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## Longitudinal Relations Among Academic Achievement, Victimization, And Depression In Chinese Children: A Random Intercept Cross-Lagged Panel Model Approach

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# Longitudinal Relations Among Academic Achievement, Victimization, And Depression In Chinese Children: A Random Intercept Cross-Lagged Panel Model Approach

## Abstract

Children's academic performance has an effect on, and is affected by, their social experiences and psychological adjustment. This study aims to investigate the longitudinal relations among academic achievement, peer victimization, and depression in Chinese children. A sample of 1045 students (639 boys, 406 girls, mean age = 9 years 4 months) attending elementary schools in Beijing, People's Republic of China, were assessed each year in Grade 3, 4, 5, and 6. This study adopted a multi-informant approach, and four waves of data on academic performance, victimization, and depression were collected from school records, peer nominations, and self-reports, respectively. Data were analyzed using the random intercept cross-lagged panel model (RI-CLPM) to examine multiple reciprocal relations among the three constructs at both the between-person level and the within-person level. The analysis revealed that, after controlling for between-person effects, the reciprocal linkages between children's academic performance and victimization were significant from Grade 3 to 4, and from Grade 5 to 6. In addition, academic achievement had unidirectional contributions to subsequent depression in lower grades and higher grades. Findings from the present study highlighted the significance of academic performance in the Chinese culture.

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MODEL APPROACH

Wai Ying Vivien Yiu

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in

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LONGITUDINAL RELATIONS AMONG ACADEMIC ACHIEVEMENT,  
VICTIMIZATION, AND DEPRESSION IN CHINESE CHILDREN: A RANDOM  
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Wai Ying Vivien Yiu

## ACKNOWLEDGMENT

Glory to God.

## ABSTRACT

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Wai Ying Vivien Yiu

Xinyin Chen

Children's academic performance has an effect on, and is affected by, their social experiences and psychological adjustment. This study aims to investigate the longitudinal relations among academic achievement, peer victimization, and depression in Chinese children. A sample of 1045 students (639 boys, 406 girls, mean age = 9 years 4 months) attending elementary schools in Beijing, People's Republic of China, were assessed each year in Grade 3, 4, 5, and 6. This study adopted a multi-informant approach, and four waves of data on academic performance, victimization, and depression were collected from school records, peer nominations, and self-reports, respectively. Data were analyzed using the random intercept cross-lagged panel model (RI-CLPM) to examine multiple reciprocal relations among the three constructs at both the between-person level and the within-person level. The analysis revealed that, after controlling for between-person effects, the reciprocal linkages between children's academic performance and victimization were significant from Grade 3 to 4, and from Grade 5 to 6. In addition, academic achievement had unidirectional contributions to subsequent depression in lower grades and higher grades. Findings from the present study highlighted the significance of academic performance in the Chinese culture.

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## CHAPTER 1: INTRODUCTION

### Introduction

During the course of children's development, school represents one of the most significant and pervasive socialization contexts in shaping children's adjustment outcomes (Ladd, 1990). Not only do children have to learn to meet new academic challenges, but they also need to navigate interpersonal relationships, gain acceptance into peer groups, and develop positive perceptions and attitudes about themselves. Therefore, academic achievement, social competence, and psychological well-being constitute the main developmental tasks that children need to master in order for them to achieve school engagement and adaptation (Ladd, 1989, 1996). When children experience academic, interpersonal, and psychological adjustment problems early in their school lives, these problems may have cumulative effects that are long-lasting (Butler et al., 1985; Coie & Dodge, 1983; Horn & Packard, 1985; Perry et al., 1971). To promote school competence and prevent educational and psychological maladjustment, it is important to understand how academic achievement, victimization, and depression contribute to each other over time.

Research on culture and child development has indicated that children's functioning and adjustment is influenced by cultural contexts (e.g., Casiglia et al., 1998; Chen et al., 1992; Chen et al., 1995a; Chen et al., 2005). Cross-cultural similarities and differences exist in the definitions of adaptive and maladaptive behaviors (Benedict, 1934; Bornstein, 1995; Chen, 2000). For example, some aspects of children's social functioning, such as prosocial behavior and aggressive behavior, has been shown to share similar functional meaning in the United States, Canada, and China (Chen et al., 1995b;

Chen et al., 1992). Across these societies, prosocial behavior is associated with adaptive developmental outcomes, whereas aggression is associated with maladaptive outcomes in children. However, cultural differences have also been found in the developmental meaning of other aspects of children's adjustment and functioning. For example, shy and sensitive behaviors are largely considered a reflection of social accomplishment and maturity in traditional Chinese culture (King & Bond, 1985; Yang, 1986) but are interpreted as a lack of confidence and perceived as problematic in Western societies (Asenforpf, 1990; Stevenson-Hinde & Shouldice, 1993).

Therefore, it is essential to consider social and cultural contexts for children's school adjustment, given that children in different societies may have different life experiences. In the current study, I examined the cross-domain associations among academic performance, victimization, and depression in a sample of Chinese elementary school children over a period of 4 years. In the following sections, I first present an overview of these three constructs in the context of Chinese society. Next, I present the Developmental Cascade Model as a conceptual and analytical approach to investigate the cascading effects of child adjustment. Then, I provide a literature review of the concurrent and longitudinal associations among academic achievement, victimization, and depression. Finally, I discuss the limitations of previous studies and the contributions of the current study, which adopts a random intercept cross lagged panel model (RI-CLPM) approach to examine the reciprocal relations between the three constructs at both the between-person level as well as the within-person level.

## **Academic Achievement in Chinese Children**

As shown by many cross-national studies, such as the Programme for International Student Assessment (PISA) and the Third International Mathematics and Science Study (TIMSS), Chinese children have been found to have better academic achievement outcomes compared to their peers in some other countries (e.g., Dornbusch et al., 1987; Ni et al., 2010; Harmon et al., 1997; Kwok & Lytton, 1996; Stevenson et al., 1990). For example, in 2018, students from Shanghai, Beijing, Jiangsu, and Zhejiang achieved the highest scores in PISA and outperformed students from other participating countries (Schleicher, 2019). Many theories have been proposed by different scholars as an attempt to explain the “learning gap” (Stevenson & Stigler, 1992) between Asian and Western children. Some suggested that Asian children have higher achievement motivation (Dweck, 1999; Tweed & Lehman, 2002) or better pedagogy at school (Kobayashi, 1994; Lewis, 1995; Stevenson & Stigler, 1992).

Among the contributing factors of Chinese children’s academic success, one distinct characteristic of the Chinese culture that also plays a role is the emphasis on academic effort and achievement, which has its roots in Confucian values (traditional Chinese philosophy) (e.g., Huntsinger et al., 1997; Rosenthal & Feldman, 1991; Stevenson et al., 1993; Wu, 1996). Such a strong cultural belief about the value and importance of education has a long history and can be found in Chinese classical writings, such as the Chinese philosopher Hsun Tzu’s claim that says, “Achievement consists of never giving up... If there is no dark and dogged will, there will be no shining accomplishment; if there is no dull and determined effort, there will be no brilliant achievement” (Watson, 1967, p. 18, as cited in Stevenson et al., 1990). Historically,

government officials were selected based on a feudal imperial exam system established in the early Chinese state (Zhang, 1995). Another culturally-specific concept that describes one's passion for learning is *hao-xue-xin*, a term that is shown to be understood by 92% of a sample of 1,803 Chinese school aged- children (Li, 2001, 2002; Li & Yue, 2002). Education is viewed as a means to achieve personal goals and improve the family's social and financial status (Chen et al., 2000; Fong, 2006; Ho, 1986; Salili & Hau, 1994), and academic achievement is a significant index of adjustment in Chinese schools (Chen, Rubin, & Sun, 1992; Stevenson et al., 1990). Failure in school continues to be interpreted as individual, family, and even national shame (Davey et al., 2007).

Chinese children's strong academic performance is also related to their experiences at home, as Chinese students face strong pressures and high expectations from parents to perform well academically (Chang et al., 2003; Suizzo & Cheng, 2007; Yamamoto & Holloway, 2010). Chinese parenting often focuses on children's academic achievement (e.g., Leung et al., 1998) and the social processes that modulate academic development (e.g., Chen et al., 1997), especially from late elementary school to the middle school years. Believing academic success to be the route that leads to future happiness, Chinese mothers perceive their children's education as their most important pursuit, and they exhibit high levels of interest and involvement in the child's education (Lam et al., 2002; Stevenson et al., 1990). Chinese parents, especially those with elementary school aged children, spend a lot of time helping their children with school work at home (Lam et al., 2002). Compared to American mothers, Chinese mothers tend to adopt higher performance standards for their children and they are less likely to be satisfied with their child's school performance (Stevenson et al., 1990).

Moreover, in children's everyday lives, greater attention is paid to academic activities among Chinese elementary school aged children than among American children (Stevenson et al., 1990). In fact, the heightened emphasis on academic achievement in China appears to arise in early elementary school. For example, not only do Chinese children spend about four times as much time doing homework as American children, but Chinese children also engage in more activities related to academics after school, such as reading, doing puzzles, playing chess, and playing other academically related games (Crystal et al., 1994).

In almost every level of Chinese schools, from as early as kindergarten to high school, competition is fierce and teachers often place considerable pressure on their students to excel in their studies (Chen et al., 2000; Davey et al., 2007). Although there has been an increase in the number of students entering Chinese colleges and universities, opportunities to receive a higher education is still limited to a small percentage of students in China (Chen, Chen, Kaspar, & Noh, 2000; China Statistical Yearbook, 2004, as cited in Davey, Lian, & Higgins, 2007). According to The Sixth National Population Census of the People's Republic of China (China National Bureau of Statistics, 2010), about 9% of its population hold a bachelor's (or higher) degree. As a result, exam preparation takes place at a very young age, and young children spend extensive periods of time studying.

Students' academic performance is often evaluated publicly at school. Children who excel academically receive praise from their teachers and gain respect from their peers (Phillipson & Phillipson, 2007). During late childhood, academic achievement (e.g., "He/she is good at school work") is the most frequently cited reason for why children

befriend someone (Chen et al., 2000). Academically competent students, who are often perceived as intellectual and moral, are more likely to be elected by peers and teachers to be leaders of institutionalized groups and organizations at schools (e.g., class leader, the Young Pioneers, etc.), and they are also likely to be nominated for school award of “distinguished student” (*san-hao-xue-sheng*) at the school level, the district level, and even the municipal level (Chen et al., 2000). Being a student leader or a “distinguished student” signifies a high level of social status in school, because these honor studentship statuses are acknowledged by school officials, the District Educational Bureau, or the Municipal Educational Bureau. Honor students often receive awards at school meetings. In contrast, children who do not perform well academically are considered abnormal and problematic and may be publicly embarrassed and punished by teachers (Chen et al., 1995a; Chen et al., 2000; Zhou et al., 2010). They are often disliked by peers (e.g., Chen et al., 1997), which further prevents them from receiving the support and assistance that they need from others. These academically incompetent children are also likely to experience additional school-related social problems, including a lack of social skills and low task orientation. In short, academic achievement in Chinese students has significant contributions to children’s social competence and social status.

Given the fact that academic performance is closely related to school experience and social status in Chinese children, as discussed above, it is not surprising that academic achievement plays a significant role in children’s development of psychological outcomes. It has been shown that the high level of stress related to academics, the pressure to achieve academically, as well as the repeated exposure to negative feedback about social and cognitive competencies, is detrimental to children’s self-esteem and

exposes children to higher risks of depression and other psychological problems, including, in some extreme cases, suicide among school children (Chen, et al., 1995b; Cole, 1991; Dong, et al., 1994; Davey & Higgins, 2005; Dai, et al., 2007). These psychopathological tendencies may in turn prevent children from developing and maintaining positive peer relationships. In sum, children's academic achievement is directly and indirectly related to their social and psychological adjustment.

### **Childhood Peer Victimization in China**

Chinese society remains strongly influenced by Confucian values that emphasize hierarchical relationships, social harmony, and minimal conflicts (Chen & French, 2008; Cole et al., 2006; Kawabata et al., 2012; Matsumoto, 1991). Positive peer relationships are regarded as an important socialization goal as well as an indicator of social achievement in Chinese schools (Ho, 1986). Influenced by collectivistic values, children are encouraged to maintain cooperative and harmonious relationships with their peers. Children who fail to do so are regarded as having improper attitudes (Chen, et al., 1995b) and are targeted for peer victimization as they are considered deviant or perceived as interfering with group goals (Chen, et al., 2003; Nakamoto & Schwartz, 2010).

In traditional Chinese culture, the peer group serves as a particularly important socialization agent in Chinese children. The importance of peers is reflected in the highly group-based organization of Chinese schools (Chen, et al., 2000). A typical classroom consists of four to five student groups (with 10 to 15 students in each group). Social and academic activities are largely organized based on student groups. Every student belongs to a group, and they are expected to participate in political, social, and academic meetings with each other on a regular basis. During these meetings, they discuss and evaluate their



achievement and problems as a group and are encouraged to monitor each other's behaviors and provide constructive criticisms of each member in regard to moral, intellectual, and behavioral issues. Children are encouraged to cooperate with each other and develop culturally appropriate behaviors that improve group functioning, such as obedience, conformity, and interdependence. As a group, student would participate in higher-level competitions and organizations, including the class committee, the student union, the Youth Pioneers, and so on. Formal evaluations of each group member are completed by their peers at the end of each academic year. Through these peer evaluations, children receive information about the collective attitude of the group toward them as well as direct feedback on how accepted they are by their group. If approved by teachers, peer evaluations are integrated into students' school records. Students who violate group norms may receive social and academic penalties such as peer rejection, school warnings, and expulsions.

Because children engage in such extensive group activities and peer interactions, disputes and conflicts can arise, and in some cases, they take the form of peer victimization. Despite expectations of positive peer relationships, victimization remains prevalent among children and adolescents in China, which raises concerns (Huang, et al., 2013). Although peer victimization carries different cultural meanings across different countries (Murray-Harvey et al., 2010; Smorti, et al., 2003), it has a similar conceptualization in the Chinese context (Zhang et al., 2000). The term *qifu* refers to “arrogant and unreasonable treatment of others, involving hitting, slapping, punching, threatening, extorting, isolating, and insulting in order to upset or hurt others” (Murray-Harvey et al., 2010). The definition of *qifu* is similar to that of *bullying* or *victimization* in

the western literature, which is defined as a systematic abuse of power through various forms (e.g., Smith & Sharp, 1994; Vaillancourt et al., 2008, 2010a, 2010b). Victims are often exposed to frequent and deliberate acts of physical, verbal, and relational aggression in relationships (Olweus, 1991), including direct bullying behaviors (e.g., teasing, physical aggression), and indirect relational behaviors (e.g., social exclusion, gossip) (Crick, et al., 1999).

Previous studies have investigated the prevalence of victimization using self-reported measures, and these studies suggested a prevalence rate of 2% - 66%, depending on the region where the study was conducted and the age group of the children (Chen & Yue, 2002; Cheng et al., 2010; Chi, et al., 2007; Eslea et al., 2004; Guo et al., 2010; Hazemba et al., 2008; Wang et al., 2012a; Wang et al., 2012b). Evidence from several studies in major metropolitan areas indicates that peer victimization is a common occurrence among Chinese students, starting from a young age (Chen, 2001; Qiao et al., 2009; Xu, 2008; Zhang, 2002; Zhang et al., 2000). For example, a large-scale study by Wong et al. (2008), which surveyed 7,025 Chinese children from 47 elementary schools, found that 24% reported bullying other students in school within the past 6 months.

Consistent with studies conducted in Western societies, which suggest that victimization decreases across different developmental stages (e.g., Schultze-Krumbholz et al., 2016), research conducted in China also seem to suggest that victimization is more prevalent among younger children. For example, Chen (2001) conducted a survey study with a sample of 3,332 students ranging from elementary school to high school. Self-report results indicated that the prevalence of bullying was higher for elementary school students (5%), compared to 4.3% of middle school and 2.7% of high school

students. This finding was consistent with results from other research studies, which also suggested that younger children were more likely to experience bullying than older students. For example, He (2002) also reported that peer victimization was found to be more serious in elementary school students than middle school students. Young children are more vulnerable because they are still developing important socio-emotional and cognitive skills, including self-control, that can inhibit aggressive tendencies and protect them from peer victimization (Chui & Chan, 2015; Zhang, 2002).

Childhood victimization has been found to be stable over time. In particular, elementary school is a developmental period when peer victimization tends to increase and stabilize (Boulton & Underwood, 1992). In Pan et al.'s longitudinal study (2017), victimization was found to be stable across grades 4, 5, and 6 in a sample of 712 Chinese students from Beijing. The high stability of childhood victimization might be partly due to the fact that Chinese students are generally not allowed to switch classrooms during elementary school years. Most children stay in the same classroom from Grade 1 to Grade 6 and they move on to different middle schools after that. In addition, as mentioned above, due to the highly hierarchical and structural nature of peer groups, elementary school students remain in more or less the same social environment for an extensive period of their childhood.

Although previous findings consistently suggested that male students were more likely to engage in bullying behaviors, especially overt victimization forms of aggression, whereas female students were more likely to be involved in relational bullying (Chen, 2001; Cheng et al., 2008; Lei & Zhang 2002; Qiao et al. 2009; He 2002; Lai, et al., 2008; Schwartz et al., 2001; Tuo et al., 2007; Wu & Cai, 2006), mixed results have been

reported regarding gender differences in terms of victimization. While some studies showed that boys were more likely to experience peer victimization than girls (Olweus, 1999; Nansel et al., 2001), other studies found the opposite pattern, suggesting that girls were more frequently victimized than boys (Glover et al., 2000; Melton et al., 1998). Some studies also reported no gender differences in victimization (Whitney & Smith, 1993). For instance, in a sample of 3,957 elementary school student, no significant gender differences were found in peer victimization (Zhang, 2002; Zhang et al., 2000).

### **Depression in Chinese Children**

Research on childhood depression has captured increased attention in the past few decades (e.g., Bandura et al., 1999; Kazdin, 1990; McLeod et al., 2007; Rice et al., 2002). A large body of research evidence suggests that childhood depression symptoms are stable over time (Harrington, 1993; Nolen-Hoeksema et al., 1992). It has been argued that depressed mood may be determined, to some extent, by dispositional or “trait-like” characteristics (Prior, 1992; Thomas & Chess, 1982). Depressed children often report negative feelings about themselves, and they tend to experience low interest in daily activities, persistent fatigue, or loss of energy. Moreover, children who are depressed may also face challenges in their cognitive functions, such as inability to concentrate or think clearly, cognitive distortion, reduced psychomotor functions, as well as significant changes in appetite and sleeping habits (Harrington, 1993). Depressed children also tend to experience pervasive difficulties in social adjustment (e.g. Bell-Dolan et al., 1993; Ollendick & Yule, 1990; Patterson & Stoolmiller, 1991; Puig-Antich et al., 1993). They are more likely to feel insecure in challenging social situations, display socially immature behaviors, and encounter problems when interacting with peers (Cole & Carpentieri,

1990; Jacobson et al., 1983; Rubin et al., 1993; Rubin et al., 1995). Depression negatively affects many aspects of children's growth and development, including their school performance, social functioning, family relationships, and it may lead to suicide (Bhatia & Bhatia, 2007; Cole, 1991; Puig-Antich et al., 1993).

In traditional Chinese society, internalizing problems such as depression have not received much attention because an individual's well-being is considered less important than the interest of the collective group (Chen, 2010; Chen, et al., 2000). A key tenant of Confucianism states that individual members of society has the obligation to comply to the moral demands of the group in order to achieve personal harmony (Kirmayer & Young, 1998). The expression of negative emotions is often thought of as socially inappropriate, selfish, and shameful to the self and family, and Chinese children are socialized to repress their feelings in public since a young age (Chen & Kasper, 2004). They are often told to focus on their school performance and social adjustment and are taught not to openly express how they feel (Ho, 1986; Kleinman & Good, 1985). In addition, the deeply ingrained cultural value that emphasizes the importance of preserving "face" in Chinese societies also contributes to the severe and pervasive stigma against mental illness, which results in low mental health awareness and education effort (Yang, 2007). A person with mental health challenges is perceived as having a moral "defect," which results in "loss of face" for the individual and he/her family.

As a result, not only are Chinese parents and teachers insensitive to children's emotional problems (e.g., depression), but there are also very few mental health services that are tailored to young children in China (Chen, et al., 2000; Chen & Kaspar, 2004; Liu et al., 2000). Psychological counseling is rarely found in schools and is often offered

as a medical or clinical service. That is, children who experience socio-emotional difficulties are considered to be having a medical problem and are often treated in medical facilities (Liu, 1998). In addition, professional help is underutilized. In a sample of 3,582 Chinese children (6-14 years old), only 5.8% of participants with depression had received mental health service in the past, and over 90% of the children with depressive disorder never received any professional help (Zhong et al., 2013). The underutilization of psychological services is a greater problem in China compared to Western societies. A variety of factors contribute to the low service utilization rate in China, including the strong stigma associated with mental health issues such as depression, atypical clinical manifestation, a lack of adequate clinical training for mental health professionals (which leads to a low number of child psychiatrists), a lack of perceived need for children's mental health care, and low accessibility of mental health insurance for children, especially those in rural areas.

Despite such cultural beliefs and low service utilization, depression among Chinese children is increasingly recognized as a significant concern (e.g., Cheung, 1986; Crystal et al., 1994). Some studies have suggested that depression is one of the most common psychiatric health complaints reported among children in China (Tepper et al., 2008). According to findings from Tepper et al. (2008)'s study, the prevalence rates of depression in Chinese children and adolescents were 5.9% with self-report (Youth Self Report, YSR), 0.9% with parent report (Child Behavior Checklist, CBCL), and 0.8% with teacher report (Teacher Report Form, TRF). Also, findings from Zhong et al.'s (2013) study revealed that the overall prevalence rate of all depressive disorders was 2.8%, and children between 9-14 years old were found to be highly vulnerable to depression. Using

DSM-IV, Yang et al. (2014) conducted a large school-based study, and found that depression (1.32%) was the second most common disorder in a sample of 9,806 children and adolescents in China (6-17 years old). Several other school-based survey studies reported a prevalence rate between 0.93%–1.62% among Chinese children aged 5-17 years (Fan et al., 2010; Leung et al., 2008; Zhang, 2010). Together, these studies suggest that, on average, one in a hundred Chinese school-aged children has depressive disorders.

Interestingly, compared to their peers in Western societies, Chinese children and adolescents appear to experience higher levels of depression (Crystal et al., 1994; Dong et al., 1994; Shek, 1991; Tepper et al., 2008; Zhong et al., 2013). For example, depression prevalence rates among Chinese children were found to be higher than those reported in the United States (Yu & Seligman, 2002), New Zealand (McGee et al., 1990), Spain (Gómez-Beneyto et al., 1994), Britain (Ford, et al., 2003), Brazil (Fleitlich-Bilyk & Goodman, 2004), Denmark (Peterson & Bilenberg, 2003), and Norway (Heiervang et al., 2007) (as cited in Zhong et al., 2013). The higher depression rates found in Chinese children are consistent with some studies that have shown higher prevalence rates of psychiatric disorders in children from developing countries (5-18%), compared to children from developed countries (Belfer & Rohde, 2005; Mullick & Goodman, 2005). This might be due to the harsh socioeconomic conditions and environmental challenges faced by children who reside in less developed countries.

Previous studies also suggested that self-reported feelings of depression was moderately stable over time from childhood to adolescence (e.g., Chen et al., 1995b; Harrington, 1993; Nolen-Hoeksema, et al., 1992; Rubin, et al., 1993; Weissman et al., 1999). For instance, in a longitudinal study conducted in Shanghai, the stability of

depression was reported to be .43 from age 12 to age 14. Similarly, in Yu & Seligman's (2000) study, children who had higher initial depression scores continued to show more depressive symptoms at follow-ups across an 8-month period.

In terms of gender differences, inconsistencies in depression among Chinese children have been reported in the existing literature. Using the Bellevue Index of Depression (BID; Petti, 1985), Guo and colleagues (1998) studied depressive symptoms in a group of 322 Chinese elementary school students (fifth and sixth graders). They reported significant gender differences, with boys having more depressive symptoms than girls. Similarly, Dong et al. (1994) studied 825 Chinese elementary and high school children age 7 to 17 years using the Childhood Depression Inventory (CDI) and also reported that boys scored higher on depressive symptoms than girls. Chen and colleagues (1995a) also measured depression in 468 second graders in China using CDI, and found that boys tended to have higher scores than girls, although the effect did not reach statistical significance. Similarly, Yu and Seligman (2002) found that boys tended to be more depressed than girls at all ages (except age 12) from 9 years old to 14 years old. However, Zhong and colleagues (2013) found that gender-specific prevalence rates of depressive disorders before the age of 9 were similar for boys and girls. However, after the age of 10, rates of depressive symptoms increased for both sexes, with the highest rate found among girls between the ages of 10 and 14, suggesting that gender differences in depression emerges during late childhood and early adolescence.

### **A Developmental Cascade Model**

Developmental scientists have long been interested in the processes through which children's adjustment in one domain affects their function in other domains over



the course of development. The Developmental Cascade Model, proposed by Masten and Cicchetti (2010), suggests that distinct domains of adaptive or maladaptive behaviors may be interrelated over time, with functions in one domain spreading to influence later development through direct and/or indirect, unidirectional and/or bidirectional pathways. Developmental cascades can result in positive or negative consequences. Positive adjustment in one domain of competence can lead to subsequent competence in other domains, and similarly, behavior problems in one domain can lead to later challenges and failures in other domains in a child's life.

In order to perform rigorous tests of cascade models, strong methodological designs and complex statistical analyses are necessary. Longitudinal data, although difficult, expensive, and time consuming to collect, are needed. Specifically, repeated measurements of multiple domains over time need to be analyzed through advanced statistical approaches that control for across time continuity (stability) and within time covariance, in order to determine whether there is any unique and cumulative cascade effect spreading from one domain to another.

Existing research has reported that children's social problems, emotional disturbances, and academic challenges are highly interrelated and contribute to each other during their development (e.g., Chen et al., 2000). Children's psychological well-being, peer relationships, and academic performance may serve as valuable resources and sources of stress at the same time. Past studies have focused on the transactional and progressive longitudinal linkages between traditional measures of "competence" and "symptoms" (Hinshaw, 1992, 2002; Masten et al., 2006; Masten & Curtis, 2000; Rutter & Sroufe, 2000). The cascade model has been used to conceptualize the underlying

mechanism that links the dynamic interplay among children's peer experience, psychological adjustment, and academic competence (Masten & Cicchetti, 2010). Some of the most widely studied cascading effects include children's school success, social (in)competence, and internalizing problems, from the preschool years all the way into adolescence.

Masten and colleagues (2005) have proposed three explanations for such observed associations. First, symptoms may undermine competence. The adjustment erosion hypothesis proposes that initial internalizing symptoms reduce later academic competence and increase subsequent susceptibility to problems in other domains. Similarly, the symptom-driven model of depression suggests that depressive symptoms exerts adverse effects on children's interpersonal relationships. Second, maladaptive functioning may contribute to symptoms (Masten et al., 2005). When children experience challenges and failures in salient developmental tasks, they are judged by others and themselves, which can then lead to increased internalizing and externalizing symptoms over time. For example, Cole (1990, 1991; Cole et al., 1996) proposed a competency-based model of depression, which posits that negative feedback to children from their peers about their academic and social incompetence instigates or exacerbate current depressive symptoms. The third explanation for the linkage between competence and symptoms proposed by Masten and colleagues (2005) points to the possibility that some other cause may contribute to both competence and symptoms, creating the illusion of a causal effect in either direction that is in fact related to some other common causes (Masten & Curtis, 2000). In the following sections, an overview of previous findings on

the associations among academic achievement, victimization, and depression will be presented from the perspective of the developmental cascade model.

## **Cascade Effects Among Achievement, Victimization, and Depression**

### ***Academic Achievement and Victimization***

The topic of academic achievement and victimization has received considerable research attention, because peer victimization experiences often take place at school (Dake et al., 2003; Duncan, 1999). There is a large amount of literature on the mechanisms through which academic achievement is associated with peer victimization. From the developmental cascade perspective, several models have been proposed to explain the association between academic achievement and social functioning in the peer group (Hinshaw, 1992).

In the first model, it is suggested that academic achievement affects social behaviors. Specifically, poor academic achievement may harm children's social status in the peer group and consequently affect their self-image. Children who have bad grades in school may experience difficulties in receiving inclusion and respect from their peers and develop negative self-perceptions of self-worth. As a result, these children may display socioemotional problems and eventually experience maltreatment from their peers. Especially given the strong emphasis on academic achievement in Chinese culture, children's academic achievement may play an important role in their social adjustment among peers (McCall et al., 2000; Schwartz et al., 2001).

Findings from previous longitudinal studies have supported the first model (e.g., McGee et al., 1986). For example, children with academic difficulties were more likely to develop maladaptive social behaviors and were subsequently rejected by peers (e.g.,

Farrington, 1979; Maughan et al., 1985). Moreover, preventive intervention efforts that boost children's academic performance at school have shown corresponding improvement in their social interactions and have a reduction in socioemotional difficulties (Coie & Krehbiel, 1984; Kellam et al., 1983).

Specifically, some researchers have hypothesized the path of academic achievement leading to subsequent changes in peer victimization. The hypothesis draws upon the "academic incompetence hypothesis," which suggests that academic challenges trigger problems in other developmental domains (e.g., Chen et al., 2010; Moilanen et al., 2010; Obradović et al., 2010). This pathway is of notable importance, because children who are academically competent may be considered as a valuable social resource by their peers (Vaillancourt & Hymel, 2006), whereas children who have poor academic achievement or learning difficulties may become a target of peer rejection and abuse (Olweus, 1978; Luciano & Savage, 2007; Walker & Nabuzoka, 2007). Nonetheless, there is a lack of longitudinal studies that have examined the effect of low academic competence on subsequent victimization.

In regard to the link between social adjustment and academic achievement, the second model proposes that social performance has an effect on children's academic achievement, in that children's social adjustment may constitute emotional and social resources for achievement in the school (e.g., Wentzel, 1991; Wentzel & Asher, 1995). For example, children who are socially skilled may be cooperative and likely to receive assistance in schoolwork. In contrast, socially rejected children may receive less help from peers with their academic work. Also, social adjustment may have significant influence on children's emotional responses and motivation towards school, which, in

turn, affect academic achievement. For example, children who are rejected and victimized by their peers may develop a negative attitude toward the school and lose interest in school activities, including the learning aspect of their schooling.

Indeed, previous research has consistently demonstrated the detrimental effects of victimization on concurrent and later academic competence (Iyer et al., 2010; Juvonen et al., 2011; Liu et al., 2014; Nakamoto & Schwartz, 2010). For example, concurrent associations between children's peer maltreatment and poor academic achievement were reported in a number of studies (e.g., Buhs & Ladd, 2001). In addition, longitudinal research findings have provided evidence for this model in demonstrating that children who experience social problems tend to underachieve or fail in academics over time (e.g., Coie et al., 1992; Ledingham & Schwartzman, 1984; Masten et al., 1995; Nansel et al., 2003a; Ollendick et al., 1992; Schwartz et al., 2005), as well as demonstrating increased absenteeism, and school avoidance and departure (e.g., Buhs et al., 2006; Gastic, 2008; Juvonen et al., 2000; Konishi et al., 2010; Kochenderfer & Ladd, 1996). Compared to their non-victimized counterparts, victimized children tend to be less capable of coping with school demands and concentrating on schoolwork, which results in poorer academic performance.

Moreover, a number of researchers have suggested that victimization might result in poor academic achievement through a mediating pathway of poorer psychosocial adjustment (Beroan, 2008; Buhs, 2005; Juvonen et al., 2000; Reijntjes et al., 2010; Schwartz et al., 2005; Totura et al., 2014; Wentzel & Caldwell, 1997; Zwierzyńska et al., 2013). Specifically, exposure to negative peer interactions may result in higher levels of psychological distress, which may in turn jeopardize children's school performance. In

fact, Beran (2008) reported an indirect longitudinal pathway from peer victimization to academic achievement. Continued victimization could also result in other problems, such as diminished concentration in problem-solving and sleeping difficulties (Khatri et al., 2000; O'Moore & Kirkham, 2001). These problems could disrupt children's learning at school and prevent them from fulfilling their potential (Craig, 1998; Fonagy et al., 2005). Nonetheless, evidence supporting an indirect path is limited, as it is not replicated in other studies (Kochenderfer & Ladd, 1996).

Finally, the third model regarding the link between academic achievement and victimization suggests that social functioning and academic achievement may have bidirectional influences on each other (Hinshaw, 1992; Olweus, 1983). Not only can social adjustment affect academic performance, but academic achievement can also, in turn, have some influence on social adjustment. Although theoretically plausible, previous empirical research on the bidirectional model has been scarce. This could be due to methodological challenges because an examination of the bidirectional model requires longitudinal panel data on both social performance and academic achievement.

Only a handful of studies have directly investigated the association between victimization and academic achievement in Asian cultures, and even fewer studies adopted a cross-lagged analysis to explore associations between peer victimization and academic achievement over time in Chinese children. For example, Liu, Bullock, and Coplan (2014) found that victimization at Grade 3 predicted poorer academic achievement two years later, whereas academic achievement at Grade 3 did not predict peer victimization at Grade 5, suggesting that victimization might function as a precursor, instead of a consequence of, lower academic achievement. Results from this study were

consistent with findings from longitudinal studies conducted in Western societies, which suggested that victimization appeared to precede lower academic achievement (e.g., Iyer et al., 2010; Morales & Guerra, 2006; Schwartz et al., 2005). However, in a later study conducted by Liu and colleagues (2018), in which the longitudinal relations between victimization and academic achievement were examined simultaneously, both direct and indirect reciprocal effects between peer victimization and academic achievement were found, conflicting earlier findings.

Overall, associations between peer victimization and academic functioning are not straightforward. Although researchers have investigated the direct and indirect effects of victimization on academic achievement, and vice versa, conflicting findings have been reported. Also, given a lack of longitudinal studies on the reciprocal effect between academic achievement and victimization in the Chinese context, little is known about the long-term linkage between academic performance and victimization among Chinese children.

### ***Academic Achievement and Depression***

The relation between children's school adjustment and depression has captured substantive research attention. Given the overwhelming emphasis on academic achievement in China, how do academically incompetent children feel about themselves? Are academic difficulties related to psychological symptoms such as depression? Are depressed children more likely to experience academic failures compared to their non-depressed counterparts? Between academic achievement and depression, which one is the precursor of the other, or do these two constructs exert bidirectional influences on each other?

Previous studies have revealed inconsistent results. Academic failures (both objective and perceived failure) have been found to be a significant risk factor for changes in depressive symptoms in some studies (Cole, 1991; Carroll et al., 2005; Herman et al., 2007; Maughan et al., 2003; Puig-Antich et al., 1993). For example, Moilanen et al. (2010) found that academic difficulties at age 8 contributed to internalizing problems at age 10. Similarly, Herman and colleagues (2008) discovered that low academic competence in first grade predicted depressive symptoms in 7<sup>th</sup> grade, in a sample of African American children. Findings from this study suggest that children who perform poorly in their schoolwork are more likely to experience lower self-worth and perceived control, both of which are associated with increased depression later on. More recently, Wu and Kuo (2015) found that lower academic achievement was predictive of lower self-concept, which in turn was related to later depression. Additionally, in a series of studies of Chinese high school students, it was found that academic achievement is negatively related to students' self-reported negative emotions (e.g., loneliness, insecurity, and depression) (Chen et al., 1995b; Chen et al., 1995). Students with lower grades were likely to report negative perceptions of their competence and lower sense of self-worth.

With regards to the reverse pathway of internalizing problems affecting children's academic achievement, there is some longitudinal evidence indicating that depression directly leads to later academic difficulties (see Chen et al., 1995b; Riglin et al., 2014), but evidence is limited and mixed (e.g., Cole et al., 1996; Roeser et al., 2000). For instance, depressive symptoms in childhood were linked to poor academic achievement 2 years later (Chen, Rubin, & Li, 1995b). Depression may lead to future academic



problems because it affects children's motivation and ability to direct attentional resources to focusing and concentrating on classroom learning activities (Duchesne et al., 2005; Obradovic et al., 2010). Interestingly, other research has found that victimization functions as a mediator in the relation between depression and academic achievement (Hoglund, 2007; Nishina et al., 2005). Further, Hoglund (2007) found that physical victimization partially mediated the relation between internalizing problems and achievement, for girls only. Although concurrent and predictive links between depression and academic problems have been noted in some research studies (Bardone et al., 1996; Bernstein & Borchardt, 1991; Kovacs & Devlin, 1998), other studies failed to find significant impact of depression on academic achievement (e.g. Chen and Li, 2000; Cole et al., 1996; Harrington et al., 1991).

Very few longitudinal studies have simultaneously examined the effects of depression on academic performance, and of academic achievement on depression. In a recent study conducted by Shen (2020), results revealed a bidirectional and negative relation between depression and academic achievement in Chinese students. That is, early depression was associated with lower subsequent educational attainment, and lower academic performance was associated with higher levels of subsequent depression. Similarly, Liu and colleagues (2018) reported a negative reciprocal relation between childhood depression and academic achievement over three years, in a sample of Chinese elementary school students.

Overall, evidence linking depression symptoms to academic achievement over time is limited and mixed. There is some evidence suggesting that academic problems contribute to later depression (e.g., Moilanen et al., 2010; Vaillancourt et al., 2013; Yong

et al., 2014), and evidence also suggests that depression has negative academic consequences. However, inconsistencies with respect to time intervals and gender have been reported in some studies (Chen et al., 1995; Cole et al., 1996; Kellam et al., 1994; Maughan et al., 2003). While existing results implicate that children's school experiences might play an important role in the development of childhood depression and vice versa, the literature is sparse and presents a complex picture.

### ***Victimization and Depression***

Given that victimization could be viewed as indicating poor competence in the domain of peer social adjustment, a widely expected developmental task faced by children, it is important to examine how victimization and depression might influence each other. A considerable amount of literature has consistently reported associations between victimization and a wide range of maladaptive developmental problems, including poorer psychological adjustment (see Card et al., 2007), psychopathology (Chen et al., 1995b; Chen, Rubin, & Li, 1995a; Coie et al., 1990), loneliness (Boivin & Hymel, 1997), fear and anxiety (Kumpulainen et al., 1998), reports of lower self-efficacy and self-worth (Chan & Wong, 2015; Juvonen et al., 2000), as well as depression (Kaltiala-Heino et al., 2000; Swearer et al., 2001). A meta-analysis of 23 cross-sectional studies, conducted by Hawker and Boulton (2000), showed that peer victimization was significantly associated with higher levels of psychosocial adjustment problems, with mean effect sizes (pearson's  $r$ ) ranging from .19 for anxiety to .29 for depression.

In addition, the research on longitudinal outcomes of peer victimization has also revealed the psychological trajectory for victimized children, although the evidence is mixed (e.g., Bond et al., 2001; Dhimi et al., 2005; Hanish & Guerra, 2002; Hodges &

Perry, 1999; Kumpulainen & Räsänen, 2000; McDougall & Vaillancourt, 2013; Schwartz et al., 2005; Snyder et al., 2003; Troop, -Gordon, & Ladd, 2005). In most studies, in support of the interpersonal risk model (Patterson & Capaldi, 1990), researchers concluded that victimization during middle childhood served as a predictor of increased depression over time (Liu et al., 2018; Schwartz, Lansford, Dodge, Pettit, & Bates, 2015; Schwartz et al., 2005), suggesting that poor peer relationships precipitate depressive symptoms. For example, peer- and teacher-reported victimization in Grade 3 and Grade 4 significantly predicted depressive symptoms 1 year later (Schwartz et al., 2005). Similarly, in Panak and Garber's (1992) study, an increase in peer rejection in third through fifth grade predicted subsequent self-reported depression, after controlling for initial levels of depressive symptoms. However, such longitudinal linkages were not reported in other studies (e.g., Prinstein et al., 2005; Schwartz et al., 1998). For instance, in a sample of elementary school students (fourth through sixth grade), peer victimization was not found to be predictive of later self-reported depression (Khatri et al., 2000). Inconsistencies in previous findings may be partly due to variances in age and ethnicity between different samples (Kochel et al., 2012).

The evidence is not as clear in the other direction, either. According to a symptoms-driven model, depression precedes poor peer relationships (e.g., Nolen-Hoeksema et al., 1992; Rohde et al., 1990; Rudolph, 2009). The underlying mechanisms for the developmental links between emotional problems (such as depression) and later social difficulties may involve the interplay of motivational, behavioral, and cognitive factors. In other words, depressive symptoms may interfere with the development of adaptive social skills and may enhance relational difficulties. Children who are depressed

may develop negative perceptions of themselves and others and gradually lose their interest in social and peer group activities, which may in turn elicit disliking or aggressive responses from their peers (Rudolph et al., 2008). In addition, depressed children may self-select into unhealthy peer groups (Rudolph, 2009), or exhibit behaviors such as withdrawal, passivity, and fearfulness that are viewed unfavorably by peers (Harrington, 1993; Kennedy et al., 1989; Schwartz et al., 1993; Veenstra et al., 2007), which may then lead to interpersonal isolation, rejection, and victimization.

Researchers have examined the symptom-driven model by studying the chronicle effect of psychological problems on later victimization, but inconsistent findings have been reported (e.g., Herres & Kobak, 2015; Vaillancourt et al., 2013). Some data showed that psychological problems predicted an increase in subsequent peer victimization (Herres & Kobak, 2015; Hodges & Perry, 1999; Vaillancourt et al., 2013). For instance, early emotional distress was found to have significant contributions to the development of social adjustment difficulties (Chen et al., 1995b). The results suggested that the social adjustment of depressed children increasingly declined with time. Moreover, Brendgen et al. (2002) found that, from Grade 4 to Grade 6, membership in a depressive group predicted lower social acceptance 6 months later. Similarly, Kochel, Ladd, and Rudolph's (2012) study examined the longitudinal associations between depression and victimization. they tested whether depression preceded victimization, or victimization predicted depression, or whether a bidirectional association was found between depression and victimization. The results showed that depression preceded peer victimization over time, whereas victimization did not predict later depression. There was no evidence to suggest that depression and victimization were reciprocally associated.

However, it is important to note that other studies (e.g., Bond et al., 2001) did not find significant longitudinal relations between psychological maladjustment and peer victimization.

Complicating the picture even further, a transactional model of depression and victimization has been proposed by some researchers (Coyne, 1976; Rudolph et al., 2008). A recent meta-analytic review of 18 longitudinal studies on victimization and internalizing problems concluded that internalizing problems function as both antecedents and consequences of peer victimization (Reijntjes et al., 2010). Although the predictive effects of victimization on future changes in internalizing problems were found to be stronger, the difference was not statically significant. Therefore, the authors concluded that the reciprocal relation between peer victimization and internalizing problems is symmetrical, suggesting a vicious cycle that contributes to the high stability of peer victimization (Reijntjes et al., 2010). Similarly, in Storch and Ledley's (2005) qualitative review, which included studies that examined the cross-sectional and longitudinal relations between children's peer victimization and psychological adjustment, it was found that childhood victimization predicted increased internalizing problems over time, and vice versa. Also, in Liu and colleagues' (2018) study, it was reported that in a sample of Chinese elementary school students, peer victimization had both direct and indirect effects on subsequent depression, and depression had an indirect negative effect on later victimization. Findings from Sweeting et al.,'s (2006) study also provided support for bidirectional links between victimization and depression in a sample of 11- to 15-year old children. However, in several other studies that tested the transactional model,

only unidirectional effects were found (Chen & Li, 2000; Nolan et al., 2003; Schwartz et al., 2005).

To conclude, although concurrent associations between peer victimization and psychological maladjustment, as indexed by internalizing problems such as depression, have been reported in the previous studies, the longitudinal relations between victimization and internalizing problems remains unclear. Overall, depression has been shown to be associated with peer social maladjustment (Harrington & Clark, 1998; Lewinsohn et al., 1999; Masten et al., 2006; Masten & Coatsworth, 1995; Pine et al., 1998; Rubin et al., 1998; Rubin et al., 1995). Some researchers argue that childhood victimization precedes internalizing problems such as depression, while others believe that depression is not a consequence, but a predictor of peer victimization. In addition, some findings from several review studies suggest that the longitudinal relations between peer victimization and internalizing problems are reciprocal. As a result, the linkages between peer victimization and depression over time need to be further investigated.

### **Limitations of Previous Studies**

Although extensive research has been carried out on topics related to academic achievement, peer victimization, and depression, the extant research failed to provide significant insight into the nature of the relations among these three variables due to several limitations. First, the majority of previous studies was cross-sectional in design, which makes it challenging to determine the directions of the effects. Second, the research to date has tended to focus on one-to-one connections between one construct (e.g., academic achievement) and its outcome (e.g., depression). Our understanding of how children's experience in one domain (e.g., academic achievement) might have an

indirect effect on their adjustment in other domains (e.g., depression and victimization) is limited. Third, very few studies to date have investigated academic performance, victimization, and depression in Chinese children. Most of the previous research has been restricted to samples of children and adolescents in Western societies, which limits the generalizability of findings to other cultural contexts.

Lastly, given the focus on unidirectional models, previous studies often employed limited statistical techniques that do not enable researchers to fully examine bidirectional influences and more complex transactions that exist between academic functioning, victimization, and depression over time. Only a handful of studies have simultaneously explored the interplay among the three constructs of interest. For example, Schwartz et al. (2005) found that peer victimization led to increased depression, which in turn predicted lower academic achievement 1 year later. However, no evidence was found for a unidirectional pathway through which lower academic achievement predicted peer victimization, or for reciprocal relations between victimization and depression.

In order to fully examine the longitudinal relations among academic performance, peer victimization, and depression from the “cascade model” perspective, stringent tests need to be performed on repeated assessments of variables across multiple domains, controlling for not only the stability in variables over time, but also the concurrent associations across domains (Masten & Cicchetti 2010). In some previous studies, the cross-lagged panel model (CLPM) was used to analyze longitudinal panel data (Liu et al., 2018; Vaillancourt et al., 2013,). The CLPM allows for modeling of reciprocal relations over time by controlling for prior levels of each construct, and is often considered to be

more suggestive of causality than other longitudinal models of a non-experimental design (Hamaker et al., 2015).

However, researchers have pointed out that CLPM fails to distinguish between-person effects from within-person effects (e.g., Berry & Willoughby, 2017; Burns et al., 2020; Hamaker et al., 2015). The underlying assumption of conventional CLPM is that individuals vary over time around a shared mean and there are no trait-like individual differences (i.e., between-person effects) that persist over time (Zhang et al., 2019). Within-person effects capture the extent to which an individual's own adjustment in one domain is related to that same individual's adjustment in another domain, and vice versa. For example, a within-person hypothesis would be that if a child experiences an increased level of peer victimization, the same child is at increased risk for depression, or during periods in which a child has higher levels of depression, this child is more likely to experience victimization. In contrast, a between-person hypothesis would be that children who experience more victimization compared to other children are more likely to be depressed compared with other non-victimized counterparts. Essentially, between- and within-person effects are aggregated in the conventional CLPM.

Consequently, in CLPM results, the estimates of lagged paths could reflect mostly between-person effects, or mostly within-person effects, or a mix of between- and within-person effects, which makes results uninterpretable (Berry & Willoughby, 2017). That is, CLPM does not account for trait-like time-invariant stability, which is often incorrectly interpreted as temporal within-person stability (Berry & Willoughby, 2017; Hamaker et al., 2015). Using simulated datasets, Hamaker, Kuiper, and Grasman (2015) demonstrated that CLPM may result in erroneous conclusions about within-person



relations with regard to presence, direction, and the strength of associations, when constructs are, to some extent, trait-like constructs. Considering the stability of peer victimization (Reijntjes et al., 2010) and the clear trait component of depression (Robins & Trzesniewski, 2005), it is important to separate between-person (trait-like) effects from within-person associations.

To address the limitations of CLPM, the random intercept CLPM (RI-CLPM) have been proposed to separate temporal within-person effects from time-invariant between-person effects (e.g., Hamaker et al., 2015; Masselink et al., 2018). In RI-CLPM, the observed score variance is split into two parts. The first part represents variance that is the result of individuals' trait-like stability. That is, the order of the individual's rank position in the sample (compared to others). This part of variance is also called time-invariant between-person effects, and is captured with random intercepts in the model. The second part of the observed score variance represents temporal within-person effects (i.e., fluctuations from the person's own expected score from measurement to measurement), and is captured with a latent factor per measurement wave. Expected scores are calculated based on the individual's rank-order position, which is indexed by their person-mean level across measurements, on the observed mean level over time. Expected scores for every individual for each measurement should follow the same pattern of change as the sample mean, but they are adjusted on a person-mean level as well. Due to the fact that individuals also fluctuate from their own expected scores within each measurement occasion, temporal within-person effects need to be accounted for, above and beyond individuals' expected scores. These temporal with-in person effects are captured by latent factors at each measurement occasion (loading constrained to one).

Finally, the error variances are constrained to be zero to capture all variance in the observed scores.

As a result, an RI-CLPM model contains auto-regressive paths, bi-directional cross-lagged paths, and concurrent correlations. Autoregressive coefficients in the RI-CLPM model truly indicate within-person carry-over effects, that is, the extent to which deviation from one's own expected scores at one wave carries over to the next measurement wave. Cross-lagged coefficients accurately represent within-person spillover effects, after controlling for time-invariant between-person stability. In other words, cross-lagged effects indicate whether an individual's deviation from their own expected score in one construct (e.g., academic performance) predicts a deviation from their own expected score in another construct (e.g., victimization) one measurement wave later, and vice versa. The correlation between the random intercepts represents the extent to which stable between-person differences in one construct (e.g., academic performance) are linked with stable between-person differences in another construct (e.g., victimization). In addition, at wave 1, within-person correlations reflect how a person's deviation from their expected score on one construct is associated with the deviation from their own expected score on a different construct. At the following waves, the correlated residuals reflect the extent to which a within-person change in one construct is associated with a within-person change in another construct, independently of the two constructs that were present at the previous wave. Results that detect both within-person carry-over and spillover effects would help us gain a better and more accurate understanding of the causal mechanisms in longitudinal associations in children's developmental process (Burns et al., 2020).

## **The Present Study: An Overview**

The current study aims to explore the complex developmental processes involving children's academic functioning, social experience, and psychological adjustment. In this study, I used a developmental cascade model to explore the nature and direction of the associations among academic functions, peer victimization, and depression in a sample of Chinese elementary school children. Panel data on these constructs were collected in each of Grades 3 to 6. RI-CLPM was used to analyze four waves of data, testing within-person carry-over paths, potential concurrent relations among variables, and the diagonal paths between constructs at adjacent time points.

To my knowledge, this is the first study to employ RI-CLPM to simultaneously examine the temporal sequence linking three developmental domains (social, psychological, and academic) in Chinese students. As discussed above, longitudinal evidence for the interplay among these three constructs yielded limited and inconsistent conclusions. Therefore, all cross-domain longitudinal linkages were viewed as exploratory, although some held particular interest in this study. Specifically, given the strong emphasis on academic achievement in the Chinese cultural context, I expected that academic achievement would have a direct and indirect negative association with later peer victimization and depression. In addition, I expected that early victimization and depression would have a direct and indirect effect on later academic achievement. Finally, given the mixed findings on the transactional effects between depression and victimization reported in earlier studies, no additional a priori hypotheses were proposed in this study.

## CHAPTER 2: METHOD

### Participants

Participants were 1,045 third-grade children (639 boys, 406 girls) in regular public elementary schools in Beijing, China. The initial mean age of children in this sample was 9 years, 4 months ( $SD = 8$  months). The participating public schools served students in their geographic area so the students came from the residential area near the schools that they attended. Students were recruited from 30 different classes, with approximately 40 students in each class. The Ministry of Education in China stipulates the core curriculum, including Chinese, Mathematics, and English. The structure and organization of elementary schools are similar across different schools. One lead teacher is designated to each class, who often teaches one major subject and manages the daily activities of the class. Students are encouraged to participate in a variety of extracurricular social and academic activities in school, which provides extensive opportunities for peer interactions. In Chinese elementary schools, students typically stay in the same class over the years, and they are not allowed to switch classes. Each student spends roughly the same amount of time in the classroom as their peers, and the course schedule and other activities are generally identical for students in the same class. Follow-up data in the same schools were collected from the students in Grades 4 to 6. The participation rate was approximately 95% at each time. There were no significant differences on the variables of interest between students who participated in all the waves and those who did not.

## **Procedures**

The administration of the study was carried out by a group of psychology faculty and graduate students at Peking University. All students in the schools were invited to participate after the researcher described the study with no criteria for exclusion. The first wave of data was collected in 2003. Written consent was obtained from the children and their parents.

In Grades 3–6, the peer assessment measure of victimization and the self-report measure of depression were group administered. In addition, data on students' academic achievement were obtained from school records. Extensive explanations of the procedure were provided during administration. No evidence was found that the children had difficulties understanding the procedure or the items in the measure.

## **Measures**

### ***Academic Achievement***

Children's academic scores in Chinese, Mathematics, and English was obtained through school records. The scores of Chinese, Mathematics, and English were standardized within the class. The scores of the three subjects were based on objective examinations conducted by the school. The maximum score for each subject was 100, and a score of 60 is usually considered the cutoff between a pass and a failure in a course. Chinese, Mathematics, and English were three major subjects taught in Chinese schools. Internal reliabilities (Cronbach's alphas) of the measure based on grades for the three subjects were .94-.96 for Grades 3-6.

### ***Peer victimization***

Victimization was assessed by peer nominations (Schwartz et al., 2001). Children nominated up to three peers to fit each of the four items, which described direct and indirect types of victimization. The total number of nominations each child received from all classmates was calculated and used to compute each item score for him or her. Children who received more nominations from the classmates for a role had higher scores on that item. Children who did not receive any nominations for an item received a score of zero. The item scores were standardized within the class ( $M = 0$ ,  $SD = 1$  for standardized scores) to adjust for differences in the number of nominators. The measure has been demonstrated to be reliable and valid in Chinese children (Chen & Tse, 2010; Schwartz et al., 2001). The internal reliabilities (Cronbach's alphas) of the measure ranged from .88 to .90 in this study.

### ***Depression***

Children's depression was measured by administering a 14-item Chinese version of the Children's Depression Inventory (CDI; Kovacs, 1992). Items were rated on a 3-point scale and they captured any given thought, feeling, or behavior associated with depression, such as self-deprecation, reduced social interest, anhedonia, fatigue, and self-blame. This measure has previously demonstrated to be reliable and valid in Chinese children (Liu et al., 2015). The internal reliabilities (Cronbach's alphas) of this measure ranged from .82 to .84 in this study.

### **Plan of Data Analysis**

I conducted the following analyses to investigate the longitudinal associations among academic achievement, depression, and victimization. I used RI-CLPM with

multiple indicators to test reciprocal effects among the three constructs. The indicators of academic achievement were grades on Chinese, Mathematics, and English. The indicators of peer victimization were four peer-rated item scores, and the indicators of depression were 14 self-reported item scores. Following the guideline suggested by Hamaker et al. (2015), I first tested the measurement invariance of the factor loadings for each construct to ensure that the items were answered and interpreted the same way over four waves.

Once measurement invariance was established, I then created three overarching random intercept factors for the between-person part of the model. The latent factors at four waves were indicators of each construct, with all factor loadings set to 1 (See Figure 1). For the within-person part of the model, the factors created in the measurement models were regressing on twelve within-person latent factors (i.e., one for victimization, one for depression, and one for academic achievement at each of the four waves), with all loadings constrained to 1 (See Figure 2). The latent factors in the within-person part were used to examine carry-over stability paths, cross-lagged paths, and within-time associations among the three variables. The residual variances of the factors in the measurement models were set to zero, ensuring that all variation in the observed scores was entirely captured by the within-person and between-person latent factors. The correlations between the factors in the within-person part at each wave were estimated. The correlations between the random intercept factors were also estimated to examine between-person level associations. The default correlations between the random intercept factors and within-person latent factors at the initial wave were constrained to zero.

Longitudinal associations among academic achievement, peer victimization, and depression were examined. To evaluate the absolute model fit, I used the following fit indices: comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and standardized root-mean-square residual (SRMR) (Hu & Bentler, 1999; Kline, 2005). Acceptable fit is indicated by CFI values  $> .90$ , and RMSEA and SRMR values  $< .08$ . Good fit is indicated by CFI values  $> .95$ , and RMSEA and SRMR values  $< .05$  (Hu & Bentler, 1999).

As a common practice, comparisons between a fully free model and models with constrained auto-regressive paths were conducted. Nested models were compared using the Satorra–Bentler scaled chi-square difference test because of the use of MLR estimation. The RI-CLPM model served as the baseline model, and cross-time equality constraints on academic achievement, victimization, and depression were added separately and each new model was compared with the baseline model. Then, a final model with equality constraints on all three constructs was compared with the previous best-fitting model. If the Satorra–Bentler scaled chi-square difference test between two models was nonsignificant, a more parsimonious model (i.e., the model with equality constraints) was chosen. In the best-fitting model, the carry-over effects of academic achievement, victimization, and depression (i.e., autoregressive paths) and the spillover effects among the three constructs over time (i.e., cross-lagged paths) were examined.

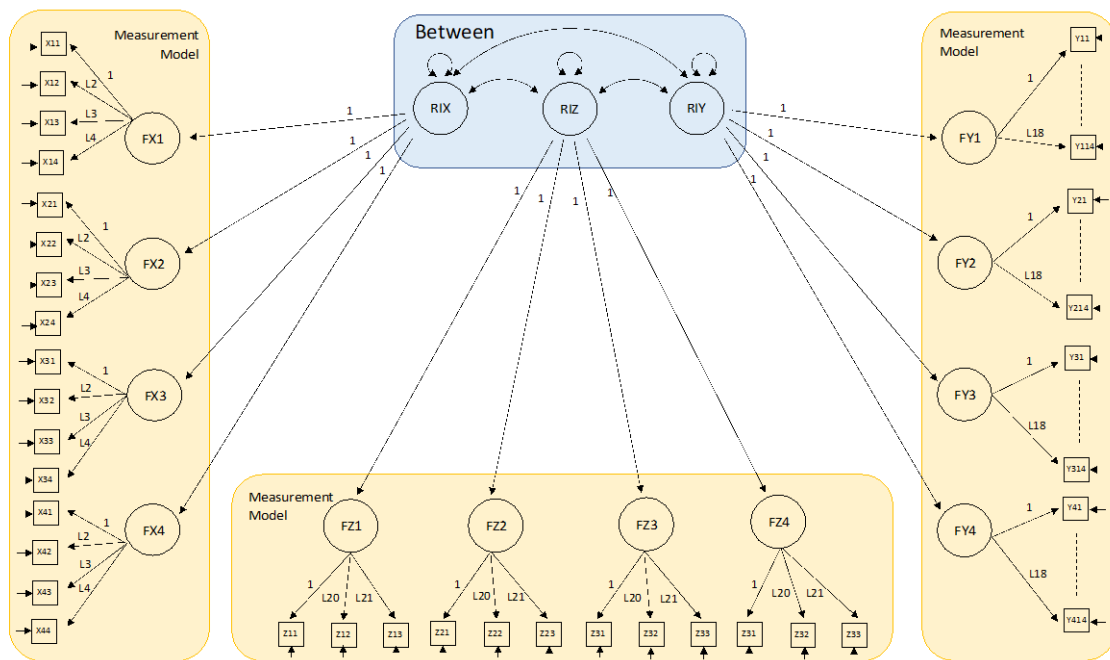
I statistically controlled for gender, which was shown to be a robust predictor of academic achievement, victimization, and internalizing problems according to the extant literature. For example, Chinese girls tend to outperform boys academically (Chen, Huang, Chang, Wang, & Li, 2010; Liu et al., 2014; Schwartz et al., 2002). Also, in



China, boys are found to be more likely to experience peer maltreatment than girls (Liu et al., 2014; Schwartz et al., 2001). It is also important to note that Chinese boys tend to report higher levels of depression than girls (Chen et al., 2012; Chen et al., 1995a). Based on these findings, gender was controlled for in subsequent analyses.

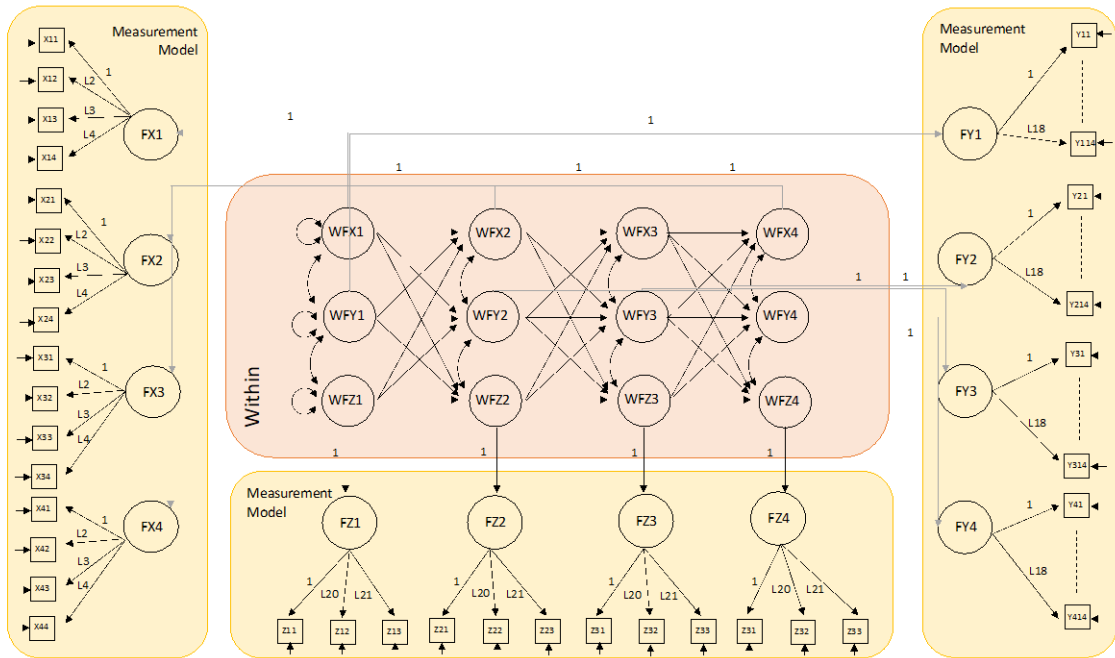
**Figure 1**

*Between-person part of the random intercept cross-lagged panel model*



**Figure 2**

*Within-person part of the random intercept cross-lagged panel model*



## CHAPTER 3: RESULT

### Descriptive Data

Missing values were present in the dataset due to the longitudinal nature of the present study. Missing data on relevant items (ranged from 24.0% to 48.2%) were handled using full-information maximum-likelihood (FIML) estimation using Mplus version 8.4. Maximum-likelihood robust (MLR) estimation is chosen to account for the potential issues of non-normal data (e.g., Graham, 2009). Multivariate analysis of variance was conducted to examine the overall effect of gender on academic achievement, victimization, and depression across multiple waves. Significant effects of gender were found, Wilks = .95,  $F(532) = 2.51$ ,  $p < .01$ . As shown in Table 1, girls had better academic achievement than boys in Grades 3–6. In addition, boys had higher scores on victimization than girls in Grades 3–6. In terms of depression, boys had significantly higher scores on depression than girls only in Grade 3.

**Table 1***Means and Standard Deviations of Variables for Boys and Girls Across Four Grades*

Variable	Boys		Girls		$\chi^2$ (df=1)
	M	SD	M	SD	
Academic achievement					
Grade 3	0.00	.85	0.22	.65	11.53***
Grade 4	0.00	.91	0.23	.70	10.63***
Grade 5	0.02	.87	0.26	.64	13.27***
Grade 6	-0.01	.90	.24	.59	14.01***
Victimization					
Grade 3	0.05	.80	-0.15	.50	12.12***
Grade 4	0.05	.82	-0.16	.57	11.52***
Grade 5	0.03	.82	-0.17	.52	11.00***
Grade 6	0.01	.82	-0.05	.71	7.32**
Depression					
Grade 3	1.33	.29	1.26	.24	8.91**
Grade 4	1.28	.28	1.23	.25	3.70
Grade 5	1.27	.29	1.26	.30	0.23
Grade 6	1.30	.31	1.26	.28	3.01

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

An exploratory factor analysis (EFA) of the three items of academic achievement in Grades 3–6, using principal components rotation, was conducted and yielded a single-factor solution for all the grades. Eigenvalues for the first extracted factor were 2.34, 2.40, 2.31, and 2.34, and eigenvalues for the second factor and beyond were  $< 1$  in Grades 3–6. Across the grades, all items had significant loadings over .87. Similarly, EFA yielded a single-factor solution that best fitted the data of victimization. Eigenvalues for the first extracted factor were 2.54, 2.75, 2.82, and 3.03, and eigenvalues for the second factor and beyond were  $< 1$  in Grades 3–6. Across the grades, victimization had significant loadings over .70. Finally, for self-report depression, eigenvalues for the first extracted factor were 4.17, 4.60, 4.63, and 4.51. In Grade 3, all items had significant loadings over .36. In Grade 4-6, all items had significant loadings over .40.

### **Measurement Invariance**

The factorial invariance for the constructs of academic achievement, victimization, and depression was tested across four times of measurement, following the procedure guidelines outlined in previous studies (e.g., Byrne, Shavelson, & Muthen, 1989; Cheung, 2008). The results showed that full metric models did not differ significantly from the unconstrained model for academic achievement across time  $\chi^2(6) = 3.95$  (loading invariance),  $p > .05$ , and for academic achievement and victimization combined across time,  $\chi^2(15) = 11.68$  (loading invariance),  $p > .05$ . Partial metric model (at least half the items per construct existed, see Byrne et al., 1989; Meredith, 1993) of academic achievement, victimization, and depression combined across time also did not differ significantly from the unconstrained model,  $\chi^2(51) = 68.65$  (loading invariance),

$p > .05$ . Taken together, measurement invariant results allowed us to compare the cross-time relations between academic achievement, victimization, and depression.

The overall measurement model with all three constructs and four time points showed adequate standardized factor loadings, ranging from .40 to .90. The standard errors were low (below .05), suggesting robust model estimation. The goodness-of-fit indices was close to satisfactory,  $\chi^2(3324) = 7,678.19$ ,  $\chi^2/df = 2.31$ , comparative fit index (CFI) = .85, root mean square error of approximation (RMSEA) = .03, standardized root-mean square residual (SRMR) = .05.

### **Within-Person Stabilities and Relations Among Academic Achievement, Victimization, and Depression**

Based on the measurement model, I added autoregressive paths and cross-lagged paths. As seen in Table 2, the model fit of the full RICLPM model (i.e., baseline model) was satisfactory,  $\chi^2(3363) = 7,107.29$ ,  $\chi^2/df = 2.11$ , CFI = .91, RMSEA = .03, SRMR = .04. Following the strategies recommended by Hamaker et al. (2015), the RICLPM model was compared with the traditional CLPM in which the variances of the random intercepts and their covariance were fixed to zero, and a chi-square difference test revealed that the RICLPM was significantly better fitting than the traditional CLPM,  $\Delta\chi^2(129) = 585.03$ ,  $p < .001$ . Setting equality constraints on the autoregressive paths of academic achievement, victimization, and depression resulted in non-convergence. Therefore, the RI-CLPM model with unconstrained autoregressive paths of all three constructs was chosen as the final model. As shown in Figure 1, standardized stability coefficients of academic achievement, victimization, and depression were all statistically significant,

ranging from .56 to .77 for academic achievement, from .50 to .79 for victimization, and from .32 to .37 for depression,  $ps < .001$ .

**Table 2**

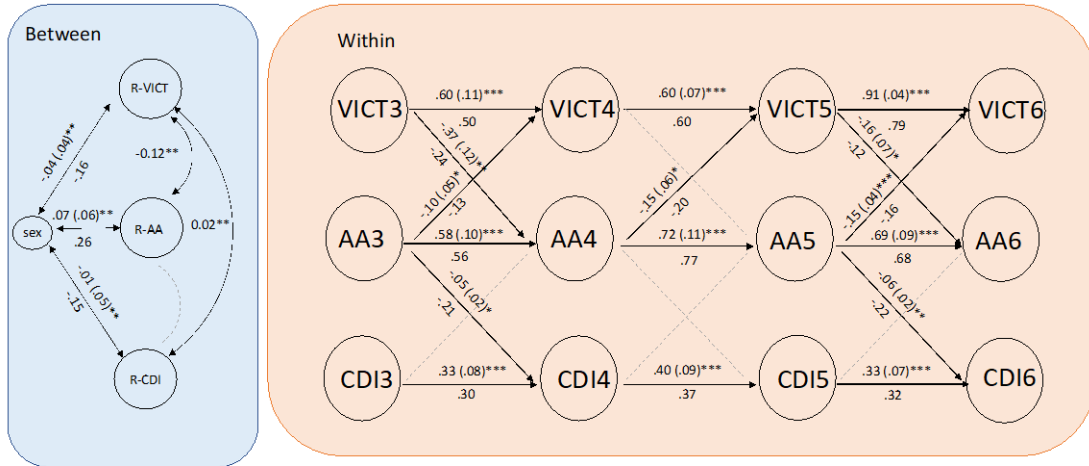
*Model Fit Indices for the Multiple Indicator Random-Intercept Cross-Lagged Panel*

*Model (RI-CLPM)*

Model	$\chi^2$ (df)	Fit statistics			Model comparisons	
		CFI	RMSEA	SRMR	$\chi^2_{diff}(df_{diff})$	$p$
CLPM	7692.318(3492)	.88	.03	.07		
RI- CLPM	7,107.29(3,363)	.91	.03	.04	585.03(129)	< .0001

**Figure 3**

*RI-CLPM results of longitudinal linkages among academic achievement, victimization, and depression from Grade 3 to Grade 6*



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

As shown in Figure 3, RI-CLPM results revealed that academic achievement had significant and negative effects on subsequent victimization and depression from Grade 3 to 4, and from Grade 5 to 6. Also, victimization was significantly and negatively associated with subsequent academic achievement for the same time periods, from Grade 3 to 4 and Grade 5 to 6. Academic achievement also had unidirectional influences on depression in lower grades and higher grades. In addition, from Grade 4 to 5, academic achievement was only significantly and negatively associated with subsequent victimization. Finally, no significant associations between victimization and depression were found. These results suggested that bidirectional influences between academic achievement and victimization were more evident in lower grades and higher grades,



after controlling for between person differences. Academic achievement also had unidirectional direct influence on later depression (Grade 3 to 4 and Grade 5 to 6) and victimization (Grade 4 to 5).

At the between-person level, the association between academic achievement and victimization was significant and negative,  $b = -.12$ ,  $B = -.41$ ,  $SE = .10$ ,  $t = -4.00$ ,  $p < .001$ , indicating that children with higher academic achievement across the waves experience less victimization. The between-person association between victimization and depression was significant and positive,  $b = .02$ ,  $B = .35$ ,  $SE = .09$ ,  $t = 3.79$ ,  $p < .001$ , suggesting that children who experienced more victimization were also more depressed.

Child gender was significantly and positively correlated with the between-person constructs of academic achievement,  $b = .07$ ,  $B = .26$ ,  $SE = .06$ ,  $t = 4.38$ ,  $p < .01$ , negatively correlated with victimization,  $b = -.04$ ,  $B = -.16$ ,  $SE = .04$ ,  $t = -3.94$ ,  $p < .01$ , and negatively correlated with depression,  $b = -.01$ ,  $B = -.15$ ,  $SE = .05$ ,  $t = -3.31$ ,  $p < .01$ . Girls had higher achievement scores, lower victimization, and lower depression than boys.

## CHAPTER 4: DISCUSSION

The present study investigated the longitudinal links between Chinese children's academic achievement, peer victimization, and depression. It was the first study that examined all three variables simultaneously using a random-intercept cross-lagged model approach, which has a greater methodological advantage over the traditional CLPM approach by controlling for between-person effects. Results showed that, at the within-person level, Chinese children's academic achievement had a direct impact on, and was affected by, their peer victimization experience. Academic performance also had unidirectional effects on subsequent depressive symptoms. Together, these findings showed that maladjustment in one domain spread over to other domains over time, which shed light on the interplay between three key aspects of children's school adjustment – academic performance, social competence, and psychological well-being. The study made a significant contribution to our understanding of the transactional nature of the relations and progressive cascading effects between academic achievement, victimization, and depression in the Chinese context from a developmental perspective.

### **Bidirectional Contributions Between Academic Achievement and Victimization**

Specifically, at the between-person level, academic performance and victimization were found to be significantly and negatively correlated. Children who performed well at school, compared to their less academically capable counterparts, were less likely to be victimized, suggesting a positive contribution of academic performance on children's social adjustment. After controlling for between-person effects, cross-lagged paths between academic performance and victimization were found to be significant from Grade 3 to Grade 4, and from Grade 5 to Grade 6, at the within-person

level. This finding supports the argument that children who are academically competent may be considered as a valuable social resource by their peers (Vaillancourt & Hymel, 2006), whereas children who have poor academic achievement or learning difficulties may become a target of peer rejection and abuse (Olweus, 1978; Luciano & Savage, 2007; Walker & Nabuzoka, 2007). Academic achievement is highly valued in the Chinese society. Children's academic performance is often evaluated in public settings in which they receive peer and teacher feedback (Chen et al., 1997; Liu, Bullock, & Coplan, 2014). Therefore, children's academic failures are exposed to an intense social-evaluative process, which may result in negative judgement and, in more extreme cases, peer victimization. In addition, the significant reversed pathway of victimization affecting later academic performance supports the argument that children's social adjustment may constitute important emotional and social resources for achievement in the school context (e.g., Wentzel, 1991; Wentzel & Asher, 1995). When children's social adjustment suffers at school, they may lose interest in school, receive less help from peers, and become less capable of coping with school demands and concentrating on schoolwork. In short, in lower grades and higher grades, a bidirectional model of academic performance and victimization was supported by the RI-CLPM results.

### **Unidirectional Contributions of Academic Achievement on Depression**

Results from the present study also revealed a unidirectional contribution of academic performance to subsequent depression, especially in lower and higher grades, suggesting that children who had lower academic attainment were more likely to score higher on depression one year later. This finding was consistent with results of previous studies, which showed that academic failures (both objective and perceived failure) was a

significant risk factor for depressive symptoms later on (Cole, 1991; Carroll et al., 2005; Herman et al., 2007; Maughan et al., 2003; Puig-Antich et al., 1993). Given the strong cultural emphasis on education and academic performance in Chinese schools, students who do not perform well academically are considered less capable, abnormal, and problematic by teachers and peers (Chen et al., 1995a; Chen et al., 2000; Zhou et al., 2010). Their low achievement is evaluated publicly and they often receive criticisms and rejection from teachers and peers. Children with poor grades may internalize these negative feedbacks and develop negative perceptions of their own competence. They may even develop a lower sense of self-worth and “learned helplessness,” which can trigger subsequent depressive symptoms.

It should also be noted that academic achievement in Grade 4 significantly predicted victimization, but not depression in Grade 5. It is possible that children in lower grades and higher grades are more susceptible to difficulties in academic performance. In lower grades, students often attempt to establish their academic status but at the same time lack adequate social-cognitive abilities to cope with challenges in school work. For example, young students’ self-regulation skills are still developing and many of them struggle with paying attention in class, which may make them more susceptible to being labeled as “incompetent” or “disruptive,” which, in turn, may contribute to victimization and depression one year later. In the final year of elementary school, between Grade 5 and Grade 6, students face heightened stress in preparing for the entrance examinations for middle school. Those who perform better at the middle school entrance examination are able to matriculate at schools with a higher ranking. Therefore, it is possible that the importance of academic achievement is once again emphasized even more between

Grade 5 and 6. Students who perform well academically during higher grade levels are considered more competent and they may have better social status. In comparison, those who experience academic challenges between Grade 5 and 6 are at higher risks for being victimized and feeling depressed. In short, academic achievement seems to play a more significant role in guiding children's behaviors and adjustment in lower and higher grade levels.

It is important to note that the reversed pathways of depression contributing to later academic performance were not significant, suggesting that depression is a consequence, but not a predictor of, children's academic performance. This could be because personal feelings and emotions, such as depressed moods, are less irrelevant to academic adjustment and social relationships in Chinese culture (Potter, 1988). Chinese children are taught to suppress their negative feelings in public, because the expression of negative emotions is often thought of as socially inappropriate, selfish, and shameful (Chen & Kasper, 2004). Children are often told to focus on their school performance and social adjustment instead (Ho, 1986; Kleinman & Good, 1985). In other words, more attention is paid to children's academic performance than their internalizing problems. As a result, academic performance is granted more developmental significance than depressive symptoms among Chinese children.

Similarly, in this study, no significant cross-lagged associations were found between depression and peer victimization at the within-person level. RI-CLPM results revealed that depression and victimization were significantly and positively correlated with each other at the between-person level. Depressed children, compared to their non-depressed peers, were more likely to experience peer victimization. However, within-

person changes in depressive symptoms did not contribute to subsequent changes in peer victimization. The current findings provide a new perspective to the extant body of literature, which presents an unclear picture of how peer victimization and depression are associated across time, by suggesting that there are no significant longitudinal links between the two constructs after controlling for between-person effects.

Findings from the present study have important implications. Well-timed and targeted interventions are needed to interrupt the negative cascade effects found in this study. Prevention and intervention efforts can work by targeting improvements in Chinese children's academic achievement, since results in this study showed that lower academic achievement led to later increases in peer victimization and depression. For example, academic support services can focus on fostering study skills development such as time management and other constructive study habits. Such intervention effort would not only help children improve their academic performance, but also reduce their adverse social experiences and psychological problems.

Alternatively, intervention efforts that aim to reduce peer victimization may also help improve Chinese children's academic achievement. Moreover, high quality prevention and intervention programs in middle childhood may result in a higher return on investment, because results from the current study suggest that cascade effects among children's academic achievement, victimization, and depression begin as early as Grade 3 in elementary school. More longitudinal studies are needed to understand when and how the processes underlying the developmental cascade among achievement, victimization, and depression initiate and accelerate, in order for intervention and prevention efforts to

intervene with any problem cascades that may have lasting consequences in children's development.

### **Limitations and Future Directions**

Several limitations and weaknesses should be noted in the present study. First, this study did not include measures such as family climate, parenting practices, or socioeconomic status to examine the potential common causes. The literature on academic achievement, childhood victimization, and depression has provided clues about potential role of family processes that may affect relations among these developmental domains. Researchers have recently argued that family background and functioning may affect parenting practices, which may have a subsequent impact on child developmental outcomes (e.g., Bronfenbrenner, 1989; Conger et al., 1993). In line with this argument, evidence suggests that parental education, SES, nonminority ethnic/cultural backgrounds are associated with children's early school adjustment (Alexander & Entwisle, 1988; Ladd & Price, 1987; Reynolds, 1991; Reynolds & Bezruczko, 1993). These environmental factors have also been shown to play an essential role in children's mental health, academic, and social adjustment in Chinese culture (e.g., Bond, 1991; Chen et al., 1995b; Cicchetti et al., 1997; Dishion, 1990; Goodyer et al., 1991; Kazdin, 1989; Wu & Tseng, 1985). Therefore, it is important to investigate broader contextual factors that may have an impact on children's academic, social, and psychological adjustment in future studies.

Second, the present study was conducted in China and did not include a comparison group that would allow for a direct cross-cultural comparison. Results from the present study were consistent with the strong and pervasive emphasis on education

and academic performance in the Chinese culture, but it remains unclear whether the results could be generalized to children from other cultural backgrounds. In order to achieve a better understanding of cultural influence on the temporal sequence of different developmental domains, it will be necessary to conduct research on this topic in other societies, including Western societies.

Third, this study focused on elementary school children in China. According to the results, cascading processes between academic performance, victimization, and depression were more evident from Grade 3 to 4, and from Grade 5 to 6. The effects of academic performance in different developmental stages may reflect the developmental nature of individual competence and psychological functions. While current findings provide support to the argument that cascading effects may be developmentally variant (Burt et al., 2008; Chen et al., 2010), more studies are needed to shed light on how and why different developmental domains interact with each other across different developmental stages.

Despite the limitations discussed above, the present study represented the first attempt to examine competing pathways within one single longitudinal model that includes three adjustment constructs using the RI-CLPM approach. To summarize findings from the present study, Chinese children's academic performance was found to have predictive power on later peer victimization and depression from Grade 3 to Grade 6, after controlling for between-person effects. During lower and higher grades, victimization also contributed to academic performance 1 year later. In contrast, depression did not seem to have significant predictive effects on children's academic performance or peer victimization. Current findings highlighted the significance of



academic achievement among Chinese children. More studies using the RI-CLPM design are needed in the future to further investigate the temporal sequence among academic performance, peer victimization, and childhood depression.

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