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An examination of relations among Taiwanese elementary-aged children's effortful control, social relationships, and adjustment at school

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AN EXAMINATION OF RELATIONS AMONG TAIWANESE ELEMENTARY-AGED CHILDREN'S EFFORTFUL CONTROL, SOCIAL RELATIONSHIPS, AND ADJUSTMENT AT SCHOOL

by

Chin-Fang Huang

An Abstract

Of a thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Psychological and Quantitative Foundations (Educational Psychology) in the Graduate College of The University of Iowa

May 2010

Thesis Supervisors: Associate Professor Kathy L. Schuh
Professor Johnmarshall Reeve

ABSTRACT

The purpose of the present study was to examine the relations among Taiwanese elementary school children's effortful control, social relationships and their adjustment at school. Data were gathered on 407 third- to sixth-grade children (81 third graders, 79 fourth graders, 116 fifth graders, and 131 sixth graders) attending three low- to middle-class public elementary schools in Taipei County, Taiwan. Participating children as well as their parents, teachers, and peers provided questionnaire and peer sociometric data. Two main research questions were addressed: a) whether there were direct relations among children's effortful control, social relationships, and adjustment at school; b) whether social relationships mediate the relations between children's effortful control and their adjustment at school. Additionally, two alternative models were tested to evaluate the likelihood of other conceptual considerations.

Structural equation modeling was used to analyze the data and examine the direct and meditational relations among the study constructs. As expected findings of this study provided evidence for the direct effects of effortful control on children's adjustment at school. Moreover, the role of teacher-child relationships as a mediator in the pathways from effortful control to children's adjustment at school (i.e., social behavior, school attitudes, and academic adjustment) was strongly supported. Consistent with the hypotheses, the meditational effects of peer relationships were also clearly supported in the pathways from effortful control to social behavior as well as school attitudes. However, inconsistent with the hypothesis, there is no evidence of a mediating effect of peer relationships by which effortful control contributes to academic adjustment. Finally, compared with the alternative models, the hypothesized model best fit the given data.

In general, the current study suggested that children's self-regulatory capabilities (i.e., effortful control) influence their adjustment at school both directly and indirectly through their relationships with teachers and peers. This study contributes to the literature of children's school adjustment by examining the effects of both dispositional self-regulation and social relationships. It is also one of the first studies to examine how teacher-child relationships and peer relationships are linked to multiple aspects of children's adjustment at school. Practical implications include a rationale to provide parents, caregivers, and teachers with specific strategies and techniques to support the development of effortful control. The findings of the study also call for a need to develop preventive interventions or training programs focusing on the development of positive classroom relationships.

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CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

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To my father, Pong-Zhi Huang
for his endless love and support

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Structural equation modeling was used to analyze the data and examine the direct and meditational relations among the study constructs. As expected findings of this study provided evidence for the direct effects of effortful control on children's adjustment at school. Moreover, the role of teacher-child relationships as a mediator in the pathways from effortful control to children's adjustment at school (i.e., social behavior, school attitudes, and academic adjustment) was strongly supported. Consistent with the hypotheses, the meditational effects of peer relationships were also clearly supported in the pathways from effortful control to social behavior as well as school attitudes. However, inconsistent with the hypothesis, there is no evidence of a mediating effect of peer relationships by which effortful control contributes to academic adjustment. Finally, compared with the alternative models, the hypothesized model best fit the given data.

In general, the current study suggested that children's self-regulatory capabilities (i.e., effortful control) influence their adjustment at school both directly and indirectly through their relationships with teachers and peers. This study contributes to the literature of children's school adjustment by examining the effects of both dispositional self-regulation and social relationships. It is also one of the first studies to examine how teacher-child relationships and peer relationships are linked to multiple aspects of children's adjustment at school. Practical implications include a rationale to provide parents, caregivers, and teachers with specific strategies and techniques to support the development of effortful control. The findings of the study also call for a need to develop preventive interventions or training programs focusing on the development of positive classroom relationships.

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CHAPTER I

INTRODUCTION

Statement of the Problem

From the time children enter kindergarten to the time they graduate from high school, they are confronted daily with numerous tasks to perform and challenges to negotiate, including adapting to school routines, participating in academic tasks, and exhibiting contextually appropriate behavior in the classroom (Ladd, 1996). Therefore, how children adapt to school life has been an important issue for researchers interested in the promotion of competence and the prevention of educational and psychological maladjustment. Certainly, children's adjustment at school is an outcome resulting from complex systems with particular constraints and requirements that interact with a range of individual characteristics and social contexts. In other words, children's individual characteristics not only influence their own adaptation to school but also have an important impact on how they are viewed and treated by their significant figures, such as school teachers and peers (Rothbart & Bates, 1998; Rothbart & Jones, 1998). Ecologically-oriented research has, thus, emphasized the importance of examining the complex interactions of children's individual characteristics and social processes associated with successful adjustment at school.

Increasing understanding of children's individual differences and their relationships to adaptations or problems can be extremely helpful in shifting the focus from educators' negative attributions of purposeful misbehavior to active problem-solving. Also, increasing awareness of how children's individual characteristics (i.e., temperamental dimensions of emotion-related regulation) might contribute to situations

that reduce teacher-child conflicts and peer group rejection, as well as to the development of appropriate strategies specific to the characteristics involved. Therefore, the purpose of the current study was to show how the individual difference characteristic of temperament-related emotion regulation explains children's successful versus unsuccessful school adjustment. The present study sought to show how children's emotion regulation explains their school adjustment directly but also indirectly, as efficient emotion- regulation abilities allow children to develop high-quality relationships that facilitate successful school adjustment whereas inefficient emotion regulation works against children developing the high-quality relationships associated with successful school adjustment.

Background of the Study

Effortful control, an aspect of temperament defined as "voluntary, conscious, and contextually appropriate efforts to control emotional processes and related behaviors" is believed to play a fundamental role in the self-regulation of emotion (Rothbart, Ahadi, & Hershey, 1994, p. 89) and often is used as an index of this capacity (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Eisenberg, et al., 2005). Blair (2002) noted that inefficient emotion regulation physiologically inhibits a child's use of higher-order cognitive processes in the classroom. Children who have difficulty paying attention, following directions, getting alone with others, and controlling negative emotions of anger and distress are less successful in school (Graziano, Reavis, Keane, & Calkins, 2007; McClelland, Morrison, & Holmes, 2000). In general, researchers have found that compared to children who have difficulties in regulating their emotion and behavior, children who are capable of modulating their emotions and behaviors flexibly and

adaptively tend to be more socially competent (Huges, Dunn, & White, 1998), demonstrate more empathetic and prosocial behavior (Blair, 2002; Eisenberg et al., 2003), are less likely to display concurrent and subsequent behavior problems (Eisenberg, Fabes, & Spinrad, 2006; Kochanska & Knaack, 2003) and demonstrate higher levels of academic achievement (Blair, 2002; Raver, 2002).

There may be a variety of reasons to expect children's effortful control to be linked to their school adjustment. One set of explanations concerns the quality of interpersonal relationships children form and maintain with their teachers and peers. While children's individual characteristics influence their own adaptation to school, these characteristics also have an important influence on how they are viewed and treated by their teachers and peers. Teachers may have a prior idea about the qualities of a model student, with students viewed as more teachable as they closely match those expectations. In one study, Martin (1985) reported that children who are distractible and low in attention received more criticism from their teachers. That is, it is possible that when children are high in effortful control, they receive more emotional and instructional support from teachers and get more opportunities to practice their social skills and become engaged in academic-related activities and, thus, learn more. Consequently, those children are expected to be more successful in school adjustment, including demonstrating positive school attitudes, being socially competent and displaying higher levels of academic performance (Hughes & Kwok, 2007; Ladd et al., 1999; Wentzel, 1999). In the same manner, better emotionally-regulated children, who cooperate with classmates, share equipment and attention, and maintain positive demeanors, are likely to have more friends and be well-accepted in the group. In turn, they may feel comfortable

and confident in a school environment, display more socially appropriate behavior, and have higher degrees of participation in academic learning.

If social relationships mediate the relationship of effortful control to children's school adjustment, one certainly would expect a relation between children's teacher-child and peer relationships and school adjustment. In the current study, teacher-child relationship is defined as the level of closeness, children's dependence, and the prevalence of conflicts among teacher-child interactions (Hamre & Pianta, 2001; Pianta, 1994). Numerous studies have demonstrated significant associations between aspects of teacher-child relationships and children's social and academic adjustment at school (Baker, 2006; Birch & Ladd, 1997; Hamre & Pianta, 2005; Wentzel, 2002). As summarized by Klem and Connell (2004), studies show that students with caring and supportive teacher-child relationships report more positive academic attitudes and values and positive motivational outcomes. In addition, the emotional connection between teachers and children in schools affect children's social adjustment as well. Generally, supportive teacher-child relationships were found to be associated with adaptive adjustment outcomes, including positive affect, better school attitudes and participation, and higher academic achievement. Conversely, children who have conflictual or over-dependent relationships with their teachers are more likely to have difficulties in both social and scholastic adjustment (Birch & Ladd, 1997; Ladd, et al., 1999; Ladd & Price, 1987; Wentzel, 2002).

Peer relationships are also an important factor in children's social adjustment. Empirical evidence has indicated that children who experience difficulties with peer relationships are at greater risk for later academic and social adjustment, such as poor

academic performance, retention, truancy, negative perceptions of school, and behavior problems (Kupersmidt, Coie, & Dodge, 1990; Ladd & Coleman, 1997; Parker & Asher, 1987). In contrast, preschoolers with positive peer relationships have a greater likelihood of experiencing success in both academic and social performance in elementary school and high school years (Ladd & Price, 1987; Ladd, Kochenderfer, & Coleman, 1996).

To date, most of the research focusing on the relations among children's emotional regulation skills, social relationships, and school adjustment has primarily examined the direct links between these constructs rather than the underlying processes. For example, although relationships between regulatory abilities (based on temperament) and academic functioning have been reported, the mechanisms supporting these are not well-understood. Thus, research is still needed to examine the mediated linkages among dispositional self-regulation (i.e., effortful control of attention and behavior), social relationships (i.e., teacher-child relationships and peer relationships), and children's school adjustment in elementary school years.

Definition of Terms

In the current study, the following terms were defined.

- **Effortful control** refers to the ability to suppress a dominant response to perform a subdominant response, to plan, and to detect errors.
- **Teacher-child relationships** refers to the level of "closeness" within the teacher-child relationship, the prevalence of "conflict" between the teacher-child interactions, and the degree of dependence the child has on the teacher to regulate the environment.
- **Peer relationships** refers to social relationships that exist between individuals

of approximately the same age and development level including friendship and group acceptance/rejection.

- **Social behavior** refers to the degree to which children display socially appropriate or inappropriate behavior including prosocial behavior, disruptive behavior, and aggression.
- **School attitudes** refers to the degree to which children develop positive or negative perceptions toward school.
- **Academic adjustment** refers to the degree to which children become involved in classroom-related activities and their performing at grade point average (GPA).

Research Questions

The major purpose of the current study is to further extend knowledge about the antecedents of school adjustment by examining how child temperamental characteristics will influence environmental attributes and then contribute to it. To achieve the purpose, the investigator undertook a comprehensive examination of a) the extent to which Taiwanese children's capability of dispositional self-regulation contributes to their school adjustment in elementary school age, b) the way both teacher-child relationships and peer relationships function to yield adaptive or maladaptive adjustment outcomes for Taiwanese children at school, and c) the degree to which the relationship of Taiwanese children's dispositional self-regulation is related to their school adjustment through the mediation of social relationships. More specifically, this study will investigate the following questions:

- Research question 1**:** To what extent does elementary-aged Taiwanese children's

effortful control directly predict their adjustment at school?

- Research question 2**:** To what extent does effortful control predict the relationships elementary-aged Taiwanese children form with their teachers and peers?
- Research question 3**:** To what extent does the quality of the social relationships formed with classroom peers by elementary-aged Taiwanese children predict their adjustment at school?
- Research question 4**:** To what extent does the quality of the social relationships formed with classroom teachers by elementary-aged Taiwanese children predict their adjustment at school?
- Research question 5**:** To what extent does elementary-aged Taiwanese children's effortful control indirectly predict their adjustment at school? To what extent do these children's relationships with peers mediate the otherwise direct relationships between effortful control and children's adjustment at school?
- Research question 6**:** To what extent does elementary-aged Taiwanese children's effortful control indirectly predict their adjustment at school? To what extent do these children's relationships with teachers mediate the otherwise direct relationships between effortful control and children's adjustment at school?

Significance of the Study

Children's successful school adjustment is an important component of their overall development; as a result, understanding how children adapt to school has been an important object for researchers and educators. Historically, researchers have often attributed child maladjustment either to constitutional factors or to environmental influences (Ladd & Troop-Gordon, 2003). However, Ladd, Birch, and Buhs (1999) criticized that researchers' efforts have been skewed toward the investigation of (1) single, rather than combined or multiple, risk and protective factors, and (2) attributes that are assumed to lie within the child as opposed to within the child's environment (p. 1373). Recently, more and more studies have attempted to identify risk and protective factors—both children's individual characteristics and contextual factors that are linked to their later social and scholastic success in school (Baker, 2006; Hamre & Pianta, 2005; Perry & Weinstein, 1998; Raver, 2002). In particular, several researchers and theorists have highlighted the complex interplay between child characteristics and the multiple social contexts children inhabit.

Drawing from an ecological developmental perspective on the precursors and correlates of school adjustment trajectories, children's individual characteristics affect how environmental forces function, including how parents, teachers, and peers respond to them. In turn, these environmental stressors or supports influence children's adjustment at school. Therefore, it is necessary to move beyond univariate models of risk and protection to examine the ways in which child and contextual forces separately influence adaptation to school life (Silver, Measelle, Armstrong, & Essex, 2005). In addition, Ladd et al. (2001) also suggested that the role of psychosocial deficits and resources in school

adjustment should be emphasized. For the last two decades, there seems to be no powerfully persuasive body of research to support the influences of children's psychosocial development (e.g., emotion-related regulation) on their adaptation to school life, particularly for elementary age children (Baker, 2006). Even though some efforts have been made to identify the associations between children's emotional and social capabilities and their school adjustment (Arnold et al., 1999; McLelland, Morrison & Holmes, 2000), relatively little work has been conducted to discern why such associations exist. To examine the associations and understand how children adapt to school life, it is, thus, imperative to focus our attention on a relatively interactive mechanism in which children's emotion-related capability, social contexts and multiple forms of school adjustment are all taken into consideration.

The current study extends the research literature of children's multiple aspects of adjustment at school by directly examining the effects of dispositional self-regulation. In addition, because few studies have been conducted in which both teacher-child and peer relationships are investigated simultaneously, this exploration of multiple social relationships will enhance our understanding of the school supports or stressors that impact children's adjustment in the school environment. This study also contributes to the research of children's school adjustment by examining the effects of dispositional self-regulation through the mediated path from social relationships.

CHAPTER II

LITERATURE REVIEW

In the following sections, a model that assumes that forces within the child and within the child's social-relational environment have independent or combined effects on school adjustment is proposed. Several bodies of literature relevant to the model are reviewed and evaluated in order to provide a theoretical rationale and empirical framework for the current study and also highlight the topics in need of investigation. First, different aspects of school adjustment are conceptualized and defined. Second, research examining the association between children's dispositional self-regulation and school adjustment is reviewed. Next, the possibility that children's social relationships mediate the effects of dispositional self-regulation on school adjustment is considered and addressed. Further, a detailed examination of the notion that children's social relationships may serve as support or risks on their school adjustment is undertaken. Finally, the related research questions and hypotheses are presented.

Children's Adjustment at School

School adjustment is one of the major challenges that children face in their early school-aged years (Ladd, 1990). Existing research suggests that childhood difficulties in school adjustment are associated with behavior and psychosocial problems in adolescence and adulthood, including grade retention, delinquency, school dropout, and psychopathology (Bolger, Patterson, Thompson, & Kupersmidt, 1995). Given the lasting and cumulative effects on children's later academic and socioemotional development, it is imperative to study and identify possible predictors of children's school adjustment. However, what constitutes school adjustment remains a critical question about which

there appears to be little consensus in this field (Ladd, 1996; Ladd, Kochenderfer, & Coleman, 1996). Some of the current research focuses primarily on cognitively-related variables, such as standardized achievement or readiness tests and grades. For example, Reynolds and Bezruczko (1993) take a narrower focus on school adjustment, only emphasizing the academic outcomes at each grade level.

In contrast, Ladd (1989) views school adjustment as a dynamic process in which the child attempts to adapt to the demands of the school environment. School adjustment refers to the degree to which a child becomes interested, engaged, comfortable, and successful in his or her school environment (Ladd & Price, 1987). As a result, school adjustment is reflected in the degree to which the child develops positive versus negative perceptions of school, feels comfortable versus distressed in new classrooms, becomes involved versus avoids school-related activities, and progresses versus falls behind at academic tasks. Likewise, Perry and Weinstein (1998) conceptualized school adjustment as a multifaceted task, involving adaptation to the intellectual, socioemotional, and behavioral demands of the classroom learning activities and reflected in the development of specific competencies across these domains. They draw on Masten et al.'s work (1995) and characterize three distinct dimensions of competence in children's adjustment at school: academic achievement, social competence, and conduct (Perry & Weinstein, 1998).

Although school adjustment has been conceptualized differently across studies, there is an increasing recognition that children's overall adjustment and success at school requires the willingness as well as the ability to meet both social and academic challenges (Wentzel, 1999, 2003). In other words, children who succeed socially and academically

in adjusting to the school environment will be considered as adapted readily. Accordingly, for the current study, children's adjustment at school includes:1) their attitudes toward school (Kochenderfer & Ladd, 1996); 2) social behavior (Murphy, Shepard, Eisenberg, & Fabes, 2004); and 3) academic adjustment (Ladd, Birch, & Buhs, 1999; Ladd, Buhs, & Troop, 2004).

First, "school attitude" refers to the degree to which children like going to, and being in the school environment versus the extent to which they wish they could avoid going to school. Ladd and Kochenderfer-Ladd (2002) found that children's self-reported attitudes toward school significantly predicted teachers' perceptions of their involvement in academy-related activities. Additional studies indicated that children's positive feelings about school were related to their high level of academic progress and academic competence. For example, Briggs and Nichols (2001) found some evidence of a positive concurrent relationship between school liking and enjoying literacy. In Ramey, Lanzi, Phillips, and Ramey's (1998) study, teachers reported that children who had positive perceptions were more academically competent than those with negative perceptions. On the other hand, albeit limited, support for the hypothesized relationship between high levels of school liking and low levels of school avoidance and attendance exist (Berndt & Keefe, 1995; Ladd et al., 1996). It seems that children who dislike school feel less belonging and connected to school environment and report low levels of motivation to attend classes.

The second aspect of school adjustment is to develop socially appropriate rather than inappropriate behavior. Displaying socially appropriate behavior indicates that a child needs to achieve his or her personal intensions or desires in a situationally- and

culturally-appropriate manner and to maintain positive relationships with others (Rose-Krasnor, 1992). In the present study, children's socially appropriate or inappropriate behavior is focused on the degree to which they display prosocial behavior, disruptive behavior, and aggression. A body of evidence has indicated that children who are socially cooperative, friendly, and well-accepted by peer groups are likely to have good performance in both social and academic areas and to be psychologically resilient (Masten et al., 1995; Rubin, Chen, McDougall, Bowker, & McKinnon, 1995). Further, children with disruptive behavior or aggression tend to be members of deviant peer groups and to have a higher level of school dropout and misconduct (Junttila, Voeten, Kaukiainen, & Vauras, 2006).

Lastly, in addition to GPA, children's engagement or involvement in the classroom environment is especially critical in school adjustment as it serves as the basis for later learning and is consequently correlated with academic achievement. From a motivational perspective, Ladd, Birch, and Buhs (1999) defined classroom engagement as children's willingness to actively adhere to the social rules and role expectations of the classroom. Behaviorally, one aspect of this construct can be termed cooperative participation—the extent to which children conduct themselves in a cooperative and responsible manner in response to teachers' and classroom demands. The other action pattern is independent participation, indicating the degree to which children display autonomous, self-reliant behavior toward classroom activities and learning tasks. Research evidence indicates that measures of classroom engagement such as cooperative participation and independent participation are related to academic progress including math skills, language skills, and attendance (Valiente, Lemery-Chalfant, & Castro, 2007;

Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008). Low-engaged children are likely to have difficulty following rules and capitalizing on learning opportunities that are correlated with cognitive functioning (Hughes & Kwok, 2006). Moreover, the level of engagement has been linked with expectations about academic abilities, children's long-term academic achievement, and their eventual completion of school (Connell, Spencer, & Abel, 1994; Skinner, Zimmer-Gembeck & Connell, 1998).

Linking Effortful Control to Children's Adjustment at School

Effortful control has been identified as a crucial developmental task of early childhood, provides the foundation for independent and adaptive behavioral functioning, and thus is believed to be a key component for success at school. Researchers have continued to find that children who are emotionally and behaviorally well-regulated have a significantly greater chance of early school success, whereas children who experience serious emotional difficulties face a severe risk of early school adjustment. For example, Blair (2002) suggested that inefficient emotional regulation physiologically inhibits a child's use of higher-older cognitive processes, including working memory, attention, and planning in the classroom settings. Huffman, Mehlinger, and Kerivan (2000) also articulated that children's regulatory abilities contributed to competence beyond measures of IQ. In addition, individual differences in children's regulatory abilities have shown to predict differences in externalizing behaviors, social competence, and conscience. As well, The National Academy of Science committee report "*From Neurons to Neighborhood*" has noted that the growth of emotion-related regulation is a corner stone of early childhood development that cuts across all domains of behaviors (Shonkoff & Phillips, 2000).Taken together, those findings indicate that children who have

difficulties paying attention, following directions, and controlling negative emotions of anger as well as distress are expected to be less successful in school (Raver, 2002).

The Role of Effortful Control in Emotional Self-Regulation

According to Rothbart and her colleagues (1998, 2001, 2003), effortful control, the self-regulatory aspect of temperament, is reflected in the ability to suppress a dominant response to perform a subdominant response, to plan, and to detect errors. In the last decade, some researchers have proposed that effortful control denotes a class of self-regulatory mechanisms on children's regulation of emotion (Eisenberg et al., 2005; Eisenberg, Smith, Sadovsky, & Spinrad, 2004; Kochanska, Murray, & Harlan, 2000; Rothbart & Bates, 1998). Although there are numerous ways to define dimensions of temperament, the current study draws on Rothbart's definition of temperament. According to Rothbart and Bates' work, temperament is "constitutionally based individual differences in emotion, motor, and attentional reactivity and self-regulation" (Rothbart & Bates, 1998, p. 108). Basically, temperament is constituted by six constructs, including positive affect, activity level, fearful distress, irritable distress, effortful control, and agreeableness/ adaptability. Those six constructs can be divided into two categories: dispositional regulation and dispositional reactivity. Dispositional self-regulation encompasses the concept of effortful control with the capability of shifting and focusing attention, as well as inhibiting responses when needed.

Based on Rothbart's series of work, Eisenberg and associates considered effortful control as a voluntary process that involves the ability to shift attention away from one stimuli or task and focus attention elsewhere as appropriate (Eisenberg et al, 2005); these two processes are referred to as attention shifting and attention focusing, representatively.

In particular, attention shifting is defined as the capability to shift attention when desired, while attention focusing is the tendency to maintain attentional focus upon task-oriented channels. Effortful control also involves inhibitory control and activational control. Inhibitory control refers to the capability to suppress inappropriate responses under instructions or in novel or uncertain conditions; activational control indicates the capacity to perform an action when there is a strong tendency to avoid it. Children high in effortful control are expected to voluntarily control their attention and behavior as necessary. Recently, effortful control has been considered as an independent contributor to the school-adjustment process (Blair, 2002). In the following, how effortful control could be related to children's academic and social adjustment is addressed.

The Relationships between Effortful Control and Children's Adjustment at School

Effortful Control and Social Adjustment

Children's effortful control is an important predictor of their positive social behavior. Children who are high in effortful control (i.e. attentional control, inhibitory control, and activation control) are expected to be more capable of modulating their negative emotions and to be relatively competent at interacting with others. Eisenberg and her colleagues (1997) posited that children who can regulate their attention are likely to be relatively positive in social interactions involving emotion. In addition, relatively extreme problems with sustaining attention as evidenced in attention-deficit hyperactivity disorder have been associated with social deficits (Landau & Moore, 1991). Possibly, the ability to effortfully control attention and behavior may foster the skills needed to get along with others and to engage in socially-constructive behaviors.

In fact, the abilities of attentional, inhibitory, and activational control have been long linked with lower levels of distress, frustration, and other negative emotion, although most of the relevant work has been conducted with infants and young children. For example, Kochanska and Knaack (2003) reported that young children with higher effortful control at 22–45 months developed stronger consciences at 56 months and displayed fewer externalizing problems (i.e., disruptive behavior and aggression) at 73 months. In recent work with elementary-aged children, Eisenberg and associates' examination of relationships between children's effortful control and social functioning have indicated that measures of effortful control in children are related to the ability to manage anger reactions with peers (Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994), high levels of sympathy and prosocial behavior (see Eisenberg, Fabes, & Spinrad, 2006, for a review), and social competence and popularity (Eisenberg et al., 1993, 1995; Eisenberg, Valiente, Fabes et al., 2003). Smith (2001) found that young African-American children who more successfully inhibited their behavior in a laboratory task were rated by their teachers as more socially competent. Overall, the studies noted provide support for the importance of effortful control including attentional, inhibitory and activational control, to social aspects of children's school adjustment.

Effortful Control and Academic Adjustment

There is some evidence that children who are better able to control attention frequently have better grades and higher achievement scores (Hoffman et al., 2000; Hughes et al., 2008;Valiente et al., 2008). For example, after accounting for contributions of family background and children's cognitive abilities, Coplan and his colleagues (1999) found a significant relationship between children's attentional abilities and their literacy

and numeric skills. While their mothers had reported greater attentional control at the beginning of the year, children demonstrated better academic skills in the end of the school year. Similarly, Valiente, Lemery-Chalfant and Castro (2007) reported that Mexican-American children's effortful control was related to teacher-reported academic competence and absenteeism. In addition, evidence also supports the hypothesis that children's inhibitory control is positively related to teachers' reports of academic performance. For instance, Opper (2003) demonstrated that young children who are better able to delay gratification were rated by their teachers as more capable at classroom tasks, more capable of solving problems without adult assistance, and more likely to retain information. Simply put, these empirical findings suggest that children who successfully control attention and inhibit inappropriate behavior are more likely to be academically successful than their less well-regulated classmates.

Effortful Control in Taiwanese Culture

Although effortful control reflects constitutionally individual differences in self-regulation, the social or cultural environment may also affect the development of these characteristics and their relationships to individuals' adjustment (Rothbart & Bates, 1998; Zhou, Eisenberg, Reiser, & Wang, 2004). Kerr (2001) theorized that cultural values could influence how people perceive and respond to dispositional characteristics such as temperament, which in turn affects the stability of these characteristics and their developmental outcomes in a given culture. Moreover, culturally-laden institutions (e.g., family and school) or customs may favor temperamentally-based characteristics that are consistent with culturally-valued behaviors and minimize those that are inconsistent (Zhou et al., 2004). Therefore, when investigating the relationships of dispositional self-

regulation to individuals' school adjustment, it is necessary to consider the adaptive meanings of the dispositional characteristics in the specific culture or society.

Compared to Western individualistic cultures, Taiwanese culture has been characterized as a relatively collectivistic culture (Oysenman, Coon, & Kemmelmeier, 2002) in which the individual's conformity to societal and in-group rules and group harmony are highly valued. A collectivist culture emphasizes sensitivity to others' needs, self-discipline, control of the expression of emotion, and control of outward behavior (Eisenberg, Pidada, & Liew, 2001). Thus, the ability to inhibit one's dominant emotions or behavioral tendencies if needed in order to behave in a socially appropriate manner (aspects of effortful control) is crucial for the individual's psychosocial well-being. Additionally, because the typical elementary-school class in urban Taiwan consists of as many as 30–40 students led by one teacher at a time, children's effortful control of attention and behavior is, in particular, highly valued and encouraged because it not only contributes to children's efficacy in regard to classroom learning but also is crucial for maintaining a harmonious learning environment for others. Therefore, children's self-regulation of attention, emotion and behavior, although important to their adjustment at school, would seem to be even more important in Taiwan. In other words, it is reasonable to expect that effortful control will be predictive of Taiwanese students' scholastic and psychosocial adjustment in elementary school.

Dispositional self-regulation (i.e., effortful control) and its relations with school adjustment have been studied primarily in the United States (e.g., Eisenberg, Fabes, Guthrie, & Reiser, 2000; Graziano, Reavis, Keane, & Calkins, 2007; Murphy, Shepard, Eisenberg, & Fabes, 2004; Valiente, Lemery-Chalfant, & Castro, 2007). There have been

very few studies regarding Taiwanese or Chinese children's dispositional self-regulation. In 1993, Ahadi, Rothbart, and Ye compared U.S. and Chinese children's (6-7 years old) temperamental characteristics using the parent-report Children's Behavior Questionnaire (CBQ) and found considerable similarity in the factor structure of temperament across the two cultures. However, because there has been no research investigating the relations of dispositional self-regulation to Chinese children's adjustment, we know little about the implications of these dispositional characteristics for children's adjustment in the Chinese culture. Recently, investigators have begun to consider the moderating role of the broader ecological context and explicitly test for model equivalence across cultures (Raver, 2004). Similar to findings with American children, Zhou, Eisenberg, Wang, and Reiser al. (2004) found a positive relationship between effortful control and social functioning among 7-to10-year-old Chinese children. Specifically, they examined the relations of first and second graders' effortful control and anger/frustration with a composite of teachers' and parents' ratings of children's externalizing problems and low social competence, as well as peers' reports of aggression. It was reported that teacher-, but not parent-, reported effortful control and anger were negatively related to peer-rated aggression. In addition, parents' and teachers' reports of high social competence/low externalizing problems (combined) generally were related to high levels of children's effortful control, and teacher-reported low anger and high effortful control uniquely predicted high-quality social functioning.

With regard to other cultures, Caspi (2000) and Caspi and Silva (1995) conducted studies in New Zealand and obtained evidence consistent with studies done in the United States. They found that children's early differences in emotion-related regulation were

related to their development of social skills and later outcomes. Specifically, at age 18 and 21, it was found that uncontrolled children were displaying more externalizing problems, and were involved in crime and were alcohol dependent. On the other hand, inhibited children were found to be socially uncomfortable, suffering from internalizing problems and depression. Similarly, Esienberg, Pidada, and Liew (2001) investigated the relationships between effortful control and negative emotionality to elementary-age children's social functioning in a study with Indonesian children. The results were also consistent with the data from studies in the United States. It has been found that uniquely addictive effects of effortful control predict children's social functioning.

Social Relationships Act as a Possible Mediator between Effortful Control and School Adjustment

Researchers have tried to draw diverse theoretical conceptualizations to explain the processes that account for the effects of dispositional self-regulation on children's school adjustment. One potential mechanism by which dispositional self-regulation affects children's school adjustment is by affecting the quality of interpersonal relationships, such as teacher-child relationships and peer relationships (Graziano et al., 2007; Valiente et al., 2008). In a survey conducted by the National Center for Early Development and Learning, 46% of a nationally representative sample of kindergarten teachers reported that they were concerned with children's regulatory readiness for school activities rather than more strictly cognitive and academic aspects of readiness (Blair, 2002). The survey suggests that teachers were concerned with being able to teach; that is, they were concerned with the capability of each child to be attentive and responsive and to become engaged in the classroom. Advanced, teachers' views of

children's teachability will likely affect how easy or difficult it will be for that child to enter and prosper in relationships with teachers.

Empirical research evidence has shown that teachers have low tolerance for children who do not exhibit appropriate social behavior, and interact with these children in a more angry, critical, and punishing manner (Cole & Koeppl, 1990). On the other hand, children who display better regulatory capabilities may be more likely to elicit warm and positive interactions with their teachers. Students who experience warm and close teacher-child relationships may be less likely to become over-aroused in stressful situations and be better able, and more motivated, to process teachers' messages and other relevant information. As a consequence, such students are likely to be relatively skilled at managing their behavior and at identifying adults' goals and expectations. In turn, they are expected to be more socially and academically competent and have less problem behaviors. Contrarily, when children are low in regulatory capabilities (i.e., effortful control) and disruptive in class, they receive less classroom support from teachers, miss out on learning opportunities, and view the classroom environment negatively and as something to be avoided (Valiente et al., 2008). Researchers also suggest that through the delivering of appropriate expectations and adequate educational resources, students who enjoy a close and supportive relationship with a teacher may also be more engaged in classroom activities, including working harder in the classroom, persevering in the face of difficulties, accepting teacher direction and criticism, coping better with stress, and attending more to the teacher (Borman & Overman, 2004; Hughes & Kwok, 2007; Wentzel, 1999). In addition, dispositional self-regulation may also influence children's school adjustment by affecting their peer relationships. Eisenberg et

al. have suggested that children who are better able to regulate their negative emotion during peer interactions are rated by teachers and parents as relatively successful in peer relations (Eisenberg et al., 1995; Eisenberg et al., 1996). As children enjoy the positive regard of their peers, they are expected to participate more fully in classroom activities. They may turn to classmates for help, easily understandable explanations, and assurance and thus promote classroom participation and academic performance in the context of positive peer relationships.

Although one assumption is attributing children's dispositional self-regulation directly to outcomes of their school adjustment, it is equally plausible that effortful control has an association with later adjustment due to the quality of children's social relationships. Some researchers have investigated the relationships among children's behavior disposition, interpersonal relation risks, and later academic adjustment (Boivin & Hymel, 1997; Coie et al., 1992; Ladd et al., 1999; Ladd & Burgess, 2001; Ladd & Troop-Gordon, 2003). They have examined whether relational risks predict developmental outcomes after controlling for children's early behavioral dispositions. In most of these studies, peer difficulties mediate the associations between behavior dispositions and later academic adjustment. For example, Ladd and his colleagues proposed a mediator model of children's psychological adjustment which indicates that the effects of children's early behavioral dispositions (e.g., prosocial behavioral style, and antisocial behavioral style) on academic performance are transmitted through other intervening factors, such as children's peer relational history (Ladd et al., 1999; Ladd & Troop-Gordon, 2003). Peer relationships are seen as a mediator between children's behavioral disposition and their later school adjustment. In their longitudinal

investigation (2003), Ladd and Troop-Gordon reported that at-risk children's aggressive behavior was related to later maladjustment directly and indirectly through subsequent relational stressors (i.e., mediated path).

Despite the conceptual attention paid toward understanding the processes linking children's "effortful control" to their social and scholastic adjustment, little empirical research has been conducted to address why this association exists. Valiente et al. (2008) conducted a study to examine the relationships among children's effortful control, teacher-child relationships, and their academic performance. This study provided evidence that the relations between effortful control and GPA were "partially" mediated by teacher-child relationships. Effortful control has found to have both direct and indirect effects (i.e., mediation effect) on academic performance. It is, thus, suggested that more cognition-oriented components of effortful control such as attention allocation may be directly related to children's academic performance. On the other hand, inhibitory components of effortful control are necessary for desirable behavior in classroom learning, but the effects on children's academic performance may be mediated by teacher-child relationships (Valiente et al., 2008). Another related study was conducted to examine children's effortful control, peer-related social competence and their academic achievement (Sylvester, 2007). In contrast, the findings indicated that peer-related social competence did not mediate the relationship between effortful control and academic achievement. Therefore, limited empirical findings seem to suggest that the capability of emotion-related regulation (i.e., effortful control) results in children's adjustment at school both directly and indirectly through the mediation of their social relationships.

Linking Social Relationships to Children's Adjustment at School

Significance of Social Relationships to School Adjustment

Investigators from various research traditions have considered children's relationships with others as both supportive and stressful influences on their development. For example, within early classroom environments, researchers have found that the relationships that children form with classmates and teachers yield supports as well as stressors. Specifically, they have argued that participation in close relationships with positive features of peers and teachers function as supportive forces and are related to adaptive school adjustment outcomes. In contrast, negative features of these relational ties or processes (e.g., rejection by the peer group, conflictual teacher-child relationships) act as stressors and interfere with children's successful adjustment (Birch & Ladd, 1996; Ladd et al., 1999). Pianta and associates (2001) have investigated how children's relationships with teachers in the school environment are likely to foster adaptive functioning in a variety of school adjustment domains. Likewise, Ladd and his colleagues have conducted a series of studies that examine how children's relationships with peers (Ladd, 1990; Ladd et al, 1999; Ladd & Price, 1987; Ladd & Troop-Gordon, 2003) and teachers (Birch & Ladd, 1996, 1997; Ladd et al, 1999) are related to children's adjustment in school contexts. Findings from related research will be addressed in the following sections.

Definition of Teacher-Child Relationships

Given that numerous studies have documented significant associations between aspects of teacher-child relationships and children's social and academic adjustment at

school, the quality of children's relationships with their school teachers has been recognized as an important contributor to their school adaptation (Baker, 2006; Birch & Ladd, 1997; Hamre & Pianta, 2005; Lynch & Cicchetti, 1997; Murray & Malmgren, 2005; Pinata, 1997; Pianta & Stuhlman, 2004). To conceptualize the quality of teacher-child relationships, researchers have utilized the key construct from the literature on parent-child attachment (Birch & Ladd, 1997; Heather, 2003). According to attachment theory, it is believed that through teachers' nurturing and responsiveness to students' needs, students are encouraged to explore their scholastic and social surroundings. Pianta and Steinberg (1992) have attempted to define qualities of teacher-child relationships using teachers' perceptions as indexed on the Student-Teacher Relationship Scale (STRS). The items used on the STRS were derived from attachment theory and research on teacher-child interactions, and were designed to tap the dimensions of warmth/security, anger/dependence, and anxiety/insecurity. Pianta and his colleagues (1995) further analyzed the STRS and reported three distinct factors: closeness, dependence, and conflict/anger (Pianta, Steinberg, & Rollins, 1995). Drawing upon Pianta et al.'s (1995) work, quality of teacher-child relationships in the current study is thus defined as the level of "closeness" within the teacher-child relationship, the prevalence of "conflict" between the teacher-child interactions, and the degree of dependence the child has on the teacher to regulate the environment (Birch & Ladd, 1997; Hamre & Pianta, 2001). In the following, the definitions of three qualitatively distinct aspects of teacher-child relationships and their associations with children's school adjustment are discussed respectively.

Relations of T-C Relationships to School Adjustment

Closeness. Closeness refers to the degree of warmth and open communication that exists between a teacher and a child, which may function as a support for a child within the environment (Birch & Ladd, 1997). From an attachment perspective, children who share a close relationship with their teachers possess a "secure base" from which to explore the environment. Having a warm and connected affection with a significant figure in the classroom is thus thought to facilitate children's learning and school performance (Heather, 2003). Closeness is similar to the idea of relatedness in motivation, which is viewed as a fundamental need required for children's optimal development and psychological well-being. The need for relatedness concerns the universal propensity to interact with, be connected to, and experience caring for and from other people (Deci & Vansteekiste, 2004). Reeve (2006) postulated that relatedness occurs when a teacher provides sense of warmth, affection, and approval for students. When students feel related to their teacher, they show lesser negative affectivity and greater classroom engagement (Furrer & Skinner, 2003; Reeve, 2006). Studies have revealed that closeness between teacher and child is positively linked to children's academic performance, school liking, and self-regulated behaviors (Birch & Ladd, 1997; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002).

Even more compelling, in Hamre and Pianta's (2001) longitudinal study children were followed from kindergarten through eighth grade to examine the extent to which kindergarten teachers' perceptions of their relationships with students predicted a range of school outcomes. It was then reported that girls who had close relationships with their kindergarten teacher tended to have more positive work habits in lower-elementary school, as well as fewer disciplinary problems (i.e. less aggression, fewer disruptions) in

upper-elementary school. Providing a close or related teacher-child relationship has also been found to associate with children's motivation and classroom engagement. For instance, Deci et al. (1992) suggested that interpersonal relationships that provide students with a sense of relatedness can be powerful motivators of children's school-related interests. Other studies showed evidence that children's pursuit of prosocial and social responsibility goals have been related to perceived support from classroom teachers (Wentzel, 1998; 2002).

Dependency. Two dimensions of relational negativity have been identified in the literature of teacher-child interactions associated with children's school adjustment, dependency and conflicts. As a construct, dependency refers to possessive and "clingy" child behaviors that are indicative of an over-reliance on the teacher as a source of support (Birch & Ladd, 1997). Contrasted with closeness, dependency can be viewed as a relationship quality that interferes with children's school adjustment. Children who show high levels of dependency on the teacher may be tentative in their explorations of the social environment, including other social relationships. Several studies have found that children in over-dependent teacher-child relationships early in life were more likely to have adjustment difficulties, more negative school attitudes, and less positive interaction within the school environment. Moreover, over-dependent relationships in kindergarten were also associated with lower grades, lower standardized test scores, and fewer positive work habits, particularly among boys, as well as increased social withdrawal and less social competence in elementary school (Hamre & Pianta, 2001; Ladd & Burgess, 1999; Pianta, Steinberg & Rollins, 1995).

Conflict. Conflictual teacher-child relationships are characterized by

inharmonious interaction, and a lack of understanding within the relationship. Children who experience a great deal of conflict with their teachers limit the extent to which they may rely on that relationship as a source of support (Birch & Ladd, 1997). In other words, conflicts in the teacher-child relationship may function as a stressor for children in the school environment and foster children's feelings of anxiety, anger, as well as alienation. As a result, the conflictual relationships may indirectly impair children's successful adjustment to school. Some studies examining the teacher-child relationships and school adjustment have showed that children with chronic conflicts in relationships with teachers in kindergarten and first-grade demonstrated less cooperative participation in school and lower levels of school liking as compared to children with high levels of teacher-child closeness (Ladd & Burgess, 2001).

Hamre and Pianta (2001) revealed that conflictual relationships with teachers in kindergarten were related to low math and language arts grades, lower standardized scores, and less positive work habits throughout upper elementary and middle school, providing strong evidence that conflictual teacher-child relationships are significant predictors of children's lack of academic adjustment to school. Similarly, Baker (2006) examined the extent to which teacher-child relationships contributed to elementary school-aged children's school adjustment and demonstrated that conflicts in the teacher-child relationships have a moderate association with schooling outcomes, including children's reading grades, work habits, and standardized test score.

As noted earlier, recent research has demonstrated links between teachers' reports of relationships and a range of school outcomes in kindergarten and preschool years. In sum, a positive teacher-child relationship characterized by open communication and a

sense of warmth and closeness is associated with young children's greater adaptation to school in terms of their academic and social adjustment. On the contrary, relational negativity characterized by high levels of dependency and conflicts has been identified as increasing a child's risk for school adjustment difficulties, including behavior problems (e.g., disruptive behavior, aggression), learning problems, negative school attitudes as well as less positive engagement in the school environment (Birch & Ladd, 1997; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Graziano et al., 2007; Hamre & Pianta, 2005; Healther, 2003; Ladd & Burgess, 1999; Pianta & Stuhlman, 2004). Conclusively, there is ample evidence to support the contention that teacher-child relationships play a significant role in the development of both psychosocial and task-oriented competencies that are fundamental to adjustment in early childhood.

However, there has been a gap in the literature regarding the teacher-child relationship as a context for development for children in the elementary-aged period. Relatively little research is known about how the nature and course of teacher-child relationships are associated with elementary-aged children's school-related outcomes. Even if some researchers suggest that children's relationships with teachers become less intense in both positive and negative dimensions as they get older, recent studies have indicated that the teacher-child relationships are robust and conceptually analogous for children in the elementary-aged period. For example, Baker (2006) suggested that an effective teacher-child relationship is beneficial for children throughout the elementary school-aged period. As well, Hamre and Pianta (2001) pointed out that relational negativity continued to uniquely predict behavioral outcomes into upper elementary and middle school, particularly for those students at greatest risk of behavior difficulties.

Given the importance of the elementary period to children's developmental outcomes, this current study is focused on how teacher-child relationships may function as resources and resilience mechanisms or stressors in elementary-aged children's school adjustment.

Definition of Peer Relationships

Of the potential sources of support, children's relationships with classmates may be among the most important. Previous research shows that peer relationships in the classroom are a major concern to children as they enter and progress through the primary grades, and that the quality of children's peer relations in grade school forecasts school avoidance, disruption, and failure during adolescence (Ladd, 1990; Park & Asher, 1987). According to Slee (1993), peer relationships refer to social relationships that exist between individuals of approximately the same age and development level. Researchers have made distinctions among peer relationships and suggested that it is important to determine whether different forms of peer relationships such as the network of interpersonal ties (e.g., friendship) and the social status (i.e., peer acceptance/rejection) are related to children's school adjustment (Ladd, 1990; Ladd & Troop-Gordon, 2003).

In the present study, quality of peer relationships and classroom peer interactions concentrate on friendship and peer acceptance/rejection. Friendship is a dyadic relationship that is characterized by a voluntary, reciprocal, and affective tie between partners. This tie and other forces that underlie friendship formation and maintenance provide a context for peer interactions (Ladd, Kochenderfer, & Coleman, 1997; Ladd & Kochenderfer, 1996; Ladd et al., 1999). In contrast to reciprocated friendships, peer acceptance or rejection refers to the quality of a child's social position within a peer group. Peer acceptance is defined as the degree to which a specific child is liked by the

members of his or her peer group; children who are liked by the majority of their peers are thought of as well-accepted, whereas, those who are disliked by the majority are considered low accepted or rejected. Peer acceptance and rejection are usually assessed through either peer rating (sociometric) procedures, such as by asking children to rate how much they like to play with each of their classmates (Aasher, Singleton, Tinsley & Hymel, 1979), or nomination procedures in which children identify peers they like to play with (Coie, Dodge & Coppotelli, 1982). Children who receive considerably more positive than negative nominations are considered popular or well-liked. In contrast, children who receive substantially more negative than positive nominations are identified as rejected.

Relations of Peer Relationships to School Adjustment

Friendship. A child with a classroom friendship may have at least one other individual with whom he or she can play or interact while at school and, thus, may view school as an enjoyable place to be. Classroom friends may also provide a sense of security, emotional support, or promote positive feelings, which are likely to cultivate a positive attitude toward school. Conversely, children who do not have a mutual friend in the classroom may find themselves unable to use that individual as a source of emotional or instrumental support, and may thus develop more negative attitudes toward the school environment. Findings reported by Coleman (1993) contended that number of friendships was a strong predictor of children's changes in affect (i.e., loneliness, anxiety) and school liking. Likewise, Ladd and Price (1987) indicated that children who entered preschool with familiar classroom friends from kindergarten developed more positive attitudes (i.e., school liking) toward school than did their other classmates. Further, Ladd (1990) found

that children with more classroom friends at the beginning of the school year had more positive school attitudes by the second month of school; moreover children who maintain theses friendships liked school better as the school year continued.

Additionally, children's friendships have also been linked with another facet of school adjustment—children's engagement or participation in the classroom (Kindermann & Skinner, 2009). A reciprocated friendship is considered to serve as a "secure base" from which children can explore both social and learning opportunities in the classroom (Birch & Ladd, 1996). Specifically, children who have friends in the classroom may be able to rely on these individuals as sources of companionship when exploring classroom activities, instrumental aid when confronted with difficulties, and emotional support when needed. Ladd et al. (1999), for example, indicated that children who have more reciprocated friendships in the classroom exhibited higher levels of participation in the setting.

Peer Group Acceptance or Rejection. Peer group acceptance or rejection have been linked to various aspects of young children's school adjustment, including their academic performance (Ladd, 1990), their school affect and attitudes (Birch & Ladd, 1996; Ladd, 1990; Parker & Asher, 1993; Ladd et al., 1997), and their school avoidance (Birch & Ladd, 1996; Ladd, 1990; Ladd et al., 1997). Peer acceptance is linked to school adjustment on the premise that a child's peer group reputation (i.e., accepted versus rejected) determines his or her access to peer-related activities and the quality of interactions with group members. Children who are liked or accepted may develop a sense of inclusion and/or belongingness that promotes positive feelings toward school. On the contrary, children who are disliked or rejected tend to be avoided by peers, denied

access to the social or learning opportunities presented within the classroom environment, and targeted for other forms of exclusion. The exclusion from peer-related activities may then negatively influence children's classroom participation by inhibiting their motivation or opportunities to become engaged in academic tasks with peers. In turn, children are likely to engender a dislike for being at school as a result of being ignored by peers or overtly excluded from various classroom activities (Birch & Ladd, 1996; Ladd et al, 1997). A series of work conducted by Ladd and his colleagues have supported the assertion that children's peer group acceptance or rejection may function as a support or a stressor in the classroom context, and be detrimental to children's adjustment to school. For example, Ladd (1990) found that rejected children developed less positive perceptions of school, displayed higher levels of school avoidance, and exhibited lower levels of school performance than did other children. Similarly, Ladd et al. (1999) reported that peer acceptance can strongly predict children's classroom participation. Children who have high versus low levels of peer group acceptance in the classroom experience different psychological climates and are confronted with different types of experiences.

The empirical literature also provides strong evidence of significant relations of peer relationships to children's prosocial behavior as well as delinquent behavior (e.g., disruptive behavior, aggression). With respect to the linkage between peer acceptance and prosocial behavior, proponents of a peer socialization perspective propose that peer relationships provide unique opportunities for children to learn and practice prosocial skills (Hartup, 1992). Presumably, peer relationships create a context in which conflicts can be resolved in a relatively equal, reciprocal fashion. Within the course of peer

interactions, children develop the ability and willingness to help, share, cooperate, and comply with rules and role expectations. If this perspective has merit, then children who are well-accepted by their classmates should benefit from peer interactions and be more likely to display a repertoire of positive, prosocial behavior than would children who are rejected (Wentzel & McNamara, 1999). In the same manner, some researchers noted that socially rejected children may be deprived of beneficial peer experiences and fail to develop social and cognitive skills that are required to cope with stressful situations. Furthermore, peer rejection experience may induce internal reactions such as a hostility bias or low self-esteem that contribute to children's later delinquent behavior.

Taking the reviewed studies together, a number of researchers have long recognized the importance of close social relationships to children's adjustment and well-being and have noted that disruptions in children's social lives are related to adjustment difficulties in both psychosocial and academic domains. Nevertheless, much of the research examining the link between relational support/stressors and children's psychological and academic adjustment in the school have tended to focus on either teacher-child relationships or peer relationships. Results from the few studies that have investigated multiple domains suggest that a comprehensive examination of children's interpersonal relationships in the classroom may yield even more insight into the complex nature of school adjustment.

Conclusions

For the last two decades, there is a sizable body of evidence indicating that children's socioemotional development is important for their chances of early school success. Certainly, cognitive maturity plays a central role in children's success at school.

However, educational psychologists' and educators' overemphasis on cognition and on children's academic preparedness might overshadow the significance of children's socioemotional-related capabilities for early school adjustment (Raver, 2002; Raver & Ziebler, 1997; Wentzel & Asher, 1995). In general, researchers have suggested that better-regulated children who can control attention and inhibit behaviors in contextually appropriate ways are more likely to adjust successfully to school's academic and social demands. For many children, academic and social adjustment in their first few years of schooling appears to build on a firm foundation of children's emotional and social capabilities (Eisenberg, et al., 2004; Eisenberg et al., 2005; Kochanska et al., 2000; McClelland, Morrison & Holmes, 2000; Smith, 2001).

Recently, Ladd and colleagues (1999, 2003) proposed a "person X environment" mediated model of adaptation to explain how early attributes of the child (i.e., behavioral styles) and the child environment (i.e., school relationships) can possibly be related to later academic achievement. In this model, it is assumed that child-by-environment models might provide a more complete representation of the forces that shape children's school adjustment (Ladd & Troop-Gordon, 2003). For example, the social relationships that children build with teachers and peers are based on children's ability to regulate emotions in prosocial versus antisocial ways and those social relationships then serve as a "source of provision" that either help or hurt children's chances of performing well, academically, at school (Ladd et al., 1999, p.1375). More specifically, they found that children who evidenced prosocial behavioral styles early in kindergarten tended to develop a large number of mutual friends and higher levels of acceptance among classmates, whereas those who exhibited antisocial styles tended to develop fewer mutual

friends and lower levels of peer acceptance. In turn, children who experienced greater success in forming positive or supportive relationships in the classroom tended to develop more adaptive types of classroom activities, and then those who manifested more adaptive types of classroom activities tended to have higher level of academic achievement (Ladd et al., 1999).

Indeed, numerous studies have tried to identify the conditions under which experiences in school settings can promote the early trajectories of children's academic and social functioning. However, most of the studies have often attributed childhood maladjustment either to constitutional factors, such as the child's effortful control, or to environmental influences, such as the child's teacher or peer relationships. In fact, investigations of either children's characteristics or environmental influences on school adjustment have been criticized on the grounds that they only partially account for the mechanisms that are responsible for the development of child health and dysfunction (Coie et al., 1993).

To my knowledge, in Taiwan, there is no other research investigating the relationships among children's effortful control, social relationships, and their school adjustment. Very few researchers in the United States have examined the mediated or moderated relations among dispositional self-regulation (i.e., effortful control), social relationships, and school adjustment. Moreover, most of the studies focus on preschoolers instead of elementary-aged children. Even if few studies have articulated that the effects of children's effortful control on adjustment is transmitted through other intervening factors, the studies primarily focus on children's academic achievement. As an example, Valiente Lemery-Chalfant, and Castro (2007) examined the relations among children's

effortful control, school liking, and academic competence. The results of this study provided evidence that while controlling for the effects of parents' education and family income, school liking mediated the relation between effortful control and academic competence. Valiente et al. (2008) investigated the relations among children's effortful control, teacher-child relationships, social competence, classroom participation and academic competence with a sample of 7- to 12-year-old-children. A hierarchical regression analysis demonstrated that the teacher-child relationship, social competence, and classroom participation partially mediated the relation between effortful control and change in GPA.

Conclusively, there is a need for a comprehensive examination of the links among children's dispositional self-regulation (i.e., effortful control), social relationships with teachers and peers, and adjustment in school contexts (i.e., psychosocial and academic adjustment). The significance of this line of research is further emphasized by the lack of studies that consider how both children's characteristics (i.e., effortful control) and their social relationships (i.e., teachers and peers) in the classrooms separately and jointly contribute to successful school adjustment. Therefore, it is proposed that children's effortful control may be associated with their early school adjustment in at least two ways (refer to Figure 1). First, effortful control may be directly linked to how well children respond to the demands of the school environment. Second, effortful control may be indirectly associated with school adjustment outcomes, mediated by the quality of the relationships that children form with teachers and peers. Moreover, this mediational model proposed in the present study represents an advance over prior research in that multiple forms of children's interpersonal relationships in the classroom are examined in

the same model as mediating processes between children's dispositional self-regulation and school adjustment.

The Pathways of Effortful Control to School Adjustment

The Hypothesized Model

The primary goal of the current study was to systematically examine the relations among children's effortful control, social relationships (i.e., teacher-child relationships and peer relationships), and school adjustment (i.e., school attitude, social behavior, and classroom participation). Based on the preceding literature review, a general pattern of linkage was specified and predicted among the investigated variables (see Figure 1). The research questions and hypotheses are as follows.

Research question 1: To what extent does elementary-aged Taiwanese children's effortful control directly predict their adjustment at school?

- Hypothesis *1-1*: Children who have higher levels of effortful control will display higher levels of socially appropriate behavior than will children with lower levels of effortful control.
- Hypothesis *1-2*: Children who have higher levels of effortful control will display higher levels of a positive attitude toward school than will children with lower levels of effortful control.
- Hypothesis *1-3*: Children who have higher levels of effortful control will display higher levels of academic adjustment than will children with lower levels of effortful control.

Research question 2: To what extent does effortful control predict the relationships these children form with their teachers and peers?

- Hypothesis *2-1*: Children who have higher levels of effortful control will have a better relationship with their teachers than will children with lower levels of effortful control.
- Hypothesis *2-2*: Children who have higher levels of effortful control will have a better relationships with their peers than will children with lower levels of effortful control.

Research question 3: To what extent does the quality of the social relationships formed with classroom peers by elementary-aged Taiwanese children predict their adjustment at school?

- Hypothesis *3-1*: Children who have better relationships with their peers will display higher levels of socially appropriate behavior than will children with poorer relationships with their peers.
- Hypothesis *3-2*: Children who have better relationships with their peers wil display higher level of a positive attitude toward school than will children with poorer relationships with their peers.
- Hypothesis *3-3*: Children who have better relationships with their peers will display higher levels of academic adjustment than will children with poorer relationships with their peers.

Research question 4: To what extent does the quality of the social relationships formed with classroom teachers by elementary-aged Taiwanese children predict their adjustment at school?

- Hypothesis *4-1*: Children who have better relationships with their teachers will display higher levels of socially appropriate behavior than will

children with poorer relationships with their teachers.

- Hypothesis *4-2*: Children who have better relationships with their teachers will display higher level of a positive attitude toward school than will children with poorer relationships with their teachers.
- Hypothesis *4-3*: Children who have better relationships with their teachers will display higher levels of academic adjustment than will children with poorer relationships with their teachers.

Research question 5: To what extent does elementary-aged Taiwanese children's effortful control indirectly predict their adjustment at school? To what extent do these children's relationships with peers mediate the otherwise direct relationships between effortful control and children's adjustment at school?

- Hypothesis *5-1*: The direct influence of children's effortful control on socially appropriate behavior is mediated by the quality of the relationships they formed with peers.
- Hypothesis *5-2*: The direct influence of children's effortful control on positive school attitudes is mediated by the quality of the relationships they formed with peers.
- Hypothesis*5-3*: The direct influence of children's effortful control on academic adjustment is mediated through the relationships they formed with peers.

Research question 6: To what extent does elementary-aged Taiwanese children's effortful control indirectly predict their adjustment at school?

To what extent do these children's relationships with teachers mediate the otherwise direct relationships between effortful control and children's adjustment at school?

- Hypothesis *6-1*: The direct influence of children's effortful control on socially appropriate behavior is mediated by the quality of the relationships they formed with teachers.
- Hypothesis *6-2*: The direct influence of children's effortful control on positive school attitudes is mediated by the quality of the relationships they formed with teachers.
- Hypothesis*6-3*: The direct influence of children's effortful control on academic adjustment is mediated through the relationships they formed with teachers.

In Figure 1, the direct effects of effortful control on school adjustment are presented in the three bold lines representing Hypothesis 1. Because the present study focused attention on the three aspects of school adjustment, the three bold lines represent the direct effects, line 1-1 represents that effortful control will predict children's social behavior, line 1-2 represents that effortful control will predict children's attitudes toward school, and line 1-3 represents that effortful control will predict children's academic adjustment. In addition to these hypothesized direct effects of effortful control on school adjustment, the present study predicts that effortful control has two mediated efforts on school adjustment. The first hypothesized mediator is the quality of children's relationships with peers and the second mediator is the quality of children's relationships with teachers. The indirect effects of effortful control on school adjustment are

represented in dashed lines. Line 5-1 represents that effortful control will predict children's social behavior by the quality of the relationships they formed with peers, line 5-2 represents that effortful control will predict children's school attitudes by the quality of peer relationships, and line5-3 represents that effortful control will predict children's academic adjustment by the quality of peer relationships. Similarly, line 6-1, 6-2, and 6-3 represents that effortful control will predicts children's social behavior, school attitudes, and academic adjustment respectively by the relationships they formed with classroom teachers.

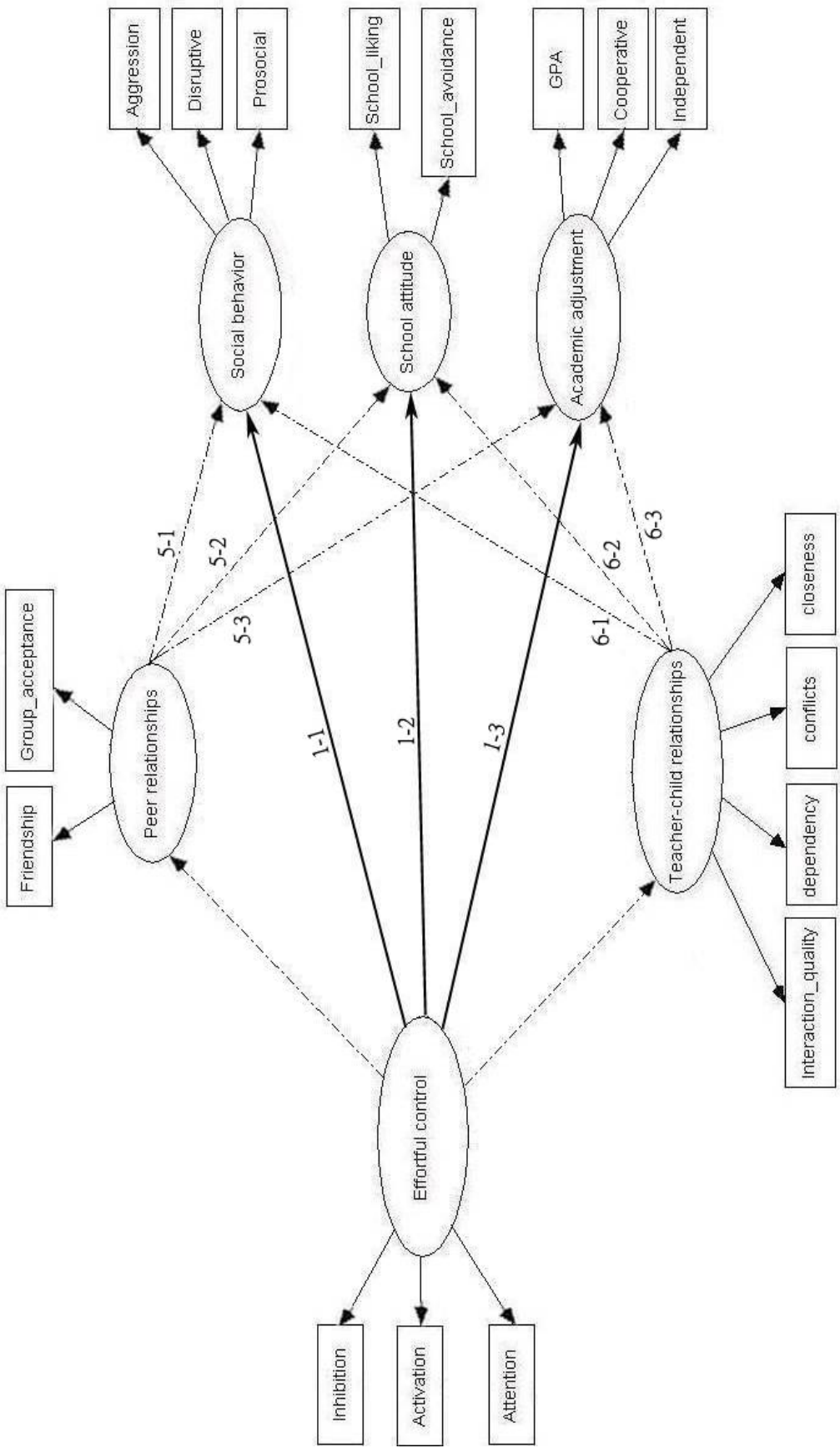

Figure 1. Relationships of Latent Variables in the Hypothetic Model

Alternative Model A

In addition to the hypothesized model, additional models are estimated to evaluate the extent to which the data corroborated alternative hypotheses. Although a child's emotion regulatory ability (i.e., effortful control) is thought to be derived partly from heredity (Rothbart et al, 1994), experience also plays an important role in shaping of this capability (Rothbart & Bates, 1998). It has been argued that children's abilities to regulate their attention, emotion, and behavior are embedded in the contexts of social relationships and that children's emotion self-regulation can be facilitated by their emotion socializers, such as parents or teachers (Fox & Calkins, 2003; Thompson, 1994). On the basis of attachment theory perspectives (Bowlby, 1973, 1980), a close and supportive relationship with one's teacher would be expected to promote a child's emotional security and confidence. A high quality relationship with the teacher may serve as a source that permits children to manage their distress and to cope successfully in stressful situations; such self-regulatory behaviors and emotional control, in turn, might help children to cope more effectively with novel academic and social demands (Hughes et al., 2008). Also, children who are socially competent with peers are believed to have more opportunities than their less competent peers to learn how to regulate themselves, and in turn promote their adjustment at school.

Therefore, a model in which children's social relationships predict their emotion-related regulation, which in turn predict school adjustment is tested. As presented in Figure 2, quality of social relationships is viewed as a predictor and indirectly influences the school adjustment outcomes by effortful control.

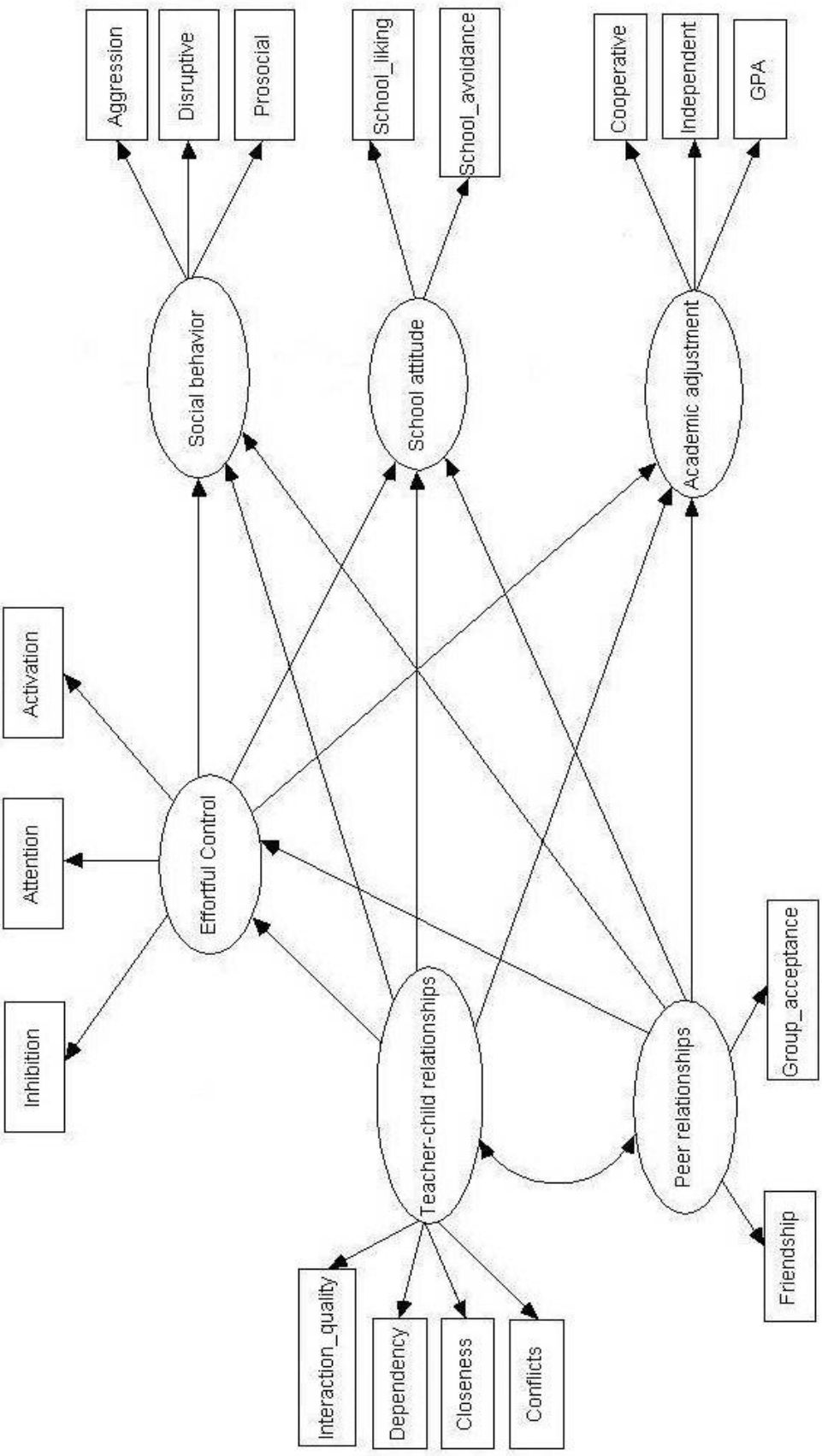

Figure 2. Relationships of Latent Variables in the Alternative Model A

Alternative Model B

It is also possible that children's effortful control predicts their school adjustment without mediation. That is, children's social relationships and school adjustment are viewed as developing concurrently, with common roots in children's effortful control. In elementary school, children are learning to acquire effective strategies for accessing social resources and adapting to their environment. Children with higher levels of effortful control may acquire sophisticated, cooperative strategies such as adhering to classroom regulations, cooperating with and considering the desires of others, more easily than their lower level of effortful control peers. Also, better regulated children may be more competent to access their social resources fully such as teacher-child relationships and peer relationships than their less well regulated classmates. If this case, children's social relationships and school adjustment would be covarying, concurrent outcomes of effortful control (see Figure 3).

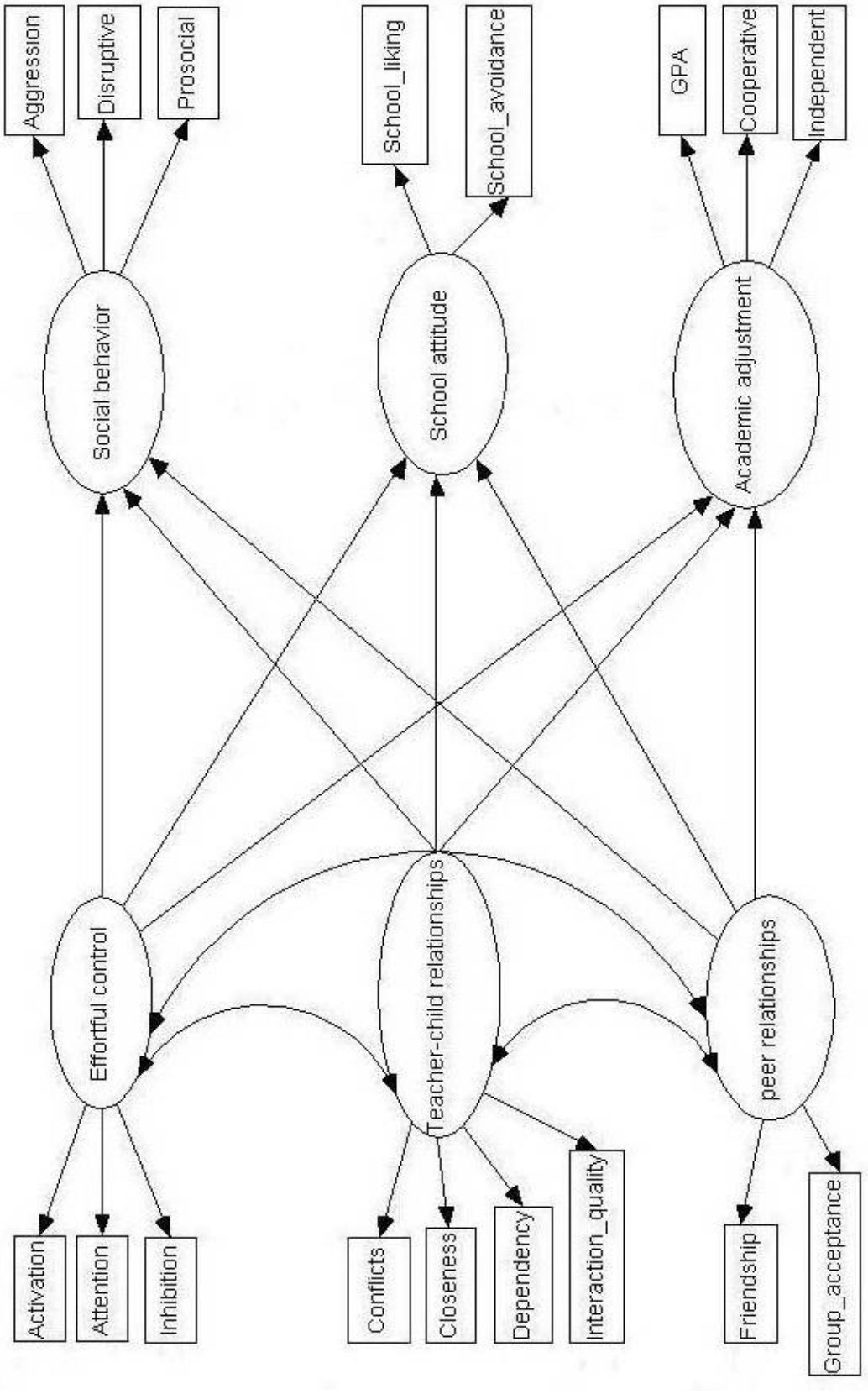

Figure 3. Relationships of Latent Variables in the Alternative Model B

CHAPTER III

METHOD

Participants

A total of 16 teachers (4 males and 12 females), 677 parents and their third- to sixth- grade children were recruited from three public elementary schools in Taipei County—Jingshan area, Taiwan. Sixteen out of 16 teachers agreed to participate in the study (100% participation rate). Four hundred and twenty-five parents out of 677 returned the questionnaires and agreed to have their children participate in the study (62% return rate). Eighteen children were absent on the date of the survey administration. Thus, a final sample of 407 children was included in the study, including 200 girls (49%) and 207 boys (51%). There are 81 third graders (20%), 79 fourth graders (19%), 116 fifth graders (29%), and 131 sixth graders (32%) from 16 classes within the three public schools, 30-35 students in each class. Jingshan area, with a population of approximately 30,000 people, is 129 kilometers from the capital of Taiwan. Most of the children's fathers' education ranges from high school to professional training; mothers generally have high school education. Children participating in this study are generally from low-to-middle income families with about 80% of their parents in blue-collar jobs. Age, gender, socioeconomic, and GPA data were collected from school records and parents.

Measures

To access children's effortful control, social relationships, and their school adjustment, 8 measures were used in this study. The measures included the Early Adolescent Temperament Questionnaire-Revised (ETQR), Student-Teacher Relationship Scale (STRS), Peer Nominations and Ratings of Teacher-Child Relationship (PNR-TC), Friend

Nomination Measure, Peer Group Acceptance Measure, School Liking and School Avoidance Scale (SLAS), Teacher's Checklist of Children's Social Behavior (TCCSB), and Teacher Rating Scale of School Adjustment (TRSSA). Prior to the formal data collection, a pilot study was conducted and some modifications of the measures were made from the pilot study. In addition, for each of the measure, Cronbach's alphas were examined to identify items that substantially lowered the internal consistency. All the measures were used as described below.

A Pilot Study

A pilot study was conducted in three elementary schools in Taipei County, Taiwan during fall, 2007. Participants were selected through convenience sampling. A sample of 51 children participated in the study, including 22 girls (43%) and 29 boys (57%). There were 14 third graders (27%), 12 fourth graders (23%), 13 fifth graders (25%), and 12 sixth graders (25%) from 12 classes within three public elementary schools. Twelve lead teachers and 51 parents also agreed to participate in the pilot study. Parent was asked to report his or her child's effortful control by completing the Early Adolescent Temperament Questionnaire-Revised (ETQR). Children were administered a set of questionnaires including the Early Adolescent Temperament Questionnaire-Revised (EATQ-R), Student-Teacher Relationships Scale (STRS), Reciprocated Friendship Measure and Group Acceptance Measure as well as School liking and School Avoidance Scale (SLAS). Teachers were required to complete the Student-Teacher Relationship Scale (STRS), Teacher's Checklist of Children's Social Behavior (TCCSB), and Teacher Rating Scale of School Adjustment (TRSSA).

Except for the subscale of conflicts in STRS, the internal consistency values of

the measures ranged from .74 to .93, suggesting good reliabilities. The subscale of conflicts in STRS showed low reliability (Cronbach's alpha=.65), and thus one of the items with low item-total correlation was omitted (i.e., item 4, this child is uncomfortable with physical affection or touch from me). This item was excluded for cultural reasons as well. In Taiwanese culture, teachers are not encouraged to have physical affection or touch with their students. That is, for Taiwanese teachers, this item might not be adequate to assess the degree to which a teacher has disharmonious and negative interactions (conflicts) with a particular student. The exclusion of this item did not cause any threat to the construct validity of the STRS. Therefore, 11 items were used to construct the subscale of teacher-perceived conflicts with a particular student. In addition, several items in the Chinese version of the STRS and the SLAS caused word comprehension problems for students, especially for third-graders. Therefore, a few wording modifications on the measures of Chinese version were implemented.

Effortful Control

For the current study, effortful control was used as a marker of children's dispositional self-regulation. Children and parents reported on the children's effortful control. Effortful control was assessed with subsets of items from three subscales of the Early Adolescence Temperament Questionnaire-Revised (for 9- to 15-year-old children and young adolescents) (EATQ-R; Capaldi & Rothbart, 1992; see Appendix A): (1) *Attention*—the capability to focus attention as well as to shift attention when desired (e.g., "I am [Your child is] good at keeping track of several different things that are happening around me [him/her]"). Attention control is a 6-item scale for parents (items 2, 5, 7, 10, 11, and 13 in Appendix A) and 7-item scale for children (items 2, 4, 5, 7, 10, 18, and 19

in Appendix A); (2) *Activation control*—the capability to perform an action when there is a strong tendency to avoid it (e.g., "I [Your child] usually gets started right away on difficult assignments"). Activation control is a 7-item for both parents (items 1, 4, 6, 14, 15, 16, and 17 in Appendix A) and children (items 1, 8, 9, 11, 15, 16 and 21 in Appendix A); (3) *Inhibitory control*— the capability to plan, and to suppress inappropriate responses (e.g., when someone tells me [your child] to stop doing something, it is easy for me [your child] to stop"). Inhibitory control is a 5-item scale for parents (items 3, 8, 9, 12, and 18 in Appendix A) and 11-item for children (items 3, 6, 12, 13, 14, 17, 20, 22, 23, 24, and 25 in Appendix A). Items were rated on a 4-point scale ranging from1 (really untrue) to 4 (really true), and the average of the items serve (18 items for parents and 25 items for children) as a composite of parent-reported and child-reported effortful control.

The Early Adolescence Temperament Questionnaire-Revised is an appropriate instrument of effortful control in this study as it has been widely used in other studies of elementary-aged children (7 to12 year-old) (Eisenberg et al., 2005; Sylvester, 2007; Valiente et al., 2008). The subscales of the Early Adolescence Temperament Questionnaire-Revised have been evidenced with good reliability and validity. For example, significant correlations with similar subscales of Dimensions of Temperament Survey-Revised (DOTS-R, Windle & Lerner, 1986) support the validity of the scale. Valiente (2003) also reported that parent-reported effortful control and observed indices of effortful control significantly related. The subscales showed good internal consistency in the current study ranging from .70 to .83 (attention: Cronbach's alpha=.80 for parents' reports and .83 for children's reports; activation control: Cronbach's alpha= .78 for parents' reports and .77 for children's reports; inhibitory control: Cronbach's alpha= .70

for parents' reports and .72 for children's reports).

Teacher-Child Relationships

Teacher Report. The teacher-child relationship was measured using the Student-Teacher Relationship Scale (STRS; Pianta, 2001); a 27-item scale that taps teachers' perceptions of the quality of their relationships with a particular student, as shown in Appendix B. The teacher completed the form for each child individually. The items on this scale were based on a previous 16-item version (Pianta & Nimetz, 1991) developed from attachment theory, the attachment Q-set (Water & Deane, 1985), and a review of literature on teacher-child interactions. The items were developed to assess what a teacher feels and believes about his or her relationships with a student and also include items to assess her feelings and beliefs about the student's behavior toward her (Hamre & Pianta, 2001). The three factors in the scale were labeled conflicts, closeness, and dependency. The conflict subscale is a 12-item index and assesses the degree to which a teacher feels that his or her relationship with a particular student is characterized by disharmonious and negative interactions (e.g., "when the child arrives in a bad mood, I know we are in for a long and difficult day"; items 1, 3, 4, 5, 7, 8, 10, 13, 16, 17, 23, and 25 in Appendix B). However, based on the results of the pilot study, one of the items with low item-total correlation was omitted (i.e., item 4, this child is uncomfortable with physical affection or touch from me). Thus, 11 items were used to construct the subscale of teacher-report of conflicts with a particular student. The closeness scale is composed of 11 items that measures the extent to which a teacher feels his or her relationship with a particular student is characterized by warmth, affection, and open communication (e.g., "this child spontaneously shares information him/herself"; items 2, 6, 9, 11, 14, 15, 18,

19, 20, 22, and 26 in Appendix B). Finally, the 4-item dependency subscale assesses the extent to which the child is over-dependent on the teacher (e.g., "the child becomes hurt or jealous when I spend time with other children"; items, 12, 21, 24, and 27 in Appendix B). The scale uses a 4-point format ranging from 1 (really untrue) to 4 (really true), and scores for each subscale are later computed by averaging item scores within each subscale. This scale has demonstrated high internal consistency and test-retest reliability and been used extensively in studies of preschool-aged and elementary-aged children (e.g., Baker, 2006; Birch & Ladd, 1997, 1998; Hamre & Pianta, 2005; Howes & Hamilton, 1992; Howes & Richie, 1999; Valiente et al., 2008). The predictive and concurrent validity of the STRS also has been demonstrated repeatedly (Hamre & Pianta, 2001; Pianta et al, 1995). The internal consistency values in the current study were .75 for conflicts, .86 for closeness, and .76 for dependency.

Child Report. Child reports of the teacher-child relationships were obtained using the Peer Nominations and Rating Measure of the Teacher-Child Relationship (PNR-TC; Birch, 2001), as shown in Appendix B. Children were asked about classroom teacher-child relationships by providing (1) ratings of the quality of each classmate's relationship with the classroom teacher and (2) nomination data corresponding to the three subscales of the STRS (e.g., some kids and teachers do get along well with each other. They really seem to like each other a lot. They like to talk to each other, and seem happy with each other. Please write down someone's name except yourself in your class who has a relationship like that with your teacher.). Children rated the quality of each classmate's teacher-child relationships by responding to the question, "how well each of the classmates gets along with your teacher."

In addition, each child in the classroom received a score for peer-nominated Conflict, Closeness, and Dependency, ranging from 0 (i.e., none of the child's classmates nominated him or her for the category) to the maximum number of peers in the classroom (i.e., every classmate nominated the child for the category). These scores were standardized within each classroom to account for differences in class size across the different classrooms. In addition, children rated the quality of each classmate's teacher-child relationships using 4-point format ranging from 1 (not at all) to 4 (very well), and an average rating was calculated for each child by averaging scores received from participating classmates. This instrument has been used in other studies in elementary school students and demonstrated high test-retest reliability. Significant correlations with the Student-Teacher Relationship subscales support the validity of this scale (Birch & Ladd, 1997; Birch, 2001; Hamre & Pianta, 2001).

Peer Relationships

Friendship. Reciprocated friendships and peer group acceptance measures were the indicators of the latent construct of classroom peer relationships in the current study. A friendship nomination measure was used to assess whether the children were participating in a reciprocated friendship. Children were given a list of their same-sex classmates participating in the study and asked to nominate up to five best friends. A measure of the number of friends each child possesses was determined by summing the reciprocated friendship nominations each child received; the number of mutual friendships possible range from 0 (i.e., no one nominated by the child also nominated the child as a friend) to 5 (i.e., all of the child's nominations were reciprocated) (Parker & Asher, 1993).

Peer Group Acceptance. The extent to which children are accepted or rejected by their classmates was assessed using a sociometric technique developed by Asher and Dodge (1986). Children rated each classmate as to the extent to which they liked to play with them at school (see Appendix C). They were asked to respond on a 4-point scale (1=not at all, 4=very much like) ("how much you like to be in school activities with this person?"). Responses were later scored and an average peer rating was calculated for each child by summing the scores received from participating classmates and dividing the total by the number of participating classmates. The techniques to assess children's reciprocal friendship and group acceptance have been widely used in other studies (Ladd, Kochenderfer, & Coleman, 1996; Ladd & Coleman, 1997; Lynch & Cicchetti, 1997; Parker & Asher, 1993).

School Adjustment Indices

School Attitudes. Children's attitudes toward school were assessed via the Schooling Liking and School Avoidance Scale (SLAS), adapted from measures develped by Ladd and Price (1987). This individually administrated, 14-item measure factored into a 9-item schooling liking subscale (e.g., "School is fun" and "You like being in school"; items 1, 3, 4, 6, 7, 8, 10, 11, and 13 in Appendix D) and a 5-item school avoidance subscale (e.g., "Do you wish you did not have to come to school?" and "Do you ask your mom or dad to let you stay home from school?"; items 2, 5, 9, 12, and 14 in Appendix D). Children responded to these questions on a four-point scale (1 = really untrue, 4 = really true). Each child received a school liking and a school avoidance score, computed by calculating the average of the responses given to the nine-item and five-item subscales. Previous studies conducted with this measure in elementary-age

children have found it to have good psychometric properties (Ladd, Buhs, & Seid, 2000; Ladd & Troop-Gordon, 2003). Examinations of the measure with data utilized in the current study indicated that both subscales have good internal reliabilities (Cronbach's alpha= .89 for school liking; Cronbach's alpha=.77 for school avoidance).

Social Behavior. Teachers rated children's social behavior by subsets of items from three subscales of Teacher's Checklist of Children's Social Behavior, adapted from measures developed by Coie, Terry, Dodge, and Underwood (1993) (see Appendix D):(1) Prosocial Behavior, includes sharing, leadership skills, and perspective taking (e.g., "this child is good to behave in a group, share things, and is helpful", "this child is a leader, and can tell others what should be done but is not too bossy"). It is a four-item scale, one item pertaining to being an athlete was dropped from the prosocial subscale for conceptual reasons (items 2, 13, 15 and 16 in Appendix D); (2) Aggression is an 8-item scale, including items 4, 5, 8, 9, 11, 17, 19, and 20 in Appendix D (e.g., "this child says mean things to peers, such as teasing or name calling", "this child starts fights with peers"); (3) Disruptive Behavior is a 8-item scale, including items 1, 3, 6, 7, 10, 12, 14, and 18 in Appendix D (e.g., "this child bothers other kids when they are trying to work", "this child acts silly or immature"). Items were rated on a 4-point format ranging from 1 (really untrue) to 4 (really true). This instrument has been used in other studies in elementary school students and demonstrated good predictive validity (Eisenberg et al., 2002; Valiente et al., 2003). The internal consistency values in the current study were .83 for prosocial behavior, .90 for aggression and .88 for disruptive behavior.

Classroom Participation. Teachers rated aspects of children's classroom participation on the cooperative and independent participation subscales of the Teacher

Rating Scale of School Adjustment (TRSSA; see Birch & Ladd, 1997; Ladd et al., 1996). These two subscales measure two related but conceptually distinct aspects of children's engagement or involvement in the classroom activities. The 7-item cooperative participation subscale taps the extent to which children accept the teacher's authority and comply with classroom rules and responsibilities (e.g., "Follow teacher's directions"; items 1, 3, 4, 6, 7, 9, and 11 in Appendix D). The 4-item independent participation subscale measures the extent to which children display independent, self-directed behavior in the classroom (e.g., "He/She is a self-directed child"; items 2, 5, 8, and 10 in Appendix D). Items on both subscales were rated on a 4-point scale ranging from 1(really untrue) to 4 (really true), and scores were computed by averaging the ratings across items within each subscale. In this study, the internal consistency values were adequate (Cronbach's alpha=.88 for cooperative participation and .82 for independent participation).

Procedures

Translation of the Research Instruments

All measures in the current study were originally written in English and no Chinese versions were available except the Early Adolescence Temperament Questionnaire-Revised (EATQ-R). The Early Adolescence Temperament Questionnaire has been translated into Chinese and used for years by Lay and Hsu (1998). Translations of the other measures were completed by two bilingual graduate students and the researcher followed the back-translation procedure (Brislin, 1986). First, all scales were translated from the original (English) to the target language (Chinese) by the researchers. Next, the Chinese versions were back-translated to the original language (English) by an

American-born Chinese graduate student majoring in psychology. The other translator whose major is linguistics then assessed the adequacy of the translation by comparing the back-translated version with the original English version. Based on the result of the evaluation, items of disagreement in meaning were revised and modified by consensus judgment of two of the raters. Chinese versions are included in Appendix E.

Data Collection

This study was introduced to all participants in March 2009 and ended in the middle of May 2009. Participants were recruited from the classes at three public elementary schools in Taipei County, Taiwan. As a multi-method, multi-reporter approach was utilized in the current study, data were gathered using peer sociometric procedures, self-, teacher-, peer- and parent-report questionnaires. In the other words, the questionnaires required in the study were distributed to parents, teachers, and children. Prior to the data collection, the study procedure was approved by the Institution Review Board, University of Iowa in early March, 2009.

Before the study began, all participants were given information about the purpose of the study, the confidentiality of their responses, the voluntary nature of their participation, and their personal rights to withdraw from this study at any time. An introductory letter and a written permission form were sent home to parents with third- to sixth-grade children in the three schools (N =423) and to be returned to the children's teachers; the letter informed parents of the major procedures of this study. When necessary, a second request was sent home with a self-addressed stamped envelope for parents to mail the completed forms directly to the principal investigator. After parents signed and returned the permission forms, indicating that they and their children were

willing to participate in this study, children were group-administered in school classrooms. The children heard a brief overview of the project, and were told that although parental consent had been obtained, their participation was voluntary. In addition, they were told that their responses would be kept confidential and that there would be no negative consequences if they chose not to participate. Children were administered a set of questionnaires including Early Adolescent Temperament Questionnaire-Revised (EATQ-R, see Appendix A), Student-Teacher Relationships Scale (STRS, see Appendix B), Reciprocated Friendship Measure and Group Acceptance Measure (see Appendix C) as well as School liking and School Avoidance Scale (SLAS, see appendix D). Before completing the questionnaires, children were given instructions as a group to ensure that they understand the items and scales. Additionally, the order of the questionnaires was counterbalanced. In other words, the questionnaires were distributed to children in four systematically-varied sets. Administration of the questionnaires ranges from 35 to 45 minutes.

For each child recruited in this study, a set of questionnaires was distributed to the parents through the main teacher in class, and parents completed and returned the questionnaires in a sealed envelope. The questionnaires were to be filled out by mothers if possible but can also be filled out by fathers or other caretakers in the family if the mother was not available. The parent questionnaires consisted of questions that assessed children's effortful control (see Appendix A). In addition, the main teachers in the class were asked to complete measures regarding perceptions of student-teacher relationships (see Appendix B), children's social behavior and classroom participation (see Appendix D). The expected time for teachers to complete all the measures was approximately one

week. To help the lead teachers complete the lengthy questionnaires and to reduce the fatigue effects as much as possible, all the questionnaires were divided into 6 packages of systematically-varied sets. The lead teachers were asked to complete the questionnaires within one of the packages a day. Both the families and the teachers were paid for their participation in the current study.

Demographic Data. Three demographic variables were provided by parents and teachers including gender, age, and SES. Three demographic indicators, fathers' education, mothers' education, and family income were recoded as children's socioeconomic status. Fathers' or mothers' reports of their own education were recoded into a three-category educational level. Low-education level included all fathers or mothers with high school education, certificates, or less. Middle-education level included all fathers or mothers with some education beyond high school, but who were not college graduates. High-education level included all fathers or mothers with Bachelor's degrees or higher. In addition, family incomes were categorized into three levels based on the Annual Reports of Taiwanese Family Income and Expenditure in 2007 (Department of Budge, Accounting, and Statistics, 2008). Families with income higher than 62,000 USD, the average of the highest 25% of Taiwanese family income, were labeled as high-level family income. Families with lower than 11,000 USD, the average of the lowest 25% of Taiwanese income, were labeled as low-level family income. Family incomes between 11,000 USD and 62,000 USD were labeled as middle-level. Thus, socioeconomic status of a family was rated by using a 3-point format ranging from 1 (high-level) to 3 (low-level).A composite score of mother education, father education and family incomes was then created (ranging from 3 to 9).If the composite score of a family ranged from 3 to 5,

SES of the family was labeled as low-level. Families with a composite score ranging from 6 to 7 were labeled as middle-level of SES. And, families with a composite score ranging from 8 to 9 were labeled as high-level of SES.

Data Analysis

Several analyses were conducted to examine the relations among children's effortful control, social relationships, and school adjustment. The proposed analyses, purposes, and related measures are summarized in Table 1. The descriptive statistics for the study variables were computed to ensure that its mean and standard deviation were within a reasonable range. Pearson product-moment correlations were conducted to examine the bivariate relations within and among variables, as well as across reporters. In addition, 2X3X4 MANOVAs were used to examine the effects of gender, SES, and grade level. Last, structural equation modeling (SEM) was used to study relations among latent variables. Structural equation modeling is a powerful, multivariate analysis method used to examine associations among the latent variables of children's effortful control, social relationships and school adjustment. In structural equation modeling, latent variables are theoretical constructs specified by multiple, conceptually-related, measured indicators (Gall, Gall, & Borg, 2003, pp. 355-357). In the current study, structure equation modeling was used to examine the hypothetic relations among children's effortful control, teacher-child relationships, peer relationships, and adjustment at school using Amos 17.0 software. Prior to test the structure equation models, the assumption of normality was assessed first. Next, confirmatory factor analyses were conducted to test the full measure model; confirmatory factor analysis of the full measurement model was tested through freeing the parameters among all constructs and allowing them to correlate; if the fit of

CFA of the measurement model was acceptable, then the structural model of the study would be tested in the second-step.

To evaluate model fit, several fit indices were considered including chi-square test statistics, the standardized root-mean-square residual (SRMR), the root-mean-error-of-approximation (RMSEA), and the comparative fit index (CFI). Chi-square index test the difference between the sample covariance matrix and restricted covariance, serving as the basic test of whether a hypothesized model adequately describes the data. According to this index, a non-significant X2 indicates a good fit. The higher the probability, the better the chance of obtaining a perfect fit. However, chi-square may lead to the rejection of a true population model because it is strongly affected by sample size. The other fit indices were included because they often provide better indicators of model fit than does chi-square statistic. Moreover, no single overall model fit statistic should be relied on exclusively.

In general, to evaluate the fit of a hypothesized model, the following criteria for fit indices are considered good fit. The Standardized Root Mean Square (SRMR) is considered first, though it should further be accompanied by one or more additional fit indices. The SRMR is a measure of the mean absolute correlation residual, the overall difference between the observed and predicted correlations. A value of .08 or lower is indicative of a good fit model (Hu & Bentler, 1999). Another fit index reported in the current study was Root Mean Square Error Approximation (RMSEA). RMSEA calculates the discrepancy between the population covariance matrix and restricted model covariance and estimates the potential error (Browne & Cudeck, 1993). The RMSEA values of .06 or less are considered indicative of good fit (Kline, 2005). The last index of

choice for testing model fit was Comparative fit index (CFI). CFI compares the hypothesized model with the independent model. The independence model is a highly strict model in which all variables are considered uncorrelated. The value of CFI ranges from 0 to1 and .90 or more are considered indicative of good fit (Hu & Bentler, 1999).

Table 1. Purposes, Related Measures, and Anticipated Analyses

Purpose	Instruments used	Anticipated analyses
To ensure the means and standard deviations are within a reasonable range To assess the effects of gender, SES, and grade level on all study constructs	Early Adolescent Temperament Questionnaire-Revised(ETQR) Student-Teacher Relationship Scale (STRS) Peer Nominations and Ratings of Teacher-Child Relationship (PNR-TC) School Liking and School Avoidance Scale (SLAS) Teacher's Checklist of Children's Social Behavior (TCCSB) Teacher Rating Scale of School Adjustment (TRSSA)	Descriptive analyses A series of 2X3X4 MANOVAs (GENDER x SES xAGE)
Research question 1: To examine the extent that elementary-aged Taiwanese children's effortful control predicts their adjustment at school	Early Adolescent Temperament Questionnaire-Revised(ETQR) School Liking and School Avoidance Scale (SLAS) Teacher's Checklist of Children's Social Behavior (TCCSB) Teacher Rating Scale of School Adjustment (TRSSA)	Correlational Analyses Hierarchical Linear Modeling (HLM) Structural Equation Modeling (SEM)
Research question 2: To examine whether effortful control is related to the relationships children form with teachers and peers	Early Adolescent Temperament Questionnaire-Revised(ETQR) Friend Nomination Measure Peer Group Acceptance Measure	
Research question 3& 4: To examine whether children's social relationships formed with teachers and peers in the classroom is related to their adjustment at school.	Student-Teacher Relationship Scale (STRS) School Liking and School Avoidance Scale (SLAS) Teacher's Checklist of Children's Social Behavior (TCCSB) Teacher Rating Scale of School	

Table 1. Continued

	Adjustment (TRSSA)	
To ensure unidimensionality of each of the latent variables To test the full measurement model	Early Adolescent Temperament Questionnaire-Revised(ETQR) Student-Teacher Relationship Scale (STRS) Peer Nominations and Ratings of Teacher-Child Relationship (PNR-TC) School Liking and School Avoidance Scale (SLAS) Teacher's Checklist of Children's Social Behavior (TCCSB) Teacher Rating Scale of School Adjustment (TRSSA)	Confirmatory Factor Analyses (CFA)
Research question 5& 6: To examine whether the children's relationships formed with teachers and peers mediate the relations between effortful control and school adjustment To examine good fit of the competing models		Structural Equation Modeling (SEM) The Sobel Test

CHAPTER IV

RESULTS

Overview

Several analyses were conducted to examine the relations among children's effortful control, social relationships and adjustment at school. Prior to inclusion in the analyses, missing value analyses were first conducted to verify for efficiency and accuracy of the data set. Participants' reports that were regarded as unreliable (e.g., 20% missing data, or data missing in a specific pattern) were not included. Overall, the missing percentage of the current study did not exceed 3% for any single observed indicator and remained 2% for each construct. Because the missing data percentage in both conditions was below 5% (low), no missing pattern analyses were conducted. In other words, the values missed were overall considered to be completely random. Missing data were then estimated using Maximum Likelihood (ML) estimation procedure by AMOS software (Tabachnick & Fidell, 2001). Second, composite scores were created for the different subscales, as noted in the method section. Items were reversed when necessary. In addition, subscales of parents' and children's reports of effortful control were averaged, because some previous studies suggested that the use of multiple raters could improve both the reliability and validity of the constructs (Eisenberg et al., 2000; Valiente et al., 2007). In the same case, subscales of teachers' and children's reports of teacher-child relationships (i.e., closeness, conflicts, and dependency) were separately aggregated to a composite score (see Table 5). To determine if SES had effects on all study constructs, a composite of standardized measure of mother education, father education and family incomes was created.

Using the final data derived, preliminary analyses were conducted. The descriptive statistics for the study variables were presented first. Next, HLM was conducted to investigate classroom-level and school-level differences in the school adjustment variables. Confirmatory factor analysis was then conducted to examine unidimensionality of each of the latent variables. Fourth, Pearson product-moment correlations were conducted to examine the bivariate correlations within and among study variables, as well as between reporters. Next, MANOVAs were conducted to examine the effects of sex, grade level, and social economic status. In the last part of this section, structural equation modeling (SEM) was used to examine the relations among the constructs.

Preliminary Analysis

Descriptive Results

First, each variable was examined to ensure that its mean and standard deviation were within a reasonable range. Means and standard deviations for all the major variables are presented in the Table F1 (see Appendix F). Generally, the means and standard deviation of all the study constructs were all within a reasonable range. Second, the assumption of normality was then tested through examining the skewness and kurtosis of each observed variable (MacDonald & Ho, 2002). Kline (2005) reported that skewness greater than 3.0 generally suggests a serious problem. When it comes to the assessment of the kurtosis index, he pointed out that experts' opinions vary, but as a conservative approach, kurtosis values greater than 10.0 might be interpreted as a sign of a problem while the values greater than 20.0 may point to a serious problem. In the current study, the normality distributions for effortful control, teacher-child relationships, peer

relationships, social behavior, school attitudes, and academic adjustment are provided in Table 2. As shown, all the values of skewness were below 3.0, and all the values of kurtosis are below 8.0. Therefore, the data were generally viewed as normal distributions.

Table 2. Skewness and Kurtosis of the Observed Variables

Variable	Skew	C.R.	Kurtosis	C.R.
Conflicts	2.90	23.88	7.96	32.77
Interaction quality	-.87	-7.18	.34	1.39
Dependency	2.55	21.02	7.16	29.49
Group acceptance	-.91	-7.53	.86	3.55
Friendship	.24	1.98	-1.11	-4.56
Disruptive	1.46	12.03	1.84	7.57
Attention	-.22	-1.77	-.29	-1.20
Activation	-.04	-.30	-.41	-1.67
Inhibition	-.17	-1.41	-.26	-1.08
Closeness	2.29	18.88	5.19	21.37
GPA	-.89	-7.36	.42	1.71
Cooperative	-.31	-2.56	-.68	-2.81
Independent	.72	5.95	6.68	27.50
School liking	-.49	-4.03	-.36	-1.46
Aggression	1.88	15.45	3.65	15.03
Prosocial	.30	2.44	-.61	-2.50
School avoidance	.89	7.31	.22	.89
Multivariate			139.19	55.24

In addition, hierarchical linear modeling was used to investigate between-classroom and between-school variance for each of the school adjustment variables (HLM, Raudenbush & Bryk, 2002). Adjusted intraclass correlation coefficients (ICCs) indicated that between-classroom variance accounted for 13.52 % for teacher-child relationships, 10.87% for peer relationships, 6.47% for social adjustment, 7.25% for school attitudes, and 10.62% for academic adjustment. Adjusted ICCs showed that the

amount of variance due to between-school was 9.84% for teacher-child relationships, 6.45% for peer relationships, 3.08% for social adjustment, 5.88% for school attitudes and 6.94% for academic adjustment. Those results suggested that much of the variance was not due to systematic classroom-level or school-level differences, but instead to the variability at the individual-level (approximately 80% for teacher-child relationships, 83% for peer relationships, 85% for social adjustment, 87% for school attitudes, and 82% for academic adjustment). In the current study, multilevel analyses were not used to explore the relations among children's effortful control, social relationships and their school adjustment outcomes.

CFA for the Measurement Model

Before testing the meditational model, confirmatory factor analysis was used to ensure unidimensionality of each of the latent variables. In this study, a six-factor measurement model was tested. That is, six latent variables were anticipated: (1) *effortful control* indicated by attention control, activational control, and inhibitory control (averaged parents' and children's reports); (2) *teacher-child relationships* indicated by closeness, conflicts, dependency (aggregate teachers' and children's reports), as well as interaction quality (children's reports); (3) *peer relationships* indicated by children's reports of reciprocal friendship and group acceptance; (4) *social behavior* indicated by teachers' reports of children's aggressive behavior, disruptive behavior, and prosocial behavior; (5) *school attitudes* indicated by children's reports of their liking and avoidance toward school; (6) *academic adjustment* indicated by teachers' reports of children's cooperative and independent classroom participation, and GPA. For the assessment of the measurement model, all latent constructs were allowed to intercorrelate. The full

measurement model revealed an adequate fit to the data (χ_2 [104 df, N = 407] = 311.22, p<.001, CFI = .91, SRMR=.05, RMSEA = .062 (with 90% CI lower bound = .058 and upper bound = .065). All indicators loaded significantly on their intended latent variables (p<.001). Factor loadings, measurement error variances, and latent variable correlations of the full measurement model were provided in Table F2, and Table F3,, respectively (see Appendix F).

The evaluation of the factor loadings in Table F2 showed that the observed indicators had high factor loadings to their common factors, indicating that they adequately reflected their underlying latent variables. All indicators in the model had statistically significant factor loadings (p < .001), confirming the existence of significant associations among measured indicators and their latent constructs (see Table F3). In addition, to detect potential multicollinearity, Maruyama (1998) suggested that correlations higher than .90 indicate the presence of multicollinearity. In the current data, no extreme values of correlations were observed among the given constructs (see Table F3, Appendix F).

To examine the relations among the study constructs, bivariate correlations were calculated. Partial correlations controlling for gender, grade level, and SES were also computed; however, because there were no substantial differences between zero-order and partial correlations (differences were generally less than .05), only zero-order correlations were reported. The zero-order correlation matrix for all measures is shown in Table 3.

Table 3. Correlation Matrix of All Measures

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Parents' reports																			
1. Effortful control	--																		
Children's reports																			
2. Effortful control	.64**	--																	
3. T-C Closeness	.34**	-.30**	--																
4. T-C Conflicts	-.30**	-.29**	-.19*	--															
5. T-C Dependency	-.22**	-.22**	-.02	.52**	--														
6. Interaction quality	.48**	.49**	.51**	-.72**	-.40**	--													
7. School liking	.26**	.36**	.22**	-.18**	-.02	.34**	--												
8. School avoidance	-.24**	-.32**	-.23**	.18**	.04	-.30**	-.66**	--											
Teachers' reports																			
9. T-C Closeness	.23**	.29**	.40**	-.25**	-.01	.42**	.24**	.16*	--										
10. T-C Conflicts	-.25**	-.20**	-.11*	.49**	.23**	-.41**	-.12*	.12*	-.33**	--									
11. T-C Dependency	-.11*	-.03	.00	.21**	.42**	-.16*	.06	-.01	.14*	.46**	--								
12. Aggressive behavior	-.21**	-.14*	-.13*	.39**	.25**	-.41**	-.13*	.11*	-.13*	.57**	.31**	--							
13. Disruptive behavior	-.27**	-.21**	-.14*	.44**	.33**	-.46**	-.13*	.11*	-.17*	.62**	.36**	.83**	--						
14. Prosocial behavior	.39**	.44**	.45**	-.33**	-.22**	.53**	.20**	-.17*	-.47**	-.42**	-.21**	-.31**	-.40**	--					
15. Cooperative participation	.50**	.48**	.37**	-.47**	-.31**	.68**	.31**	-.27**	.45**	-.53**	-.23**	-.46**	-.52**	.67**	--				
16. Independent participation	.54**	.51**	.37**	-.37**	-.29**	.62**	.28**	-.21**	.36**	-.27**	-.13*	-.23**	-.32**	.55**	.69**	--			
Peers' reports																			
17. Friendships	.23**	.21**	.29**	-.29**	-.29**	.41**	.12*	-.12*	.11*	-.24**	-.23**	-.19*	-.29**	.38**	.34**	.31**	--		
18. Group acceptance	.32**	.30**	.31**	-.54**	-.49**	.72**	.21**	-.18**	.20**	-.35**	-.26**	-.41**	-.46**	.45**	.42**	.46**	.58**	--	
19. GPA	.71**	.68**	.39**	-.40**	-.30**	.55**	.24**	-.23**	.27**	-.24**	-.08	-.16**	-.25**	.44**	.56**	.66**	.24**	.38**	--

Validity and Stability of the Constructs

Effortful Control. As displayed in Table 4, parents' reports of effortful control were significantly correlated to children's reports of effortful control. Parents and children appeared to be fairly consistent in their reports of effortful control (rs=.55, .57, and .46, $p<.01$, respectively). In addition, convergent validity could be showed for this construct because measures were obtained from multiple informants. The correlations between parents and children's reports on the shared indicators were not only significantly positive (attentional =.55, activational =.57, and inhibitory=.46, $p<.01$), but also stronger than non-shared indicators.

Table 4. Correlations of Parents' Reports and Children's Self-Reports of Effortful Control

	Parent's reports of children's effortful control		
Children's self-report	Attentional control	Activational control	Inhibitory control
Attentional control	.55 **	.41 **	.36 **
Activational control	.32 **	.57 **	.31 **
Inhibitory control	.38 **	.32 **	.46 **

Note. Ns=407 for the whole sample

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

Teacher-Child Relationships. In Table 5, it is indicated that teachers' and children's reports of closeness, conflicts, and dependency were positively correlated (rs=.40, .49, and .42, $p<.01$, respectively). Moreover, children's reports of interaction

quality with their teachers were positively correlated with teachers' reports of closeness (r=.42, $p<.01$), and negatively correlated with teachers' reports of conflicts (r=-.41, $p<.01$) and dependency (r=-.16, $p<.01$). The correlations between teachers' and children's reports on the shared indicators were not only statistically significant (closeness=.40, conflicts=.49, and dependency=.42, $p<.01$), but also stronger than non-shared indicators. Generally, teachers' and children's reports of teacher-child relationships were moderately consistent.

Table 5. Correlations of Teachers' Reports and Children's Self-Reports of Teacher-Child Relationships

	Teacher's reports of T-C relationships		
Children's self-report	Closeness	Conflicts	dependency
Closeness	.40 **	-.11 *	.00
Conflicts	-.25 **	.49 **	.21 **
Dependency	-.01	.23 **	.42 **
Interaction quality	.42 **	-.41 **	-.16 **

Note. Ns=407 for the whole sample

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

Correlations among Constructs

Generally speaking, all bivariate correlations among constructs were statistically significant and in the expected directions, providing preliminary support for the hypothesized model. Effortful control was correlated with teacher-child relationships,

(r= -.53, $p < .001$), peer relationships (r = .34, $p < .001$), school attitudes (r = .34, $p < .001$), social behavior (r = -.30, $p < .001$), as well as academic adjustment (r = .78, $p < .001$). Similar relationships were observed among other variables, as presented in Table F3 (standardized estimation). Peer relationships were correlated with teacher-child relationships (r = -.73, $p < .001$), school attitudes(r = .25, $p < .001$), social behavior(r = -.49, $p < .001$), and academic adjustment(r = .57, $p < .001$). Teacher-child relationships were correlated with children's adjustment at school including school attitudes (r = -.40, $p < .001$), social behavior(r = .50, $p < .001$), and academic adjustment(r = -.78, $p < .001$). The latent variables of children's adjustment at school were correlated with each other (rs=-.17, .40, and -.47 respectively, see Table F3).

Relations between Effortful Control and Relationships with Peers and Teachers. As expected, parents' and children's reports of effortful control were consistently correlated with children's relationships formed with their teachers and peers (see Table 3). Specifically, both parents' and children's reports of effortful control were positively associated with the quality of relationship children have with their classroom teachers and peers. Those results indicated that children who demonstrated more effortful control were likely to have high-quality of T-C relationships (i.e., more closeness and less conflict), have more interpersonal ties, and better group acceptance.

Relations between Peer Relationships and Children's Adjustment at School. Generally speaking, children's relationships were correlated with their adjustment at school, including social behavior, school attitude, and academic adjustment (see Table 3). First, consistent with the expectation, peer relationships were positively correlated with children's prosocial behavior (rs=.38 and .45, p<.01) but negatively correlated with

aggressive behavior (*r*s=-.20 and -.41, *p*<.01) and disruptive behavior (*r*s=-.30 and -.46, *p*<.01). Thus, it is suggested that children who have more interpersonal ties (i.e., friendships) or are better-accepted in the group show higher levels of prosocial behavior and lower levels of aggressive and disruptive behavior.

In addition, peer relationships were mildly correlated to children's school attitudes. Children who have more interpersonal ties or are better-accepted in the group are more likely to display more positive attitudes toward school. Lastly, the correlations examining the relations between peer relationships and academic adjustment are consistent with our expectation. Results revealed that peer relationships were positively correlated with children's GPA, cooperative participation, and independent participation in the classroom. That is, children who have more reciprocal friendships or are better-accepted in the group show higher GPA as well as higher levels of participation in the classroom.

Relations between T-C Relationships and Children's Adjustment at School. Teachers' and children's reports of teacher-child relationships were generally associated with children's social behavior, school attitudes, and academic adjustment, except for the measure of dependency (see Table 3). Regarding social behavior, both teachers' and children's reports of relationship quality were associated with children's socially appropriate behavior (i.e., aggressive behavior, disruptive behavior, and prosocial behavior). As for school attitudes, except for the measure of dependency, the other aspects of teacher-child relationships were associated with children's attitudes toward school. In addition, as expected, both teachers' and children's reports of closeness as well as children's reports of interaction quality were positively correlated with academic

adjustment including GPA, cooperative classroom participation, and independent classroom participation. Contrarily, teachers' and children's reports of conflicts and dependency were negatively correlated with children's academic adjustment. Overall, teachers' and children's reports of teacher-child relationships showed high agreement and were mildly to moderately correlated to children's adjustment at school.

Relations between Children's Effortful Control and Adjustment at School. As expected, parents' and children's reports of effortful control were consistently correlated with children's adjustment at school (i.e., social behavior, school attitudes, and academic adjustment) (see Table 3). The results indicated that children who are more capable of focusing attention, shifting attention, and regulating their behaviors display more socially appropriate behavior, have more positive attitudes toward school and show better academic adjustment. Although those results were consistent with what was anticipated, the relations between parent's reports of effortful control and children's social behavior and school attitudes only demonstrated mild correlations. In comparison, the relations of parents' reports of effortful control and academic adjustment display moderate to high correlations. Overall, the relations between children's reports of effortful control and adjustment at school showed high consistency with the relations of parents' reports of effortful control toward children's adjustment at school.

Tests of Effects of Gender, Grade Level, and SES

A series of 2X4X3 MANOVAs were conducted to assess the effects of children's gender, grade level, and SES on all study constructs. MANOVAs were run separately for children's effortful control, teacher-child relationships, peer relationships, and their adjustment at school including social behavior, school attitude, and academic adjustment

(see Table F4, Appendix F). Effortful control MANOVAs included parents' and children's reports of effortful control. Teacher-child relationships MANOVAs included teachers' and peers' reports of closeness, conflicts, dependency as well as peers' reports of interaction quality. Peer relationships MANOVAs included peers' reports of friendship and group acceptance. Social behavior MANOVAs included teachers' reports of children's aggressive behavior, disruptive behavior, and prosocial behavior. School attitude MANOVAs included children's self-report of their school-liking and school-avoidance. Lastly, the academic adjustment MANOVAs included teachers' reports of children's participation in the classroom and their GPA. Multivariate omnibus results from the MANOVAs are reported in Table F4 (Appendix F). To control for Type I error, Bonferroni correction procedures were used for determining if univariate tests were significant. Specifically, univariate *F*-tests for examining the effects of gender, grade level, and SES on single measure were significant if $p<.05$/number of measures in a construct. The results of univariate tests were reported in F5 (Appendix F).In the following, significant results of children's gender, grade level, and SES on all study constructs are discussed.

MANOVAs on Effortful Control. As shown in Table F4 (Appendix F), omnibus tests revealed main effects of gender on both parents' reports and children's reports of effortful control. No other main effects or two- or three-way interaction effects were found. Gender accounted for 2% of the variance in parents' report of effortful control and 3% in children's report of effortful control (see Table F4). Univariate *F*-tests for the main effects of gender indicated significant differences for parents' reports of attentional control and activational control. F (1,384) =5.73 and 6.95, ps<.017(.05/3=.017),

respectively. Follow-up comparisons showed that parents rated girls higher on attentional control and activational control than boys. Also, univariate *F*-tests for the main effects of gender showed significant differences for children's reports of activational control and inhibitory control. F (1,384) =7.96 and 9.78, ps<.017 (see Table F5, Appendix F), respectively. An examination of the mean differences revealed that girls reported higher level of activational control and inhibitory control than boys. The means of parent-report and child-report of effortful control measures are broken down by gender, SES, and grade level in the following table.

Table 6. Means of the Effortful Control Measures on Different Gender, SES and Grade-Level Groups

Variables	Gender		SES			Grade-level			
	Male	Female	Low	Middle	High	3th	4th	5th	6th
Parent-report of effortful control									
Attentional Control	2.58	2.68	2.52	2.68	2.96	2.62	2.59	2.63	2.67
Activational Control	2.50	2.68	2.50	2.64	2.77	2.58	2.63	2.57	2.59
Inhibitory Control	2.59	2.77	2.59	2.71	3.06	2.71	2.66	2.66	2.67
Child-report of effortful control									
Attentional Control	2.78	2.82	2.63	2.92	3.05	2.92	2.78	2.77	2.77
Activational Control	2.78	2.94	2.72	2.95	3.10	2.90	2.89	2.83	2.84
Inhibitory Control	2.89	3.08	2.90	3.02	3.20	3.00	2.88	2.98	3.04

Note. Ns=407 for the whole sample, 200 for girls and 207 for boys; 174 for low SES, 206 for middle SES, and 27 for high SES; 81 for 3th graders, 79 for 4th graders, 116 for 5th graders, and 131 for 6th graders.

MANOVAs on Relationships with Teachers and Peers. As presented in Table F4, (Appendix F), significant main effects of gender and SES on peer's reports of teacher-child relationships were found. No other main effects or two- or three-way interaction effects were indicated. Gender and SES accounted for 4% and 3.6% of the variance in children's reports of teacher-child relationships, respectively (see Table F4). Univariate *F*-tests for the main effects of gender revealed significant differences for children's reports of closeness, and interaction quality with their teachers. F= (1,384) =6.92 and 13.50, ps<.013 (.05/4=.013), respectively. An examination of the mean differences indicated that peers rated girls higher on closeness and interaction quality with their teachers than boys. In addition, univariate *F*-tests for the main effects of SES showed significant differences for peers' reports of closeness and interaction quality with their teachers. F= (2,384) =11.24 and 5.22, ps<.013, respectively (see Table F5, Appendix F). In comparison, children with high SES showed higher closeness with their teachers than children with middle and low SES. Also, Bonferroni post comparisons revealed that the higher SES of the child's family is, the better interaction quality he has with his teacher. The means of teacher-report and peer-report of T-C relationships as well as peer relationships measures are broken down by gender, SES, and grade-level in the following table.

Table 7. Means of Social Relationships Measures on Different Gender, SES, and Grade-Level Groups

Variables	Gender		SES			Grade-level			
	Male	Female	Low	Middle	High	3th	4th	5th	6th
Teacher-report of T-C relationships									
Closeness	2.64	2.84	2.64	2.79	2.97	2.87	2.84	2.47	2.83
Conflicts	1.43	1.28	1.43	1.30	1.25	1.31	1.41	1.42	1.28
Dependency	1.43	1.47	1.51	1.41	1.42	1.31	1.47	1.49	1.49
Peer-report of T-C relationships									
Closeness	1.56	3.14	1.49	2.73	3.74	2.16	2.44	2.28	2.41
Conflicts	3.34	1.02	2.82	1.69	2.11	1.69	2.43	2.41	2.20
Dependency	1.44	1.18	1.54	1.06	1.74	.85	1.16	1.46	1.55
Interaction quality	2.84	3.12	2.83	3.07	3.24	3.12	2.87	2.94	2.99
Peer relationships									
Friendship	2.06	2.20	1.99	2.24	2.15	1.88	2.08	2.16	2.27
Group acceptance	2.79	2.90	2.77	2.90	2.94	2.97	2.81	2.77	2.86

Note. Ns=407 for the whole sample, 200 for girls and 207 for boys; 174 for low SES, 206 for middle SES, and 27 for high SES; 81 for 3th graders, 79 for 4th graders, 116 for 5th graders, and 131 for 6th graders.

MANOVAs on School Attitudes. The multivariate results did not show any significant main effects of gender, SES and grade-level on children' reports of school attitudes. Also, no two- or three-way interaction effects were found. In Table 8, the means of different aspects of school adjustment measures were broken down by gender, SES, and grade-level.

MANOVAs on Social Behavior. The multivariate results indicated significant main effects of gender and grade-level on teachers' reports of children's social behavior. No other main effects or two- or three-way interaction effects were found. Gender and

grade-level accounted for 3.6% and 2.7% of the variance in children's report of teacher-child relationships, respectively (see Table F4). Univariate *F*-tests for the main effects of gender revealed significant differences for teachers' reports of social behavior. F (1,384) =4.42, 11.73, and 7.34, ps<.025(.05/2=.025), respectively. Follow-up tests of the mean differences indicated that teachers rated boys with higher levels of aggressive behavior and disruptive behavior and lower levels of prosocial behavior than girls. Additionally, univariate *F*-tests for the main effects of grade-level showed significant differences for teachers' reports of prosocial behavior. F (3, 384) = 8.57, ps<.017(see Table F5, Appendix F). An examination of the mean differences revealed that 6th grade children displayed higher level of prosocial behavior than any other grade children.

MANOVAs on Academic Adjustment. As presented in Table F4, multivariate tests displayed main effects of gender and grade level on teachers' reports of children's participation in the classroom and academic performance (i.e., GPA). No other main effects or two- or three-way interaction effects were found. Gender and grade level accounted for 2.6% and 3.3% of the variance in teachers' reports of children's academic adjustment, respectively (see Table F4). As well, univariate *F*-tests for the main effects of grade level displayed significant differences for teachers' reports of children's cooperative participation in the classroom. F (1,384) =8.75, ps<.017(see Table F5, Appendix F). Follow-up comparisons indicated that 3th -grade children demonstrated higher level of classroom participation than 4th -grade children, and 6th -grade children demonstrated higher level of classroom participation than 5th -grade children. The means of teacher-report of school adjustment measures are broken down by gender, SES, and grade level in Table 8.

Table 8. Means of the School Adjustment Measures on Different Gender, SES, and Grade-Level Groups

Variables	Gender		SES			Grade Level			
	Male	Female	Low	Middle	High	3th	4th	5th	6th
Social behavior									
Aggressive Behavior	1.43	1.27	1.44	1.28	1.27	1.16	1.47	1.41	1.33
Disruptive Behavior	1.63	1.32	1.55	1.43	1.37	1.34	1.64	1.52	1.43
Prosocial Behavior	2.14	2.52	2.25	2.36	2.55	2.15	2.28	2.17	2.61
School attitude									
School liking	2.91	3.10	2.88	3.10	3.05	3.21	3.11	2.90	2.91
School avoidance	2.15	1.89	2.18	1.90	1.98	1.85	1.97	2.25	1.97
Academic adjustment									
GPA	3.41	3.45	3.28	3.52	3.65	3.57	3.36	3.37	3.43
Cooperative participation	2.98	3.26	2.95	3.22	3.38	3.34	3.12	2.86	3.21
Independent participation	2.66	2.82	2.54	2.85	3.16	2.91	2.66	2.76	2.67

Note. Ns=407 for the whole sample, 200 for girls and 207 for boys; 174 for low SES, 206 for middle SES, and 27 for high SES; 81 for 3th graders, 79 for 4th graders, 116 for 5th graders, and 131 for 6th graders.

Structural Equation Modeling

Structural equation modeling was used to examine the hypothetic relations among children's effortful control, teacher-child relationships, peer relationships and adjustment at school using Amos 17.0 software.

The Structure of Hypothesized Model

In the present study, the hypothesized model was proposed by associating effortful control with children's adjustment at school in two ways. First, effortful control was directly linked to how well children interact with their teachers and peers (Hypotheses 2 and 3), and how well they adjust to the school environment (Hypothesis 1). Second, effortful control was indirectly associated with school adjustment outcomes, mediated by the quality of the relationships that children form with teachers and peers (Hypotheses 5 and 6). In general, the hypothesized model of the study provided an acceptable fit to the given data (χ_2 [108 df, N = 407] = 431.74, p< .001, CFI = 0.90, SRMR = 0.06, RMSEA = 0.07 (with 90% CI lower bound = 0.06 and upper bound = 0.09). A non-significant path was observed in this originally hypothesized model (see Figure 4 and Table F6). Specifically, the non-significant path was from peer relationships to academic adjustment (r=.02, *p*>.05).

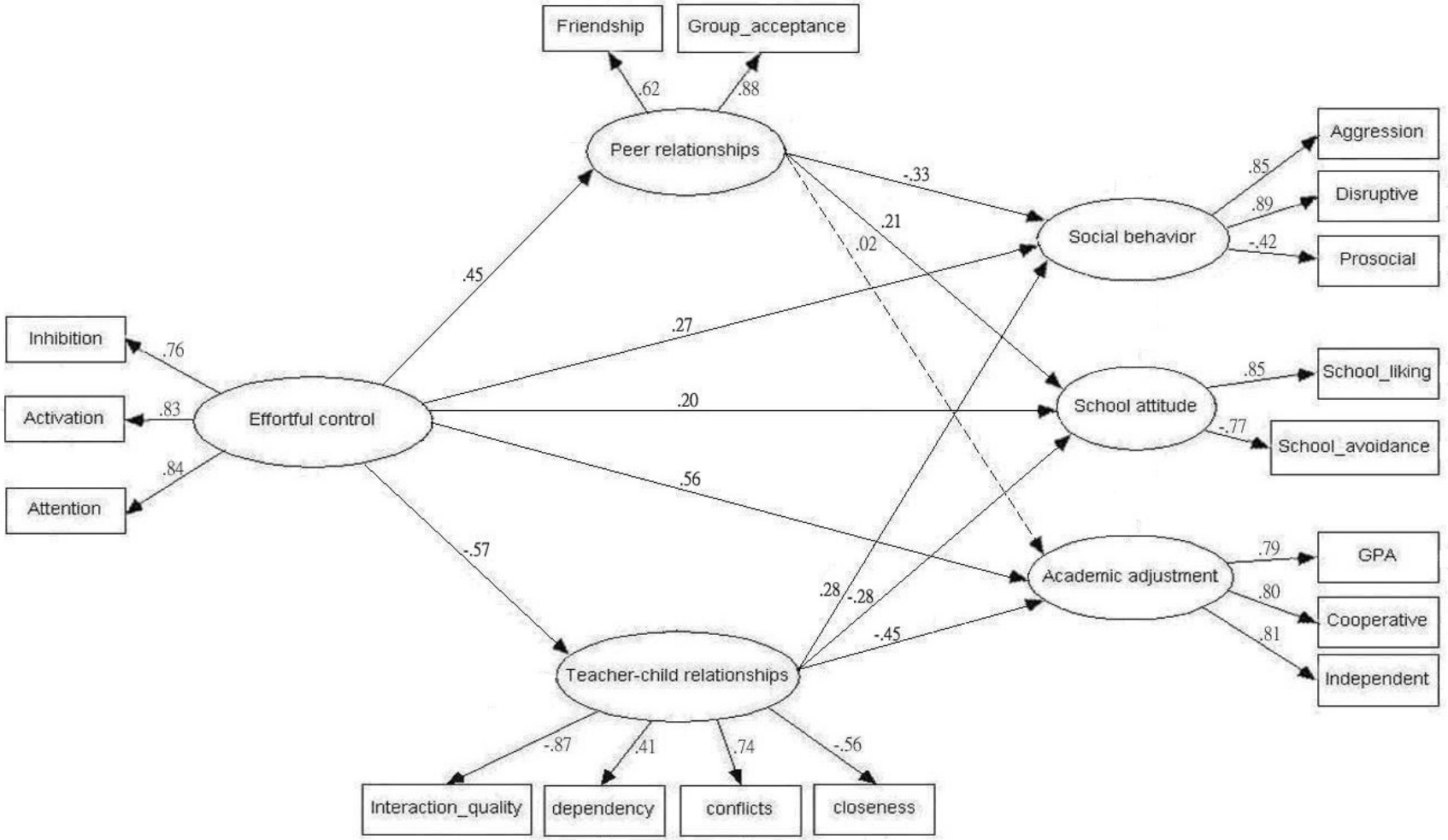

Figure 4. Standardized Path Coefficients and Residual Variance in the Hypothesized Structural Model

Note.$\chi 2$ (108 N = 407) = 431.74, p< .001, CFI =0 .90, SRMR=0.06, RMSEA = 0.07

Tests of Direct Effects

Consistent with the hypotheses*1-1, 1-2, 1-3, 2-1,* and *2-2*, effortful control showed significant direct effects on children's social behavior (β =.27, $p < .001$), school attitudes (β =.20, $p < .01$), academic adjustment (β =.56, $p < .001$), peer relationships (β =-.45, $p < .001$), as well as teacher-child relationships (β = -.57, $p < .001$) (see Figure 4). It indicated that children who have higher levels of effortful control are likely to display higher levels of socially appropriate behavior, more positive attitudes toward school, higher involvement in the classroom (i.e., cooperative participation and independent participation), and demonstrate higher GPA as well. In addition, the findings displayed that children who have higher levels of effortful control were likely to report more reciprocal friendships and greater group-acceptance. These children also showed higher levels of closeness, lower levels of conflicts, and dependency, as well as better interaction quality with their teachers.

Consistent with the hypothesis *3-1*, peer relationships showed significant effects on social behavior (β = -.33, $p < .001$). Specifically, children who reported more interpersonal ties and better group acceptance tended to report less aggressive and disruptive behavior, but more prosocial behavior. Also, consistent with hypothesis *3-2*, the current study supported the contention that children who form better relationships with peers demonstrated higher levels of school liking and lower levels of school avoidance (β = .21, $p < .001$). Nevertheless, inconsistent with hypothesis *3-3*, peer relationships did not show any significant influence on children's academic adjustment, including cooperative and independent classroom participation, as well as GPA performance.

As anticipated, teacher-child relationships demonstrated significant direct effects on social behavior (β = .28, $p < .001$), school attitudes (β = -.28, $p < .001$), and academic adjustment (β = -.45, $p < .001$) (consistent with hypothesis *4-1*, *4-2*, and *4-3*). Specifically, children who have better relationships with their teachers tend to display lower levels of aggressive behavior and disruptive behavior, and higher levels of prosocial behavior. They also show more liking and less avoidance toward school than other children. In addition, children who have better relationships with their teachers demonstrate higher levels of classroom participation and better performance on GPA. Overall, the hypothetical model explained 33% of the variances in teacher-child relationships, 20% of the variance in peer relationships, 24% of the variance in social behavior, 16% of the variance in school attitudes, and 81% of the variance in academic adjustment (see Table F6, Appendix F).

Tests of Indirect Effects

The next table, Table 9, shows the assessment of indirect effects of variables involved in the structural model. For the computation of the standard errors of the indirect effects of exogenous variables on endogenous variables (SE_{ab}), the Sobel test (1982), as explained by Kline (2005), was performed. The Sobel test of standard error calculation for indirect effect basically involves the following computation:

$$SE_{ab} = \sqrt{b^2SE_a^2 + a^2SE_b^2}$$

where *a* is an unstandardized path coefficient between X and Y variables and SE_a is its standard error; *b* is unstandardized path coefficient between Y and Z variables and SE_b is its standard error. The ratio of ab / SE_{ab} provides a *z* value for the indirect effect of X on Z

through the potential mediation of Y. For example, on the first row of Table 9, the significance of the indirect effect of effortful control (X) on social behavior (Z) through the potential mediation of peer relationships (Y) was examined. "*a*" represents unstandardized path coefficient between effortful control and peer relationships and SE_a is its standard error; *b* is unstandardized path coefficient between peer relationships and social behavior and SE_b is its standard error. The ratio of ab / SE_{ab} provides a *z* value for the indirect effect of effortful control on social behavior through the potential mediation of peer relationships. For the path models involving more than one mediator, the standard error approximation is considered to be accurate when the minimum sample size exceeds 100-200 (Stone & Sobel, 1990, as cited in MacKinnon, Fairchild, and Fritz, 2007). The sample size involved in the current study satisfied this condition.

Table 9. Unstandarized Parameter Estimates, Standard Errors, and Test Statistics for the Effects of Exogenous Variables (predictors) and Endogenous Variables (outcome)

Paths	a	SEa	b	SEb	z	p
EC→ PR→ social behavior	.395	.049	-.330	.064	-4.343	<.001
EC→ PR→ school attitudes	.395	.049	.224	.046	4.190	<.001
EC→ T-C R→ social behavior	-.856	.092	.164	.030	-4.713	<.001
EC→ T-C R→ academic adjustment	-.856	.092	-.310	.034	6.512	<.001
EC→ T-C R→ school attitudes	-.856	.092	-.238	.057	3.809	<.001

Note. Ns=407 for the whole sample

EC=Effortful Control; PR=Peer Relationships; T-C R=Teacher-child Relationships

Indirect effect analysis, presented in Table 9, indicates that effortful control indirectly affected social behavior through its association with peer relationships and teacher-child relationships ($z = -4.34$, $p < .001$ and $z = -4.71$, $p < .001$, respectively). Similarly, effortful control indirectly predicted children's school attitudes through its associations with peer relationships and teacher-child relationships ($z = 4.19$, $p < .001$, and $z = 3.81$, $p < .001$, respectively). There is also a significant indirect effect of effortful control on academic adjustment through its association with teacher-child relationships ($z = 6.51$, $p < .001$). Based on these findings, the direct, indirect, and total effects of the predictor variables on the outcome variables in the model are presented in Table 10. As presented in Table 10, effortful control has both direct and indirect (meditational) effects on children's social behavior, attitudes toward school, and academic adjustment. Moreover, because all of the indirect effects were significant ($\beta = .27$, .20, and .56, $p<.001$, respectively), the influence of effortful control on children's adjustment at school was not completely, but partially, mediated by their peer and teacher-child relationships.

Consistent with the hypothesis *5-1* and *5-2*, this model supported the viewpoint that children who are more capable of regulating their emotion and behaviors are more likely to have positive relationships with their peers, which then leads to higher levels of socially appropriate behavior and positive attitudes toward school. This model also supported hypothesis *6-1*, *6-2*, and *6-3*. That is, children who are high in effortful control tend to form better relationships with their teachers, which in turn contributes to their greater adjustment at school. However, this study did not support the hypothesis (*5-3*) that the influence of children's effortful control on academic adjustment is mediated through their relationships formed with peers.

Table 10. Standardized Estimates of the Direct, Indirect, and Total Effects of the Exogenous Variables (predictors) on the Endogenous Variables (outcome) in the Hypothetic Model of the Study

Exogenous Variables	Endogenous Variables	Direct Effects	Indirect Effects	Total Effects
Effortful Control	Peer Relationships	.450***		.450***
Effortful Control	T-C Relationships	-.567***		-.567***
Peer Relationships	Social Behavior	-.329***		-.329***
Peer Relationships	School Attitudes	.213***		.213***
T-C Relationships	Social Behavior	.282***		.282***
T-C Relationships	School Attitudes	-.281***		-.281***
T-C Relationships	Academic Adjustment	-.454***		-.454***
Effortful Control	Social Behavior	.272***	.292***	.564***
Effortful Control	School Attitudes	.200***	.241***	.441***
Effortful Control	Academic adjustment	.557***	.257***	.814***

Note. Ns=407 for the whole sample

T-C=Teacher-child relationships

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

The Alternative Models

Although the fit of the overall model was consistent with the hypothesized model, it is possible that the interrelations of the latent constructs could also be described by different competing models. Therefore, two alternative models were tested for their plausibility for the observed relations in this study. Because the alternative models were not nested within the hypothesized model, a chi-square difference test could not be used to choose between the models. Instead, the Akaike Information Criterion (AIC) was used to compare the models. Competing models could be ranked according to their AIC, with the one showing the lowest AIC being the best (Kline, 2005).

Testing of Alternative Model A. This alternative model A provided a marginal fit to the given data (χ_2 [107df, N = 407] = 502.37, p<.001, CFI = 0.84, SRMR=0.07, RMSEA = 0.09 (with 90% CI lower bound =0 .08 and upper bound = 0.11). All indicators loaded significantly on their respective factors. Because effortful control did not predict children's attitudes toward school, (see Table F7 and Figure 5) there is no mediating effect in the path from social relationships to school attitudes. Moreover, the AIC of alternative model A is larger than the hypothesized model (-127.64.21 VS.-164.62), indicating that the latter was the better model.

Testing of Alternative Model B. This alternative model provided a marginal fit to the given data as well (χ_2 [107 df, N = 407] = 554.74, p< .001, CFI = 0.81, SRMR=0.08, RMSEA =0.11 (with 90% CI lower bound = 0.10and upper bound = 0.12). All indicators loaded significantly on their respective factors. However, the paths from peer relationships to social behavior and academic adjustment were non-significant (see Table F8 and Figure 6). In addition, the AIC for alternative model B was greater that for the hypothesized model (-197.32 vs. -164.62). Thus, alternative model B is not quite as good a model as the hypothesized model.

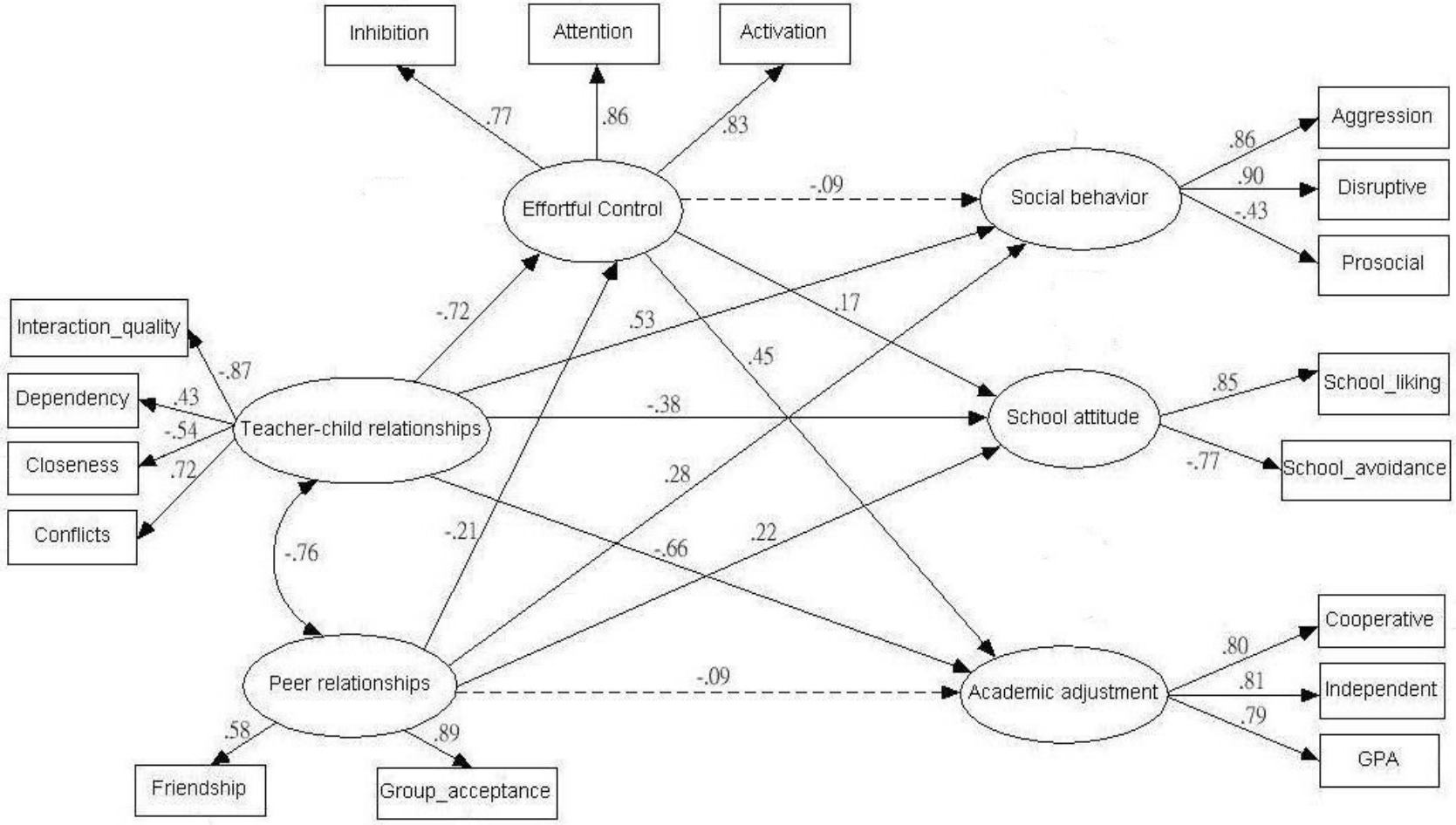

Figure 5. Standardized Path Coefficients and Residual Variance in the Competing Model A

Note. χ^2 (107, N = 407) = 554.74, p< .001, CFI = 0.81, SRMR=0.08, RMSEA =0.11

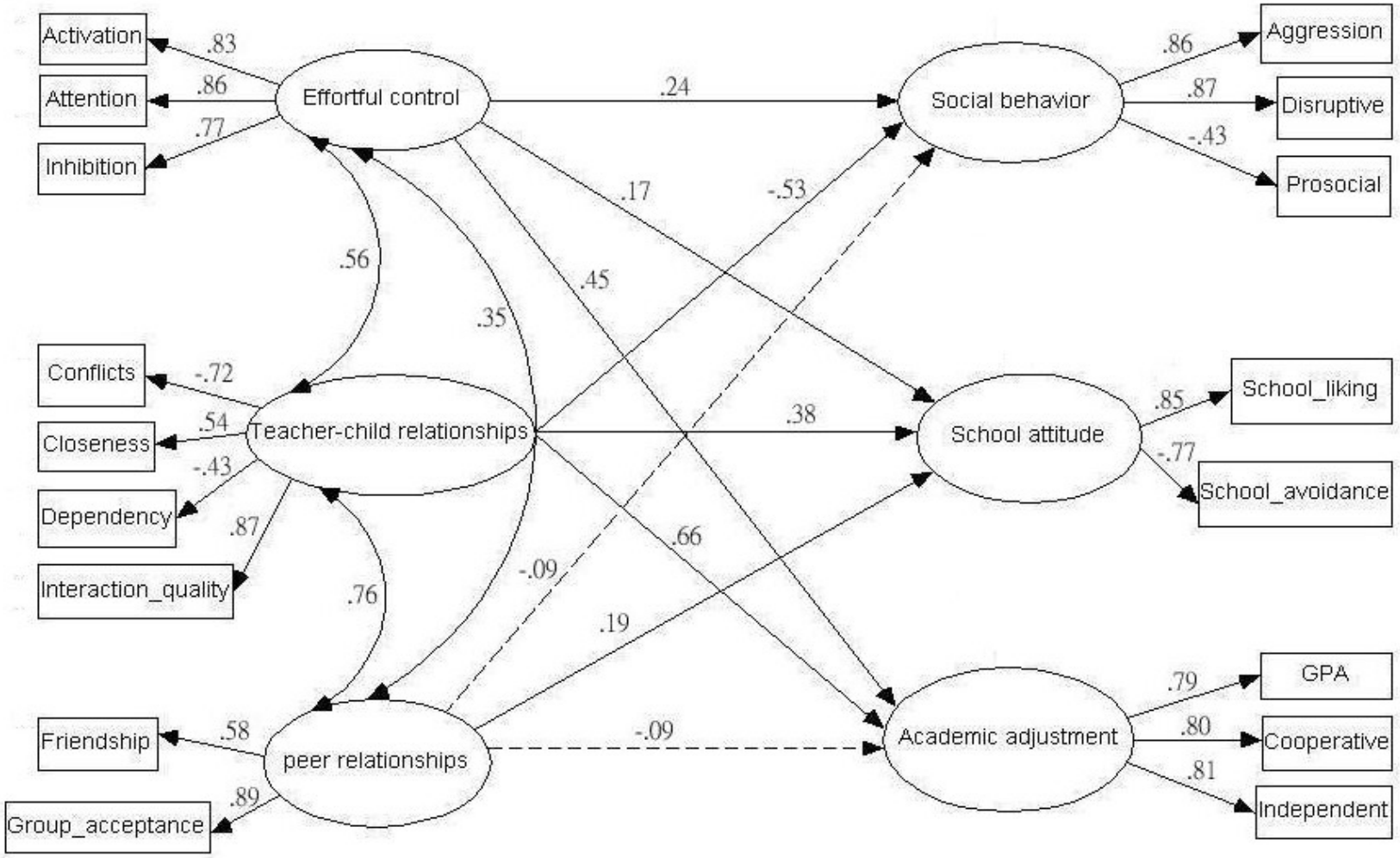

Figure 6. Standardized Path Coefficients and Residual Variance in the Competing Model B

Note. χ^2 (107, N = 407) = 502.37, p=<.001, CFI = 0.84, SRMR=0.07, RMSEA = 0.09

CHAPTER V

DISCUSSION

This study addressed several important questions to extend the literature on socioemotional processes that likely contribute to elementary-aged children's adjustment at school. The major goal of the current study was to examine the influences of children's dispositional characteristics (i.e., effortful control) and two different school-based relationships on their school adjustment. Specifically, this study identified children's dispositional characteristics that directly and indirectly predict their social and academic functioning and investigated the pathways among those constructs. Therefore, two processes were examined: 1) the direct effects of effortful control on children's adjustment at school and social relationships and 2) the mediating effects of social relationships by which effortful control contribute to children's adjustment at school. As to the test of the direct effects, the findings showed strong support for the direct effect hypothesis that high levels of children's effortful control predicted successful adjustment at school. As to the test of the indirect effects, findings showed strong support for the hypothesis that the quality of children's relationships with their teachers mediated the effortful control to school adjustment effect but weak support for the hypothesis that the quality of children's relationships with their peers mediated this same effect of effortful control to school adjustment. .

In addition to the hypothesized direct and indirect models, two alternative models were tested to evaluate the likelihood of other conceptual considerations. The test of alternative models is important as the existence of plausible equivalent or alternative models may lead to a threat to the validity of the hypothesized model (Eisenberg et al.,

competing models. The model in which children's relationships formed with teachers and peers were expected to predict their effortful control, which in turn predicted social and academic adjustment at school (alternative model a) was not supported, largely because there was no significant relationship from effortful control to school adjustment. Another model that proposed that children's relationships would covary with effortful control in the prediction of school adjustment (alternative model b) was not supported, largely because the paths from peer relationships to social behavior and academic adjustment were non-significant. .

In the following chapter, a detailed discussion of the specific findings based on the hypothesized model, which was the one with the best fit, will be undertaken and integrated in the context of the empirical research presented earlier. Next, the strengths and practical implications of the research study are presented. Following this section, limitations of the study as well as future research directions are discussed.

Links between Children's Effortful Control and Adjustment at School

Findings of the present study were consistent with the viewpoint that dispositional emotion regulation involving one's actions and attention is critical for academic achievement (Blair, 2002; Coplan et al., 1999; Denham et al., 2003; Raver, 2002). Specifically, children's emotion-related regulation (i.e., effortful control) reported by parents and children was associated with children's GPA and teachers' reports of academic participation in the classroom. These findings were generally in accordance with prior studies. For instance, Howse and colleagues (2003) reported that, among kindergarten and first-grade children considered at risk for school failure, dispositional

emotion regulation was positively associated with achievement test scores, above and beyond the contribution of prior achievement. Recently, Graziano and colleagues (2007) found that kindergarteners' emotion self-regulation was positively associated with higher scores on standardized assessments of literacy and mathematics, with contributions of children's classroom behavior and relationships with their teachers controlled. Similar associations have also been found between teacher-rated academic behavior skills and academic achievement. For example, Opper (2003) has reported that well-regulated preschool children are rated by their teachers as better at academic tasks, more likely to remember lesson content, and more academically capable than their less well regulated peers.

Effortful control involving voluntarily focusing attention and inhibiting or initiating behavior are not only critical processes in academic success but also influential in the degree to which children develop positive attitudes toward school and embrace the school environment. It is likely that children frequently need to manage behavior and emotion as well as demands related to school work in school environments (Alexander & Entwisle, 1998; Ladd, 1996). Children low in effortful control may place themselves at risk for emotional distress and alienation from classroom activities that reduce their motivation for school-related activities and develop negative perceptions toward school. In contrast, children high in effortful control may integrate into more adaptive school networks and lead to higher levels of positive attitudes to school.

In addition, consistent with the previous studies, effortful control significantly predicted children's social behavior. Children who are more capable of modulating their attention and emotion are more likely to be relatively positive in their social interactions.

For example, Eisenberg and her colleagues have indicated that measures of effortful levels of problem behavior were associated with higher levels of sympathy and prosocial behavior and lower levels of problem behavior (Eisenberg et al., 1993, 1995; Eisenberg, Valiente, Fabes et al., 2003). The results in the current study are also supported by the studies involving children with attention deficit/hyperactivity disorder (AD/HD). Children who have been clinically identified as having difficulties controlling attention and/or inhibiting behaviors in contextually appropriate ways often have more social problems (see Stormont, 2001, for a review).

Links between Children's Effortful Control and Social Relationships

Findings of correlational analyses and structural equation modeling supported the viewpoint that effortful control was directly related to children's social relationships (i.e., teacher-child relationships and peer relationships). The results implied that children's dispositional self-regulation affects how easy or difficult it is to interact with their teachers and peers. In general, well-regulated children are more socially competent than their less well-regulated peers. Perhaps it is because teachers may have low levels of tolerance for children who do not exhibit appropriate attention and behavior in the classroom activities, and view those children as difficult to manage, requiring more energy to control their behavior as well as assist them with engaging in classroom activities. On the other hand, children who are high in regulatory capabilities tend to be relatively skilled at managing their emotion and behavior and at identifying teachers' goals and expectations. In turn, they are likely to elicit warm and close relationships with their teachers. Also, in the current study, peers expressed preference for well-regulated

children. The finding is consistent with prior research suggesting that well-regulated children are more popular (Spinrad et al., 2006) and better accepted (Eisenberg et al., 1997) than less well regulated.

Links between Children's Social Relationships and School Adjustment

Consistent with expectations, teacher-child relationships were directly associated with children's social behavior, school attitudes, and academic adjustment. The results suggested that children who develop a higher level of close relationship or maintain a higher level of interaction quality with their teachers are likely to display more socially-appropriate behavior, more positive attitudes toward school, higher engagement in the academic-related classroom activities, as well as higher GPA performance. Conversely, children who develop a higher level of conflictual relationship or maintain a lower level of interaction quality with their teachers tend to show more aggressive and disruptive behavior, more avoidance toward school, less engagement in classroom activities, and lower academic performance. In general, those findings are not new, as many studies have demonstrated the role teachers play in children's adjustment at school. For example, a number of studies have shown that a negative teacher-child relationship increases children's risk for school difficulties, including behavior problems, learning problems, negative school attitudes, as well as less positive involvement in the school environment (Birch & Ladd, 1997; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Graziano et al., 2007; Hamre & Pianta, 2005; Healther, 2003; Pianta & Stuhlman, 2004). The results are also aligned with the findings of Hamre & Pianta (2001), Ladd & Burgess (1999), and Pianta et al. (1995), although the population of the current study is elementary-aged

children. Supporting their arguments, children who show more relational negativity with their teachers tend to demonstrate lower standardized test scores, fewer positive working habits, and less social competence. Overall, findings of this study supported the argument that children's relationships with teachers are important for their adjustment at school.

Results of the concurrent structural model also revealed that children's peer relationships are directly related to their social behavior and attitudes toward school, whereas peer relationships have no direct influence on children's academic adjustment. Consistent with previous studies, children who have more interpersonal ties and better group acceptance are more likely to display socially-appropriate behavior, including lower levels of aggressive and disruptive behavior, and higher levels of prosocial behavior (Hartup, 1992, Wentzel & McNamara, 1999). Certainly, this finding supports the perspective that peer relationships provide unique opportunities for children to learn and practice social skills (Hartup, 1992). In other words, children who are better accepted by their classmates benefit from peer interaction and therefore success to develop social and cognitive skills that are required to display socially appropriate behavior.

In addition, similar to previous studies, the current study also supports the argument that positive peer relationships foster social inclusion in the classroom and yields a sense of belonging toward the school environment. For example, studies conducted by Ladd and his colleagues have reported that children who have friends or are better accepted in the classroom develop more positive perceptions of school (Birch & Ladd, 1996; Ladd, 1990; Ladd et al., 1997).Consistent with their findings, the result indicted that peer relationships have a direct influence on children's tendency of school-linking and school avoidance.

As for the association between peer relationships and academic adjustment, the present study is definitely not the first to report that positive peer relationships are not crucial for academic achievement. For example, Cornell (1990) has reported that unpopular students were as academically capable as their better-liked peers. Similarly, Ladd and Burgess (2001) have reported that positive peer relationships in the fall of kindergarten were not associated with children's spring academic achievement. From a more nuanced analysis of peer relationships and academic achievement, Wentzel (1991) reported that academic achievement was not the sole province of socially competent children. In Wentzel's study, popular and neglected students had similar high levels of academic achievement. In addition, both average and controversial students were found to have moderate achievement levels. In fact, Wentzel reported that academic achievement suffered only among students who were actively rejected by their peers. These findings posited that children's academic achievement does not depend on peer relationships. Recent ecologically-oriented research also suggests a complex association between young children's peer relationships and their academic achievement (Estell et al., 2002; Farmer & Rodkin, 1996; Rodkin, Farmer, Pearl, & Van Acker, 2000).

Estell and colleagues (2002) have described groupings of first-grade children that show no definitive association between children's peer popularity and academic achievement. Their analyses revealed groups of popular, academically successful children and groups of children who were popular, but not academically-successful. Similarly, Farmer and colleagues (1996) have found third-grade children at either end of the achievement spectrum to be well-liked by classmates. Taken together, the studies discussed above and the present study suggest that peer relationships and academic

achievement may not be as strongly related as previously thought (Estell et al., 2002; Farmer & Rodkin, 1996; Ladd & Burgess, 2001; Rodkin et al., 2000).

Social Relationships as a Mediating Mechanism in the Pathways Linking Effortful Control and Children's Adjustment at School

Based on previous research suggesting links among children's effortful control, teacher-child relationships, peer relationships, social behavior, school attitudes, and academic adjustment, it was further hypothesized that children's relationships with teachers and peers would mediate the relations between children's effortful control and their adjustment at school. The evidence in the current study supported that teacher-child relationships partially mediated children's effortful control and social behavior, school attitudes, and academic adjustment. It was also suggested that the pathways linking effortful control and children's social behavior and school attitudes were partially mediated by peer relationships. Specifically, the indirect (meditating) effects can be presented as follows: (a) the significant indirect effect of effortful control on social behavior was through its effect on teacher-child and peer relationships; (b) the significant indirect effect of effortful control on school attitudes was through its effect on teacher-child and peer relationships; (c) the significant indirect effect of effortful control on academic adjustment was through its effect on teacher-child relationships. Each of the mediating associations will discussed more fully below.

First, for teacher-child relationships, as expected, the results indicated that when children are high in effortful control, they may be more likely to develop warm and positive interactions with their teachers, and then receive more classroom support from their teachers, such as the delivering of appropriate expectations and adequate

educational resources. In turn, those children displayed more socially and academically competent behaviors as well as more positive attitudes toward school. Conversely, when children are low in effortful control, they may elicit a more conflictual or dependent relationship with their teachers, and therefore receive less support and resources as well as missing out on learning opportunities. Consequentially, children who receive less instruction and fewer positive feedbacks from teachers tend to display higher levels of problem behavior and lower levels of motivation for subsequent learning and performance. They may also view the school environment negatively and something to be avoided (Valiente et al, 2008).

On the other hand, the results of this study provide some support for the claim that children's peer relationships play a partially-mediating role in the pathways from their effortful control to school adjustment. Specifically, peer relationships mediated the relations between children's effortful control and social behavior. The findings implied that children who are high in effortful control may promote healthy peer relationships that, in turn, provide unique opportunities for children to learn and practice social skills, such as sharing, cooperation, and complying with rules. Consequently, those children demonstrate more prosocial behavior and less delinquent behavior (i.e., disruptive and aggressive behavior). On the contrary, children who are low in effortful control are more likely to have less friendship and negative peer interactions and then may be deprived of beneficial peer experience. As a result, those children are less socially competent and show higher levels of delinquent behavior.

As well, support was found for the assumption that peer relationships mediate the relations between children's effortful control and school attitudes. Eisenberg and her

colleagues (Eisenberg et al., 2001, 2003) have linked effortful control to positive and supportive relations with peers, whereas children who are low in effortful control are more likely to be rejected by peers. Additionally, studies conducted by Ladd and his colleagues (Ladd, 1996; Ladd et al., 1999) have reported that children who receive assistance and support from peers increase their positive attitudes toward school. The current study obtained further evidence to suggest the link between effortful control and school attitudes was partially mediated through peer relationships. That is, effortful control would promote the development of healthy peer relationships that, in turn, lead to a higher level of school-liking and lower level of avoidance toward school.

Strength of the Research Study

A significant strength of the present research was the generation of the structural model. The model responded to a need in educational research to examine of the associations among children's effortful control, social relationships, and adjustment at school. There are two major advantages for the use of structural equation modeling. First, unlike path analysis which uses single indicators for the measurement of each construct, SEM techniques use multiple indicators defining latent constructs. The second advantage of SEM is that it allows for the correlation among residual variances, if supported by the theory and the model.

In addition, strengths of this study include the exploration of effects of multiple social relationships on children's adjustment at school. Although research scientists, educators, and policy makers have speculated that social relationships is an important predictor of school adjustment, this is one of the first studies to examine both teacher-child relationships and peer relationships linked to school adjustment. In addition to

the multiple prospective research design, multiple methods (e.g., questionnaires, peer nominations) were used to validate the measures. Multiple methods could confirm that reliable and valid measures of the constructs of interest would be included in the analyses.

Third, the process-oriented model is another important strength of this study. A number of investigators have found links between children's self-regulatory capabilities and their adjustment at school, but the process maintaining these relations has not been well examined. Understanding how and why effortful control is associated with children's adjustment at school is important for identifying effective targets of intervention and promoting children's healthy development. To examine these associations, the current study suggests a meditational model in which child characteristics and contextual forces jointly influence children's adjustment at school. This study contributes to the literature of children's school adjustment by examining the effects of dispositional self-regulation through the mediated path of social relationships.

Much of the work linking children's effortful control to adjustment at school primarily focuses on academic achievement or academic progress (Hoffman et al., 2000; Hughes et al., 2008; Opper, 2003; Valiente, Lemery-Chalfant & Castro, 2007). To my knowledge, very few studies broadly examine both children's social and academic adjustment to provide insight into their life at school. However, educational psychologists' and educators' over emphasis on cognition and on children's academic performance have shadowed the significance of socioemotional related adjustment for their school life (Blair, 2002). This study includes multiple aspects of children's adjustment at school (e.g., social behavior, attitudes toward school, and academic

adjustment) and therefore expands our understanding of elementary-aged children's school life.

Finally, the targeted population, elementary-aged Taiwanese children also increases the importance of this study. Until now, most of the researchers who have investigated the relations between children's dispositional self-regulation and school adjustment have focused on preschoolers instead of elementary-aged students. Given that elementary school age is a critical period for cognitive, social, and emotional development, the investigation of the given constructs within a sample of elementary-aged children contributes to the significance of the present study. Additionally, in Taiwan, there is no other research examining the direct and indirect relationships among children's effortful control, social relationships, and adjustment at school. The strength of this study is thus further emphasized by the lack of research that considers how both children's effortful control and their relationships with teachers and peers in the classroom separately and jointly contribute to their successful adjustment at school.

Practical Implications of the Research Study

The findings of the present study fill a significant gap in our understanding regarding how socioemotional processes may impact children's adjustment at school. As the results showed, effortful control and social relationships are important factors impacting elementary school children's social and academic functioning. Therefore, it is necessary to provide several suggestions on how to promote children's development of effortful control and successful social relationships.

The results of the current study contribute to educational practices and policies as well as preventive or promotive intervention in some specific ways. First, efforts to

improve children's social and academic adjustment through sustaining or enhancing children's effortful control appear to be very critical. Effortful control, defined as the ability to inhibit a dominant response to perform a subdominant response, to detect errors, and to engage in planning, is a major form of self-regulation. Although effortful control, rooted in children's physiological temperament, is thought to be derived partly from heredity, experience plays an important role in shaping of this capability (Calkins, 1994; Rothbart & Bates, 1998). A number of developmental psychologists have suggested that emotional regulatory skills should be launched as early as possible (Calkins, 1994; Diamond & Aspinwall, 2003; Eisenberg & Spinrad, 2004). Providing parents, caregivers, and teachers with specific strategies and techniques shown to support the development of effortful control may engender better self-regulatory skills for many children. For example, Rothbart and his colleagues have created a set of exercises to promote preschool children's effortful control. Each exercise is presented in the form of a game the child can enjoy. There are a total of nine exercises structured in three sets depending on the aspects self-regulatory they are targeting. It has been reported that those training exercises did improve children's self-regulatory capabilities (Rothbart, Ellis, Rueda, & Posner, 2003). Therefore, if parents, teachers and others working with less-regulated children are prepared to teach necessary self-regulatory skills, these children are more likely to be successful at school. In addition, teachers' knowledge about children's individual self-regulatory capabilities may also help them to adjust their formal curriculum to fit a child's individual needs and capabilities.

Developing successful relationships with teachers and peers is also a critical part of classroom experience for children as well as a potential source for improving

adjustment at school. Children who feel emotionally warm and close with a teacher and peers may view them as a secure base and resources for exploring the learning environment. In other words, children with a close relationship with their teachers and peers can take advantage of the support provided by the positive relationships to explore and to learn. In this vein, there is a need for preventive intervention or training programs to focus on the development of positive classroom relationships. Pianta (2006) suggested that it is valuable to use classroom observations to assess classroom practices and provide direct, targeted feedback and training for teachers that will positively impact children's experiences in the classroom. A critical component to training programs will involve providing individualized on-going monitoring, feedback, and reflective supervision to teachers, instead of only offering group-based trainings in the form of classes or workshop.

It is also important that teachers are trained on how to communicate and interact with children that foster positive adjustment to school. For example, teachers may learn to create a non-threatening environment by avoiding negative evaluations of students' performance, treating students' thoughts and responses as valuable, and making efforts to understanding their perceptions. Although the results of the current study did not fully support the importance of peer relationships to children's adjustment at school, there is little doubt that the skills that support children's social interaction in peer activities are important. Therefore, it is also suggested that parents, caregivers, and school teachers should model and teach socially appropriate behaviors that will facilitate children's inclusion and engagement in peer activities.

Limitations of the Research Study

Although the present study has several strengths, some weakness and limitation should be noted. The major findings of the current study should be interpreted within the context of its limitations. First, this study can not be generalized to all Taiwanese elementary students in public schools due to the age range of participants in the present study, limited to third to sixth graders. Second, the pattern of findings in the present study was not affected by children's gender, age, or family SES. It is possible that 4-year age span of children at each assessment was not sufficient to produce any significant variations in the pattern of relations. Moreover, the sample included in the current study was primarily middle- to low-class families. Moderation may have found if the sample size was larger and if the variability in age or SES were greater.

Third, because the survey was administered in a single section, it is possible that children's temporary and state-like feelings at the moment of survey administration may have affected their responses. In addition, even though statements in the instrument were reworded several times to increase children's comprehension, the variations in different schools and classroom environments still may have caused bias, especially for third-grade students. Therefore, caution is necessary in the interpretation of the study findings.

Some limitations of the study were related to the measures used in the present study. The proposed study aimed to gather information on the relations among children's effortful control, social relationships, and their adjustment at school. The indices of students' adjustment at school relied mostly on teachers' perceptions. However, children's actual adjustment at school may not be identical or comparable to teachers' perceptions. The consideration of other informants' perceptions might bring different outcomes for the

hypothesized model. In addition, most of the data in the current study were gathered with questionnaires, and therefore the bias that participants tend to respond to the items in a socially-acceptable manner is unavoidable.

Another important limitation is relevant to the correlational nature of structural equation modeling. The concurrent nature of this study limits the extent to which we can determine the causality of the relation between children's dispositional emotion-regulation and their adjustment at school. In other words, instead of demonstrating causal relations, structural equation models analyzed from the current data can only access the plausibility of a given model. Additionally, it is also critical to recognize that fit between the hypothesized model and the observed data in the current study does not suggest that the given model is the only way to explain the sample structure. MacCallum (1995) articulated that "there will virtually always be other models that fit the data exactly the same degree, or very close so, thereby representing models with different substantive interpretation but equivalent fit to the observed data" (pp. 17-18). In other words, the fit between the hypothesized model and the observed data in the present study only provides one plausible explanation to the observed phenomena. Even though two alternative models selected in the current study were demonstrated to be less plausible, it does not indicate that our hypothesized model is the only one that can account for the data.

Future Directions of Research

The present study addressed the issue of how children's dispositional self-regulation was related to their social relationship and adjustment at school. Moreover, meditational analyses were conducted to determine the mechanism by which children's dispositional self-regulation relates to school adjustment. The findings discussed above

contribute to a growing body of knowledge concerned with the issue. Several avenues for future research are presented below.

First, in future work, it would be useful to measure various components of effortful control and related constructs to more closely assess why there are both direct and indirect effects. More cognitively-oriented components of effortful control such as planning and attention allocation may be directly related to academic adjustment. Inhibitory components are necessary for desirable behavior, and these may be aspects of effortful control that are mediated by social relationships, such as teacher-child relationships and peer relationships. One could test the working hypothesis that social processes mediate the activational and inhibitory components of effortful control, but the attentional advantages directly relate to academic adjustment.

As one of the primary research questions of the current study involved tests of mediation, the fact that peer relationships data was collected only from two assessments may restrict our interpretation to partial mediation. Ladd and his colleagues (1997) proposed that children routinely participate in more than one form of peer relationships and thus investigators who wish to understand how relationships affect children's adjustment at school must gather data on multiple forms of relationships. Recently, peer victimization has been proposed as a form of peer relationships that is distinct from group acceptance and reciprocal friendship. In their studies, peer victimization accounted for variation in school liking and school avoidance that was unique relative to the other forms of peer relationships (Ladd & Kochenderfer, 2002; Ladd et al., 2004). Therefore, it is valuable for future studies to include peer victimization as a form of peer relationships.

Third, because reporters of this study were assessed most of the constructs with

questionnaires, follow-up studies could incorporate additional methods such as observation and diary method to assess the key constructs. Observation measures of effortful control and social relationships could potentially give insight into directionality of effects and help to understand specific behaviors and social interactions that enable children to have successful adjustment at school. In other words, observational assessment has the advantage of increased contextual effects. For example, Kochanska and colleagues (2000) have developed a battery of tasks to measure young children's effortful control, and methods are available to observationally code both student-teacher engagement and engagement.

Previous studies have frequently suggested associations between children's family backgrounds and their adjustment to school (see McLoyd, 1998 for review). However, research has demonstrated that emotion self-regulation's contribution to academic achievement remains significant above and beyond the contributions of family background (Coplan, Barber, & Lagace-Seguin, 1999; Howse et al., 2003; Miech, Essex, & Goldsmith, 2001). For example, Miech and colleagues (2001) examined emotion self-regulation's role in socioeconomic status' associations with social and academic aspects of school adjustment. They found that emotion self-regulation meditated, but did not moderate these associations. These findings tend to indicate that children's emotion self-regulation may be a mechanism by which family background wields its long acknowledged influence on children's early school adjustment. In the present study, due to non-significant results on children's social economic status, models were not tested separately for social economic status differences. Nevertheless, the sample included in the current study was primarily middle- to low-class families. Thus, future studies are

still needed to enlarge the variability in social economic status to shed light onto understand how the relations among children's effortful control, social relationships and adjustment at school work differently or similarly across different SES groups.

Finally, a longitudinal study should also be conducted to investigate the potential existence of reciprocal relationships among children's effortful control, social relationships and their adjustment at school. In the present study, the potential bidirectional relationships among variables were not examined due to the absence of longitudinal data. But, the existence of such relationships is likely and should be considered for future research. If the concurrent model was replicated with the use of longitudinal data, the nature of the links between children's effortful control, social relationships, and their school adjustment outcomes may be clarified.

Conclusions

The current study examined the role of dispositional self-regulation (i.e., effortful control) and social relationships in children's social and academic aspects of adjustment at school. In sum, findings from the current study are consistent with the premise that children's dispositional self-regulation is associated with their relationships formed with teachers and peers and contributes to the prediction of diverse and important forms of school adjustment (i.e., social behavior, school attitudes, and academic adjustment). The evidence obtained suggests that children higher in effortful control have closer relationships and better quality interaction with their teachers and peers; moreover, those children are found to show higher levels of socially appropriate behavior, more positive attitudes toward school, and better academic performance. It was also found that children's relationships formed with their teachers and peers predict their social behavior

and school attitudes. Additionally, the most significant contribution of the study is its findings on the role of social relationships, which acts as a meditational mechanism. In other words, effortful control is associated with children's social behavior and school attitudes through the mediation of social relationships. However, the current study did not find that peer relationships provide a mechanism by which dispositional self-regulation (i.e., effortful control) influences children's academic adjustment. The results call into question theory concerning the importance of peer relationships to their academic adjustment (Ladd et al., 2004) and require further examination. From an applied standpoint, the results have implications for interventions aimed at reducing risks associated with poor classroom relationships. Efforts to ameliorate children's self-regulatory skills (e.g., effortful control) may be effective in altering trajectories of social and academic adjustment. In addition, the results of the current study highlight the importance of process-oriented models in explicating the effects of children's self-regulatory capabilities on their adjustment at school.

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APPENDIX A

EFFORTFUL CONTROL MEASURES

Early Adolescent Temperament Questionnaire-Revised (EATQ-R)
(Parent-Report)

ID _____Gender _____ Age _____

Instructions: Please read carefully before starting:

Below are a set of statements that describe children's behavior or responses in a number of situations. We would like you to tell us what your child's behavior or reaction is likely to be in those situations. Of course, there are no "correct" reactions; children differ widely in their reactions, and it's these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of this child's reaction within the past month. Please respond to all the items. (1= really untrue; 2=slightly untrue; 3=slightly true; 4=really true)

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
1. If having a problem with someone, usually tries to deal with it right away.	1	2	3	4
2. Finds it easy to really concentrate on a problem.	1	2	3	4
3. Has a hard time waiting his/her turn to speak when excited.	1	2	3	4
4. When asked to do something, does it right away, even if she/he doesn't want to.	1	2	3	4
5. Pays close attention when someone tells her/him how to do something.	1	2	3	4
6. Usually gets started right away on difficult assignments.	1	2	3	4
7. She/he is often in the middle of doing one thing and then goes off to do something else without finishing it.	1	2	3	4
8. Opens presents before she/he is supposed to.	1	2	3	4
9. Is able to stop him/herself from laughing at inappropriate times.	1	2	3	4
10. Is good at keeping track of several different things that are happening around her/him.	1	2	3	4

Continued

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
11. When interrupted or distracted, forgets what she/he was about to say.	1	2	3	4
12. Is usually able to stick with his/her plans and goals.	1	2	3	4
13. Has a difficult time tuning out background noise and concentrating when trying to study.	1	2	3	4
14. Usually finishes her/his homework before it's due.	1	2	3	4
15. Usually does something fun for a while before starting her/his homework, even though she/he is not supposed to.	1	2	3	4
16. Usually puts off working on a project until it is due.	1	2	3	4
17. Has a hard time finishing things on time.	1	2	3	4
18. Is more likely to do something s/he shouldn't do the more she/he tries to stop her/himself.	1	2	3	4

Early Adolescent Temperament Questionnaire-Revised (EATQ-R)
(Child-Report)

ID _____Gender _____ Age _____

Instructions: Please read carefully before starting:

Below are a set of statements that describe your own responses or behavior in a number of situations. We would like you to tell us what your reaction or behavior is likely to be in those situations. Of course, there are no "correct" reactions. Please read each statement and decide whether it is a "true" or "untrue" description of this your behavior/reaction within the past month. Please respond to all the items. (1= really untrue; 2=slightly untrue; 3=slightly true; 4=really true)

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
1. I have a hard time finishing things on time.	1	2	3	4
2. It is easy for me to really concentrate on homework problems.	1	2	3	4
3. When I'm excited, it's hard for me to wait for my turn to talk.	1	2	3	4
4. When interrupted or distracted, I forgot what I was about to say.	1	2	3	4
5. I find it hard to shift gears when I go from one class to another at school.	1	2	3	4
6. The more I try to stop myself from doing something I should not, the more likely I am to do it.	1	2	3	4
7. I pay close attention when someone tells me how to do something.	1	2	3	4
8. I put off working on projects until right before they're due.	1	2	3	4
9. If I have a hard assignment to do, I get started right away.	1	2	3	4
10. I tend to get in the middle of one thing, then go off and do something else.	1	2	3	4
11. If my friends are mad at me, I try to stay away from them.	1	2	3	4
12. It's easy for me to keep a secret.	1	2	3	4

Continued

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
13. It's hard for me not to open presents before I'm supposed to.	1	2	3	4
14. When someone tells me to stop doing something, it is easy for me to stop.	1	2	3	4
15. I tend to be on time for school and appointments.	1	2	3	4
16. I do something fun for awhile before starting my homework, even when I'm not supposed to.	1	2	3	4
17. When I'm having a really good time, I have a hard time leaving to go home when I'm supposed to.	1	2	3	4
18. When trying to study, I have difficulty tuning out background noise and concentrating.	1	2	3	4
19. I am good at keeping track of several different things that are happening around me.	1	2	3	4
20. I'm good at self-discipline.	1	2	3	4
21. I finish my homework before the due date.	1	2	3	4
22. I could easily change a bad habit if I wanted to.	1	2	3	4
23. I tend to say the first thing that comes to my mind, without stopping to think about it.	1	2	3	4
24. I can stick with my plans and goals.	1	2	3	4
25. I blurt out answers in class before the teacher calls on me.	1	2	3	4

Note. Copyright 1992 by Capalidi, D.M., & Rothbart, M.K. The items shown are for the parent and child-report of effortful control measures used in the present study, adopted from the Early Adolescence Temperament Questionnaire-Revised (EATQ-R)

APPENDIX B

TEACHER-CHILD RELATIONSHIPS MEASURES

Student-Teacher Relationship Scale (STRS)
(Teacher-Report)

ID _____Gender _____ Age_____

Instructions: Please read carefully before starting:

Below are a set of statements that describe your interactions with your individual student in a number of situations. We would like you to tell us what your perceptions of interactions with your students are likely to be in those situations. Please read each statement and decide whether it is a "true" or "untrue" description of this your interactions within the past month. Please respond to all the items. (1= really untrue; 2=slightly untrue; 3=slightly true; 4=really true

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
1. This child and I always seem to be struggling with each other.	1	2	3	4
2. I share an affectionate, warm friendship with this child.	1	2	3	4
3. This child reacts strongly to separation from me.	1	2	3	4
4. This child is uncomfortable with physical affection or touch from me.	1	2	3	4
5. This child's feelings toward me can be unpredictable or can change suddenly.	1	2	3	4
6. If upset, this child will seek comfort from me.	1	2	3	4
7. Dealing with this child drains my energy.	1	2	3	4
8. When this child arrives in a bad mood, I know we are in for a long and difficult day.	1	2	3	4
9. This child values his/her relationship with me.	1	2	3	4
10. This child remains angry or resistant after being disciplined.	1	2	3	4
11. It is easy to be in tune with what this student is feeling.	1	2	3	4
12. This child whines or cries when he/she wants something from me.	1	2	3	4

Continued

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
13. This child easily becomes angry at me.	1	2	3	4
14. I've noticed this child copying my behavior or ways of doing things.	1	2	3	4
15. When I praise this child, he/she beams with pride.	1	2	3	4
16. Despite my best efforts, I'm uncomfortable with how this child and I have gotten along.	1	2	3	4
17. This child is sneaky or manipulative with me.	1	2	3	4
18. When this child is misbehaving, he/she responds well to a look or my tone of voice.	1	2	3	4
19. My interactions with this child make me feel effective and confident.	1	2	3	4
20. This child tries to please me.	1	2	3	4
21. This child asks for my help when he/she doesn't need help.	1	2	3	4
22. This child openly shares his/her feelings and experience with me.	1	2	3	4
23. This child sees me as a source of punishment and criticism.	1	2	3	4
24. This child becomes hurt or jealous when I spend time with other children.	1	2	3	4
25. This child feels that I treat him/her unfairly.	1	2	3	4
26. This child spontaneously shares information about him/herself.	1	2	3	4
27. This child is overly dependent on me.	1	2	3	4

Note. Copyright 2001 by Pianta, R. C. The items shown are for teacher-report of teacher-child relationships measures used in the present study, adopted from Student-Teacher Relationship Scale (STRS).

Peer Nominations and Ratings Measure of the Teacher-Child Relationship (PNR-TC)
(Child-Report)

ID _____Gender _____ Age _____

1. _____ Some kids and teachers *don't* get along with each other. They always seem to be angry with each other. They might argue or fight a lot, and they don't seem to like each other very much. Please write down someone's name except yourself in your class who has a relationship like that with your teacher.

2. _____ Some kids and teachers *do* get along well with each other. They really seem to like each other a lot. They like to talk to each other, and seem happy with each other. Please write down someone's name except yourself in your class who has a relationship like that with your teacher.

3. _____ Some kids seem to cling onto or stay close to the teacher a lot. They've always asking for his/her help, and get upset when the teacher is working with someone else. They don't like to do things without his/her help. Please write down someone's name except yourself in your class who has a relationship like that with your teacher.

Note. Copyright 2001 by Birch, S. H. The items shown are for child-report of teacher-child relationships measures used in the present study, adopted from Peer Nominations and Ratings Measure of the Teacher-Child Relationship (PNR-TC).

Peer Nominations and Ratings Measure of the Teacher-Child Relationship (PNR-TC)
(Child-Report)

ID _____Gender _____ Age _____

Instructions: Please read carefully before starting:

Here is a list of your classmates who participate in the study. In order to help us know more about the quality of relationships those classmates have with your teacher, we would like to ask you to rate how well each of the classmates on the list gets along with your teacher (1= not at all; 2= kinda well; 3=well ; 4=very well).

Names	Not At All	Kinda Well	Well	Very Well
	1	2	3	4

Note. Copyright 2001 by Birch, S. H. The items shown are for child-report of teacher-child relationships measures used in the present study, adopted from Peer Nominations and Ratings Measure of the Teacher-Child Relationship (PNR-TC).

APPENDIX C

PEER RELATIONSHIPS MEASURES

Peer Group Acceptance

(Peer-Report)

ID _____Gender _____ Age _____

How much you like to be in school activities with this person?

	Not at all	Sort of	Much	Very Much
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4
_____	1	2	3	4

Note. Copyright 1979 by Asher, S.R., Singleton, L.C., Tinsley, B.R., and Hymel, S. The item showed is peer-reports of group acceptance used in the present study.

Reciprocal Friendship

(Peer-Report)

ID _____Gender _____ Age _____

Your classmates who participate in the current study have been listed. To help us know more about how you interact with your classmates. We would like to ask you to write down 1-5 best friends' names based on the list (at least one and up to five).

1. _____
2. _____
3. _____
4. _____
5. _____

Note. Copyright 1979 by Asher, S.R., Singleton, L.C., Tinsley, B.R., and Hymel, S. The item showed is peer nomination of reciprocal friendship used in the present study.

APPENDIX D

SCHOOL ADJUSTMENT MEASURES

School Liking and School Avoidance Scale (SLAS)
(Child-Report)

ID _____Gender _____ Age _____

Instructions: Please read carefully before starting:

Please consider the descriptions of the following items and rate the extent to which each description applies to you. Please fill in ONLY ONE response to each question and respond to all the items (1= really untrue; 2=slightly untrue; 3=slightly true; 4=really true).

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
1. School is fun.	1	2	3	4
2. You wish you do not have to go to school.	1	2	3	4
3. When you get up in the morning, you feel happy about going to school.	1	2	3	4
4. You like to come to school.	1	2	3	4
5. You wish you could stay home from school.	1	2	3	4
6. You are happy when you're at school.	1	2	3	4
7. You like being in school.	1	2	3	4
8. School is yucky.	1	2	3	4
9. You would like it if your mother or father let you stay home from school.	1	2	3	4
10. School makes you feel like crying.	1	2	3	4
11. School a fun place to be.	1	2	3	4
12. You feel happier when it's time to go home from school.	1	2	3	4
13. You hate school.	1	2	3	4
14. You ask your mother or father to let you stay home from school.	1	2	3	4

Note. Copyright 1987 by Ladd, G. W., & Price, J.M. The items shown are for the child-report of school adjustment measures used in the present study, adopted from Schooling Liking and School Avoidance Scale (SLAS)

Teacher's Checklist of Children's Social Behavior (TCCSB)
(Teacher-Report)

ID _____Gender _____ Age _____

Instructions: Please read carefully before starting:

Please consider the descriptions of the following items and rate the extent to which each description applies to your students. Please fill in ONLY ONE response each item and respond to all the items (1= really untrue; 2=slightly untrue; 3=slightly true; 4=really true).

Items Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
1. This child acts silly or immature.	1	2	3	4
2. The child is very good at understanding other people's feelings.	1	2	3	4
3. This child exaggerates and makes up stories.	1	2	3	4
4. This child starts fights with peers.	1	2	3	4
5. This child gets angry easily and strikes back when he or she is threatened or teased.	1	2	3	4
6. This child does things that other children think are strange or inappropriate.	1	2	3	4
7. This child makes odd noises or unusual comments.	1	2	3	4
8. This child says mean things to peers, such as teasing or name calling.	1	2	3	4
9. This child gets other kids to gang up on a peer that he or she does not like.	1	2	3	4
10. This child bothers kids when they are trying to work.	1	2	3	4
11. This child threatens or bullies others in order to get his or her own way.	1	2	3	4
12. This child seeks the teacher's attention too often.	1	2	3	4
13. This child is good to behave in a group, share things, and be helpful.	1	2	3	4

Continued

Items Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
14. This child complains or whines a lot.	1	2	3	4
15. This child is very aware of the effects of his/her behavior on others.	1	2	3	4
16. This child is a leader, and can tell others what should be done but is not too bossy.	1	2	3	4
17. This child uses physical force (or threatens to use force) in order to dominate other kids.	1	2	3	4
18. This child makes a lot of comments that are not related to what the group is doing, many of those comments are self-related.	1	2	3	4
19. This child always claims that other children are to blame in a fight and feels that they started the trouble.	1	2	3	4
20. When a peer accidentally hurts this child (such as by bumping into him/her), this child assumes that the peer meant to do it, and then overreacts with anger and fighting.	1	2	3	4

Note. Copyright 1993 by Coie, J., Terry, R., Dodge, K.A., & Underwood, M. The items shown are for the teacher-report of school adjustment measures used in the present study, adopted from Teacher's Checklist of Children's Social Behavior (TCCSB).

Teacher Rating Scale of School Adjustment (TRSSA)
(Teacher-Report)

ID _____Gender _____ Age _____

Instructions: Please read carefully before starting:

Please consider the descriptions of the following items and rate the extent to which each description applies to your students. Please fill in ONLY ONE response each item and respond to all the items (1= really untrue; 2=slightly untrue; 3=slightly true; 4=really true).

Item Descriptions	Really Untrue	Slightly Untrue	Slightly True	Really True
1. This child is easy for me to manage.	1	2	3	4
2. This child seeks challenges.	1	2	3	4
3. This child responds promptly to my requests.	1	2	3	4
4. This child follows my directions.	1	2	3	4
5. This child needs lots of help and guidance.	1	2	3	4
6. This child accepts my authority.	1	2	3	4
7. This child listens carefully to my instructions and directions.	1	2	3	4
8. This child works independently.	1	2	3	4
9. This child uses classroom materials responsibly.	1	2	3	4
10. This child is a self-directed child.	1	2	3	4
11. This child accepts responsibility for a given task.	1	2	3	4

Note. Copyright 1997 by Birch, S. H., & Ladd, G. W. The items shown are the teacher-report of school adjustment measures used in the present study, adopted from Teacher Rating Scale of School Adjustment (TRSSA)

APPENDIX E

CHINESE VERSION OF MEASURES

識別碼_____

學校_____ 性別 _____ 出生年/月 _____

指導語: 在接下來的頁面裡，你會讀到一系列的敘述句，通常大家會用這些敘述句來描述自己。這些敘述句包含許多不同的活動及態度。針對每一個敘述句，請你依這個敘述句有多符合你來圈選出最適合的答案。這些問題並沒有最好的答案，對於這些敘述句，每個人的感覺都相當不同，所以請你選擇**對你而言**最符合的答案。

請你以下列的量尺來評估敘述句有多符合或者不符合你：

圈選　如果這個敘述句：

1. 幾乎總是不符合
2 偶爾符合
3 通常符合
4 幾乎總是符合

附註：請確認是否回答問卷所有的問

描述句是否符合你的情況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
1. 我不太能夠準時完成事情	1	2	3	4
2. 對我來說要專注於家庭作業的問題上是容易的	1	2	3	4
3. 在別人告訴我該怎麼做的時候我會很專心聽	1	2	3	4
4. 我常會把事情做到一半就跑去做別的事情	1	2	3	4
5. 我會把作業拖到最後一刻才做	1	2	3	4
6. 我越想阻止自己做某件不該做的事，就越可能去做	1	2	3	4
7. 我會在截止日期之前完成我的家庭作業	1	2	3	4
8. 我很容易保守秘密	1	2	3	4
9. 在學校時,依據不同課堂的要求來調整自己的學習步調對我而言是困難的	1	2	3	4
10. 當試著要用功時，我很難排除背景的吵鬧聲並且專心	1	2	3	4
11. 即使不應該，我還是會在寫功課前先玩一會兒	1	2	3	4
12. 我能遵循我的計畫跟目標	1	2	3	4
13. 只要我想要的話我可以輕易的改變壞習慣	1	2	3	4
14. 我很能自我約束	1	2	3	4
15. 對我來說等到可以的時候才打開禮物是很困難的	1	2	3	4
16. 當別人叫我不要做某件事時，我很容易就能停下來	1	2	3	4
17. 當興奮時, 我很難等輪到我時再發言	1	2	3	4
18. 如果我的朋友生我的氣，我會試著要避開他們	1	2	3	4

下一頁

描述句是否符合你的情況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
19. 當說話被打斷時，我會忘記我原本要說的內容	1	2	3	4
20. 我會準時到校以及赴約	1	2	3	4
21. 當我玩得很開心的時候, 準時回家對我而言是困難的	1	2	3	4
22. 我想到什麼就說什麼，不會停下來想一想	1	2	3	4
23. 如果我有困難的作業要做的話我會馬上開始做	1	2	3	4
24. 上課的時候我會在老師叫我之前就脫口說出答案	1	2	3	4
25. 我很能夠掌握身邊發生的各個事情	1	2	3	4

描述句是否符合你的情況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
1. 你覺得學校很好玩	1	2	3	4
2. 你希望你可以不用去上學	1	2	3	4
3. 當你早上醒來時, 你很高興要去上學	1	2	3	4
4. 你喜歡來學校	1	2	3	4
5. 你喜歡可以待在家裡而不用上學	1	2	3	4
6. 你在學校時很開心	1	2	3	4
7. 你喜歡待在學校	1	2	3	4
8. 學校是令人厭惡的	1	2	3	4
9. 你希望爸媽讓你待在家裡而不用去上學	1	2	3	4
10. 學校會讓你想哭	1	2	3	4
11. 學校是個好玩的地方	1	2	3	4
12. 放學時會讓你感覺比較快樂	1	2	3	4
13. 你討厭學校	1	2	3	4
14. 你要求爸媽讓你待在家裡而不用上學	1	2	3	4

識別碼_____

學校 _____ 性別_____ 出生年/月_____

指導語: 在接下來的頁面裡的敘述句是很多學生在學校生活中常見的社會行爲表現,請您針對每一個細項，評估您的每位學生在過去一個月內，該行爲出現的頻率高低，並且圈選出最符合的選項。

請你以下列的量尺來評估敘述句有多符合或者不符合他(她)：

圈選　如果這個敘述句：

1. 幾乎總是不符合
2 偶爾符合
3 通常符合
4 幾乎總是符合

附註：請確認是否回答問卷所有的問題。

描述句是否符合他(她)的狀況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
1. 這個孩子表現出愚蠢或不成熟	1	2	3	4
2. 這孩子很擅長於了解他人的感受	1	2	3	4
3. 這個孩子會誇大及編造故事	1	2	3	4
4. 這個孩子會主動和同伴打架	1	2	3	4
5. 當這個孩子被威脅或取笑時會很容易反擊	1	2	3	4
6. 這孩子會做其他人認爲奇怪或是不適當的事	1	2	3	4
7. 這孩子會發出奇怪的噪音或是不尋常的言論	1	2	3	4
8. 這孩子會對同伴說刻薄的話	1	2	3	4
9. 這孩子會聯合其他人去排擠他不喜歡的人	1	2	3	4
10. 這個孩子會去干擾其他正在做事的孩子	1	2	3	4
11. 這孩子會爲了爲所欲爲而威脅或是欺侮他人	1	2	3	4
12. 這個孩子過度尋求老師的注意	1	2	3	4
13. 這孩子在團體中表現良好、樂於分享及助人	1	2	3	4
14. 這孩子常抱怨或是發牢騷	1	2	3	4
15. 這孩子非常了解他/她的行爲對於他人的影響	1	2	3	4
16. 這孩子是個領導者，能夠告訴別人該做什麼而不會太過跋扈	1	2	3	4
17. 這孩子會爲了要支配其他孩子而採用武力	1	2	3	4
18. 這孩子總是把打架的錯推到其他孩子身上，並 且認爲是他們開始找麻煩的。	1	2	3	4
19. 這孩子會提出許多跟團體正在進行的事情無關的意見，大多數的都是與自己有關的	1	2	3	4
20. 當同伴不小心弄傷了這孩子(例如撞到他/她)，這孩子會認爲同伴是故意的，然後憤怒的反應	1	2	3	4

識別碼_____

學校 _____ 性別_____ 出生年/月 _____

指導語: 在接下來的頁面裡的敘述句是很多學生在師生互動過程中常表現出的行爲及態度,請您針對每一個細項，評估您的每位學生在過去一個月內，該行爲出現的頻率高低，並且圈選出最符合的選項。

請你以下列的量尺來評估敘述句有多符合或者不符合他(她)：

圈選　如果這個敘述句：

1. 幾乎總是不符合
2 偶爾符合
3 通常符合
4 幾乎總是符合

附註：請確認是否回答問卷所有的問題。

描述句是否符合他(她)的狀況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
1. 這個孩子跟我似乎難以相處	1	2	3	4
2. 我親切、溫柔、且友善的對待這孩子	1	2	3	4
3. 這孩子對於與我分開表現出強烈的反應	1	2	3	4
4. 這孩子對於我的感覺是無法預測且會突然改變	1	2	3	4
5. 如果有了不愉快，這孩子會在我身上尋求安慰	1	2	3	4
6. 應付這孩子讓我精疲力盡	1	2	3	4
7. 當這孩子不愉快的到校時，我知道今天麻煩大了	1	2	3	4
8. 這個學生很重視他和我的關係	1	2	3	4
9. 這孩子在被訓誡後會一直保持憤怒或是抗拒的態度	1	2	3	4
10. 要了解這個孩子的感受是很容易的	1	2	3	4
11. 當這孩子對我有所求的時候，他/她會嘀咕(嗚咽) 或是哭泣	1	2	3	4
12. 這個孩子很容易生我的氣	1	2	3	4
13. 我注意到這個孩子會模仿我的行爲或做事情的方式	1	2	3	4
14. 當我讚美這孩子時，他/她會驕傲的笑	1	2	3	4
15. 儘管我盡了一切努力，我仍然對於與這個孩子相處感到不舒服	1	2	3	4
16. 這孩子在我背後鬼鬼祟祟或是想要戲弄我	1	2	3	4
17. 當這孩子不乖的時候，他/她會因爲我的一個眼神或是說話的聲音而有所反應	1	2	3	4

下一頁

描述句是否符合他(她)的狀況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
18. 和這個孩子的互動讓我感覺良好且有自信	1	2	3	4
19. 這個孩子會試圖取悅我	1	2	3	4
20. 這孩子在非必要的時候尋求我的協助	1	2	3	4
21. 這孩子坦率的與我分享他的感受及經歷	1	2	3	4
22. 這孩子將我視爲是懲罰及批評的來源	1	2	3	4
23. 當我花時間在其他孩子身上時，這孩子會有受傷或是忌妒的感覺	1	2	3	4
24. 這孩子認爲我對他/她不公平	1	2	3	4
25. 這孩子會主動的分享自己的事情	1	2	3	4
26. 這個孩子過度依賴我	1	2	3	4

描述句是否符合他(她)的狀況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
1. 管理這個學生對我而言是容易的。	1	2	3	4
2. 這個孩子會尋求挑戰。	1	2	3	4
3. 這個孩子會迅速回應我的要求。	1	2	3	4
4. 這孩子會聽從我的指示。	1	2	3	4
5. 這孩子需要許多的幫助以及指導。	1	2	3	4
6. 這個孩子服從我的權威。	1	2	3	4
7. 這孩子仔細聆聽我的教導和指示。	1	2	3	4
8. 這孩子可以獨立作業。	1	2	3	4
9. 這個學生負責的使用教室的物品。	1	2	3	4
10. 這孩子是個自我引導的孩子	1	2	3	4
11. 當被指派作業時，這個孩子會負起責任。	1	2	3	4

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學校 _____ 性別_____ 出生年/月_____

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2. 偶爾符合
3. 通常符合
4. 幾乎總是符合

附註：請確認是否回答問卷所有的問題。

描述句是否符合他(她)的狀況？	幾乎總是不符合	偶爾符合	經常符合	幾乎總是符合
1. 他(她)難以準時完成工作	1	2	3	4
2. 他(她)很容易就能專注在一個問題上	1	2	3	4
3. 當別人告訴他/她該如何做事時，他(她)會表現專注	1	2	3	4
4. 當被要求完常某件事情時, 即使不願意, 他(她)也會馬上去做	1	2	3	4
5. 他(她)通常在期限之前完成家庭作業	1	2	3	4
6. 他(她)做事會做到一半就放棄，然後再去做另外一件事	1	2	3	4
7. 當他(她)和別人發生問題時, 通常會試著馬上處理	1	2	3	4
8. 當要唸書時，很難排除背景的吵雜聲然後保持專注	1	2	3	4
9. 即使知道不應該，他(她)還是會在寫功課前先玩一會兒	1	2	3	4
10. 他(她)通常能夠遵循著自己的計畫跟目標	1	2	3	4
11. 在還不能打開禮物前，他(她)就把禮物打開	1	2	3	4
12. 他(她) 通常都會把作業拖到截止時間才做	1	2	3	4
13. 當興奮時, 無法等到輪到他 (她) 時再發言	1	2	3	4
14. 當被打斷或其他事造成分心時, 他(她)會忘記本來要說的事情	1	2	3	4
15. 他(她)越想阻止自己做某件不該做的事，就越可能去做	1	2	3	4
16. 他(她)能夠阻止自己在不適當的時候大笑	1	2	3	4
17. 他/她通常會馬上開始進行困難的作業	1	2	3	4
18. 他/她能夠掌握發生在身邊的各個事件	1	2	3	4

APPENDIX F

MANOVA ANALYSES, CORRELATIONAL ANALYSES, AND STRUCTURAL EQUATION MODELS

Table F1. Descriptive Statistical Values for Major Measures

	N	M	SD
Parents' reports of effortful control			
Attentional control	407	2.63	.56
Activational Control	407	2.59	.57
Inhibitory control	407	2.68	.62
Children's self-report of effortful control			
Attentional control	407	2.80	.63
Activational Control	407	2.86	.61
Inhibitory control	407	2.98	.51
Children's self-report of school attitude			
School liking	407	3.01	.70
School avoidance	407	2.03	.76
Peer report of friendships	407	2.13	1.59
Peer report of group acceptance	407	2.84	.45
Table 2. Continued			
Peer report of T-C interaction quality	407	2.98	.52
Teachers' report of T-C relationships			
Closeness	407	2.74	.61
Conflicts	407	1.35	.39
Dependency	407	1.45	.47
Teachers' report of social behavior			
Aggressive behavior	407	1.35	.50
Disruptive behavior	407	1.48	.56
Prosocial behavior	407	2.33	.73
Teachers' report of classroom participation			
Cooperative participation	407	3.12	.62
Independent participation	407	2.74	.90

Table F2. Estimates of Factor Loadings for the Full Measurement Model

			Estimate	S.E	C.R	P	Standardized Estimate
Effortful Control	--->	Inhibition	1.00				.77
Effortful Control	--->	Activation	.99	.06	16.63	.000	.87
Effortful Control	--->	Attention	1.01	.06	17.20	.000	.86
School attitude	--->	School avoidance	-.98	.12	-8.27	.000	-.77
Peer relationships	--->	Friendship	2.07	.20	10.52	.000	.58
Academic adjustment	--->	GPA	15.78	.93	16.98	.000	.79
Academic adjustment	--->	Cooperative	1.00			.000	.79
School attitude	--->	School liking	1.00			.000	.85
Peer relationships	--->	Group acceptance	1.00			.000	.87
Social behavior	--->	Prosocial	-.72	.08	-8.82	.000	-.43
Social behavior	--->	Disruptive	1.25	.07	18.91	.000	.89
Social behavior	--->	Aggression	1.00			.000	.85
Academic adjustment	--->	Independent	1.48	.08	17.56	.000	.81
Teacher-child relationships	--->	Conflicts	1.00			.000	.73
Teacher-child relationships	--->	Closeness	-.69	.07	-10.19	.000	-.51
Teacher-child relationships	--->	Dependency	.58	.07	8.49	.000	.42
Teacher-child relationships	--->	Interaction quality	-.71	.04	-18.81	.000	-.88

Table F3. Factor Correlations in the Measurement Model

			Estimate	S.E.	C.R.	P	Standardized Estimation
Effortful Control	<-->	Teacher-child relationships	-.18	.02	-7.58	.000	-.53
Effortful Control	<-->	Social behavior	-.06	.01	-5.03	.000	-.30
Effortful Control	<-->	School attitude	.10	.02	5.24	.000	.34
Effortful Control	<-->	Academic adjustment	.18	.02	9.59	.000	.78
Effortful Control	<-->	Peer relationships	.07	.01	5.92	.000	.34
Peer relationships	<-->	Teacher-child relationships	-.23	.02	-10.09	.000	-.73
Social behavior	<-->	Teacher-child relationships	.15	.02	7.48	.000	.50
School attitude	<-->	Teacher-child relationships	-.17	.03	-6.08	.000	-.40
Academic adjustment	<-->	Teacher-child relationships	-.28	.03	-9.46	.000	-.78
Peer relationships	<-->	Social behavior	-.09	.01	-8.04	.000	-.49
School attitude	<-->	Peer relationships	.07	.02	4.44	.000	.25
Peer relationships	<-->	Academic adjustment	.13	.01	8.86	.000	.57
School attitude	<-->	Social behavior	-.04	.02	-2.82	.005	-.17
School attitude	<-->	Academic adjustment	.12	.02	5.93	.000	.40
Academic adjustment	<-->	Social behavior	-.10	.01	-7.18	.000	-.47

Table F4. MANOVA Results of All Study Variables

Measures	df	Wilks' Lambada	Partial η^2	F	P
Parent-report of Effortful control					
Gender	3	.980	.020	2.624	.005 *
Grade-level	9	.981	.006	.802	.614
SES	6	.973	.014	1.768	.103
Gender X Grade-level	9	.981	.006	.807	.610
Gender X SES	6	.984	.008	1.016	.413
Grade-level X SES	18	.959	.014	.887	.595
Gender X Grade-level X SES	15	.961	.013	1.034	.417
Child-report of Effortful control					
Gender	3	.970	.030	3.977	.008 *
Grade-level	9	.990	.003	.438	.915
SES	6	.986	.007	.885	.506
Gender X Grade-level	9	.989	.004	.458	.903
Gender X SES	6	.990	.005	.648	.692
Grade-level X SES	18	.949	.017	1.113	.333
Gender X Grade-level X SES	15	.966	.011	.885	.581
Teacher-report of T-C relationships					
Gender	3	.980	.020	2.579	.053
Grade-level	9	.987	.004	.565	.826
SES	6	.986	.007	.883	.507
Gender X Grade-level	9	.979	.007	.898	.526
Gender X SES	6	.985	.008	.983	.436
Grade-level X SES	18	.955	.015	.984	.476
Gender X Grade-level X SES	15	.981	.006	.482	.950
Peer-report of T-C relationships					
Gender	4	.960	.040	3.943	.004 *
Grade-level	12	.957	.015	1.408	.156
SES	8	.929	.036	3.590	.000 **
Gender X Grade-level	12	.950	.017	1.647	.074
Gender X SES	8	.994	.003	.263	.977
Grade-level X SES	24	.901	.026	1.675	.052
Gender X Grade-level X SES	20	.907	.024	1.898	.060

Table F4. Continued

Measures	df	Wilks' Lambada	Partial η^2	F	P
Peer relationships					
Gender	2	.990	.010	1.975	.140
Grade-level	6	.971	.014	1.864	.084
SES	4	.994	.003	.616	.651
Gender X Grade-level	6	.996	.002	.272	.950
Gender X SES	4	.996	.002	.425	.791
Grade-level X SES	12	.944	.028	1.867	.035
Gender X Grade-level X SES	10	.988	.006	.453	.919
Social behavior					
Gender	3	.964	.036	4.823	.003 **
Grade-level	9	.922	.027	3.492	.000 **
SES	6	.971	.014	1.856	.086
Gender X Grade-level	9	.990	.003	.446	.910
Gender X SES	6	.992	.004	.483	.821
Grade-level X SES	18	.920	.027	1.801	.021
Gender X Grade-level X SES	15	.954	.015	1.203	.263
School attitude					
Gender	2	.988	.012	2.276	.104
Grade-level	6	.966	.017	2.216	.012
SES	4	.991	.005	.897	.465
Gender X Grade-level	6	.975	.013	1.620	.139
Gender X SES	4	.997	.002	.302	.877
Grade-level X SES	12	.976	.012	.768	.684
Gender X Grade-level X SES	10	.971	.015	1.135	.333
Academic adjustment					
Gender	3	.974	.026	3.413	.008 *
Grade-level	9	.900	.033	4.576	.000 **
SES	6	.974	.013	1.672	.125
Gender X Grade-level	9	.997	..001	.131	.999
Gender X SES	6	.989	.005	.690	.658
Grade-level X SES	18	.942	.020	1.273	.197
Gender X Grade-level X SES	15	.946	.018	1.437	.122

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

Table F5. Results of Univariate Tests of Effects of Gender, SES and Grade-Level on the Study Constructs

	Gender					SES					Grade-level				
	Df	MS	F	P	Partial η^2	Df	MS	F	P	Partial η^2	Df	MS	F	P	Partial η^2
Parent-report of Effortful control															
Attentional Control	1	1.68	5.73	.016	.015										
Activational Control	1	2.16	6.95	.009	.018										
Inhibitory Control	1	1.90	5.21	.023	.013										
Child-report of Effortful control															
Attentional Control	1	1.44	3.81	.052	.010										
Aactivational Control	1	2.86	7.96	.005	.020										
Inhibitory Control	1	2.45	9.78	.002	.025										
Peer-report of T-C relationships															
Closeness	1	5.88	6.92	.009	.018	2	9.55	11.24	.000	.055					
Conflicts	1	5.49	5.87	.016	.015	2	.12	.13	.879	.001					
Dependency	1	.22	.22	.636	.001	2	.64	.65	.523	.003					
Interaction quality	1	2.98	13.50	.000	.034	2	1.15	5.22	.006	.026					
Teacher-report of social behavior															
Aggressive Behavior	1	1.02	4.42	.016	.011						3	.27	1.16	.325	.009
Disruptive Behavior	1	3.12	11.73	.001	.030						3	.22	.84	.472	.007
Prosocial Behavior	1	3.19	7.34	.007	.019						3	3.73	8.57	.000	.063
Academic adjustment															
GPA	1	176.22	1.99	.159	.005						3	8.13	.09	.965	.001
Cooperative participation	1	3.10	9.73	.002	.025						3	2.78	8.75	000	.064
Independent participation	1	2.02	2.71	.101	.007						3	.44	.59	.625	.005

Table F6. Estimates of Factor Loadings for the Hypothesized Model

		Estimate	S.E.	C.R	P	Standardized Estimate
Effortful Control	---> Peer relationships	.39	.05	7.63	.000	.45
Effortful Control	---> Teacher-child relationships	-.86	.09	-9.55	.000	-.57
Effortful Control	---> Social behavior	.18	.04	2.82	.000	-.27
Effortful Control	---> School attitude	.24	.10	2.39	.017	.20
Effortful Control	---> Academic adjustment	.49	.06	8.30	.000	.56
Peer relationships	---> Social behavior	-.33	.06	-2.58	.010	-.33
Peer relationships	---> School attitude	-.22	.05	2.84	.003	.21
Peer relationships	---> Academic adjustment	.02	.06	.31	.759	.02
Teacher-child relationships	---> Academic adjustment	-.31	.03	-7.27	.000	-.45
Teacher-child relationships	---> School attitude	-.24	.06	-3.01	.000	-.28
Teacher-child relationships	---> Social behavior	.16	.03	5.61	.000	.28
Effortful Control	---> Inhibition	1.00				.76
Effortful Control	---> Activation	1.00	.06	16.46	.000	.83
School attitude	---> School_avoidance	-.98	.12	-7.90	.000	-.77
Peer relationships	---> Friendship	2.34	.35	6.72	.000	.62
Academic adjustment	---> GPA	15.51	.99	15.65	.000	.79
Academic adjustment	---> Cooperative	1.00		1.00		.80
School attitude	---> School_liking	1.00		1.00		.85
Peer relationships	---> Group_acceptance	1.00		1.00		.88
Effortful Control	---> Attention	1.00	.06	17.07	.000	.84
Social behavior	---> Prosocial	-.73	.08	-8.87	.000	-.42
Social behavior	---> Disruptive	1.24	.06	22.06	.000	.89
Social behavior	---> Aggression	1.00				.85
Academic adjustment	---> Independent	1.45	.08	17.52	.000	.81
Teacher-child relationships	---> Conflicts	1.00				.74
Teacher-child relationships	---> Closeness	-.74	.07	-10.13	.000	-.56
Teacher-child relationships	---> Dependency	.55	.07	8.00	.000	.41
Teacher-child relationships	---> Interaction_quality	-.37	.02	-15.52	.000	-.87

Table F7. Estimates of Factor Loadings for the Competing Model A

		Estimate	S.E.	C.R	P	Standardized Estimate
Peer relationships	---> Effortful Control	-.23	.10	-2.28	.023	-.21
Teacher-child relationships	---> Effortful Control	-.28	.04	-6.94	.000	-.72
Effortful Control	---> School attitude	.21	.09	2.24	.025	.17
Peer relationships	---> School attitude	.19	.11	2.37	.021	.22
Peer relationships	---> Academic adjustment	-.10	.07	-1.33	.185	-.09
Peer relationships	---> Social behavior	-.09	.09	-1.02	.307	-.09
Effortful Control	---> Social behavior	.23	.09	2.92	.002	.28
Effortful Control	---> Academic adjustment	.47	.06	8.27	.000	.45
Teacher-child relationships	---> Academic adjustment	-.27	.04	-6.90	.000	-.66
Teacher-child relationships	---> School attitude	-.19	.06	-3.19	.001	-.38
Teacher-child relationships	---> Social behavior	.19	.04	4.66	.000	.53
School attitude	---> School_avoidance	-.98	.12	-7.95	.000	-.77
Peer relationships	---> Friendship	2.11	.20	10.57	.000	.58
Academic adjustment	---> GPA	15.63	1.00	15.66	.000	.79
Academic adjustment	---> Cooperative	1.00				.80
School attitude	---> School_liking	1.00				.85
Social behavior	---> Prosocial	-.72	.08	-8.85	.000	-.43
Social behavior	---> Disruptive	1.24	.06	21.84	.000	.90
Social behavior	---> Aggression	1.00				.86
Academic adjustment	---> Independent	1.46	.08	17.51	.000	.81
Teacher-child relationships	---> Conflicts	1.00				.72
Teacher-child relationships	---> Closeness	-.73	.07	-10.16	.000	-.54
Teacher-child relationships	---> Interaction_quality	-.39	.02	-17.10	.000	-.87
Peer relationships	---> Group_acceptance	1.00				.89
Teacher-child relationships	---> Dependency	.59	.07	8.28	.000	.43
Effortful Control	---> Inhibition	1.00				.77
Effortful Control	---> Activation	.99	.06	16.55	.000	.83
Effortful Control	---> Attention	1.01	.06	17.32	.000	.86

Table F8. Estimates of Factor Loadings for the Competing Model

		Estimate	S.E.	C.R	P	Standardized Estimate
Effortful control	---> Social behavior	.24	.08	2.38	.017	.21
Effortful control	---> School attitude	.21	.09	2.24	.025	.17
Effortful control	---> Academic adjustment	7.33	1.02	7.23	.000	.45
Teacher-child relationships	---> Social behavior	-.48	.11	-4.47	.000	-.53
Teacher-child relationships	---> School attitude	.47	.14	3.25	.001	.38
Teacher-child relationships	---> Academic adjustment	10.62	1.39	7.62	.000	.66
peer relationships	---> Social behavior	-.09	.09	-1.02	.307	-.09
peer relationships	---> Academic adjustment	-1.54	1.15	-1.34	.182	-.09
peer relationships	---> School attitude	-.23	.11	2.32	.021	.19
Effortful control	---> Inhibition	1.00				.77
Effortful control	---> Attention	1.01	.06	17.32	.000	.86
Effortful control	---> Activation	.99	.06	16.55	.000	.83
Teacher-child relationships	---> Conflicts	-2.54	.15	-17.10	.000	-.72
Social behavior	---> Aggression	1.00				.86
Social behavior	---> Disruptive	1.24	.06	21.84	.000	.87
Social behavior	---> Prosocial	-.72	.08	-8.85	.000	-.43
School attitude	---> School_liking	1.00				.85
School attitude	---> School_avoidance	-.98	.12	-7.95	.000	-.77
Academic adjustment	---> GPA	1.00				.79
Academic adjustment	---> Cooperative	.06	.00	15.66	.000	.80
Academic adjustment	---> Independent	.09	.01	16.86	.000	.81
peer relationships	---> Group_acceptance	1.00				.89
Teacher-child relationships	---> Interaction_quality	1.00				.87
Teacher-child relationships	---> Dependency	-1.48	.18	-8.34	.000	-.43
Teacher-child relationships	---> Closeness	1.86	.16	11.93	.000	.54
peer relationships	---> Friendship	2.11	.20	10.57	.000	.58