inference (e.g., a sincere smile or a phony laugh) in real time that are otherwise difficult to capture after the event. In addition, the recorded episode can easily be transcribed into an analyzable entity (Harrist & Pettit, 2000).

In this study, a social event is defined as any interaction between the target participant child and his/her parent. Observers recorded behaviors exchanged between the child and the parent as well as the context where the interaction was occurring. Following is an example of a recorded social event:

*Target child (TC) returns to the living room with her patent leather shoes on. Mother (M) looks at them and exclaims, “You’ve got them on the wrong feet!” TC quickly changes them, saying that she keeps forgetting. M continues to comment that she doesn’t know how TC can do that.*

Because different social events could happen close in time, to determine the beginning and end of a social event three criteria were used: contextual change (e.g., Has

the setting or participants been changed?), content characteristics (e.g., Is there a different purpose or goal involved in this social interaction compared to others?), and affective tones (e.g., Is the affective tone of this episode different from others?). Social events could be discerned based on change of any of the three criteria. A total of 14,000 social events were recorded. The average number of social events that occurred was 82 per mother-child dyad and 48 per father-child dyad.

Trained graduate and postgraduate students coded the social event on three components that evaluated the quality of dyadic interaction between the target child and one of his/her parents (triadic interactions involving both parents were not coded): engagement, measuring the reciprocity of the interaction, is the number of back-and-forth turns in a social event; affective tone, capturing the emotional stance of the interaction, is a 1-3 rating scale (1 = both partners negative, 2 = only one partner is negative, 3 = mutual non-negativity); and connectedness, describing the joint nature of the interaction, is on a 1-to-5 rating scale: 1 = both partners had different focus of attention and few exchange of action/affect during most of the interaction time, 3 = partners may have different focus of attention during part of the interaction time and there might be some exchange of action/affect but not for the entire event, 5 = the partners shared the same attention for the entire interaction time and there were frequent exchanges of action/affect between the partners.

Based on these components, three interaction styles—positively synchronous, negatively synchronous, and nonsynchronous—were derived in order to classify each parent-child social event (see Table 8.1). Positively synchronous interactions were evidenced by high engagement (2 or more turns), mutually non-negative affect (a rating

of 3), and high connectedness (a rating of 4 or 5). Negatively Synchronous interactions were characterized by high engagement (2 or more turns) and highly connected (a rating of 4 or 5) but mutually-negative affect (a rating of 1). Nonsynchronous events were marked by low-to-moderate connectedness (a rating of 1, 2, or 3) and affective tone that was not mutually negative (a rating of 2 or 3). Because a number of social events could occur to each parent-child dyad, a proportional score was calculated for each of the three interaction styles (i.e., positively synchronous, negatively synchronous, and nonsynchronous) in which each dyad was classified. Cronbach's alpha was .86 for the synchrony measure for mothers and .85 for the synchrony measure for fathers. Inter-rater reliability (Kappa) was .75 for engagement (.75 for mother-child dyads, .78 for father-child dyads), .84 for affective quality (.84 for mother-child dyads, .91 for father-child dyads), and .45 for connectedness (.45 for mother-child dyads, .47 for father-child dyads).

Table 8.1. Parent-child Synchrony Classification at Kindergarten.

	<b>Engagement</b>	<b>Mutual affect</b>	<b>Connectedness</b>
<b>Positive Synchrony</b>	High	Non-negative	High
<b>Negative Synchrony</b>	High	Negative	High
<b>Non-Synchrony</b>	Low	Non-negative	Low

### **Child Outcomes.**

The measures of child outcomes are the same as Manuscript One (see Manuscript One methods for details).

### **Parent-child Synchrony at Child 16.**

Parent-child synchrony was also assessed when the child was 16. However, unlike the measure of parent-child synchrony at kindergarten that took place at participants'

homes, parent-child synchrony at child age 16 was measured using specific experimental tasks conducted at the research laboratory (see Criss et al., 2001). In three laboratory tasks, parent and child (adolescent) were first asked to report some conflict topics they both agreed on. These conflict topics, ranging from teenager's school work, friends, and after-school activities to emotional conflicts between parent and child, were pre-selected by researchers and presented to the participants on a set of cards. Parent and child took turns reading the cards and providing their answers (General Parent-Adolescent Interaction Task). After 8 minutes' discussion, parent and child chose five of the topics that both of them agreed upon having conflicts to further discuss about some possible solutions (Problem-Solving Task). Parent and child were involved in this problem-solving discussion for another 8 minutes. Finally, parent and child were presented with 4 hypothetical vignettes where they were asked to discuss the issues of conflicts as if they were really happening to them (Hypothetical Vignette Task). Both parent and child needed to continue their discussion until they reached a solution to the conflicts involved in each vignette before moving to the next one. This discussion section last 10 minutes. Following is an example of the hypothetical vignettes:

*Your family is planning the annual summer picnic at the park. However, you usually get very bored at the family picnics. You would rather go to a friend's house.*

Trained research assistants provided global ratings of what the CDP Coding Manual referred to as "Synchrony" but what is actually coordinateness and balance of the interactions between parent and child as a measure of parent-child synchrony at child 16 (including the "flow" of interaction as well as affective matching, be it positive or negative affect which were not distinguished in the coding). The ratings were conducted

on a 9-point scale, with 1 indicating no interaction and 9 indicating perfect synchrony. In the Kindergarten wave, three types of synchrony were operationalized: positive, negative, and non-synchrony. Thus, positive versus negative affect was coded to distinguish positive versus negative synchrony. In the age 16 synchrony coding, only affect matching was coded with no distinction between positive versus negative affect (see Appendix B for the detailed coding instructions of synchrony at age 16). To make this synchrony measure more comparable to that used in kindergarten, the rating of relationship quality that assesses the overall shared affect between parent and child was added. This rating was also conducted on a 9-point scale, with 1 indicating an unhappy and emotionally unsatisfying relationship and 9 reflecting a warm, open, happy, and emotionally satisfying relationship. In the current study, the classification of parent-child synchrony into positive synchrony, negative synchrony, and non-synchrony at child age 16 is therefore a combination of global ratings on coordinateness/balance and relationship quality (see Table 8.2): Positive synchrony was characterized by high coordinateness/balance (a rating of 7 to 9) and positive relationship (a rating of 7 to 9). Negative synchrony was indicated by high coordinateness/balance (a rating of 7 to 9) but negative relationship (a rating of 1 to 3). Non-synchrony was reflected by low coordinateness/balance (a rating of 1 to 3) and neutral relationship (a rating of 5). A binary code was assigned when each synchrony classification (positive-, negative-, or non-synchrony) occurred in the task (0=did not occur, 1=occurred). A summed score (range = 0-3) was then computed for each of the three interaction styles across the three tasks. Cronbach's alpha was .77 for the synchrony measure for mothers and .66 for the synchrony measure for fathers. Inter-observer reliability calculated as Kappa (using the 9-

pt ratings) was .69 for relationship quality and .74 for synchrony.

Table 8.2. Parent-child Synchrony Classification at Child Age 16

	<b>Coordinateness/Balance</b>	<b>Affect</b>
Positive Synchrony	High	Positive
Negative Synchrony	High	Negative
Non-Synchrony	Low	Neutral

### **Analytic Plan**

The goals of manuscript two were to (a) explore the unique contributions of parent-child synchrony to children's social development, after controlling for the effects of parenting practices; and (b) examine the longitudinal continuity of synchrony. To address the first goal, hierarchical regression analyses were conducted to examine the independent contributions of the three types of parent-child synchrony and parenting practices to child outcomes (i.e., social competence, internalizing and externalizing problems, academic performance) at first grade. Multivariate hierarchical regression was performed with positive parenting measures being entered in the first step and three synchrony measures being entered in the second step. Contributions of parent-child synchrony above and beyond the effects of positive parenting were examined based on the additional explained variance introduced by the second step (i.e., the change of *R*-squared statistics).

To examine the second goal, Spearman's rank-order correlation was first conducted with each type of parent-child synchrony across two time points (kindergarten and age 16). Categorized synchrony scores at child age 16 were used in this correlational analysis to determine the continuity of each synchrony category. Given that the categorization of synchrony at child age 16 may result in a loss of statistical power due to



decreased variation, the original measures (i.e., coordinateness/balance, relationship quality) at child age 16 were kept as continuous variables for which the across-time Pearson product-moment correlations involving synchrony at kindergarten were run. Because of the limited number of father participants at the child age 16, only the mother sample was included in the correlation analysis. Missing data were handled by multiple imputation approach.

## CHAPTER IX

### MANUSCRIPT TWO FINDINGS

#### **Mother and Father Kindergarten Synchrony and Child Social Development at the First Grade**

Due to the rare occurrence of negative synchrony (no negative synchronous interactions were observed for 85% of mothers and 91% of fathers in kindergarten year, and 98% of mothers at child age 16), negative synchrony was excluded from further analysis. The correlations between mother and father kindergarten synchrony and child outcomes at first grade are shown in Table 9.1: Mother and father positive synchrony both positively, albeit marginally ( $p=.09$ ,  $p=.07$ , respectively), correlated with child social competence. In contrast, mother and father non-synchrony were both significantly, negatively correlated with child social competence and academic performance. Moreover, father non-synchrony and child externalizing problems were positively associated.

Table 9.1. Correlations Between Mother and Father Synchrony at Kindergarten and Child Outcomes at First Grade.

	<b>Externalizing problems</b>	<b>Internalizing problems</b>	<b>Social competence</b>	<b>Academic performance</b>
Mother positive synchrony ( <i>n</i> =157)	0.06	0.04	0.13	0.08
Mother non-synchrony ( <i>n</i> =157)	0.08	-0.02	-0.16*	-0.27**
Father positive synchrony ( <i>n</i> =102)	-0.09	-0.05	0.18	0.14
Father non-synchrony ( <i>n</i> =102)	0.23*	0.02	-0.28**	-0.27**

\* $p < .05$

\*\* $p < .01$

The next set of analyses that further addressed the first hypothesis examined the independent contributions of mother and father kindergarten synchrony to child outcomes at first grade. To this end, hierarchical linear regression was used to examine the contributions of parent-child synchrony at kindergarten after taking into consideration the effects of parenting measures. The results (see Table 9.2) showed that mother positive synchrony ( $N=157$ ) at kindergarten positively predicted child social competence and academic performance at first grade ( $\beta = 0.04$ ,  $SE = 0.02$ ,  $p < .05$ ;  $\beta = 0.03$ ,  $SE = 0.01$ ,  $p < .05$ ) whereas mother non-synchrony negatively predicted child academic performance ( $\beta = -0.04$ ,  $SE = 0.01$ ,  $p < .05$ ). In regard to the father sample ( $N=102$ ) positive synchrony at kindergarten positively predicted both child social competence ( $\beta = 0.09$ ,  $SE = 0.03$ ,  $p < .01$ ) and academic performance ( $\beta = 0.07$ ,  $SE = 0.02$ ,  $p < .01$ ) at first grade.

### Table 9.2. Hierarchical Linear Regression Analysis of Predicting Child Outcomes

Predictor variables	Step 1					Step 2				
	Internalizing problems	Externalizing problems	Social competence	Academic performance	Internalizing problems	Externalizing problems	Social competence	Academic performance		
Mother disciplinary tactics	0.52 (0.37)	0.17 (1.49)	-0.38 (0.25)	0.46 (0.20)*	0.57 (0.37)	-0.06 (1.52)	-0.28 (0.25)	0.50 (0.19)*		
Mother derogatory tactics	-0.75 (0.51)	-3.58 (2.07)	0.46 (0.35)	0.46 (0.27)	-0.85 (0.51)	-3.32 (2.10)	-0.36 (0.35)	0.37 (0.27)		
Mother physical affection	1.08 (0.75)	0.40 (3.03)	-0.47 (0.51)	0.55 (0.40)	1.09 (0.75)	0.59 (3.07)	-0.60 (0.51)	0.46 (0.39)		
Mother verbal affection	-1.49 (0.87)	-4.69 (3.53)	0.69 (0.60)	0.83 (0.46)	-1.50 (0.87)	-4.75 (3.55)	0.73 (0.59)	0.87 (0.45)		
Mother positive synchrony					-0.00 (0.03)	-0.06 (0.11)	0.04 (0.02)*	0.03 (0.01)*		
Mother non-synchrony					-0.04 (0.03)	0.11 (0.11)	-0.03 (0.02)	-0.04 (0.01)*		
$R^2$	0.06	0.05	0.05	0.14	0.09	0.05	0.09	0.19		
$R^2$ change					0.03	0.00	0.04	0.05		
Father disciplinary tactics	-0.01 (0.34)	0.73 (1.34)	-0.19 (0.23)	-0.06 (0.17)	0.04 (0.46)	-0.10 (1.58)	-0.28 (0.28)	-0.07 (0.21)		
Father derogatory tactics	0.28 (0.76)	-4.32 (2.96)	0.78 (0.51)	1.13 (0.37)**	-0.18 (1.15)	-5.25 (3.96)	1.00 (0.70)	1.55 (0.52)**		
Father physical affection	-0.41 (0.74)	-5.39 (2.87)	0.33 (0.50)	0.77 (0.36)*	-0.22 (0.98)	-4.46 (3.36)	0.23 (0.59)	0.76 (0.44)		
Father verbal affection	0.05 (0.92)	-0.41 (3.58)	-0.60 (0.62)	0.97 (0.45)*	0.02 (1.28)	-5.35 (4.40)	0.08 (0.77)	1.50 (0.58)*		
Father positive synchrony					-0.02 (0.06)	-0.30 (0.19)	0.09 (0.03)**	0.07 (0.02)**		
Father non-synchrony					0.03 (0.05)	0.39 (0.16)*	-0.06 (0.03)	-0.02 (0.02)		
$R^2$	0.01	0.06	0.03	0.23	0.01	0.17	0.15	0.37		
$R^2$ change					0.00	0.11	0.12	0.14		

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

 $10^{-0.1} > d_{**}^{**}$

On the contrary, father non-synchrony positively predicted child externalizing problems ( $\beta = 0.39$ ,  $SE = 0.16$ ,  $p < .01$ ). No other significant predictions were found.

### **Longitudinal Continuity of Synchrony**

The first set of correlational analyses was conducted with the categorical measure of synchrony at child age 16. Results showed that mother positive synchrony between kindergarten (a proportion score) and child age 16 (0-3 sum of binary occurrence score) did not significantly correlate ( $r = 0.04$ ,  $p = .64$ ,  $n = 146$ ) whereas mother nonsynchrony across these two time points was positively correlated ( $r = 0.22$ ,  $p < .01$ ,  $n = 146$ ). The nonsignificant correlation of mother positive synchrony across time could be due to the low statistical power as a result of transforming a continuous variable (9-point rating) into a categorical variable (0-3 summed score). In fact, over half (56%) of the time mother positive synchrony at child age 16 was coded as nonoccurrence after converting it into the binary variable (i.e., 0=did not occur, 1=occurred). Therefore, as a post-hoc analysis to increase power, the ratings of coordinateness/balance and relationship quality at child age 16 were kept as continuous variables which were then summed across the three tasks. Correlations were then computed between mother positive synchrony and nonsynchrony at the kindergarten year and mother coordinateness/balance and relationship quality at child age 16. Results showed that mother positive synchrony in kindergarten was positively correlated with mother connectedness/balance at child age 16 ( $r = 0.19$ ,  $p < .05$ ,  $n = 146$ ) whereas the correlation between mother nonsynchrony in kindergarten and mother connectedness/balance at age 16 was negative ( $r = -0.20$ ,  $p < .05$ ,  $n = 146$ ). The correlations involving mother relationship quality had the same signs but were not significant (mother positive synchrony and relationship quality:  $r = 0.07$ ,  $p$

= .39,  $n = 146$ ; mother nonsynchrony and relationship quality:  $r = -0.06$ ,  $p = .44$ ,  $n = 146$ ).

## CHAPTER X

### MANUSCRIPT TWO DISCUSSION AND CONCLUSION

#### **Discussion of Findings**

The goal of manuscript two was to investigate the unique influences of parent-child synchrony on child social development. The analyses conducted in this study hope to achieve this goal by first testing the stability of the parent-child synchrony construct and second examining the contributions of parent-child synchrony to child social outcomes after taking into account the effects of parenting practices. Results are in general in support of parent-child synchrony as a unique and stable construct.

Although parent-child synchrony has been proposed as a meaningful concept beyond infancy (Harrist & Waugh, 2002), very little attention has been paid to the role and functions of synchrony in subsequent eras. Even far less empirical research has been conducted to explore the continuity of parent-child synchrony between early and later developmental stages and thus this study is an attempt to fill in the gap in this research area. The fact that parent-child synchrony was found to be relatively stable across time points to the need to speculate the key contributor to the stability of this construct.

Although the longitudinal continuity of parent-child synchrony itself is an unexplored area, attachment theory may be borrowed to aid in the understanding of the steadiness of synchrony between parent and child. Specifically, attachment theory posits that during positive, sensitive interactions with parents, children are instilled with a sense of

protection, comfort, and safety from which security is established that signifies the internalization of positive images of parents and people around them (Bowlby, 1969, 1982). In contrast, a sense of insecurity in children is developed out of negative or neglectful relationships with parents (Belsky & Fearon, 2008; De Wolff & van IJzendoorn, 1997; Thompson, 2006). Security, however, could be a proxy of positive parent-child relationship which is an umbrella term that includes a series of emotional and behavioral components. For example, the mutually responsive orientation (MRO) perspective proposed by Kochanska and colleagues (Aksan, Kochanska, & Ortmann, 2006; Kochanska, 2002; Kochanska, Kim, Boldt, & Yoon, 2013) considers positive affect, connectedness and mutual responsiveness as the key elements that define the quality of parent-child relationship. Although MRO has been demonstrated as a useful approach to capturing the interactional style and quality of parent-child interaction, it is a global rating based on the aggregation of four dyadic dimensions (coordinated routines, harmonious communication, mutual cooperation, and emotional ambience). Admittedly, global rating has the advantage of easing the interpretation of results and facilitating theory construction, but it may fall short of identifying the underlying components that endure over time. Indeed, when global assessment was used the longitudinal continuity of parent-child synchrony only received partial corroboration. When individual components were examined, however, the continuity of parent-child synchrony over two developmental stages was more evident where connectedness in particular emerged as a distinct dimension that correlated across time.

The fact that connectedness rather than relationship quality stands out as a more significant factor in linking with synchrony at kindergarten could be attributed to several



possible reasons. First, different methodologies were employed in observing and coding synchrony at the two developmental periods: for synchrony at kindergarten naturalistic observation was used whereas for synchrony at child age 16 experimental tasks were adopted. The different nature of research design could give rise to different rates of observed dimensions when coding synchrony. For example, when experimental tasks were conducted in a standardized situation participated parents and children may only display a limited range of emotions and most likely negative emotions such as anger and sadness are probably rarely, if not completely absent, manifested in this setting due to social desirability effects. The low frequency of observed negative emotions in laboratory settings is well documented in previous studies (Buss & Goldsmith, 1998; Fox, Henderson, Rubin, Calkins, & Schmidt, 2001; Kochanska et al., 2002). It has been shown that negative emotions coded in a laboratory situation could occur 8.8 times less than the coded positive emotions (Durbin, 2010). Certainly, naturalistic observation is not immune to this conundrum but at least one would expect the severity of this problem to be lesser than in the laboratory assessment because perhaps participants are less aware that they are put in the spotlight. The composite nature of synchrony data at kindergarten precludes the possibility of further analyzing the underlying behavioral and emotional components and thus investigating the longitudinal continuity of these individual components could be a direction for future research. Another possibility could be that compared with behaviors, emotions or emotion-based relationships are more fluid and situation depended, rendering them unstable to code over time. Even though a negatively synchronized dyad is characterized by negative emotions, some of these negative emotions may be very subtle and hard to notice. For example, the discussion tasks used to

elicit emotional conflicts in this study are probably more effective in inducing certain types of negative emotions (e.g., anger and distress) rather than others (e.g., fear and sadness). This is in line with the greater number of studies that focused on those more overt and noticeable negative emotions (see Cole, Zahn-Waxler, & Smith, 1994; Diener & Mangelsdorf, 1999; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002). In this sense, the lack of evidence in synchrony continuity on the part of emotion component could be due to the difficulty in observing negative emotions, with the weak across-time correlation possibly resulted from inconsistent coding of emotions.

Aside from continuity, perhaps what is more interesting is the differential roles of parenting practices and parent-child synchrony during early childhood. The findings from this study lend some preliminary support to the distinct function of synchrony in the realms of child social and academic development after accounting for the effects of parenting practices. Predictive validity has been demonstrated in the current study as indicated by the established association between the two synchrony styles (i.e., positive synchrony and non-synchrony) and child social competence and academic performance, albeit with weaker evidence for positive synchrony. The uniqueness of synchrony points out the need to separate it from the general parenting concept. This separation is necessary because of the potential different nature of these two constructs: whereas parenting pays more attention to the influences from the parent to the child, parent-child synchrony recognizes the contributions of children and the considers parent-child dyad as a relational unit. The affiliative bond formed between the parent and child has important developmental connotations as it brings in a recognition of the growing physical mobility, competence and autonomy of children after they enter the toddler period (Shaw

& Bell, 1993). Considering that children become more active as they grow older, parents should be more strategic even if they intend to instill in their children some “how-to” knowledge. For example, if parents want to teach children something about the approach to interacting with peers, the transfer of knowledge and modeling of skills would be made easier if an optimal interactive context is created. That is not to say the directional influences from parent to child must be eschewed but rather they are certainly needed especially when children are misbehaving and disruptive. The reciprocal interaction style, however, provides another channel for children’s learning in addition to the unidirectional parenting practices. After taking into consideration of the effects of parenting practices, the findings of this study confirm the direct link between parent-child synchrony and social competence as speculated in previous research (Harrist, Pettit, Dodge, & Bates, 1994): synchronous interaction itself can provide an ideal learning situation where children practice and master social skills such as timely and contingent response, appropriate pacing of interactions, and so on.

Highlighting the relational function during the developmental course also has theoretical alignments. For example, attachment theory traces the sense of security to the source of warm and responsive interactions between parent and child in which an internal working model that regards others as welcoming and reliable is developed. Children with this positive internalization thus have the tendency to reciprocate positive interactions with others, which is itself a key facet of social competence during early and middle childhood. Alternatively, the competence in the social realm can be explained by social learning theory. That is, parent-child interaction provides a learning experience for children to practice and acquire the skills necessary to initiate and maintain a harmony

relationship with peers. Competent children could have learned from their past experience that they do not have to resort to some socially unacceptable behaviors such as aggression to either get their ways or simply attract others' attention. Social learning theory (Bandura, 1977), compared with attachment theory in this aspect, also offers a better explanation for the link between non-synchrony and externalizing but not internalizing problems because incompetent children, without resorting to the aversive behaviors, have deficient sociocognitive skills to build a positive relationship with peers. The link nonetheless found only for father-child non-synchrony, is indicative of the more salient role of fathers as oppose to mothers in children's behavioral development. Perhaps fathers particularly serve as gatekeepers of their children's conduct problems and children who are deprived of good relationships with their fathers are more susceptible to developing problematic behaviors.

The influences of parent-child synchrony also extend beyond the social realm, as evidenced by the association between kindergarten synchrony and first-grade academic performance. The negative association between non-synchrony and academic performance was more evident than the positive association between synchrony and academic performance, suggesting that the negative effects associated with the absence of synchrony can be more widespread than the positive effects of synchrony. The implications from this result therefore lean more toward decreasing the non-synchrony between parent and child given the limited time and resources for intervention.

### **Limitations**

Several limitations of this study should be noted. First, the sample size of this study was relatively small. This is likely the cause of the marginally significant

associations between positive synchrony and the social competence outcome. In addition to the limited number of participants, the sample was also homogeneous in terms of its nonclinical nature. This might be the reason why negative synchrony was rarely observed in this study but previous report nonetheless showed that the occurrence of coercive exchange was around 15% among clinically referred families (Wahler et al., 1990). Thirdly, the two time points of this study was somewhat far apart from each other, and so even though the longitudinal continuity is evident the correlational findings fail to provide any indication of the trend of synchrony within and beyond these two time points. It might be the case that synchrony is less stable during some developmental periods (e.g., early adolescence and early adulthood). Future research with multiple time points will be able to depict a clearer picture in this aspect.

### **Conclusion**

Despite these limitations, the current study demonstrates the continuity of parent-child synchrony across time, further validating this relational construct. The results of this study also highlight the important function of synchrony in promoting positive development of children and the potential risks associated with the absence of synchrony. Interventional efforts should particularly be focused on reducing non-synchronous interactions between parent and child when time and resources are limited.

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## APPENDICES

### APPENDIX A: THE USE OF PROPENSITY SCORE MATCHING TO REDUCE BIAS IN MANUSCRIPT ONE

#### **Selection of Covariates for Matching**

A key step of using propensity score matching is the selection of covariates. Steiner and colleagues (2010) identified three domains that were most effective in reducing bias, two of which were relevant to the present study: *proxy-pretests* and *demographics*. In order to designate some variables as pretest covariates, kindergarten year was chosen as the pretest time point and second grade was selected as the posttest time point, and therefore parenting practice measures at first grade were predictors of child outcomes at second grade. Pretest covariates in this study included child externalizing problems, internalizing problems, social competence, academic performance, oppositional defiant disorder, and family socioeconomic status at the kindergarten year. Family socioeconomic status was assessed by the Hollingshead Four-Factor Index (Hollingshead, 1975) completed by the parents. The Hollingshead Four-Factor Index contained educational and occupational information from the mother and father. An educational score was computed by converting the years of completed education to a 7-point scale (1-6 years = 1, 7-9 years = 2, 10-11 years = 3, 12 years = 4, 13-15 years = 5, 16-17 years = 6, 18 years and above = 7). The occupational score, based on the type of job that the mother or father reported, ranged from 1 (farm

laborers/mental service workers) to 9 (higher executives and major professionals). A composite family socioeconomic score for individual or single income families was created by multiplying the educational score by a weight of 3 and the occupational score by 5 and then summing the products (i.e., Hollingshead score = (occupation value x 5) + (education value x 3)). The same equation was used for two income families but the resulting scores from the mother and father were divided by two in order to derive a single score for family socioeconomic status. Child oppositional defiant disorder was assessed by 5 items from the CBCL/4-16 and a composite score was calculated by summing the corresponding items.

### **Estimation of Treatment Effects without Propensity Score Matching**

The measure of mother disciplinary tactics was chosen for matching in this study because some parenting experts have called for the need to distinguish intermediate use of power-assertive disciplinary tactics from the lowest and highest use (Barber & Xia, 2013; Larzelere, Knowles, Henry & Ritchie, in press). The scores from this measure were then standardized and divided into three groups based on the standardized scores: low-level group contained individuals with scores that were one standard deviation below the mean, high-level group included individuals with scores that were one standard deviation above the mean, and individuals in the medium-level group had scores that fell between one standard deviation above the mean and one standard deviation below the mean.

Using multiple regression, initial examination of the data without propensity score matching suggested child social competence and academic performance at the second grade were negatively associated with the use of disciplinary tactics by mothers ( $\beta=-1.31$ ,  $SE=0.57$ ,  $p<.05$ ;  $\beta=-0.45$ ,  $SE=0.13$ ,  $p<.001$ , respectively).

### **Balance Evaluation for Propensity Score Matching**

Matching was conducted for mother disciplinary tactics at the kindergarten year. The analysis was performed through R statistical software with the twang package being used for propensity score matching. The twang package was chosen because it can handle more than two treatment conditions (this is realized through the mnps function in twang) and thus it fits the treatment configuration of this study (three power-assertive disciplinary tactics conditions have been created: high, medium and low). The twang employs tree-based regression models that use iterations to estimate the weights for multiple treatments. The parameter of interest for impact evaluation used in this study is the average treatment effect (ATE) which assesses the average level of gain or loss on the outcome if a randomly chosen person were assigned to a particular treatment compared with another treatment (Burgette, Griffin & McCaffrey, 2017). The stopping rule was the absolute standardized bias or the effect size (ES) which calculated the absolute standardized mean difference as for the estimate of balance metric and the mean of the balance metrics as a way to summarize across covariates (“es.mean” hereafter).

A series of graphic and statistical diagnostics are then used to evaluate the degree of balance achieved by the propensity score matching model. Propensity score analysis assumes that the probability of receiving each treatment for each experimental unit should be non-zero and in the graph this is reflected by the overlap of empirical distributions of propensity scores. As shown in Figure 12.1, the non-zero probability assumption is generally met when assessing the balance of match on mother disciplinary tactics. A second step of balance diagnosis is to assess the reduction of absolute standardized mean differences (ASMD) between the treatment groups after weighting is

applied. Figure 12.2 showed significant decreases of ASMD after weighting was applied through the es.mean stopping rule. Statistical diagnostics were in line with these graphic assessments as indicated by the increased p-values after weighting (Table 12.1). From Table 12.2, we see that the effective sample sizes after the matching do not deviate from the original sample sizes before matching, indicating that the majority of cases are retained.



Table 12.1. Covariate Balance Statistics for Propensity Score Matching on Mother Disciplinary Tactics

	Maximum Standardized Effect Size	Minimum p-value	Maximum Kolmogorov-Smirnov Score	Minimum Kolmogorov-Smirnov p-value
<b>Before weighting</b>	0.25	0.04	0.16	0.09
	0.15	0.17	0.11	0.29
	0.34	0.01	0.20	0.02
	0.15	0.19	0.08	0.63
	0.20	0.07	0.11	0.20
	0.43	0.00	0.17	0.06
	0.09	0.45	0.10	0.72
<b>After weighting</b>	0.03	0.85	0.05	0.98
	0.12	0.29	0.11	0.51
	0.03	0.78	0.07	0.96
	0.11	0.33	0.08	0.66
	0.21	0.03	0.09	0.58

Table12.2. Sample Sizes Before and After Propensity Score Matching.

<b>Power assertive disciplinary tactic treatment condition</b>	<b>Original sample size before matching</b>	<b>Effective sample size after matching</b>
Low	111	94.25
Medium	356	343.87
High	114	101.45

Figure 12.1. Non-zero Assumption for Propensity Score Matching on Mother Disciplinary Tactics.

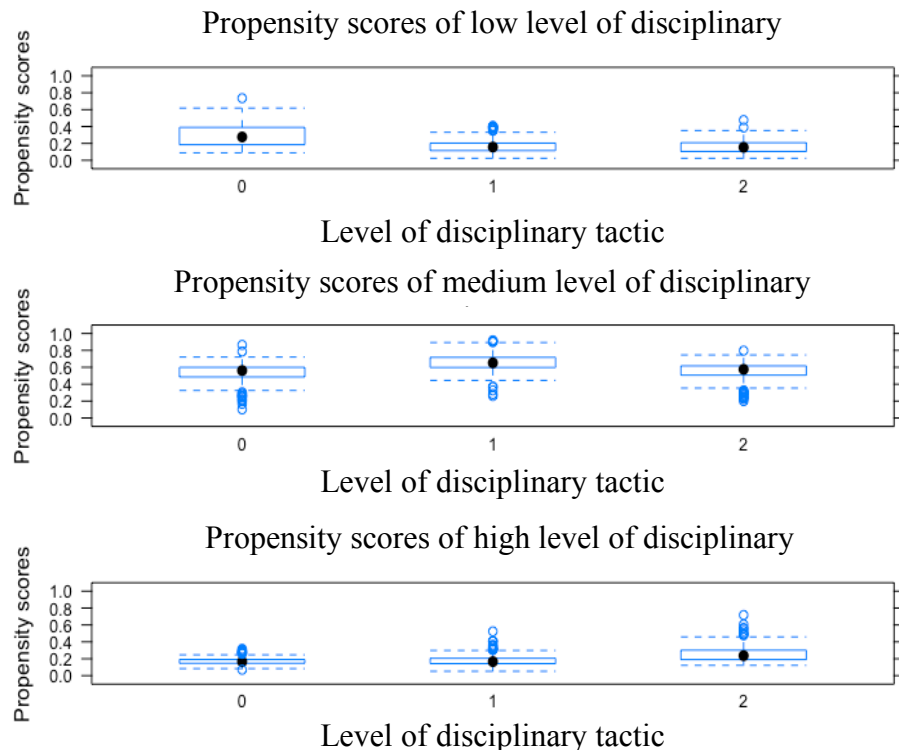
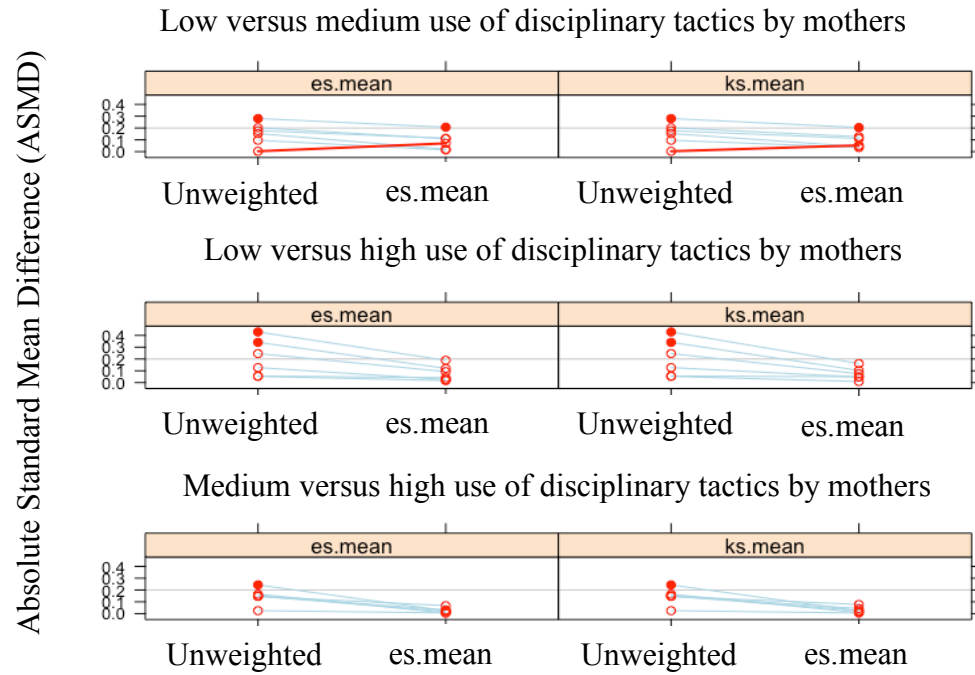


Figure 12.2. Pairwise ASMD comparison for propensity score matching on mother disciplinary tactics.



### Regression using Propensity Scores

Four models were run by predicting the influences of mother disciplinary tactics on different child outcomes. By setting the low level of mother disciplinary tactics as the reference group, the medium level of mother disciplinary tactics predicted a lower level of externalizing problems, but this prediction was not significant ( $\beta = -2.72$ ,  $SE = 2.94$ ,  $p = 0.36$ ). The high level of mother disciplinary tactics did not significantly differ from low level of mother disciplinary tactics in predicting child externalizing problems ( $\beta = 0.57$ ,  $SE = 3.42$ ,  $p = 0.87$ ). Compared with low level of mother disciplinary tactics, no significant difference was found for high and medium level of mother disciplinary tactics when predicting child internalizing problems. High level of mother disciplinary tactics did, however, significantly predict lower level of child social competence ( $\beta = -2.30$ ,  $SE = 1.15$ ,  $p < .05$ ) and academic performance ( $\beta = -0.56$ ,  $SE = 0.26$ ,  $p < .05$ ) relative to low level of mother disciplinary tactics whereas no significant difference was found between medium level and low level of mother disciplinary tactics in predicting child internalizing problems ( $\beta = -0.58$ ,  $SE = 0.85$ ,  $p = 0.49$ ).

## Appendix B

### Coding Instructions for Synchrony at Age 16

Rate: All (Dyadic)

Synchrony assesses the harmony, interconnectedness, responsiveness, reciprocity, engagement, mutual focus, and shared affect of the dyad. It assesses how coordinated and balanced the interaction is (e.g., smooth turn taking and following the other's lead). It could be characterized by a balance between partners in leading and following the action sequence. That is, one partner does not dominate the interaction. Both partners are responsive to one another. Synchrony indexes the degree to which the members of the dyad reflect back on one another (e.g., reflective listening). It is a judgment of the smoothness of the dyad's interaction free from warmth. Thus, this is not synonymous with positive affect (or warmth). In fact, it is possible for a dyad to be low in positive affect, yet still be highly synchronous.

**1** = Both partners are in the room, but are engaged in different or parallel activities with no interaction.

- Mom and teen look only at cards or around the room but not each other and do not converse

**2** = Partners interact, but don't seem to be on the same wave-length. One condition that suggests a rating of '2' is if partners talk but they don't have a shared focus throughout the majority of the 8-minute segment. One partner may talk about the housework and chores while the other talks about the mall, and they don't respond to the other's comments, throughout a segment. To be coded a '2', the partners do not make eye contact or share affect. A '2' also may be assigned if one partner bids for attention and the other consistently ignores or makes irrelevant responses a majority of the time. A '2' may be assigned if one partner totally dominates the interaction during the segment.

- Mom says, "I'd really like to talk to you about this housework issue," and the adolescent

laughs or ignores her. This type of behavior would be consistent during the segment.

- The adolescent monopolizes the conversation and will not let mom interrupt the filibuster throughout the segment.
- Mom is talking about housework, and the adolescent announces “I want dinner.” Again, such behavior would be consistent throughout the segment.
- Mom is on-task discussing problem, but the adolescent is ignoring her and tapping the microphone through the majority of the segment.

**3** = If partners are making eye contact and/or sharing affect, this tends to rule out assigning a ‘2’, even if they are engaged in different tasks. Such behavior would be assigned a ‘3’. A ‘3’ also would be assigned if a partner abruptly interrupts ongoing interaction or the others’ focus, especially if this seems very inappropriate, a majority of times during the segment.

- Mom is talking about cleaning and the adolescent abruptly butts in and won’t let her finish. Such behavior would occur repeatedly throughout the segment.
- Mom says, “I’d really like to talk to you about this housework issue” and the adolescent looks at her but does not respond verbally. Such examples would occur repeatedly during the segment.

**4** = One way to receive a ‘4’ is for a significant portion of the segment to look like a ‘3’, but other portions of the segment look like higher levels of synchrony. A second way to receive a ‘4’ is for most of the segment to look fairly synchronous, but for there to be one or more notable, obvious miscues. A rating of ‘4’ may be assigned if the partners are using the same materials (e.g., card prompts), but the focus of attention is mostly on the materials themselves rather than on the actions, affect, etc. of the partner. A ‘4’ also can be assigned if the partners have the same focus, but one is dominating and the other following for the majority of the segment. For instance, if the partners are sharing the same focus, but this is because one is carrying the “synchrony” by always being responsive to the partner. Shared affect and/or a good bit of eye

contact throughout the segment tends to rule out a rating of '4'.

- Mother makes suggestions about possible solutions to the present problems and the teen always agrees and follows mother's suggestion; mother never follows adolescent's suggestion or adolescent may make occasional comments such as, "Oh." Partners do not make eye contact or share affect.

**5** = A rating of '5' is assigned to dyads who are typical in regards to synchrony. Partners are engaged in the same activity and have a joint focus through the majority of the segment. To get a '5', both partners must be responsive to each other, noticing cues and responding with at least minimal appropriateness (e.g., not ignoring or doing something bizarre). There often is some balance and mutuality in the leading and following, but not perfect balance. That is, both partners may make suggestions and receive positive responses and get a rating of '5'. Partners may have eye contact and shared affect and receive a '5', but can receive a '5' without shared affect or eye contact. Basic turn-taking without additional signs of synchrony would tend to get a '5'.

- The parent and teen take turns giving opinions on problems, rarely commenting on each others' opinions, and not making a lot of eye contact or sharing affect.

**6** = A rating of '6' is assigned when partners are engaged in the same activity and there is some balance and mutuality in leading, following, and responsiveness throughout the segment. To get a '6', there must be at least some eye contact or some shared affect (e.g., looking at each other and laughing; both looking surprised at a topic), but it need not be for the whole period.

**7** = A rating of '7' is given when partners are engaged in the same activity and there is considerable

balance and mutuality in leading, following, and responsiveness throughout the segment. To get a '7', there must be considerable eye contact or shared affect (e.g., looking at each other and laughing; both looking surprised at a topic), but it need not be for the whole period. Any miscues seem inconsequential or trivial in the context of the interaction.



- Partners are engaged in a conversation in which the tone and pace are well-timed and matched, indicating considerable mutual responsiveness.
- The parent or adolescent appears especially responsive.

**8** = A rating of '8' is given for partners who are engaged in the same activity, are mutually responsive to one another, mutually balanced in offering leads and following leads, have equal responsibility for maintaining the interaction and share affect and/or make eye contact a good bit. Minor miscues occur but seem inconsequential.

**9** = A rating of '9' is given for partners who are engaged in the same activity, are mutually responsive to one another, mutually balanced in offering leads and following leads, have equal responsibility for maintaining the interaction and share affect and/or make eye contact a good bit throughout the segment. Partners can both be described as responsive. Even minor miscues do not occur.

Clarifications: Synchrony

1. Physical closeness can substitute for eye contact or shared affect, if the closeness reflects moving together, shared, joint agenda.

2. Behaviors that tend to raise ratings:

- a. Eye contact
- b. Shared affect
- c. Responsiveness of **BOTH** partners
- d. Suggestions by **BOTH** partners
- e. Physical closeness

3. Behaviors/actions that tend to lower ratings:

- a. One partner is directing other, and other is following - it is not mutual or reciprocal.
- b. One partner is making comments that are irrelevant to partner's interest (e.g., The adolescent is talking about school work, and the mother is talking about garden club).
- c. What is allowed for one partner is not for another (e.g., The parent teases the

adolescent, but gets angry when adolescent does the same back).

d. One partner ignores or misses the other's cues.

e. One partner abruptly and inappropriately changes the topic/focus of the problem solving task.

f. One partner constantly interrupts the other person.

g. One partner is completely (or nearly) disengaged from the task.

h. One partner talks directly to the camera (e.g., mother talks about the teen in the third person).

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