Domain-Specificity
Between Types of Peer Support and Multidimensional Self-Concept

by

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Statement of Authentication

The work presented in this thesis is, to the best of knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in whole or in part, for a degree at this or any other institution.

..................................................

(Signature)
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<td>SELF-DESCRIPTION QUESTIONNAIRE (SDQII)</td>
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ABSTRACT

Having positive peer relations is an important goal in itself and is also postulated to impact on other desirable educational outcomes such as adjustment to school, and social and psychological functioning. Despite the growing popularity of peer support interventions in educational settings, research evaluating the effectiveness of peer support interventions has been plagued with theoretical and methodological flaws. The primary purpose of the present investigation was to capitalise on recent advances in peer support and self-concept research to rigorously test the impact of different types of peer support interventions on multiple dimensions of self-concept and peer support by employing a construct validity approach to the study of intervention effects. More specifically, the research aimed to: (1) conduct a meta-analysis to synthesise and critically analyse the current research literature, to elucidate the impact of academically-orientated peer tutoring interventions on tutees’ academic outcomes and self-concepts; (2) identify psychometrically sound self-concept and social support instruments for use with evaluating secondary school peer support interventions; and (3) test the impact of researcher-devised academically-orientated and socially-orientated peer support interventions administered to Australian and Chinese students on specific facets of self-concept and perceived peer support.

Results of the meta-analysis found that academically-orientated peer tutoring had positive impact on tutees' academic achievement and self-concept. Certain intervention parameters were significant moderators of academic achievement and self-concept. In addition, the construct validity approach to the study of intervention
effects was supported. An English and Chinese version of the Self-Description Questionnaire II (SDQII), and a peer support scale (English version) were shown to be reliable and valid measures of self-concept and peer support respectively. Moreover, the results demonstrated the instrument’s cross-cultural validity of self-concept across the Australian and Chinese participants. Results pertaining to the impact of different types of peer support interventions were consistent with predictions based on a construct validity approach whereby: (a) the academically-orientated peer support intervention conducted in Australia had a positive effect mainly on academic domains of self-concept most logically related to the goal of the intervention, whereas non-academic domains of self-concept were less affected; and (b) the socially-orientated peer support intervention conducted in Australia and China had a positive effect mainly for the non-academic domains of self-concept most logically related to the intervention’s goals, whereas academic domains of self-concept were less affected.

The findings have important implications that peer support interventions have the potential to make a significant contribution to schools’ efforts to orchestrate positive academic and social outcomes in multiple domains of self-concept and peer support. The results also support the usefulness of employing a construct validity approach to the study of intervention effects and the self-concept theory and research on which this is based. They advance our understanding of the factor structure of self-concept for Chinese and Australian secondary students; the differential positive impact of academically-orientated and socially-orientated peer support interventions on self-concept; and provide strong empirical evidence to identify features of peer support intervention design that will produce optimal effectiveness and therefore serve to inform theory, research, and practice.
CHAPTER 1

INTRODUCTION

Maintenance of positive peer relationships is an important goal in itself and is also postulated to impact on other desirable educational outcomes. Positive peer relationships are associated with coping with transition to high school (Felner, Ginter, & Primavera, 1982), adjustment to school (Berndt & Keefe, 1995), positive self-concept (Savin-Williams & Brendt, 1990), subsequent achievement (Goodenow, 1993), and subsequent social and psychological functioning (Parker & Asher, 1987). Furthermore, negative peer relationships have been related to serious problems such as delinquency, drug abuse, and depression (Cairns & Cairns, 1989). Hence, it is not surprising to find that peer support interventions in educational settings are growing in popularity and are commonly found in school settings worldwide (e.g., the United Kingdom, Canada, Australia, and New Zealand). Thus, numerous peer support interventions have been implemented with the purpose of promoting the wellbeing of students and preventing antisocial and aggressive behaviour within the peer group (Carr, 1994; Cowie & Sharp, 1996). For example, in Australia, the Peer Support Foundation was established to design and implement peer support interventions to develop primary and secondary students’ conceptions of self, personal responsibility, and empowerment (Ellis, Marsh, & Craven, 2005). However, research critically
analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws.

Research capitalising on current advances in social support research, self-concept research, and the development of multidimensional self-concept measurement instruments provides promising directions for critically analysing the impact of peer support interventions on desirable educational outcomes. Peer support has been shown to be related to self-concept. Positive features of friendships are related with higher self-esteem in several correlational studies (Coates, 1985; Dubow & Ullman, 1989; Townsend, McCracken, & Wilton, 1988). In addition, Hirsch and Rapkin (1987) conducted a longitudinal study to assess students on social support and self-esteem at the end of Grade 6 and at the middle and end of Grade 7. They found that perceived peer support was associated with high self-esteem. However, the multifaceted, hierarchical model of Shavelson, Hubner, and Stanton (1976) postulated that self-concept was composed of different facets. Self-concept was postulated to be divided into academic and non-academic domains, as well as there being a general self-concept. Some aspects of this model have been revised (Marsh, Byrne, & Shavelson, 1988; Marsh & Shavelson, 1985; Shavelson & Marsh, 1986) and even extended to artistic domains (Vispoel, 1993). On the basis of the Shavelson model, multidimensional self-concept instruments (Marsh, 1990c, 1992b, 1992c) have been developed with sound psychometric properties. Hence, recent self-concept research has emphasised the multidimensionality and domain-specificity of self-concept.

Reviews of self-concept research support the view that self-concept cannot be clearly understood if its multidimensionality is not taken into consideration (Craven,
Marsh, & Burnett, 2003; Marsh, Byrne et al., 1988; Marsh & Craven, 1997, 2006; Marsh & Shavelson, 1985). Therefore, it has been argued that adolescents can distinguish their self-concept as multiple distinct domains (Harter, 1982; Marsh & Holmes, 1990; Marsh & Shavelson, 1985). Research also shows that positive features of friendships are strongly associated with various domains of self-concept. Keefe and Berndt (1996) found that positive features of friendships were strongly related with various domains of self-concept including global self-worth, social acceptance, behavioural conduct, and scholastic competence, in a study based upon 297 seventh and eighth graders. Marsh, Parada, Craven, and Finger (2004) have also found that being a victim of bullying was negatively associated with all eleven facets of self-concept as measured by the SDQII (Marsh, 1992b) and showed that positive features of friendships were strongly associated with various domains of self-concept. However, research examining the impact of peer support interventions on self-concept has often not accounted for the multidimensionality of the self-concept construct, as identified by recent advances in self-concept research (e.g., Marsh & Craven, 2006). In addition, researchers have not felt compelled to demonstrate the psychometric properties of the self-concept instrumentation they have employed. Self-concept theory and research also advocate that a construct validity approach should be employed to test the impact of interventions on specific domains of self-concept rigorously (e.g., Craven et al., 2003). The construct validity approach predicts that facets of self-concept relevant to the goals of the intervention will be most affected by the intervention, whereas facets of self-concept less relevant to the goals of the intervention will be less affected (also see later discussion below). Given that these advances in self-concept theory and methodology have rarely been capitalised upon in peer support research, little is known about the impact of peer support interventions on specific domains of self-concept relevant to the goals of the
intervention. Furthermore, although several reviews have employed meta-analysis to systemically review the effect of academically-orientated peer tutoring empirically, they also have not accounted for multidimensionality of self-concept nor adopted a construct validity approach. In addition, a number of previous meta-analyses are dated (e.g., P. A. Cohen, Kulik, & Kulik, 1982; Cook, Scruggs, Mastropieri, & Casto, 1985) and thus do not capitalise on methodological advances in meta-analysis such as homogeneity and regression analyses, to examine what intervention features moderate the effect of tutoring and constitute the “best practice” for intervention design. Of the current meta-analyses that have adopted at least some of the current advances in methodology in meta-analysis, they were confined to certain populations such as elementary school children and were confounded with other types of intervention (e.g., Rohrbeck, Ginsburg-Block, Fantuzzo, & Miller, 2003). Thus, the effectiveness of peer support interventions needs to be further elucidated.

Research has also demonstrated that there is a causal reciprocal relation between academic self-concept and academic achievement (Marsh, 1990a; Marsh & Craven, 1997, 2006; Marsh, Hau, & Kong, 2002; Guay, Marsh, & Boivin, 2003). For example, Marsh and Yeung (1997a) have found that mathematics achievement has a strong, positive direct effect on Mathematics self-concept, and Mathematics self-concept has a strong positive effect on mathematics achievement. Marsh and Craven’s (2006) review of empirical research identifies that academic self-concept and academic achievement share a mutually reinforcing reciprocal relation such that prior academic self-concept and academic achievement both have subsequent positive effects on academic self-concept and academic achievement. The reciprocal effect can be generalised to young children, non-Western countries, physical activity, and elite and non-elite sport. These studies suggest that academic self-concept is
strongly related to academic outcomes, whereas non-academic self-concept is not. Conversely, non-academic self-concept is strongly related to non-academic outcomes whereas academic self-concept is not. For instance, physical self-concept has been found to correlate with physical domain outcomes such as physical activity, endurance, and strength (Marsh, 1996). These findings demonstrate there is domain-specificity between self-concept and certain outcomes. Recent self-concept enhancement research has also demonstrated that specific facets of self-concept relevant to the goals of the intervention can be enhanced (see Craven et al., 2003). Craven et al. (2003) emphasise a construct validity approach to the study of intervention effects whereby they postulate that target facets of self-concept most relevant to the goals of the intervention should be affected most, whereas non-target facets of self-concept less relevant to the goal of intervention should be affected less. Self-concept enhancement studies have shown that target non-academic facets of self-concept (Marsh, Richards, & Barnes, 1986a, 1986b) or target academic facets of self-concept (Craven, 1989; Craven, Marsh, & Debus, 1991; Marsh & Richards, 1988) specific to the goals of the intervention are affected most. This research offers support for the utilisation of a construct validity approach to the study of intervention effects. It seems plausible that different types of peer support interventions would have a different impact on specific domains of self-concept most logically related to the intervention’s goals. As such, peer support interventions designed to impact on academic outcomes may impact positively on academic facets of self-concept most logically related to the intervention, whereas peer support interventions targeting non-academic outcomes may impact positively upon non-academic facets of self-concept most logically related to the intervention’s goals. However, the construct validity approach to testing the effects of peer support interventions on multiple domains of self-concept has not been employed in the vast majority of
studies, so that little is known about the impact of peer support interventions on target domain of self-concept.

In order to address the issues described above, the present investigation comprised five interrelated studies. As mentioned previously, meta-analytic reviews on the effect of academically-orientated peer tutoring have often been plagued with theoretical and methodological flaws (e.g., failure to account for multiple domains of self-concept or to employ a construct validity approach to the study of intervention effects); some are dated; others are limited to certain population samples (e.g., elementary school children) and confounded with other types of intervention. To overcome these limitations, there is a need to conduct an updated, comprehensive meta-analysis to establish the effects of peer tutoring on academic achievement and self-concept based on current advances in meta-analysis methodology, engaging a wide range of participants and subject content. Hence, Study 1 aims to capitalise on recent advances in meta-analysis methodology to undertake an updated and comprehensive meta-analysis to critically: (a) evaluate the impact of academically-orientated peer tutoring interventions on academic achievement and multiple domains of self-concept based on a construct validity approach to the study of intervention effects in order to account for the multidimensional structure of the self-concept construct established by recent research; and (b) elucidate peer support intervention features that predict and moderate effective academically-orientated peer tutoring interventions in order to inform intervention design in general and in relation to Study 3 of the present investigation. To overcome the limitations of previous research and address the need to employ multidimensional self-concept instruments with sound psychometric properties, Study 2 aims to capitalise on recent advances in statistics to: (a) assess whether the English and Chinese versions of the
SDQII are reliable and valid instruments; (b) compare the factor structure of self-concept for Chinese and Australian secondary students; (c) identify the psychometric properties of a peer support subscale; and (d) examine the relation of peer support and multiple dimensions of self-concept in order to further validate the instrument. In order to elucidate the impact of peer support interventions on multiple dimensions of self-concept and peer support, the construct validity approach to the study of intervention effects was adopted. Three peer support interventions were designed to capitalise on recent advances in self-concept theory and research. Study 3 aims to: (a) critically analyse the impact of an academically-orientated peer support intervention on target and non-target facets of self-concept and peer support from an Australian sample; and (b) test whether the effects generalise to both males and females. Study 4 aims to: (a) critically analyse the impact of a socially-orientated peer support intervention on target and non-target facets of self-concept and peer support from an Australian sample; and (b) test whether the effects generalise to both males and females. Finally, Study 5 aims to: (a) critically analyse the impact of a socially-orientated peer support intervention on target and non-target facets of self-concept from a Chinese sample; (b) test whether the effects generalise to both males and females; and (c) test whether the effects of intervention are maintained over time.

In summary, the present investigation was designed to contribute to advancing theory and research by: (a) developing a new multidimensional construct of peer support which includes academic and social domains. These two types of peer support were considered important to evaluate in an educational setting since both types of social support interventions have been demonstrated by research to impact on academic and non-academic desirable educational outcomes. Moreover, both
academic and social domains of social support are two aspects that are important for the development of adolescents; (b) examining the specific relation between multiple dimensions of peer support and multidimensional facets of self-concept; (c) comparing the factor structure of self-concept for Chinese and Australian secondary students; (d) conducting an updated and comprehensive meta-analysis capitalising upon recent advances in meta-analysis methodology and self-concept theory and research to evaluate the impact of academically-orientated peer tutoring interventions on academic achievement and self-concept, and to identify which intervention features constitute “best practice”; (e) test the salience of a new academically-orientated peer support intervention administered to an Australian sample; and (f) testing the salience of a new socially-orientated peer support intervention administered to both an Australian and Chinese sample.

In a practical sense, this study contributes to (a) formally investigating the differential effects of two types of peer support interventions; (b) the advancement of knowledge about the impact of different types of peer support interventions on self-concept and peer support; (c) the advancement of knowledge of peer support intervention on enhancement of self-concept on a cross-cultural basis in Australia and Hong Kong; (d) elucidating the effect of academically-orientated peer tutoring interventions on the enhancement of academic achievement and self-concept; and (e) providing strong empirical evidence to identify the features of peer support intervention design that will produce optimal effectiveness.
CHAPTER 2

THE SIGNIFICANCE OF SOCIAL SUPPORT
AND AN OVERVIEW OF PEER TUTORING
INTERVENTION RESEARCH

Introduction

The primary aim of this chapter is to provide an overview of the construct of social support, its significance in education settings, and research relevant to the present investigation pertaining to peer tutoring. Firstly, the definition of social support and the problems inherent in defining the social support construct are discussed. Secondly, common measures of social support are examined. Thirdly, the educational significance of social support will be discussed. Fourthly, current trends in social support research are explored. In addition, an overview of peer tutoring research is provided. Finally, the implications of this research for the present investigation are presented.
Definition of the Social Support Construct

Social support has been extensively studied and has been defined in a way that has been proposed to address different aspects of social support. Some definitions highlight the social exchanges. For example, House (1981) suggested that social support is “an interpersonal transaction involving one or more of the following: (1) emotional concern (liking, love, empathy), (2) instrumental aid (goods and services), (3) information (about the environment) or (4) appraisal (information relevant to self-evaluation)” (p. 39), whereas Shumaker and Brownell (1984) conceived social support as an exchange of resources between individuals with the intent to enhance the wellbeing of the recipient. The resources proposed to be shared included: behavioural assistance, feedback, information, intimacy, and lay referrals.

Some definitions emphasise functions related to needs. For example, Cobb (1976) defined social support as information that leads to the beliefs that an individual is cared for and loved, is valued and esteemed, and belongs to a network of communication and mutual obligation.Thoits (1982) viewed social support as “the degree to which a person’s basic social needs are gratified through interaction with others” (p.147). These needs identified by Thoits were affection, esteem or approval, belonging, identity, and security, which are fulfilled by the means of different forms of aid, including socio-emotional aid and instrumental aid. Turner, Frankel, and Levin (1983) defined social support as the degree to which the individual feels loved, respected, and involved.

Other researchers have defined social ties as social support. For example, Lin (1986) viewed social support as the provision of instrumental and expressive aid by
three levels of linkage: the community, social networks, and confiding partners. Furthermore, Weiss (1974) proposed six functions served through social interactions: attachment, social integration, reassurance of worth, reliable alliance, guidance, and opportunity for nurturance.

**Characteristics of the Social Support Construct**

*Reviews of the Characteristics of Social Support*

Despite the diversity in definition of social support constructs, Vaux (1988) examined the complexity of the social support construct and tried to identify a clear and consensual definition of social support. Whilst he found that there is no single and simple definition of social support that is adequate, three social support constructs were distinguished in Vaux’s (1988) review: support network resources, supportive behaviour, and subjective appraisals of support. Support network measures focus on the integration of an individual into a group and the social relationships among those within that group. Supportive behaviour focuses on what an individual actually received, whereas support appraisal focuses on assessment of the supportive relationship and supportive behaviour within the supportive relationship. These three categories can be delineated as structure and function (House & Kahn, 1985), whereby social network is deemed a structure whereas aspects or dynamics of social relationships that covered the support received and perceived were referred to as functions. B. R. Sarason, Sarason, and Pierce (1990) also distinguished these three types of constructs in relation to available measures of social support. Hupcey (1998) examined the social support research articles from
1993 to 1996 and revealed that most of the measures used were virtually identical to the three categories of measures identified by B. R. Sarason et al. (1990). A total of 58 studies measured support behaviour, 25 studies focused on support network resources, 39 studies focused on both support network resources and supportive behaviour, and 6 studies examined the subjective appraisals of support. Hupcey (1998) summarised that “in these current studies, as in studies over the past 25 years when social support is measured it is done by examining the type of social support and/or social network characteristics and, only in terms of recipients’ perceptions” (p. 1237). Hence, three social support constructs have been commonly measured: support network resources, supportive behaviour, and subjective appraisals of support.

Recently, Williams, Barclay, and Schmied (2004) examined 30 definitions of social support from the literature used across disciplines and identified the commonalities amongst these definitions of social support. These definitions can be grouped into several categories, including notions of time and timing; social ties and relationships; supportive resources; intentionality of support; impact of support; recognition of support need; and characteristics of providers and recipients. It was noted that definitions range from nonspecific to specific definitions. Results suggest that the concept of social support is so diverse that none of them have been accepted as definitive. As such, there is little consensus on theoretical and operational definitions (Thoits, 1982; Vaux, Burda, & Stewart, 1986) since social support is a multi-faceted concept that has been difficult to conceptualise, define, and measure (Hupcey, 1998).
Three Common Measures of the Social Support Construct

**Network measures.** Network measures include the structure, composition, and component relationships of social support. Network structure includes size and density. Network size measures the number of members (e.g., family, friends, and neighbours) involved in the network, whereas network density measures the interrelationship of members involved in the network. Network composition examines who is involved in the network, such as family members, friends, and neighbours, whereas network component relationship assesses the relationship of members involved in the network in terms of: frequency of contact, intensity of relationship, and durability of relationship.

Some scales such as the Social Relationship Scale (SRS; McFarlane, Norman, Streiner, & Roy, 1983) and the Social Support Questionnaire (SSQ; I. G. Sarason, Levine, Basham, & Sarason, 1983) exclusively measure network size. Others focus on assessing both the size and density, such as the Social Network Questionnaire (SNQ; Hirsch, 1979) and some focus on measuring the composition, such as the Social Support Resources measure (SS-R; Vaux, 1982), and the Social Support Network Interview (SSNI; Fischer, 1982). Still others, such as the Social Support Resources (SS-R; Vaux, 1982), measure the relationship quality of the social network. Hence, different aspects of the network have been measured by a number of existing instruments.

**Supportive function measures.** Supportive behaviour may take many forms and serve many functions. For example, Caplan (1974) identified three kinds of
activities: help in resources mobilisation and management of problems; sharing tasks; and provision of material and cognitive assistance to cope with particular stressful situations. Vaux (1982) emphasised the provision of emotional support, socialising, practical assistance, financial assistance, advice, or guidance. Weiss (1974) identified six provisions of social relationships: attachment, social integration, reassurance of worth, reliable alliance, guidance, and opportunity for nurturance. Vaux (1988) noted two categories of functions: instrumental and affective. Instrumental functions serve to provide tangible support through the provision of material or financial aid, information, suggestions, and advice or guidance. Affective functions serve to fulfil the need for love and affection, esteem and identity, and belonging and companionship. These needs are met through emotional support, feedback, social reinforcement, and socialising. Barrera and Ainlay (1983) identified four dimensions: provision of directive guidance, provision of nondirective guidance, positive social interaction, and tangible assistance. Since there are numerous typologies in the modes and function of social support, different types of measures were found. For example, the Inventory of Socially Supportive Behaviour (ISSB; Barrera, Sandler, & Ramsay, 1981) measures activities directed at assisting in mastering emotional distress, sharing tasks, giving advice, teaching skills, and providing material aid. The Social Support Behaviour (SS-B; Vaux, 1982) measures supportive behaviour including emotional, socialising, practical assistance, financial assistance, and advice or guidance.

Support appraisals. Support appraisals are subjective, evaluative assessments of a person’s supportive relationships and the supportive behaviour that occurs within these relationships. Appraisals may take many forms, such as feeling satisfied, cared for, respected, or involved in the relationship. Appraisals may be
global, reflecting an evaluation of one’s relationships with the network as a whole, or focused, whereby specific relationships (for example, relationships with parents or friends) or a particular mode of support (for example, emotional support or practical assistance) are examined. For example, the Perceived Social Support instrument (PSS; Procidano & Heller, 1983) examines the extent to which an individual perceives his/her needs for support, information, and feedback are fulfilled. The Social Support Appraisals (SS-A; Vaux, 1982) measures the degree to which an individual feels cared for, respected, and involved. Some measures have also been designed to measure specific relationships. For example, the Work Relationship Index (WRI; Holahan & Moos, 1981, 1982) measures the supportiveness of colleagues and supervisors, whereas the Family Relationship Index (FRI; Holahan & Moos, 1981, 1982) assesses the support provided by family.

Some network measures also incorporate assessment of appraisal of support. For example, the Social Support Resources (SS-R; Vaux, 1982) assesses an individual’s satisfaction on five modes of social support (emotional, socialising, practical assistance, financial assistance, and advice or guidance) and the Arizona Social Support Interview Schedule (ASSIS; Barrera, 1981) examines the satisfaction with six modes of support including: material aid, physical assistance, intimate interaction, guidance, feedback, and social participation. The Social Support Questionnaire (SSQ; I. G. Sarason et al., 1983) evaluates satisfaction with support across twenty-seven situations. The Social Relationship Scale (SRS; McFarlane, Neale, Norman, Roy, & Streiner, 1981) focuses on rating helpfulness or unhelpfulness with support across a range of potentially stressful situations. A recently developed scale, the Child and Adolescent Social Support Scale (CASSS; Malecki, Demaray, & Elliott, 2000) assesses the four types of support (emotional,
informational, appraisal, and instrumental) from different sources of support (parents, teachers, classmates, and friends). Hence, although certain social support instruments measure one of the three characteristics exclusively, some measure more than one characteristic simultaneously.

**The Educational Significance of Social Support**

**Relation of Social Support and Wellbeing**

Over the past decades, the relation between social support, health, and wellbeing has been investigated. Research has demonstrated that social support can reduce the risk of mental and physical illness (e.g., S. Cohen & Wills, 1985; Hogan, Linden & Najarian, 2002). Research has also shown that in educational setting, social support contributes to the wellbeing of individuals in relation to academic outcomes, social domains, behavioural aspects, and mental health. For example, Levitt, Guacci-Franco, and Levitt (1994) showed that perceived social support was related to several academic indicators for adolescent students, including grades and standardised achievement test scores. Similarly, Richman, Rosenfeld, and Bowen (1998) found that social support was positively associated with a wide range of academic outcomes including: attendance, grades, school satisfaction, school sense of adherence, and prosocial behaviour of academically at-risk adolescents. In addition, Midgley, Feldlaufer, and Eccles (1989) found that a decline in adolescents’ perceived teacher support was related to lower intrinsic interest and belief in the value of school work. Furthermore, Goodenow (1993) investigated the effect of classroom belonging and support on two motivation variables (expectancy of success and intrinsic value) in a sample of 353 sixth- through eighth-grade middle school
students. He found that both teacher support and peer support were significant predictors for expectancy of success, whereas only teacher support was a significant predictor for intrinsic value attached to academic subject. In addition, Sebanc (2003) assessed the association of features of young children’s friendship with prosocial and aggressive behaviour in a group of 98 preschool children. He found that friendship was positively correlated with prosocial behaviour whereas friendship conflict was positively correlated with overt aggression and peer rejection. Martin, Swartz-Kulstad, and Madson (1999) investigated the psychological factors that predicted college adjustment of first-year undergraduate students. They found that faculty support and peer support significantly predicted successful adjustment to college. In addition, Lipschitz-Elhawi and Itzhaky (2005) examined the relation between the provision of resources and the adjustment of 112 adolescents. They demonstrated that family support was related to academic and personal adjustment. Hence, social support has been identified as an important variable that is related to desirable educational outcomes.

**Relation of Social Support and Self-Concept**

Research has also demonstrated that social support is associated with positive self-concepts. For example, Demaray and Malecki (2002a) found that perceived social support was positively associated with self-concept in a sample of 1,711 students in Grades 3 through 12. Forman (1988) found that there was a positive relation between social support and self-worth for children with learning problems or disabilities. Similarly, Kloomak and Cosden (1994) found a positive relation between high levels of social support and high levels of self-concept. In addition, Rothman and Cosden (1995) demonstrated that positive perception of learning disability was
associated with high levels of parental and classmate support. Furthermore, Cauce, Felner, and Primavera (1982) reported that high levels of social support were related to better self-concept of high-risk adolescents. Harter and Whitesell (1996) also found that parental support was positively associated with global worth and negatively associated with depressed affect in a sample of 1,725 middle-class, primarily White adolescents. Similarly, Way and Chen (2000) found that friendship support was positively associated with self-esteem and negatively associated with depressed affect.

Positive school support is also related to self-concept. For example, Way and Robinson (2003) found that positive perceptions of school climate were associated with greater self-esteem in a sample of 100 Black, Latino, and Asian American adolescents. Hoge, Smit, and Hanson (1990) also found that perceptions of school climate predicted self-esteem in middle school students. In fact, Roeser, Eccles, and Sameroff (1998) demonstrated that overall school climate and positive teacher regard predicted positive changes in emotional adjustment in a sample of 1,041 White and African American early adolescents from a wide range of socio-economic status (SES). These results indicate that positive school climate is important for promoting the self-concept of individuals of different ethnicity.

**Relation of Social Support and Social Skills**

Social support has also been found to be related to social skills. For example, Demaray and Elliott (2001) indicated that there was a positive relation between perceived social support and social skills for children with attention-deficit or hyperactivity disorder. Similarly, Bost (1995) found a positive relation between
perceived social support and peer acceptance. Social support has also been found to be negatively associated with problem behaviour of adolescents. For instance, Demaray and Malecki (2003) found that students not exhibiting bullying behaviour or experiencing bullying received more parental, teacher, and classmate support than bullies or bully/victims. These results imply that social support is related positively to social relations and negatively to inappropriate behaviour.

**Relation of Social Support and Deviant Behaviour**

Support from parents and teachers has been found to be related to a wide range of health issues. For example, Frauenglass, Routh, Pantin, and Mason (1997) found that there was a negative relation between family support and drug and tobacco use. Similarly, Lifrak, McKay, Rostain, Alterman, and O’Brien (1997) found that support from teachers and parents was negatively associated with drug use. In addition, Licitra-Kleckler and Waas (1993) reported that low family support was associated with more drug and alcohol use, more school and family difficulties, and engaging in more delinquency for adolescents experiencing high levels of stress. Also, Garnefski and Diekstra (1996) showed that those adolescents with emotional and behavioural problems had negative perceptions of support available to them from family, peers, and their school. Furthermore, Bender and Losel (1997) reported that perceived social support served as a buffering role for well-adapted adolescents in the presence of deviant behaviour. Hence, whilst social support can serve as a buffer against deviant behaviour for well-adapted students, research suggests that at risk students can also benefit from social support.
Social support has also been found to be associated with mental health. For example, Compas, Slavin, Wagner, and Vannatta (1986) reported that there was negative relation between social support and internalising problems such as anxiety and depression. Furthermore, White, Bruce, Farrell, and Kliewer (1998) found a negative relation between family support and anxiety in a sample of African American children. Overall, research findings have shown that social support is negatively related to depression in adolescents (Caldwell, Antonucci, Jackson, Wolford, & Osofsky, 1997; Cheng, 1997, 1998; Compas et al., 1986; Licitra-Kleckler & Waas, 1993; Ostrander, Weinfurt, & Nay, 1998; Patten et al., 1997). In addition, Demaray and Malecki (2002a) found that perceived social support was positively associated with a wide range of positive adjustment indicators such as social skills, self-concept, and adaptive skills; and was negatively associated with problematic behavioural indicators such as externalising and internalising behaviours. These results demonstrate that social support can reduce problematic behaviour and negative affect as well as promoting adjustment.

**Current Trends in Social Support Research**

**Distinction between Global Social Support and Relationship-Specific Measures of Social Support**

In the past, social support research has put much effort into examining the effect of global perceptions of social support. The overall social network, its size and density were thus commonly examined. However, social support research has
increasingly focused on assessing the support provided by particular supportive figures, and examining the relation between these more specific measures and psychological wellbeing. Some of the findings have compared the effect on wellbeing of various sources of social support. For example, Grissett and Norvell (1992) found that non-bulimic women perceived greater support in their lives, from both family and friends, than bulimic women. In work settings, Russell, Altmaier, and Van Velzen (1987) found that support provided by one’s supervisor could reduce job burnout among teachers but support given by co-workers, friends, and one’s spouse did not.

Research has also provided support for the view that global support is a unique construct different from various relationship-specific supports, although there seems to be an association between global support and relationship-specific support. For example, Pierce, Sarason, and Sarason (1991) demonstrated that global support and relationship-specific support were two distinct but related constructs and each contributed uniquely to the prediction of loneliness in a sample of 94 male and 116 female undergraduates. Regression analyses showed that relationship-specific support still contributed significantly to variation of self-reported loneliness after the effects of general perceived social support had been controlled. In another study, the same authors investigated the impact of global perceived social support and relationship-specific perceived social support on the reaction of participants after receiving an encouragement note from their own mother just before they delivered a stressful speech (Pierce, Sarason, & Sarason, 1992). Participants who perceived greater support from their mothers were more likely to perceive the note as supportive and encouraging. However, global perceived social support had no impact on the reactions of participants to the note. Considered together, these two studies
provide evidence to suggest that global support and relationship-specific support are two distinct constructs.

To further examine the unique influence of global support and relationship-specific support, Davis, Morris, and Kraus (1998) conducted a study with 183 college students to assess the impact of global support and relationship-specific support (support from friend, family, faculty advisor, and romantic partner) on three types of loneliness (global, social, and emotional) and on generalised negative affect. In terms of generality-specificity dimensions, generalised negative affect is the most general of all since it reflects the affect in one’s life that is not attributable to any particular cause. Conversely, emotional loneliness is the most specific since it results from absence of a single close relationship. Lastly, both social and global loneliness fall in the middle of generality-specificity dimensions, since they measure social dissatisfaction in broader contexts than emotional loneliness. Regression analyses demonstrated that only relationship-specific support had a significant impact on emotional loneliness, whereas only global support had a unique association with generalised negative affect. For social and global loneliness, which fall at the intermediate level of generality, both global support and relationship-specific support made a significant contribution. This study provides important external validity evidence to show that global support and relationship-specific support are two distinct but related constructs, whereby each contributes uniquely to wellbeing.
Supportive Functions Specific to Particular Situations

Some recent studies have developed social support measures for particular contexts. Motl, Dishman, Saunders, Dowda, and Pate (2004) adapted the Social Provisions Scale (Cutrona & Russell, 1987) to measure social support specific to physical activity. This instrument consists of four subscales including: reliable alliance (e.g., “There are people I can count on to be physically active with me”), attachment (e.g., “I do not have any friends or relatives who are physically active”), guidance (e.g., “There is a person I can turn to for advice if I have problems with physical activity”), nurturance (e.g., “There are people who depend on me to help them by being physically active”), social integration (e.g., “I know people who enjoy the same physical activities that I do”), and reassurance of worth (e.g., “Other people think of me as being physically active”). Duncan, Duncan, and Strycker (2005) also investigated the effect of social support on physical activity by using a questionnaire specifically assessing the types of support for physical activity. They included emotional support (e.g., encouragement given to the child, watching the child participating in a physical activity, and talking about the child’s physical activity) and instrumental support (e.g., doing the physical activity with the child and providing the child with transportation to the physical activity).

La Greca and Bearman (2002) developed the Diabetes Social Support Questionnaire-Family Version (DSSQ-Family) to assess the specific ways that family members provide support for adolescents with type I diabetes. Items were developed, including five key areas of diabetes care: insulin management (e.g., “My family reminds me to take my shots”), blood glucose testing (e.g., “My family asks me about the results of my blood tests”), meals (e.g., “My family encourages me to
eat the right foods”), exercise (e.g., “My family congratulates or praises me for exercising regularly”) and emotional support (e.g., “My family is available to listen to concerns or worries about my diabetes care”). Ratings were obtained in terms of frequency and supportiveness of each item. However, Hanna, DiMeglio and Fortenberry (2005) criticised the DSSQ-Family (La Greca & Bearman, 2002) for not including any specific dimensions of support except emotional support for adolescents with type I diabetes. They developed the Diabetes-Specific Parental Support for Adolescents’ Autonomy Scale to assess the parental provision of support that promotes adolescents’ development of autonomy. Items were developed and categorised based on dimensions of Barrera and Ainlay’s (1983) social support measure. These included three dimensions: guidance (e.g., “My family showed me how to figure out insulin dose”), non-directive support (e.g., “My family was around when I needed help with high or low blood sugar”), and tangible assistance (e.g., “My family paid for the supplies”). Similar studies have developed social support measures for a range of particular contexts. However, Williams et al. (2004) noted, only 2 out of the 30 definitions identified in their review have developed definitions of social support specific to the context, although they did suggest that it is necessary to adopt a contextualised approach to define social support in a way that adheres to the meanings prescribed by people situated in a particular context.

**Differential Effects of Particular Supportive Function by Different Supportive Figures**

It has been suggested that it is important to consider both the source and type of support when examining the association of social support with wellbeing of adolescents (see review by Cauce, Reid, Landesman, & Gonzales, 1990) since there
is differential impact on certain outcomes due to particular supportive functions given by different supportive figures. Thus, some recently developed instruments measure the multidimensionality of types and sources of social support simultaneously. For example, the Student Social Support Scale (SSSS; Nolten, 1994) assesses emotional, instrumental, informational, and appraisal support from parents, teachers, classmates, and close friends. Similarly, the Child and Adolescent Social Support Scale (CASSS; Malecki, Demaray, Elliott, & Nolten, 1999) assesses emotional, instrumental, informational, and appraisal support from parents, teachers, classmates, and close friends. Importantly, both instruments have demonstrated reliability, factorial and construct validity (Malecki & Elliott, 1999; Malecki & Demaray, 2002).

Malecki and Demaray (2003) used the CASSS (Malecki et al., 1999) to assess the relation between types of support (emotional, informational, appraisal, and instrumental) from different sources of support (parents, teachers, classmates, and friends) to student adjustment on a sample of Grade 5 through 8 adolescents. They found that adolescents received emotional and informational support most often from parents, informational support from teachers, and emotional and instrumental support from classmates and close friends. Although all types of support were significantly associated with students’ personal adjustment, only emotional support from teachers was a significant predictor of students’ social skills and academic competence. Similarly, Demaray and Malecki (2002b) used the CASSS (Malecki et al., 1999) to assess the relation between social support and self-reported adjustment or maladjustment indicators in a sample of at-risk students in sixth through eighth grade. Results indicated that all types of support from parents and classmates were strongly associated with clinical indicators such as: locus of control, social stress,
depression, and interpersonal relationship, whereas all types of support from parent, teacher, and school were correlated with school-related indicators such as attitude to school and to teachers. These two studies indicate that certain types of support provided by different support figures have different impacts on certain outcomes.

**Brief Overview of Peer Support Intervention**

Positive supportive relationships with peers have positive impact on desirable educational outcomes such as coping with transition to high school (Felner et al., 1982), adjustment to school (Berndt & Keefe, 1995), positive self-concept (Savin-Williams & Brendt, 1990), subsequent achievement (Goodenow, 1993), and subsequent social and psychological functioning (Parker & Asher, 1987). Peer support offers psychological support to individuals to enhance their wellbeing before problems arise (Turner, 1999), and facilitates the development of effective measures to cope with acute stresses (Shedler & Black, 1990). Peer support is particularly important for adolescents since adolescents identify more with their peers and openly talk with their peers. They are more likely to change their behaviour when they see their peers are also making changes in their behaviour (Campbell & MacPhail, 2002; Latham, 1997).

Since peer support plays crucial role in adolescence, it is not surprising to find that peer support interventions are commonly found in school settings worldwide (e.g., the United Kingdom, Canada, Australia, and New Zealand). Numerous peer support interventions have been conducted for promoting pro-social values of students and preventing antisocial and aggressive behaviour within the peer group (Carr, 1994; Cowie & Sharp, 1996). The benefits of these peer support interventions
have been reported. For example, Naylor and Cowie (1999) conducted a large-scale survey to examine 226 teachers' and 2,313 pupils' perceptions and experiences of peer support systems in tackling bullying in United Kingdom secondary schools and colleges \((n = 51)\). Results showed that peer support interventions were effective in alleviating the negative effects of bullying for victims. A follow-up study of this survey also revealed positive result for these peer support interventions in anti-bullying (Cowie, Naylor, Chauhan, & Smith, 2002). Wassef, Mason, Collins, VanHaalen, and Ingham (1998) conducted a peer support intervention in a sample of 118 Grade 14-19 students. Results showed that there was significant improvement in the interpersonal (e.g., family relations, making supportive friendships), internal (e.g., self-worth, coping with stress) and school (e.g., attitude towards school, school work) domains. However, research critically analysing the impact of diverse peer support interventions has often been plagued with theoretical and methodological flaws.

There are different forms of peer support interventions including those emphasising emotional support such as befriending, peer-mediated conflict resolution and peer counselling and those focusing on education and information giving such as peer mentoring and peer tutoring (Cowie & Wallace, 2000). Befriending systems involve assignment of a student to "befriend" a peer. The help may be practical that peer supporters offer help through companionship and support with emotional and social problems. Peer counselling systems extend the befriending and peer-mediated approaches into interventions that are based on a counselling model and they involve training of peer counsellors with a wider repertoire of counselling skills by qualified counsellor or psychologist. The systems are implemented through a formal referral system. A peer-mediated conflict resolution approach offers more structured approach to train students themselves to defuse
interpersonal conflicts among peers such as bullying and quarrelling. Peer supporters are trained with listening skills that facilitate disputants to agree to a mutually acceptable solution such that the outcome is fair to both sides. A peer mentoring system involves a supportive one-to-one relationship between a more experienced student (the mentor) and a younger peer (the mentee). The mentor serves as role model and offers support in solving problems, promoting high aspiration and positive reinforcement. Peer tutoring is characterised by specific role-taking that one student serves as tutor while the other acts as tutee. Since more research has been conducted in peer tutoring compared with other forms of peer support interventions discussed above and therefore it has implications for the present investigation, peer tutoring will be examined in detail in the following section.

An Overview of Peer Tutoring Research

Definitions of Peer Tutoring

Peers are defined as those individuals that interact at comparable levels of behavioural complexity (Lewis & Rosenblum, 1975). Academically-orientated peer tutoring interventions are characterised as including “a system of instruction in which learners help each other and learn by teaching” (Goodlad & Hirst, 1989, p. 13) or “a more able child helping a less able child in a cooperative working pair carefully organised by a teacher” (Topping, 1989, p. 489). There are two basic forms of peer tutoring: same-age peer tutoring and cross-age peer tutoring. Same-age peer tutoring involves a tutor and tutee of similar age. In cross-age peer tutoring, older student provides tutoring to younger student. In addition to these two basic types of peer tutoring, there are many different varieties of peer tutoring, including reciprocal
tutoring, whereby students take turns as tutor and tutee, and, class-wide tutoring, whereby the whole class participates in the tutoring.

**The Impact of Academically-Orientated Peer Tutoring Interventions on Academic Outcomes**

Research provides evidence that academically-orientated peer tutoring has positive effects on academic outcomes. The majority of academically-orientated peer tutoring research has put an emphasis upon examining the impact of intervention on academic achievement, in particular in relation to reading and mathematics. For example, Fuchs, Fuchs, Hamlett et al. (1997) examined the effect of peer-mediated instruction (PMI), a type of peer tutoring, on mathematics achievement. Forty, second- to fourth-grade teachers and their students were assigned to PMI with training in elaborated help and in methods for providing conceptual mathematical explanations (PMI-EC) and a contrast group (no PMI). The mathematics achievement of 4 students who represented 4 points on the achievement continuum (learning disabled, low-, average-, and high achieving) were evaluated from each of the 40 classes. Results showed that the achievement of PMI-EC students was higher than the contrast group. These results suggest that academically-orientated peer tutoring research has a positive impact on academic achievement.

Spelling, writing, science, and arts have also been the subject of peer tutoring interventions. For example, Utay and Utay (1997) examined the effects of peer-assisted learning (cross-age tutoring, peer tutoring, cooperative learning, and computer-mediated writing) to improve writing skills of 38 second to sixth graders.
with learning disabilities, matched with 34 learning-disabled controls. Results showed that the use of peer-assisted learning could increase students’ desire to write, and improve attitudes toward word processing on the writing skills of both older and younger partners. Gyanani and Pahuja (1995) explored the effect of peer tutoring on the development of verbal and spatial abilities that yield high academic achievement in geography with 415 junior high school students (aged 11-26 yrs) in India. Results indicated that peer tutoring increased verbal and spatial abilities, and the academic level of students in geography. Bell, Young, Blair, and Nelson (1990) investigated the effects of peer tutoring on the academic performance of students with behavioural disorders and non-disabled students coming from the highest, middle, and lowest performing strata in a regular education history class. Seven students with disabilities and 52 non-disabled high school students (mean age 16 yrs) participated in the study. It was shown that tutoring was associated with increases in the individual history test scores of students with behavioural disorders and with significant increases in the average test scores for the groups of highest, middle, and lowest achieving tutees. Cheung and Winter (1999) examined the effect of tutoring on 77 students’ spelling performances in integrated science. They found that tutoring led to significant gains in the spelling performance of the students. These results suggest that peer tutoring is effective in increasing academic achievement in core subjects other than reading and mathematics.

Peer tutoring interventions have also targeted non-core subjects such as health. For example, Utley et al. (2001) examined the effectiveness of class-wide peer tutoring for facilitating the acquisition of health education and safety facts for students with developmental disabilities. Five students with developmental disabilities were taught health and safety facts using class-wide peer tutoring and
traditional teaching methods. Using a single-subject design, results indicated that there were increases in weekly posttest scores using peer tutoring procedures, compared to traditional teacher-led instructional procedures. Ward and Ward (1996) used a multiple baseline design to assess the effects of a peer tutoring intervention on the correct cardiopulmonary resuscitation skills of 10 university freshmen undertaking physical education majors. Results indicated that participants achieved and maintained 100% correct performance during the class-wide peer tutoring condition. These results suggest that peer tutoring is also effective in increasing academic performance in non-core subjects.

A few studies have adopted longitudinal research designs to examine the maintenance effect of peer tutoring. For example, Greenwood, Delquadri, and Hall (1989) conducted a longitudinal investigation. An experimental, low-SES group received class-wide peer tutoring implemented by their teachers during each grade from first to fourth grade, while a low-SES control group received teacher-designed instruction. Results indicated that the experimental group produced significantly greater academic (reading, mathematics, and language) gains than did the control group. The 241 participants of this longitudinal study at the end of 3rd grade were assessed again (Greenwood, 1991). The low-SES experimental group displayed significant gains in comparison to the control group. Greenwood, Terry, Utley, Montagna, and Walker (1993) further conducted a follow-up study of the outcomes of this longitudinal study. Compared with the low-SES control group, the low-SES experimental group receiving class-wide peer tutoring had maintained significant growth in reading, language, and mathematics achievement, produced higher performance in science and social studies achievement and had fewer group members placed into special education interventions between 1st and 6th grades.
These results suggest that peer tutoring can have long-term impact, and can impact upon a number of subject content areas of academic achievement simultaneously.

While most academically-orientated peer tutoring research have examined the effect of tutoring on academic achievement, only a few studies have examined the effect of such interventions on other academic-related outcomes (e.g., attitude to subject matter, academic motivation, academic attribution, and academic self-efficacy). For example, Fuchs, Fuchs, and Kazdan (1999) showed that students receiving peer-assisted learning strategies showed more positive beliefs about working hard to improve reading in comparison to a control group. In addition, Sprinthall and Scott (1989) tested the effects of a mathematics cross-age tutoring intervention on measures of success attribution. Elementary females in experimental group improved on measures of success attribution, whereas control group showed declines on success attribution. Griffin and Griffin (1998) also investigated the effects of reciprocal peer tutoring on graduates’ test anxiety and academic self-efficacy in addition to achievement. In an experiment, a sample of 47 graduates was enrolled in a human growth and development course. It was found that students participating in the reciprocal peer tutoring had a significantly lower level of test anxiety than controls. In another experiment, the sample of 50 graduates was enrolled in an educational psychology course. It was found that students participating in the reciprocal peer tutoring had significantly higher level of academic self-efficacy.

Overall academically-orientated peer tutoring has been found to have positive effects on academic outcomes in different subjects, and a number of these effects have been shown to be durable over time. The generalisability of effects in relation
to certain student characteristics (e.g., grade level and ability level) and intervention features (e.g., type of peer tutoring) will be explored in the following section.

**The Effect of Academically-Orientated Peer Tutoring Interventions on Academic Achievement Regarding Certain Student and Intervention Features**

*Grade level.* A few recent studies have evaluated peer tutoring in kindergarten. For example, Falk and Wehby (2001) examined the effectiveness of Kindergarten Peer-Assisted Learning Strategies in increasing the beginning reading skills of 6 male kindergarten children having emotional or behavioural disorders. The intervention indicated that the peer tutoring phase led to increases in scores on letter-sound correspondence and blending probes of participants. However, most of the studies have evaluated peer tutoring for elementary students. For example, Greenwood, Arreaga-Mayer, Utley, Gavin, and Terry (2001) conducted classwide peer tutoring in the literacy instruction of 117 elementary English language learners in a multiracial/multiethnic urban elementary school. Results indicated that the students receiving tutoring made considerable progress in mastering the literacy curriculum.

Some studies have also targeted high school participants. For example, Klingner and Vaughn (1996) investigated the efficacy of reciprocal teaching coupled with cross-age tutoring interventions on the reading comprehension of 26 7th and 8th graders with learning disabilities who used English as a second language. Students made significant progress in reading comprehension. Other studies have also targeted university undergraduates. For example, Riggio, Fantuzzo, Connelly, and
Dimeff (1991) examined the effects of reciprocal peer tutoring on the academic performance of 85 students in an undergraduate psychology course. The performance measure was a 50-item examination that included 25 comprehensive examination questions. They found that peer tutoring enhanced academic achievement. Hence, there is a positive impact of peer tutoring on academic achievement at different grade levels.

**Ability level.** Some peer tutoring studies have been conducted whereby both the tutor and the tutee have special needs. For example, Palincsar, Brown, and Martin (1987) evaluated the effects of reciprocal teaching in the use of comprehension-monitoring strategies. Seventh-grade remedial reading students acted as tutors for their same-age tutees. Results indicated that both the tutors and tutees had gains in reading comprehension. Cochran, Feng, Cartledge, and Hamilton (1993) conducted a study whereby four low-achieving 5th-grade Black boys with behavioural disorders tutored sight words to 4 low-achieving 2nd-grade Black boys with behavioural disorders. Four 5th-grade and four 2nd-grade Black boys with behavioural disorders who did not participate in the tutoring intervention served as comparisons. Percentage increases in sight words were greater for all tutors and tutees compared with those of their non-tutoring peers. Hence, some research has indicated that peer tutoring is effective in promoting academic achievement for students with special needs.

Some peer tutoring studies have evaluated intervention effects on students with low ability. For example, Fantuzzo, Polite, and Grayson (1990) evaluated the effects of a reciprocal peer tutoring intervention on the arithmetic performance of 12 underachieving elementary school students. Another 5 underachieving students, who
received no reciprocal peer tutoring intervention, served as controls. Results indicated that the reciprocal peer tutoring condition that involved peer-managed group contingencies yielded consistent increases in the rate of accurate arithmetic performance to a level that was significantly above the rates of untreated control students.

Some studies have included participants with different abilities. For example, Mathes, Howard, Allen, and Fuchs (1998) examined the effectiveness of Peer-Assisted Learning Strategies (PALS) for first-grade readers. The reading achievements of 96 first-grade students with different learning abilities (low-achieving, average-achieving, and high-achieving) were examined. Ten teachers incorporated PALS into their reading intervention while 10 continued to teach reading as usual. It was found that all learner types were positively affected by participation in PALS. These results demonstrated that peer tutoring has a positive impact on students of different ability levels.

Type of peer tutoring. While peer tutoring is effective in improving academic achievement in same-age peer tutoring, as mentioned in the previous section, it has also been found to be effective for cross-age peer tutoring. For example, Greenwood, Dinwiddie et al. (1984) conducted 3 experiments with 5 female teachers and 128 third- through sixth- graders to compare the effects of teacher instruction with classwide same-age peer tutoring. Accuracy on weekly spelling, arithmetic, and vocabulary tests and on pre- and post-standardised achievement tests (including Gates-MacGinitie Reading Tests, Wide Range Achievement Tests) was assessed as dependent variables. In Experiment I, results showed that the classwide peer tutoring, compared to the teacher’s procedure,
produced more student academic responding and higher weekly test scores on spelling, arithmetic, and vocabulary. Findings were replicated in Experiments II and III in that standardised test score gains were higher in areas in which peer tutoring was used. Sprinthall and Scott (1989) tested the effects of a mathematics cross-age tutoring intervention. Tutors were 15 high school girls, paired with elementary female tutees. Tutors showed improvement on a conceptual level test while a comparison group of teacher aids showed no change. Elementary female tutees also improved on national mathematics achievement test while a control group of elementary females showed less change on mathematics achievement. Hence, there is evidence to suggest that both same-age and cross-age tutoring is effective. In sum, taken together, the results of research reviewed above suggest that peer tutoring has a positive impact on achievement and is effective for different grade levels, ability levels, and types of peer tutoring.

**Traditional Literature Reviews on the Effect of Academically-Orientated Peer Tutoring**

*Topping (1987) Review*

Topping (1987) examined ten different peer tutored paired reading projects. Comparison of the pretest and posttest data on reading achievement indicated that paired reading accelerated children’s reading progress, with peer tutors gaining more than tutees. The authors concluded that peer tutoring has a positive impact on reading achievement for both tutors and tutees.
Scruggs and Ritcher (1988) Review

Scruggs and Ritcher (1988) evaluated 24 empirical studies of tutoring interventions using learning disabled students as peers. Eleven of these 24 studies employed learning disabled students as tutors; most of these studies targeted reading ($n = 14$) whilst the other studies focused on other subject areas (spelling $n = 2$; mathematics $n = 5$; social studies $n = 1$; library skill $n = 1$; and unspecified subject $n = 1$). Although the results were equivocal, in general peer tutoring had a positive effect on academic achievement.

This review also evaluated the effect of peer tutoring regarding intervention features such as research design. Eight of these studies used pre-post group design, eight using no-treatment control group design and eight employing alternative instructional activities as control group in experimental design. All the studies using pre-post group design reported positive changes in academic performance after peer tutoring. However, only 3 of 8 studies with no-treatment control groups and 4 of 8 studies with control-group design using alternative instructional activities showed significant academic gains. The results seem to be equivocal. Hence, the type of research design may moderate the effects of peer tutoring.

Spencer and Balboni (2003) Review

Spencer and Balboni (2003) examined the peer tutoring of students with mental retardation. Studies targeted different subject areas: reading ($n = 13$), mathematics ($n = 5$), spelling ($n = 7$), social studies ($n = 1$), language skills ($n = 2$), sign language ($n = 2$), and a combination of reading, spelling, and mathematics
(n = 3). These studies included cross-age tutoring and same-age reciprocal peer tutoring. The design involved both single-subject and group design. Positive changes in academic performance were found for students with mental retardation serving as tutors or tutees. This review also evaluated the effect of peer tutoring regarding student characteristics such as grade level. The researchers concluded that peer tutoring was effective for both elementary and secondary level students.


Robinson, Schofield, and Steers-Wentzell (2005) examined the effect of peer tutoring in mathematics on minority and White students. Their review was built upon previous reviews (e.g., P. A. Cohen et al., 1982; Rohrbeck et al., 2003) and included 28 published findings after 1998. They found that peer tutoring had a positive effect on mathematics achievement, a variety of attitudinal, and socio-emotional outcomes such as students’ attitudes toward school and academic efficacy. In addition, they evaluated whether the impact of peer tutoring on mathematics achievement varied with the role of students as tutor and tutee, and certain intervention features. They found that peer tutoring was effective in promoting academic achievement for both tutor and tutee. They also found that longer tutoring interventions do not necessarily improve academic gains more than shorter ones. Some short-term tutoring interventions were also found to demonstrate greater effects than long-term interventions. However, they concluded that it remains unclear as to whether the length or intensity of tutoring interventions has differential effects on socio-emotional outcomes. In addition, there was no clear support for the importance of tutor training although many successful tutoring interventions were found to include this.
In sum, these reviews demonstrate that peer tutoring has a positive impact on academic achievement. Moreover, the results suggest that the effect of peer tutoring may be moderated by certain student characteristics and intervention features.

Limitations of Traditional Literature Review and Advantages of Meta-Analysis

Although traditional literature reviews attempt to synthesise different studies to draw consistent conclusions, such reviews rely mainly on qualitative summaries or “vote-counting” of results based on statistical significance (Lipsey & Wilson, 2001). Such reviews are strongly affected by investigator’s subjective opinion, sample size, and selection procedures.

Meta-analysis is an empirical method for systematically reviewing research literature with the purpose of identifying relations among study features and outcomes (Durlak, 1995). It synthesises results from multiple studies to observe effect sizes across those studies on the phenomenon under review (Rosenthal, 1984). Meta-analysis has several advantages over traditional literature reviews:

1. Meta-analysis allows the examination of direction and magnitude of effects obtained in each study as well as the distribution of effects across studies (Durlak & Lipsey, 1991) instead of focusing on statistical significance testing;

2. Meta-analysis allows the support of conclusions on the basis of scientific data rather than expert opinion (Durlak, 1995). It can make explicit and clear the criteria that define the sample of studies selected, the
procedures in identifying and retrieving eligible studies, the study characteristics and findings (Lipsey & Wilson, 2001). In this way, the meta-analysis done by a particular reviewer is subject to replication and criticism regarding the assumptions, judgments, and procedures (Durlak & Lipsey, 1991). Hence, it reduces bias in the investigations that are identified for reviews;

3. Meta-analysis can identify patterns that are regularly obscured by traditional null-hypothesis testing (Schmidt, 1992) because it organises information found in research reports in a meaningful way and allows precise analysis of the relationships between study findings and study characteristics (Lipsey & Wilson, 2001). It can address numerous variables from coding study characteristics and examine a wide range of relationships, interactions and the like using multivariate techniques (Durlak & Lipsey, 1991);

4. It has more statistical power than narrative reviews (Cohn & Becker, 2003; Lipsey & Wilson, 2001) since it estimates the effect size for each study and produces synthesised effect estimates by pooling effect sizes across studies;

5. Meta-analysis is useful in identifying trends when sample sizes are small. In contrast, since traditional literature reviews focus on statistical significance testing, which is highly dependent on sample size, studies with small sample size will have statistically non-significant effect (Lipsey, 1990); and
6. Meta-analysis permits policymakers to evaluate the effectiveness of interventions and identify features that moderate the effectiveness of the intervention. Hence, it allows policymaker to evaluate what features of the intervention constitute the “best practice” for the effectiveness of the intervention. In the next section, several meta-analyses are examined to systemically review the effect of peer tutoring empirically.

**Meta-Analyses of the Effect of Academically-Orientated Peer Tutoring**


This classic meta-analysis examined peer tutoring from 65 studies of elementary and secondary school interventions. P. A. Cohen et al. (1982) evaluated the effect of peer tutoring based on the role of student as tutee or tutor respectively. For tutees, most of the studies \((n = 52)\) in this meta-analysis reported findings for academic achievement of tutees while only a few studies reported results in relation to self-concept \((n = 9)\) and attitude toward subject matter \((n = 8)\). The authors found that tutoring had positive effects on academic performance. The average effect size of achievement of tutees was 0.4, suggesting it was modest in magnitude. Regarding the subject area, the effect sizes of mathematics, reading, and other subjects were 0.60, 0.29 and 0.30 respectively. The effect size of mathematics was greater than that in reading and other subjects.

Beside the subject area, this review also evaluated whether the impact of peer tutoring on academic achievement of tutees varied with certain student...
characteristics and intervention features. For certain student characteristics, for example, the effect size of Grade 1-3, 4-6, and 7-9 tutees was 0.45, 0.25, and 0.33 respectively. Using Grade 1-3 tutees produced a greater effect than Grade 4-6 and 7-9 tutees. The effect size of low-ability and middle-ability tutees was 0.42 and 0.33 respectively. Using low-ability tutees produced a greater effect than middle-ability tutees. For intervention features, for example, the effect sizes of cross-age tutoring and not cross-age tutoring were 0.49 and 0.29 respectively. Thus, the positive effect of tutoring on tutees was greater for cross-age tutoring than for other forms. A shorter length of tutoring produced a greater effect on tutees than interventions of a longer duration. The effect size for durations ranging from 0-4 weeks, 5-18 weeks, and 19-36 weeks was 0.95, 0.42 and 0.16 respectively.

Regarding the effect on tutors, most of the studies \( (n = 38) \) reported findings on academic achievement of tutors while only a few studies reported results on self-concept \( (n = 16) \) and attitude toward subject matter \( (n = 5) \). The average effect size of tutor achievement was 0.33. Regarding the subject area, the effect sizes of mathematics and reading were 0.62 and 0.21 respectively. The effect size of mathematics was greater than that of reading. This review also evaluated what student characteristics and intervention features moderated the impact of peer tutoring on tutor academic achievement. For the student characteristics, for example, the effect sizes of Grade 1-3, 4-6, and 7-9 tutors were 0.25, 0.48 and 0.28 respectively. Using Grade 4-6 tutees produced a greater effect than Grade 1-3 and 7-9 tutors. The effect sizes of very low-ability, low-ability, and middle-ability tutors were 0.42, 0.23, and 0.25 respectively. Using very low-ability tutors produced a greater effect than low-ability and middle-ability tutors. For the intervention feature, for example, the effect sizes for cross-age tutoring and not cross-age tutoring were

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0.35 and 0.28 respectively. The positive effect of tutoring on tutors was greater for cross-age tutoring than not cross-age tutoring.

Regarding the effect on other academic outcomes, those who received tutoring developed positive attitudes toward the subject matter covered in the intervention. The average effect size for tutees was 0.29 and it was 0.42 for tutors. However, the conclusion needed further research to confirm, since the sample size was too small.

Overall, this meta-analysis seems to provide evidence that tutoring had positive effects on achievement and participants’ attitudes toward the subject matter of both tutors and tutees. Subject area, certain student characteristics, and intervention features such as grade and ability level of students, and type of tutoring, seem to moderate the effect of tutoring on achievement. Although this meta-analysis was comprehensive, it is now dated, given studies examined were up to 1980. In addition, not all tutoring was peer tutoring. The study included all types of tutoring, such as teacher-led and other adult-led tutoring. Hence, results may have been confounded with different types of tutoring. Although the study evaluated the effect of tutoring with regard to certain student characteristics and intervention features, more rigorous statistical procedures could be employed, such as homogeneity and regression analyses. However, it needs to be appreciated that this meta-analysis was also conducted prior to the development of methodological advances in meta-analysis and as such did not include methods for: correcting the effect size due to small sample size, weighting the effect size according to sample size and consideration of sample size outliers (see Chapter 5 for further discussion of these methods).
Cook, Scruggs, Mastropieri, and Casto (1985) Meta-analysis

Cook et al.’s (1985) meta-analysis investigated the effectiveness of handicapped students (learning disabled, behaviourally disordered, and intellectually handicapped) as tutors of other students. The meta-analysis included peer tutoring as well as cooperative learning. A total of 19 articles yielding 54 cases with 74 effect sizes were located. They also evaluated the effect of peer tutoring based on the role of student as tutee or tutor respectively.

For tutees, most of the studies \((n = 17)\) reported findings on the academic achievement of tutees while only a few studies reported results on self-concept \((n = 1)\), attitude toward school \((n = 3)\), and behaviour rating scales and checklists \((n = 3)\). Findings indicated that tutoring had positive effects on academic performance. The average effect size of achievement was 0.65. Regarding subject areas, the effect sizes of reading \((n = 13)\), mathematics \((n = 5)\), language \((n = 2)\), spelling \((n = 2)\) and reading/writing/mathematics \((n = 2)\) were 0.49, 0.85, 1.13, 0.51 and 0.15 respectively. The effect size of language was greater than that of mathematics, spelling, and reading.

For the effect on tutors, most of the studies \((n = 25)\) reported findings on academic achievement of tutors while only a few studies reported results on self-concept/sociometric ratings \((n = 7)\), attitude toward school \((n = 4)\), and behaviour rating scales and checklists \((n = 12)\). The average effect size of achievement was 0.59. These results indicated that tutoring had positive effects on academic performance. Regarding the subject area, the effect sizes of reading \((n = 15)\), mathematics \((n = 8)\), language \((n = 6)\), spelling \((n = 2)\),
reading/writing/mathematics \( (n = 18) \) were 0.30, 0.67, 0.25, 0.01 and 0.82 respectively. The effect size of reading/writing/mathematics was greater than that in mathematics, language, spelling, and reading.

This review also evaluated whether the impact of peer tutoring on academic achievement varied with intervention features. For example, using unstandardised tests produced greater effect sizes than using standardised tests in measuring study outcomes. The average effect size for tutors using unstandardised tests was 0.91 and it was 0.41 when using standardised tests. Similarly, the average effect size for tutees using unstandardised tests was 0.89 and it was 0.45 when using standardised tests. However, unlike the finding from the meta-analysis conducted by P. A. Cohen et al. (1982), there was no clear relation between length of intervention and study outcome.

Regarding the effect on other academic outcomes, the interventions had a positive impact on the attitude to school, with an effect size of 0.86 and 0.25 for tutee and tutor respectively. However, the sample size was small, such that caution should be taken on the conclusions drawn.

In general, the findings based on this meta-analysis seem to provide evidence that academically-orientated peer tutoring had positive effects on the achievement of both tutors and tutees. The effect of peer tutoring varied with subject content and certain intervention features. The effect on the attitude to school was also positive. However, similar to the meta-analysis conducted by P. A. Cohen et al. (1982), there were serious methodological limitations due to being unable to, for example, capture recent methodological advances in meta-analysis.
Rohrbeck et al.’s (2003) more recent meta-analysis examined the effect of peer-assisted learning interventions in elementary schools. Studies included one-to-one peer tutoring as well as cooperative learning groups (3 to 6 participants). Findings indicated that tutoring had positive effects on academic performance. The weighted average effect size of achievement was 0.33. Regarding the subject area, the weighted effect sizes of reading ($n = 26$), mathematics ($n = 33$), social studies ($n = 13$), science ($n = 6$), spelling ($n = 3$), writing ($n = 5$), language ($n = 11$), literacy, a combination of outcomes variables in reading, writing, spelling and language ($n = 35$) were 0.26, 0.22, 0.49, 0.62, 0.21, 0.33, 0.21 and 0.27 respectively. The effect size of science was greater than other subjects. Unlike the previous meta-analyses, homogeneity analyses were conducted and results indicated that subject area was a significant moderator on effect size of achievement.

This meta-analysis also evaluated whether the impact of peer tutoring on academic achievement varied with certain student characteristics and intervention features. For example, the effect size of Grade 1-3 and 4-6 tutees was 0.37 and 0.28 respectively. Using Grade 1-3 tutees produced greater effect than Grade 4-6 tutees. Goals selected by teacher and tutees themselves produced an effect size of 0.30 and 0.99 respectively. Hence, goal selected by tutees themselves produced greater effect than goals selected by teachers. Again, homogeneity analyses were conducted and indicated that grade level and goal selection were significant moderators on effect size of achievement.

In general, the findings based on this meta-analysis seem to provide evidence
that academically-orientated peer tutoring had positive effects on the achievement of students. The effect of peer tutoring varied with subject content, certain student characteristics, and intervention features. Unlike the previous two meta-analyses discussed above, this meta-analytic review was able to capitalise on recent methodological advances in meta-analysis including using homogeneity analyses to examine the moderators, correcting the effect size due to small sample size, weighting the effect size according to sample size, and making adjustment on sample size outliers. However, it was confined to elementary school students and thus the findings cannot be generalised to other grade levels of students.

**Ryan, Reid, and Epstein (2004) Meta-analysis**

Ryan, Reid, and Epstein's (2004) meta-analysis examined 14 primary studies which included tutoring interventions for students with emotional and behavioural disorders. Only seven of these studies provided sufficient information amenable to calculating effect size. Findings indicated that the overall effect size of achievement for all these seven studies was 1.88. Thus, tutoring had a positive effect on academic performance. Regarding the subject area, the effect sizes of English \( (n = 2) \), reading \( (n = 3) \), mathematics \( (n = 2) \) were 2.03, 0.81, and 2.08 respectively. One study included both history and mathematics, resulting in effect sizes of 3.00 and 1.15 respectively. The effect sizes of mathematics and English were similar, and peer tutoring in these academic subject areas produced greater effect sizes compared to reading.

Beside subject area, this review also evaluated whether the impact of peer tutoring on academic achievement varied with certain student characteristics and
intervention features. For example, regarding the age group of students, the effect for adolescents \((n = 4)\) was greater than children \((n = 3)\), with effect sizes of 2.55 and 0.83 respectively. Regarding different types of tutoring, the effect for same-age peer tutoring \((n = 6)\) was greater than that for cross-age peer tutoring \((n = 2)\), with effect sizes of 1.92 and 1.12 respectively. The effect for combined roles of tutor and tutee \((n = 4)\) in same-age reciprocal peer tutoring was greater than that for acting as tutor \((n = 2)\) or tutee \((n = 1)\), with effect sizes of 2.12, 2.02 and 0.63 respectively. Type of tutoring and grade level also seemed to moderate the effects of tutoring on achievement. However, these features have not been tested by appropriate statistical procedures such as homogeneity analyses. Similarly to the meta-analysis conducted by P. A. Cohen et al. (1982), there were serious methodological limitations.

Although this meta-analysis provided support for peer tutoring producing a positive effect on academic achievement, most of the studies reviewed were limited to single-subject design instead of including control group. In addition, the sample size of primary studies was small, ranging from 3 to 12, and thus it was difficult to generalise the findings to the entire population of students with emotional and behavioural disorders.

**The Impact of Non-Academically Orientated Peer Tutoring on Non-Academic Outcomes**

There are only a few studies examining the impact of non-academically orientated peer tutoring research compared with academically-orientated peer tutoring research. In general, some of the non-academically orientated peer tutoring research placed their emphasis on social outcomes such as peer relations and social
skill-related outcomes. For example, Blake, Wang, Cartledge, and Gardner (2000) conducted two related studies on elementary and middle students with serious emotional disturbances. Peer trainers used a formal social skills curriculum to teach their tutees more positive peer interactions. In Study 1, three peer trainers were assessed, while three peer trainees were assessed in addition to three peer trainers in Study 2. Both studies indicated that positive behaviours (e.g., supportive behaviour or positive communication) were increased and maintained at a high level, whereas negative behaviours (e.g., abusive behaviour) were decreased and maintained at a low level for both peer trainers and trainees. Haring, Breen, Pitts-Conway, Lee, and Gaylord-Ross (1987) found that peer tutors interacted substantially more with students with autism than did the controls. Similar to special friends, high school peer tutors interacted more frequently with familiar students with autism than unfamiliar peers with autism or unfamiliar nonhandicapped peers. Compared with peer tutors, the special friends had no significant higher social and teaching exchanges with familiar peers with autism. Duan and O’Brien (1998) conducted a study on the effect of social skills training provided by a peer tutor for three students with developmental disabilities. Findings demonstrated that social interaction for both tutees and tutors was increased and the intervention effect was maintained 6 months after the withdrawal of intervention.

Some studies have also examined the effect of interventions on locus of control, moral behaviour, and special issues such as drug and smoking prevention. For example, Lazerson, Foster, Brown, and Hummel (1988) conducted a study of cross-age tutoring on a sample of truant and tardy junior high school tutors with learning difficulties. The tutees, aged from 6 to 10 years, also had learning difficulties. Results indicated that the tutors showed a dramatic significant increase
toward internal orientation of locus of control. Cognetta (1977) conducted a study on the effect of cross-age teaching class in which senior high students taught junior high students. It was found that the senior high student tutors showed significant improvement in ego stage development after the intervention. They also had positive gains in levels of moral reasoning, whereas the comparison classes showed no significant change.

**Traditional Literature Reviews on the Effect of Non-Academically Orientated Peer Tutoring**


This review compared the effectiveness of peer-led and adult-led school health education on health-related behaviour. It included thirteen studies of interventions. Results showed that most of the studies \((n = 11)\) were successful in promoting health-related behaviour such as substance abuse, alcohol abuse, and smoking prevention. Moreover, seven studies found that peer-led intervention was more effective than adult-led intervention. For example, Luepker, Johnson, Murray, and Pechacek (1983) found that the average number of cigarettes smoked per week for participants in peer-led intervention was significantly lower than those in controls and adult-led intervention. Botvin, Baker, Renick, Filazzola, and Botvin (1984) found that participants in peer-led interventions displayed less monthly smoking, less monthly and weekly marijuana use, and less alcohol consumption than those in controls and adult-led intervention.
McConnell (2002) Review

This review examined interventions on promoting social interaction for autistic students. It included sixteen studies of peer-mediated interventions. It was found that most of the studies were successful in promoting social interactions. However, most of the studies reviewed involved very small sample sizes ($N < 10$) and relied on multiple baseline design.

Spencer and Balboni (2003) Review

This review investigated peer tutoring of students with mental retardation. Studies targeted different non-academic aspects: Daily living/self-help skills ($n = 4$) and social skills ($n = 14$). Daily living/self-help skills included preparing lunches, learning to administer first aid skills, teaching driver’s education and improving cafeteria skills, whereas social skills included social acceptance and social interaction. These studies included cross-age tutoring and same-age reciprocal peer tutoring or non-reciprocal tutoring. The design involved both single-subject and group design.

Findings generally reported positive changes in daily living/self-help and social skills for students with mental retardation serving as tutors. For example, Agran, Fodor-Davis, Moore, and Martella (1992) investigated the effect of peer-delivered self-instructional training on a lunch-making work task for students with severe disabilities by using tutors with mild mental retardation. Results showed that tutees were able to make lunches in correct sequence. Custer and Osguthorpe (1983) found that social acceptance of non-handicapped tutees was increased after
their being taught by trained tutors with mild mental retardation. They also identified positive benefits for the mentally retarded as tutees taught by non-handicapped students. For example, Bell, Young, Salzberg, and West (1991) evaluated the effect of peer tutoring on performance in written test on driving manoeuvres of mentally handicapped tutees by using non-handicapped students as tutors. Result showed that all tutees passed the driver education tests. Donder and Nietupski (1981) investigated the effect of social skill training on the social behaviour of mentally retarded tutees by using non-handicapped students as tutors. They found that appropriate social behaviour of tutees was increased while inappropriate social behaviour of tutees was reduced. Hence, these results indicate that non-academically orientated peer tutoring has an impact on the daily living/self-help and social skills of students.


This review evaluated social interaction interventions for preschool and kindergarten students, focusing on those with socially withdrawn behaviour. They included fourteen studies of peer-mediated interventions. They found that most of the studies were successful in promoting social interactions. The intervention effect on social interaction was generalised across settings and maintained after withdrawal of intervention. However, most of the studies reviewed involved a very small sample ($N < 7$) and multiple baseline design.

In sum, these reviews indicate that non-academically orientated peer tutoring has a positive effect on a great variety of non-academic outcomes. Hence, it is postulated that there is domain specificity between certain type of peer support intervention and outcomes most relevant to the goals of the intervention.
Implications for the Present Investigation

The studies discussed above provide evidence that global support and relationship-specific support are two distinct but related constructs, and each contributes uniquely to aspects of wellbeing. Hence, it is important to distinguish general social support from specific supportive figures. The present investigation was designed so that only one single supportive figure (a peer) was engaged in providing supportive interventions, in order to avoid potential confounding effects based upon multiple supportive figures being involved in intervention delivery.

In the present investigation, two types of peer support interventions were implemented and evaluated: an academically-orientated peer tutoring intervention and a socially-orientated peer support intervention. The former intervention provided academically-orientated support while the latter intervention provided socially-orientated support. These two types of peer support were considered important to evaluate in an educational context, since both types of social support interventions have been demonstrated by research to impact on academically and non-academically desirable educational outcomes. Moreover, both academic and social domains of social support are important for the development of adolescents. Given that these two types of peer support have often not been distinguished in social support research, it was deemed important to include both intervention types in order to test their differential effects fully.

Although several reviews have employed meta-analysis to systemically review the effect of academically-orientated peer tutoring empirically, many of them are dated. For example, the meta-analytic review done by P. A. Cohen et al. (1982) was
confined to literature found prior to 1980. Moreover, this study did not capture recent methodological advances in meta-analysis, such as homogeneity and regression analyses (e.g., P. A. Cohen et al., 1982; Cook et al., 1985) and thus was not designed to elucidate what student characteristics and intervention features moderate the effect of tutoring. Of the current meta-analyses that adopted at least some of the current advances in methodology in meta-analysis, they were confined to certain populations, such as elementary school children and confounded with other types of intervention (e.g., Rohrbeck et al., 2003). Moreover, some studies did not evaluate what student characteristics and intervention features predict the effectiveness of the intervention by regression analyses and hence what features constitute the “best practice” for intervention design. Hence, there is a need to conduct an updated, comprehensive meta-analysis to establish the effect of peer tutoring on academic achievement based on current advances in meta-analysis methodology, engaging a wide range of participants and subject content. Thus, a primary aim of the present investigation was to address this need.

Research evidence examining the impact of peer tutoring interventions discussed above seems to provide support for non-academically orientated peer tutoring interventions impacting mainly on non-academic outcomes, and academically-orientated peer tutoring interventions having positive effects mainly on academic outcomes. Thus it is plausible to suggest that there is domain specificity between different types of peer support intervention and outcomes most relevant to the goals of the intervention. For example, academic peer support interventions are predicted to impact most strongly on academic outcomes relevant to the goals of the intervention, whereas non-academic peer support interventions are predicted to impact most strongly on non-academic outcomes relevant to the goals of the
intervention. However, this notion of a construct validity approach to the study of intervention effects (see Craven et al., 2003) has not been utilised in previous peer support intervention studies. To address the issue, the present investigation examined and contrasted the differential effects of two types of peer support interventions (an academically-orientated peer tutoring intervention in Study 3 and a socially-orientated peer support intervention in Study 4 & 5) to study their differential effect on multidimensional self-concepts.

**Summary**

In summary, this chapter has presented an overview of definitions of social support, its significance in education settings, and research relevant to the present investigation pertaining to peer tutoring. It was shown that social support is associated with self-concept. Results emanating from traditional literature reviews and meta-analyses were also presented and discussed. It was demonstrated that there is a need to conduct an updated, comprehensive meta-analysis in the present investigation to establish the positive effect of academically-orientated peer tutoring on academic achievement, and to examine what student characteristics and intervention features predict the effectiveness of the intervention in order to inform intervention design in general and in relation to the academically-orientated peer support intervention of Study 3 in the present investigation. It was also shown that reviews of academically-orientated peer tutoring and non-academically orientated peer tutoring seem to suggest there is domain specificity between type of peer support and certain outcomes. To further explore this issue the present investigation adopts a construct validity approach to elucidate the salience of two peer support interventions and their differential effects. In the next chapter, an overview of
self-concept research is presented and the relation between self-concept, social support, and other outcomes is explored.
CHAPTER 3

SELF-CONCEPT:

MULTIDIMENSIONALITY AND RELATION TO
SOCIAL SUPPORT AND OTHER OUTCOMES

Introduction

Previous self-concept research has been plagued with theoretical and methodological flaws. The purpose of this chapter is to provide an overview of self-concept research and to explore the relation of self-concept, social support, and other outcomes. Firstly the significance of self-concept, construct of self-concept and, the multidimensional nature of self-concept with reference to past and current models are examined. Secondly, the psychometric properties of a multidimensional measure of self-concept are evaluated. Thirdly, evidence demonstrating the domain-specificity of different facets of self-concept and other constructs is provided, to demonstrate the importance of adopting a construct validity approach to evaluating self-concept enhancement interventions. Fourthly, the relation between self-concept, social support, and peer tutoring is explored. Finally the implications of this research for the present investigation are presented.
The Significance of Self-Concept

Self-concept is valued as a desirable outcome in itself and is posited as a mediating variable that facilitates other academic and social outcomes. The importance of self-concept can be seen in educational policy statements that emphasise the development of positive self-concept as one of the major goals of education. For instance, the goal to develop high self-esteem for students has been included in the Revised Common and Agreed Goals of Schooling (Ministerial Council on Education, Employment, Training and Youth Affairs, 1998) and is reflected in State/Territory syllabus documents in Australia. A positive self-concept has been found to share important relations with psychological health, personal achievement, and positive relationships. For example, Craven et al. (2003) noted that “self-concept is thought to make such a difference, that people who think positively about themselves are healthier, happier, and more productive. Hence, enhancing self-concept is considered necessary to maximising human potential, from early development and school achievement, to physical/mental health and wellbeing, to gain employment and other contributions to society” (p. 96).

Research also indicates that enhancing academic self-concept leads to maximising human potential. A positive academic self-concept is associated with academic behaviour such as persistence on academic tasks, academic choices, educational aspirations (Byrne, 1996a, 1996b; Marsh, 1990a, 1992a; Marsh, Byrne et al., 1988; Marsh & Yeung, 1997a, 1997b), and subsequent academic achievement (see Marsh & Craven, 2006; Marsh & Yeung, 1997a). Developing a positive self-concept has been found to be related to addressing social problems such as bullying, victimisation, and violence in schools (Marsh, Parada, Yeung, & Healey,
2001); mediating the adverse consequences of peer victimisation and peer rejection (Lopez & DuBois, 2005); and risk behaviour such as smoking, alcohol, drugs, suicide, and risky sex behaviour. Hence, enhancing self-concept can reduce social problems.

Promoting positive self-concept is also perceived as important for addressing social inequalities of disadvantaged groups. For example, low self-esteem has been identified as a critical variable contributing to Aboriginal Australians’ disadvantage (Johnston, 1991). Therefore, enhancing self-concept is a vital key to improving educational outcomes of Aboriginal Australians. Enhancing self-concept also has implications for social policy. For example, Tracey, Marsh, and Craven (2003) argued that inclusion of academically disadvantaged students into regular classrooms might not produce desirable outcomes for these groups of students, since academically disadvantaged students in special classes will have higher self-concepts compared to similarly disadvantaged students in regular classes. Tracey et al. (2003) suggested that it was vital to identify educational settings for these disadvantaged students that resulted in enhancing students’ human potential including self-concept, achievement, and life effectiveness. In a broader sense, this research has implications for other social policy issues relating to moving individuals to nursing homes and out of special care facilities (Craven et al., 2003). Hence, self-concept enhancement research has assisted in elucidating and addressing problems experienced by disadvantaged groups.
The Multidimensionality of Self-Concept

Historical Overview of Self-Concept Theory

The origins of self-concept theory can be traced back to William James in 1890 (Bracken, 1996; Hattie, 1992). James distinguished three components of the self-system: material, social, and spiritual selves. James therefore indicated that the nature of self-concept was multidimensional. He also imposed a hierarchical structure in his model of the self-concept structure whereby the material self was positioned at the bottom of the hierarchy, social self in the next position, and spiritual self being at the apex of hierarchy. James’ work in theorising the structure of self-concept as multidimensional and the hierarchical nature of self-concept underpinned the development of future self-concept models.

Despite James’ work, early theorists and researchers adhered to the concept of self-concept being a global or unidimensional construct rather than a multidimensional construct. For example, the Rosenberg Self-Esteem Scale (Rosenberg, 1979) is a 10-item unidimensional measure of self-esteem based on Rosenberg’s (1979) conceptualisation of self-concept as “the totality of the individual’s thoughts and feelings having reference to himself as an object” (p.7). Hence, the Rosenberg Self-Esteem Scale measures perceptions of global self-esteem—the extent to which an individual generally considers himself/herself as worthy and holds positive attitudes toward himself/herself. Coopersmith (1967) also designed an instrument as a unitary measure of self-esteem based on the definition of self-esteem as “the evaluation a person makes, and customarily maintains, of him- or herself; that is, overall self-esteem is an expression of approval or disapproval,
indicating the extent to which a person believes him- or herself competent, successful, significant, and worthy” (pp. 1-2). Although some instruments consisted of items which tapped different domains of self-concept, a single score for general self-concept was derived by summation of items from different domains. Such instruments were designed based on the assumption that self-concept was a combination of item responses tapped from different content-specific domains and was unidimensional in nature. For example, the Piers-Harris Children’s Self-Concept Scale (PHCSCS; Piers, 1984), which consisted of six subscales: behaviour, intellectual and school status, physical appearance, anxiety, popularity, and happiness and satisfaction was developed to measure different domains of self-concept. However, the scores of these scales were composed into one single score to measure self-concept. Thus, in scoring the instrument the multidimensional structure of the self-concept structure was ignored and rather a unidimensional measure of self-concept was assessed. Marsh and Craven (1997) noted that “reviews of self-concept research written before the 1980s (e.g., Burns, 1982; Shavelson et al., 1976; Wells & Marwell, 1976; Wylie, 1974, 1979) often noted the lack of theoretical basis in most studies, the poor quality of self-concept measurement instruments, methodological problems, and a general inconsistency in reported findings” (p. 133). Hattie (1992) also described this period as “dustbowl empiricism”, when self-concept research was predominantly based on the method of “throw it in and see what happens.” Hence, the understanding of self-concept constructs historically has been weak and unclear.
Shavelson et al. (1976) noted important deficiencies in self-concept research, concluding that “it appears that self-concept research has addressed itself to substantive problems before problems of definition, measurement, and interpretation have been resolved” (p. 470). However, unlike many other views, Shavelson et al. (1976) emphasised: “our approach is constructive in that we (a) develop a definition of self-concept from existing definitions, (b) review some steps in validating a construct interpretation of a test score, and (c) apply these steps in examining five popularly used self-concept instruments” (p. 470). Shavelson et al. (1976) defined self-concept as perceptions of self of an individual that are formed through interaction with and interpretations of one’s environment. They are affected particularly by evaluations by significant others, reinforcement, and attributions for one’s own behaviour. Shavelson et al. (1976) emphasised that self-concept is not an entity within the person and postulated that the self-concept construct:

1. is organised or structured;
2. is multidimensional in that it consists of different facets;
3. is hierarchical in that it has a global, general self-concept at the apex, inferences about the self in broader domains (e.g., social, physical, and academic) at the middle and inferences about the self in specific domains at the base;
4. becomes less stable, in that the general self-concept at the apex of the hierarchy is stable, but as one descends the hierarchy, self-concept becomes increasingly situation-specific and less stable;
5. is more differentiated with age;
6. has both a descriptive and an evaluative component;
7. is differentiated from other constructs.
Self-concept is multifaceted instead of unidimensional, as posited in the Shavelson hierarchical model, in which a general self-concept is located at the apex and it is divided into academic and non-academic self-concepts at the next level. Academic self-concept is further divided into self-concepts in particular content areas whereas non-academic self-concept is divided into three areas: Social self-concept (which was subdivided into relations with peers and those with significant others); Emotional self-concept; and Physical self-concept, which was subdivided into physical ability and physical appearance. Further levels of division were hypothesised for each of these specific self-concepts so that self-concepts were more specific and more closely related to actual behaviour at the base of the hierarchy. In evaluating the construct validity of five common self-concept instruments: Brookover’s Self-Concept of Ability Scale, Coopersmith’s Self-Esteem Inventory, Gordon’s How I See Myself Scale, the Piers-Harris Children’s Self-Concept Scale, and Sear’s Self-Concept Inventory, Shavelson et al. (1976) found that none of these five instruments was able to differentiate among even the broad academic, social, and physical domains. Hence it was not until new measures were developed that the model proposed by Shavelson et al. (1976) could be tested.

However, in more recent research, the multidimensionality of self-concept has been supported by numerous factor analytic studies (e.g., Harter, 1982; Marsh, Barnes, & Hocevar, 1985; Marsh, Parker, & Barnes, 1985) and construct validity reviews (e.g., Byrne, 1984; Marsh & Shavelson, 1985). Advances in self-concept theory and research have also demonstrated that self-concept cannot be adequately understood if its dimensionality is ignored (Marsh & Craven, 1997; Craven et al., 2003). Hence, recent self-concept research has emphasised the multidimensionality of self-concept.
On the basis of Shavelson et al.’s (1976) model, Marsh developed the SDQ instruments: Self-Description Questionnaire I (SDQI) for preadolescent primary school student, SDQII for adolescent high school students, and Self-Description Questionnaire III (SDQIII) for late adolescents and young adults (see Marsh, 1990c; 1992b; 1992c). SDQ research (Byrne, 1984; Hattie, 1992; Marsh, 1990b, 1993; Marsh & Shavelson, 1985; Shavelson & Marsh, 1986; Marsh & Craven, 1997; Marsh, Parada, Craven et al., 2004) has provided strong support for the multidimensionality of self-concept and SDQ instruments have been evaluated to be among the best multidimensional instruments in terms of psychometric properties and construct validation research, available (Boyle, 1994; Byrne, 1984; Hattie, 1992; Wylie, 1989).

Numerous factor analyses by diverse samples have identified all of the factors that each of the three SDQ instruments is designed to measure, and these domains of self-concept are remarkably distinct. The emphasis on the multidimensional nature of self-concept has resulted in the development of self-concept instruments in distinct areas such as the Vispoel (1993, 1995) Artistic Self-Perception Inventory and the Physical Self-Description Questionnaire (Marsh, Richards, Johnson, Roche, & Tremayne, 1994). In addition to within-construct validity, studies have also demonstrated between-construct validity. For example, Marsh, Parada, and Ayotte (2004) demonstrated that relations between 11 SDQII factors and seven mental health problems varied substantially. Similarly, Marsh, Trautwein, Lüdtke, Köller, and Baumert (2003) demonstrated the multivariate pattern of relations between SDQ domains and the Big Five personality factors, wellbeing (affect and life satisfaction)
and academic outcomes (school grades, test scores, coursework selection). Hence, these studies have shown the distinct factors of multiple domains that the SDQ measures, and provided evidence for the multidimensionality of the self-concept construct.

**The Marsh-Shavelson Model**

In the Shavelson et al.’s (1976) model, Mathematics and Verbal self-concepts were grouped under a single higher-order academic self-concept factor. However, factor analyses indicated that correlations between Verbal and Mathematics self-concepts were close to zero (Marsh, 1990b; Marsh, Byrne et al., 1988; Marsh & Shavelson, 1985; Shavelson & Marsh, 1986). This led to the Marsh-Shavelson revision (Marsh, 1990b; Marsh, Byrne et al., 1988; Marsh & Shavelson, 1985; Shavelson & Marsh, 1986) of the original Shavelson et al.’s (1976) model whereby two higher-order academic factors – Mathematics/academic and Verbal/academic – were posited instead of just one, as found in the original model. Thus three second-order factors: non-academic, Verbal/academic, and Mathematics/academic were proposed in the revised model.

**Domain-Specificity of Multidimensional Self-Concept Facets and Relation to Other Constructs**

**Relation of Self-Concept and Academic Achievement**

In her review of the relation between self-concept and academic achievement, Byrne (1984) found that self-concept was positively correlated to achievement in
most studies. She also found that achievement was correlated more strongly with academic self-concept than with general self-concept. These results provide support for the separation of academic self-concept from general and non-academic components of self-concept.

In addition, specific academic facets of self-concept have been shown to have a relation with the matching area of academic achievement. For example, Shavelson and Bolus (1982) found that English, mathematics, and science achievement were correlated more highly with matching areas of academic self-concept than with general self-concept. Marsh (1990c) reviewed 11 studies relating SDQI responses by preadolescents and showed that most of the correlations between academic achievement indicators and the four non-academic domains were negative whereas the correlations between reading self-concept and verbal achievement were positive. Similarly, the correlations between Mathematics self-concept and mathematics achievement were also positive. A similar pattern of results was also found for SDQIII responses in high school students (Marsh & O’Neill, 1984). Mathematics achievement was correlated more strongly with Mathematics self-concept than general academic and Verbal self-concepts, whereas English achievement was correlated more strongly with Verbal than general academic and Mathematics self-concepts. The nine non-academic scales, including general self-concept, were not significantly related to any of the achievement scores. These results demonstrated the content specificity of the relation between self-concept and achievement. Marsh (1992a) further validated these findings by assessing the relations between more specific components of academic self-concept and school performance in eight core school subjects, using the Academic Self-Description Questionnaire II (ASDQII) measure. Correlations between matching areas of
achievement and self-concept were large and statistically significant for all eight content areas, while each area of achievement was systematically less correlated with other non-matching academic self-concept scales. These results indicated that academic achievement in each school subject should correlate more highly with the corresponding academic self-concept scale than with any other self-concept scale.

**Causal Ordering of Academic Self-Concept and Academic Achievement**

Marsh and Yeung (1997a) examined the data collected from 603 students for three high school subjects (English, mathematics, science) in each of three years on academic self-concept, school grades, and teacher ratings of achievement. Structural equation models showed reciprocal effects for achievement and academic self-concept for all subjects. For example, mathematics achievement had a strong, positive direct effect on Mathematics self-concept, and Mathematics self-concept had a strong positive effect on mathematics achievement. Guay et al. (2003) evaluated the causal reciprocal relation between academic self-concept and academic achievement from a developmental perspective in a multicohort-multioccasion design in a sample of Grade 2, 3, and 4 students from 10 elementary schools. They demonstrated that as children grew older their academic self-concept became more strongly correlated with academic achievement. There was strong support for the reciprocal effect between academic self-concept and academic achievement for all three age cohorts. Results also indicated that the paths leading from prior academic self-concept to subsequent achievement were stronger than the paths leading from prior achievement to subsequent academic self-concept for all three cohorts. The results of this study demonstrated that the reciprocal causal effect between academic self-concept and academic achievement could be generalised over preadolescent age
groups. In order to test the generalisability of the reciprocal causal effect between academic self-concept and academic achievement across a non-English speaking culture, Marsh and Köller (2004) collected longitudinal data (five waves) from a large cohort of Grade 7 students in East Germany \( n = 2,119 \) and West Germany \( n = 1,928 \) from the start of the unification of the school systems following the fall of the Berlin Wall. It was found that prior Mathematics self-concept and prior mathematics achievement had significant effects on subsequent Mathematics self-concept and subsequent achievement, but not German self-concept and German achievement. Prior German self-concept and prior German achievement had significant effects on subsequent German self-concept and subsequent German achievement but not Mathematics self-concept and mathematics achievement. Multigroup analyses showed that support for the reciprocal causal effect generalised well across the East and West German samples, which had different educational cultures.

Marsh, Hau et al. (2002) conducted a longitudinal study on a large representative sample of Hong Kong high school students (7,802 students, 56 high schools). They found significant effects of prior achievement on subsequent academic self-concept after controlling for the effects of prior academic self-concept, but also significant effects of prior academic self-concept on subsequent achievement after controlling for the effects of prior achievement. Multilevel analyses showed that support for the reciprocal causal effect generalised well across the sample of 56 high schools. Moreover, results indicated that the paths leading from prior academic self-concept to subsequent achievement were stronger than the paths leading from prior achievement to subsequent academic self-concept. Hence, this study provided strong support for the cross-cultural generalisability of the
reciprocal causal effect between academic self-concept and academic achievement that had been investigated primarily on findings from Western countries.

Since much research evaluating the reciprocal causal effect was based on academic self-concept and academic achievement in traditional school subjects, Marsh, Chanal, and Sarrazin (2004) examined the reciprocal causal effect in relation to physical self-concept and the physical performance skills of a gymnastics training intervention on a sample of 376 adolescents. The effect of prior gymnastics self-concept on subsequent gymnastics achievement and the effect of prior gymnastics achievement on subsequent gymnastics self-concept were both significant. This provides support for the reciprocal causal effect between physical self-concept and physical performance. Multiple group structural equation models also demonstrated that the reciprocal causal effect was generalised over responses by boys and girls and by younger and older students. Marsh, Papaioannou, and Theodorakis (2004) also demonstrated the reciprocal causal effect in relation to physical self-concept and exercise behaviour on a large sample of Greek physical education classes (2,786 students, 200 classes, 67 teachers). Multilevel analyses showed that prior physical self-concept and exercise behaviour both significantly affected subsequent physical self-concept and exercise behaviour. This study provides evidence that the reciprocal causal effect between self-concept and performance was also found in subjects other than academic subject areas.

Relation of Self-Concept to Other Desirable Educational Outcomes

Besides academic achievement, academic self-concept has been found to be associated with other academic outcomes, including course selection and academic
self-attribution. For example, Marsh and Yeung (1997b) investigated the relation between academic self-concept and coursework selection of 246 male 8th- and 10th-grade Catholic school students in Australia. Structural equation models were used to examine the paths from school grades and self-concept to subsequent course selection. It was shown that specific components of self-concept were more strongly related to course selection. For example, paths from English self-concepts to wanting to take more English courses were significant. Similarly, paths from Mathematics self-concepts to wanting to take more mathematics courses were significant.

Marsh, Cairns, Relich, Barnes, and Debus (1984) assessed the relation among multiple dimensions of academic self-attribution and self-concept in 248 fifth graders. Academic self-concept was found to be correlated strongly with academic locus of control whereas non-academic self-concept showed a weak association. Students who attributed their academic success to their own ability and effort showed higher academic self-concepts. Conversely, those who attributed their academic failure to their lack of ability and effort showed lower academic self-concepts. Also, the relations between academic self-attributions and academic self-concept were specific to particular content areas. For example, self-attribution in mathematics was strongly correlated with Mathematics self-concept rather than Verbal self-concept. Conversely, self-attribution in verbal areas was more strongly correlated with Verbal self-concepts than Mathematics self-concept. Marsh (1984) assessed the relation among multiple dimensions of academic self-attribution, self-concept and inferred self-concept in 559 fifth graders. The findings replicated the result of Marsh et al. (1984). In sum, these findings provide evidence to support the domain-specificity of self-concept and the relation of specific domains of self-concept to other constructs.
The Construct Validity Approach to Studying the Effects of Self-Concept Enhancement Interventions

Self-Concept Enhancement Meta-Analyses

*Hattie (1992) meta-analysis.* This extensive meta-analysis was conducted to investigate the effectiveness of self-concept interventions. Only 89 out of 650 studies contained sufficient data for meta-analysis. The average effect size for these 89 studies (485 effect sizes) was 0.37 (SD =0.12). Hattie (1992) concluded that only 10% of those who experienced an intervention increased their self-concept compared with the control group. Hattie (1992) also noted “that so many studies had to be rejected is a reflection of the quality of research conducted in the area of self-concept change” (p. 227). “There were too many fair and poor studies, too many studies were rejected because they evaluated the interventions by intuition, too few studies with follow-ups, and too few studies that include control groups” (p. 236). To these concerns, Marsh and Craven (1997) added that “too few studies have used well-validated, multidimensional self-concept instruments in which at least some of the scales are closely matched to the intended goals of the intervention” (p. 179). As indicated in Hattie’s (1992) meta-analysis, the most common self-concept measures for children were two unidimensional instruments, the Piers-Harris Children’s Self-Concept Scale (Piers, 1984) and the Self-Esteem Inventory (Coopersmith, 1967, 1984). For adult tests of self-concept, the unidimensional instrument, the Tennessee Self-Concept Scale (Fitts, 1964) was the most popular one. In regard to the self-concept dimensions assessed, a global measure of self-concept was the most common dimension of self-concept measured, suggesting a reliance on outdated unidimensional models of the self-concept structure. Hattie (1992) found that


academic interventions had a greater effect on academic self-concept than on global self-concept. These results suggest that self-concept enhancement intervention is domain-specific.

**Haney and Durlak (1998) meta-analysis.** The meta-analysis investigated the effectiveness of self-concept interventions published prior to 1992. One hundred and two studies were reviewed and 120 interventions were evaluated. The mean effect size for interventions specifically focused on enhancing self-esteem or self-concept was 0.57, whereas that for interventions focused on other target domains such as social skills or behaviour was 0.10. Results indicated that interventions specifically focused on enhancing self-esteem or self-concept were significantly more effective than interventions focused on domains other than self-esteem or self-concept, such as social skills or behaviour. However, a single effect size per intervention was calculated by averaging all self-concept measures in this meta-analysis even when multidimensional self-concept scales had been utilised.

Ignorance of the appropriate use of multidimensional self-concept measures has obscured the findings in the self-concept literature. As Wylie (1974) commented: “the issue is whether…all questionnaire items covary in a unidimensional fashion or covary only with smaller clusters of items of similar content. If this multidimensional hypothesis proves to be correct, one might seek to develop separate subtotals for item clusters, these might then prove to be more efficient predictor variables than the single global predictor” (p. 98).

**O’Mara, Marsh, and Craven (2004) meta-analysis.** This meta-analysis was conducted to investigate the effectiveness of self-concept interventions published in
the years 1970 to 2000. A total of 145 studies were reviewed and 200 interventions were evaluated. Unlike the meta-analysis conducted by Haney and Durlak (1998), multiple self-concept domains were included in this meta-analysis. The mean effect size for interventions specifically focused on enhancing self-esteem or self-concept was 0.41, whereas for those interventions seeking to increase self-concept indirectly such as through social skills training it was .18. These conclusions are consistent with those drawn from Haney and Durlak (1998), suggesting that interventions focused on enhancing self-concept were more effective than those interventions focused on an outcome other than self-concept. Moreover, the mean effect size for specific self-concept facets most relevant to the goal of the intervention (0.43) was higher than facets judged to be of secondary (0.18) or incidental (0.09) relevance to the intervention. These results demonstrate the need to account for the multidimensionality of the self-concept construct. Hence, adoption of multidimensional self-concept measures was appropriate for measuring specific domain outcomes, to ensure the real effect of intervention on self-concept was not masked by the use of unidimensional self-concept scales or the averaging of multiple domains of self-concept scales into a single global score.

Valentine, DuBois, and Cooper (2004) meta-analysis. This meta-analysis investigated the causal order of self-beliefs and achievement. The articles published in the years 1978 to 2001 were reviewed and 56 longitudinal studies were evaluated. Unlike the previous meta-analysis, this study included self-efficacy as well as self-esteem and self-concept. The effect of prior self-beliefs on subsequent achievement after controlling for the effects of initial levels of achievement was modest, with the mean standardised regression coefficient of .08. However, the effects of prior self-beliefs were significantly stronger when self-beliefs were
assessed specific to the academic domain rather than on global measures such as self-esteem, and when measures of self-beliefs and achievement were matched in terms of subject area. The findings from this investigation and the meta-analysis by O’Mara et al. (2004) provide strong support for the multidimensionality of self-concept and the usefulness of a construct validity approach to the study of intervention effects.

Marsh et al. (1986a, 1986b) noted that if none of the facets of self-concept that match the target goals of the intervention are used, then the effects of intervention are unlikely to be significant. Hence, they emphasised that it was important to adopt multidimensional measuring instruments with demonstrated validity based on theoretical models in the evaluation of self-concept enhancement interventions, whereby those facets of self-concept specifically relevant to the focus of the intervention should be included in the self-concept measure. Marsh et al. (1986a, 1986b) suggested a construct validity approach to the study of intervention effects using a multidimensional self-concept measure. In this approach, it was postulated that specific facets of self-concept most relevant to the intervention goals should be most affected, whereas facets less relevant to the intervention goals should be less affected and serve as a control for response biases.

**Juxtaposition of a Physically-Orientated and Academically Orientated Intervention**

Marsh et al. (1986a, 1986b) conducted the Outward Bound Standard Course for 361, 17-25-year-olds. The Outward Bound standard course is a 26-day residential intervention which aimed at improving non-academic aspects through physically and
mentally demanding outdoor activities. Based on a construct validity approach, it was predicted that the intervention would affect non-academic self-concept primarily and have much less impact on academic self-concept. Consistent with the prediction, Marsh et al. (1986a, 1986b) found that those who had participated in the Outward Bound Standard Course \((n = 361)\) displayed a significantly larger positive change on the non-academic (SDQIII) dimensions of self-concept most relevant to the intervention goals compared to less relevant SDQIII scales. The size and pattern of results were also maintained in an 18-month follow-up study.

Marsh and Richards (1988) also evaluated the impact of the Outward Bound Bridging Course for 13-16 year old low achieving males. This course is a six-week residential experience aimed to improve academic achievement in language and mathematics through remedial teaching, normal schoolwork, and experiences likely to influence personality in general, and self-concept and self-esteem in particular (Marsh & Richards, 1988). Hence, it was found that the intervention had impact primarily on academic self-concepts and had much less effect on non-academic self-concepts. Consistent with what was predicted by a construct validity approach to the study of intervention effects, the bridging course resulted in significant gains on SDQI academic scales, and these gains were significantly larger than effects for non-academic SDQI scales. Moreover, there was also significant gain in objective measures of reading and mathematics achievement.

The juxtaposition of these two Outward Bound interventions demonstrates that intervention focusing on academic domains affected academic self-concept facets most relevant to the goals of the intervention and had much less effect on non-academic facets of self-concept, whereas interventions focusing on
non-academic domains affected non-academic self-concept facets most relevant to the goals of intervention and had much less effect on academic self-concept. The contrasting set of results of these studies provides particularly strong support for the use of multidimensional self-concept measures and the adoption of construct validity approaches in intervention studies.

*Marsh and Peart (1988) Study: The Enhancement of Physical Self-Concept*

Marsh and Peart (1988) conducted a study specifically designed to enhance the physical self-concept of high school girls through six-week aerobic training. The participants were randomly assigned into one of three intervention groups. Two experimental groups participated in aerobics training, either in a cooperative or competitive group, whereas the control group participated in an unstructured volleyball game. The cooperatively orientated intervention had a positive effect on physical self-concept whereas the competitively orientated intervention had a negative effect on physical self-concept. Both groups had no significant changes on other SDQII scales. These results support the construct validity approach to the study of intervention effects and demonstrate the domain specificity of intervention effects.

*Craven, Marsh, and Debus (1991) Study: The Enhancement of Reading and Mathematics Self-Concept*

Craven et al. (1991; Craven, 1989) implemented an enhancement intervention for a sample of primary school participants who had low academic self-concepts. The intervention emphasised reading and mathematics. The primary aim of the study was to enhance Reading and Mathematics self-concepts through a combination of
internally focused performance feedback and attributional retraining. Internally focused performance feedback was used to train the participants to change low self-concept attributions to high self-concept attributions directly. Attributional retraining was used to enhance the self-concept indirectly based on the assumption that academic self-concept and self-attribution were reciprocally related so that positive change in attribution would lead to gain in academic self-concept (see Marsh, 1984). The intervention was administered both by the classroom teacher in a regular classroom and by a researcher in withdrawn assistance groups. The results demonstrated that the researcher-administered treatment was successful in enhancing targeted facets of self-concept. The intervention resulted in statistically significant effects for the targeted areas of self-concept (Reading and Mathematics) and smaller effects in related areas (School and General). No significant effects were found in areas of self-concept unrelated to the intervention. This study demonstrated that it was important to include multiple dimensions of target and non-target domains of self-concept in intervention studies.

Ellis, Marsh, and Craven (2005) Study: The Enhancement of Reading Self-Concept

Ellis et al. (2005) implemented a peer support intervention on a sample of 930 students in Year 7. One of the aims of intervention was to increase the English competence of the students. Consistent with predictions based on the construct validity approach, it was found that the experimental group displayed a significantly higher Verbal self-concept compared to the control group, since it was the target self-concept that was most relevant to the goal of the intervention. However, there was no significant impact on Mathematics self-concept, which was less relevant to
the goal of the intervention. These results provided clear support for the adoption of the construct validity approach to the study of intervention effects and multiple dimensions of target and non-target domains of self-concept.

**The Relation between Social Support and Self-Concept**

*Theoretical Basis*

In the symbolic interaction approach, Cooley (1902) and Mead (1925, 1934) contended the self was primarily a social construction based on social interactions with others, whereby appraisals of significant others and perceptions of their views are incorporated into our self-concept. Hence, it is these reflected appraisals of others that have shaped our self-concept. Cooley postulated the “looking-glass self” whereby our understanding of ourselves is a reflection of how significant others react to us; significant others thus constitute a social mirror. For Mead, he put more emphasis on the internalisation of these opinions in the form of “generalised other” implying that an individual adopts the perspective of a more generalised group of significant others instead of the opinions of a set of specific others. In essence, this approach indicates the importance of appraisals of significant others in shaping our self-concept. Thus, supportive relations with significant others would be positively related to self-concept.

An attachment approach has also been proposed by Bowbly (1969). He emphasised that children would form an “internal working model” as a result of interaction with their caregivers (mainly their parents) in their early years. This working model reflects children’s conceptions of self and others (mainly their
parents). These models determine how children feel about themselves and about others (mainly their parents). Children who have supportive and warm parents will form a positive working model whereby they have positive conceptions of themselves and others. Such children were hypothesised by Bowbly (1969) to be securely attached to their parents and they perceived themselves as competent and loved. In contrast, children who experienced their parents as rejecting, were hypothesised to form a negative working model in that they perceived themselves as unworthy (Bretherton, 1991) and were insecurely attached to their parents. This is close to Epstein’s (1973, 1980, 1991) model of self-concept, that a person with high self-esteem in effect carries within him a loving parent, while a person with low self-esteem in effect carries within him a disapproving parent. In short, this approach hypothesises that the early origins of self are developed on the basis of infant-caregiver interaction. Positive and supportive interaction is predicted to lead to positive self-concept, while poor interaction results in negative self-concept.

**Relation between Constructs of Social Support and Self-Concept**

Thoits (1985) proposed that the positive effect of social support is due to positive evaluations. This is consistent with the theoretical importance of social support on self-esteem. Hence, it is common to find that certain constructs and measures of social support functions include esteem enhancement components. For example, Cobb (1976) defined the function of support as providing information that leads to beliefs that an individual is cared for and loved, is valued and esteemed, and, belongs to a network of communication and mutual obligation. Weiss (1974) included reassurance of worth as one of the functions that supportive relationships provide (also see S. Cohen & Hoberman, 1983; Wills, 1985). Wills (1985) also
suggested that having someone available to an individual to talk about problems, could counteract self-esteem threats. Hence, those supportive functions such as esteem support, emotional support, ventilation or having confident relationships, serve as esteem-enhancing functions. Hence, a number of measures have included supportive functions related to esteem-enhancement, such as the SS-B (Vaux, 1982) and the Interpersonal Support Evaluation List (ISEL; S. Cohen, Mermelstein, Kamarck, & Hoberman, 1985). Although some researchers have specifically hypothesised that support leads to promoting esteem, Vaux (1988) postulated that support including instrumental functions (e.g., Pattison, 1977; House, 1981; Vaux, 1982) such as giving advice and guidance, is actually related to esteem and identity.

**Empirical Findings**

As discussed in Chapter 2, social support has been shown to have a positive association with self-concept. For example, Levitt et al. (1994) conducted a study on a multiethnic sample of 333 African-American, Anglo/European American, and Hispanic-American students at three grade levels (1-2, 4-5, 8-9) and found that social support was related to self-concept. In addition, a study conducted by Van Aken and Asendorpf (1997) showed that a low level of support from mother, father, and classmate was related to low general self-worth. Furthermore, Nelson (1984) found that teacher support was positively correlated with self-esteem for a group of seventh and eighth-grade students and that self-concept mediated the effect of social support on achievement. In addition, DuBois, Felner, Sherman, and Bull (1994) demonstrated that global self-esteem mediated the relation between social support and the emotional problems of a group of 215 seventh- through ninth-grade students. The findings from these studies suggest that social support is positively associated
with self-concept and that social support is mediated by self-concept.

The Relation between Peer Support and Self-Concept

Consistent with the symbolic interaction approach, Sullivan (1953) proposed that intimate friendships enhance adolescents’ self-worth since peers become increasingly important in adolescence. As predicted by Sullivan’s hypothesis, positive features of friendships are related with higher self-esteem in several correlational studies (e.g., Coates, 1985; Dubow & Ullman, 1989; Furman & Buhrmester, 1985; Townsend et al., 1988). For example, Barrera, Chassin, and Rogosch (1993) found that self-esteem was related to support from a best friend. Similarly, Bishop and Inderbitzen (1995) demonstrated that adolescents with at least one reciprocal friend had higher self-esteem than those without a reciprocal friend. Positive peer relation was related to higher self-esteem. For instance, Sun, Hui, and Watkins (2006) found that self-esteem was positively related to peer support in a group of 433 adolescents from Grade 7 to Grade 10. De Bruyn and Van Den Boom (2005) found that peer popularity was related to self-esteem in a group of 778 Grade 7 adolescents. Conversely, negative peer relations had a negative impact on self-esteem. For example, Lopez and DuBois (2005) found that peer victimisation and peer rejection had a negative impact on peer self-concept. Similarly, Flook, Repetti, and Ullman (2005) showed that low peer acceptance predicted lower academic self-concept.

Longitudinal studies have also shown that perceived peer support is strongly associated with self-esteem. For example, Hirsch and Rapkin (1987) assessed students at the end of Grade 6 and at the middle and end of Grade 7. They found that
perceived peer support was associated with high self-esteem. Colarossi and Eccles (2003) demonstrated that self-esteem was significantly affected by friend support over time, in a longitudinal study of a group of 217 adolescents aged from 15-18.

Consistent with a multidimensional theory of self-concept, some studies have also shown that positive features of friendships were strongly associated with various domains of self-concept. For example, Keefe and Berndt (1996) found that positive features of friendships were strongly related with various domains of self-concept including: global self-worth, social acceptance, behavioural conduct, and scholastic competence in a study based upon 297 seventh and eighth graders. Rhee (1993) found that peer support is important for children’s perceived social acceptance and behavioural conduct in a sample of Korean elementary school children. Marsh, Parada, Craven et al. (2004) demonstrated that being victims of bullying was negatively associated with all eleven facets of self-concept, as measured by the SDQII, and showed that positive features of friendships were strongly associated with various domains of self-concept. Furthermore, longitudinal studies have found that positive features of friendships are strongly associated with specific domain of self-concept. For example, Berndt, Hawkins, and Jiao (1999) conducted a longitudinal study with 101 students to examine the relation between self-esteem and friendship quality. Participants completed the same questionnaire in the spring of sixth grade and again in the autumn of seventh grade. They found that one of the subscales of self-concept (social competence domain) increased during the seventh-grade year when their friends in the autumn had higher social competence. They concluded that one’s social competence is higher when friends are more confident in their social skills.
An Overview of Research Examining the Impact of Peer Tutoring on Self-Concept

Empirical Evidence

Much peer tutoring research has put emphasis on examining the effect of peer tutoring interventions on academic achievement. However, a few studies have investigated the impact of peer tutoring interventions on self-concept, although these studies showed inconsistent findings.

Most early research adopted a unidimensional self-concept scale to study the effect of peer tutoring interventions on self-esteem. For example, Bar-Eli and Raviv (1982) attempted to examine the impact of cross-age tutoring on the self-concept of fifteen underachieving fifth- and sixth-grade tutors by adopting a unidimensional self-concept scale. However, there was no significant difference for experimental and control groups on the self-concept measure. In contrast, Blaney, Stephan, Rosenfield, Aronson, and Sikes (1977) reported a positive finding by using a unidimensional self-concept scale to examine the impact of peer tutoring on the self-concept of fifth-grade students. It was found that the treatment group manifested higher self-esteem than controls. It indicated that there was a positive impact of peer tutoring on self-concept. Hence, the paradoxical findings of these two studies suggest that the impact of peer tutoring on self-concept is equivocal.

Some self-concept scales employed in studies examining the impact of peer support interventions have consisted of multidimensional scales but have been scored as a single score. For example, Top and Osguthorpe (1987) administered the
Piers-Harris Children’s Self-Concept Scale (PHCSCS; Piers, 1984) to a sample of 78 fourth- through six-grade learning disabled or behaviourally disordered students and 82 non-handicapped first graders. Three subscales (behaviour, intellectual and school status, and happiness and satisfaction) of this instrument were summed into one total score to measure general self-concept. They found that there were no significant difference between treatment and control groups for general self-concept but they did not examine the different domains of self-concept separately.

Some recent studies have used a multidimensional self-concept measure to assess the effect of peer tutoring on different facets of self-concept, instead of just measuring general self-concept. For instance, the Self-Perception Profile for Children (SPPC; Harter, 1985) is a self-report measure comprising five specific domains of self-concept (scholastic competence, athletic competence, social acceptance, physical appearance, and behavioural conduct) and a global self-concept (global self-worth). Ginsburg-Block and Fantuzzo (1997) measured the impact of reciprocal peer tutoring in mathematics on the self-concept of a group of 40 academically at-risk fourth and fifth graders by using two subscales (social acceptance and behavioural conduct) of the Harter instrument. They found that the treatment group received peer tutoring had higher social acceptance and behavioural conduct. Ginsburg-Block and Fantuzzo (1998) adopted two subscales (scholastic competence and social acceptance) for measuring the impact of peer tutoring in mathematics on the self-concept of a group of 104 academically low-achieving third and fourth graders. They found that the treatment group that received peer tutoring had higher scholastic competence and social acceptance. Other studies have included more subscales of Harter’s instrument. For example, Fantuzzo, Davis, and Ginsburg-Block (1995) utilised three subscales: scholastic competence, social
acceptance, and behavioural conduct in a sample of 72 fourth- and fifth-grade academically at-risk students. They found that the treatment group had higher scholastic competence, social acceptance, and behavioural conduct in comparison to the control group.

The findings discussed above seem to indicate that the effect of peer tutoring on self-concept is inconclusive. Some showed the positive impact of peer tutoring on self-concept while the others did not.

**Traditional Literature Reviews on the Effect of Peer Tutoring**

Robinson et al. (2005) examined the effect of peer tutoring in mathematics on minority and White students. They built upon previous reviews (e.g., P. A. Cohen et al., 1982; Rohrbeck et al., 2003) and included 28 published findings after 1998. They found that previous reviews (e.g., P. A. Cohen et al., 1982) indicated a small effect of peer tutoring on self-concept and none of the studies reviewed demonstrated decreases in self-concept. However, they found that more recent studies reported somewhat more positive findings. For example, Fantuzzo et al. (1995) found that the experimental group had higher self-concept than the control group in a sample of 72 fourth- and fifth-grade academically at-risk students. Ginsburg-Block and Fantuzzo (1997) also reported a positive effect of peer tutoring on self-concept in a group of 40 academically at-risk fourth-and fifth-graders. Hence, more recent research suggests a more positive impact of peer tutoring on self-concept as compared with earlier research.
**Meta-Analysis on the Effect of Peer Tutoring**

*P. A. Cohen, Kulik, and Kulik (1982) meta-analysis.* P. A. Cohen et al.’s (1982) classical meta-analysis found that for tutees, 9 studies reported the effect of tutoring on self-concept, and the average effect size was only 0.09. For tutors, 16 studies reported the effect of tutoring on self-concept and the average effect size was only 0.18. It indicated that the effect of tutoring on self-concept was so small that it did not have an effect on the self-concept of tutors and tutees.

*Cook, Scruggs, Mastropieri, and Casto (1985) meta-analysis.* Cook et al. (1985) investigated the effectiveness of handicapped students (learning disabled, behaviourally disordered, and intellectually handicapped) as tutors of other students. Their meta-analysis included peer tutoring as well as cooperative learning. 19 articles yielding 54 cases with 74 effect sizes were located. Only a few studies (n = 7) reported results on self-concept/sociometric rating. The average effect size for tutor (n = 7) was -0.06 whereas it was 0.12 for tutee (n = 1). Similarly to the findings from the meta-analysis conducted by P. A. Cohen et al. (1982), results showed that changes in self-concept of tutors and tutees were small.

**Limitations of Previous Research**

*Adoption of atheoretical or unidimensional self-concept scale.* Most earlier peer tutoring research adopted a unidimensional self-concept scale. For example, Yogev and Ronen (1982) administered the Rosenberg Self-Concept Scale (Rosenberg, 1965) to a group of 73 high school freshmen to investigate the effect of cross-age tutoring on the self-concept of these high school tutors. In addition, Blaney
et al. (1977) created a unidimensional self-concept scale to investigate the impact of peer tutoring on the self-concept of fifth-grade students. However, the theoretical basis and psychometric properties of the instrument were not provided. Some recent research has also adopted unidimensional scales. For example, Bagley and Mallick (1996) also utilised the Rosenberg Self-Concept Scale (Rosenberg, 1965) for measuring the impact of peer tutoring on self-esteem of a group of 27 disabled children. However, the findings on the impact of peer tutoring were inconsistent in these research.

As discussed earlier, self-concept cannot be fully understood if multidimensionality is ignored. Hence, it is clear that the widespread use of therorectically and psychometrically inferior measurement tools has been a major factor contributing to inconsistency in previous research findings (Byrne, 1984; Wylie, 1974, 1989). To be fully understood, the multidimensionality of self-concept constructs must be accounted for and considered.

Inappropriate analysis of multidimensional self-concept scales. Although multidimensional self-concept scales have been utilised in a number of studies examining the impact of peer tutoring, such scales have often been inappropriately scored. Some researchers have only utilised a limited number of scales from a multidimensional instrument but they have calculated a total score based on these scales (e.g., Top & Osguthorpe, 1987). This sole reliance on a unidimensional approach to the structure of self-concept is likely to have masked the impact of interventions on specific domains of self-concept most logically related to the intervention.
Adoption of multidimensional self-concept scales lacking strong psychometric properties. Even when multidimensional instruments have been utilised often, instruments have been selected without first demonstrating the psychometric properties of the instrumentation. Although reliability was often reported, factor structures of different facets of self-concept were not evaluated through appropriate statistical procedures. In addition, potentially robust instruments have been utilised but the psychometric properties of the instruments have not been demonstrated by applying strong statistical tools. For example, the psychometric properties of a number of instruments have been analysed using exploratory factor analysis (EFA). However, unlike confirmatory factor analysis (CFA), EFA does not allow a specified model to be tested and compared with alternative models (e.g., Marsh & Hocevar, 1985). Moreover, tests for the invariance of the factor structure are not permitted using EFA. Hence, there is a need to adopt multidimensional self-concept instruments with proven strong psychometric properties.

Lack of adoption of construct validity approach in multidimensional self-concept scales. The construct validity approach (see previous discussion) to assess the effect of peer tutoring on self-concept has not been utilised in previous research to assess the effects of peer tutoring on target and non-target facets of self-concept. Most studies have included a global self-concept domain rather than multidimensional facets of self-concept. Hence, little is known as to whether there is a strong effect of peer tutoring on the target facets of self-concept most relevant to the goal of the intervention, while there is less effect on the non-target facets of self-concept less relevant to the goal of intervention, as research design has typically not accounted for the multidimensionality of the self-concept construct nor employed a construct validity approach to the study of intervention effects.
Implications for the Present Investigation

It has been shown that self-concept is a multidimensional construct instead of a unidimensional construct. It is clear that the multidimensionality of self-concept as defined in the Shavelson et al.'s (1976) model is critical to consider in research designs that aim to enhance self-concept. Reviews of self-concept research provide strong support for the claim that self-concept cannot be understood adequately if its multidimensionality is ignored. Hence, the advent of multidimensional self-concept instruments combined with advances in self-concept theory can provide the basis for overcoming some limitations of past self-concept enhancement research. As mentioned previously, SDQ instruments have been evaluated to be among the strongest multidimensional instruments available in terms of psychometric properties and construct validation research (Boyle, 1994; Byrne, 1984; Hattie, 1992; Wylie, 1989). Hence, the present investigation utilised the SDQII in order to account for the multidimensionality of the self-concept construct and to ensure a rigorously validated measure with sound psychometric properties was employed.

In addition, previous research has demonstrated the domain-specificity of different facets of self-concepts and other constructs. For example, research demonstrates that academic self-concept domains correlate more strongly with academic outcomes (e.g., academic achievement, academic attribution, and course selection) than non-academic outcomes, and physical self-concept correlates more strongly with physical performance. Hence, in the present investigation, predictions of the effect of peer support interventions on self-concept were based on the domain-specificity between type of peer support intervention and different facets of self-concepts incorporating a construct validity approach to the study of intervention
effects as recommended by Craven et al. (2003). The construct validity approach has demonstrated that the facets of self-concept most relevant to the intervention’s goals are most affected and that less relevant domains are least affected. Applications of this approach have shown that changes due to interventions that target non-academic facets of self-concept (Marsh et al., 1986a, 1986b) or academic facets of self-concept (Craven, 1989; Craven et al., 1991; Marsh & Richards, 1988) are specific to the goals of the intervention. Hence, it is important to match outcome measures with intervention goals. Moreover, it is important to include both those self-concept scales most relevant to the intervention and other, less relevant areas of self-concept in the present investigation.

Since there is a positive relation between social support and self-concept, it is plausible to expect peer support would also be related to self-concept in the present investigation. However, none of the studies discussed previously the author is aware of have examined the relation between different types of peer support and specific domains of self-concept. As discussed in Chapter 2, meta-analyses of academically-orientated peer tutoring interventions suggest that this type of intervention impacts positively on academic domains (see P. A. Cohen et al., 1982; Rohrbeck et al., 2003) whereas non-academically orientated peer tutoring interventions impact positively on non-academic domains (see Blake et al., 2000). It is thus postulated that particular types of peer support interventions will impact on specific outcome domains. Since there is domain-specificity between self-concept and certain outcomes, it is plausible to suggest that an academically-orientated peer support intervention will have a positive influence mainly on academic facets of self-concept most relevant to the goals of the intervention in the present investigation, based on a construct validity approach. In contrast, a socially-orientated peer support
intervention is hypothesised to have a positive impact on non-academic facets of self-concept most relevant to the goals of the intervention.

Much of the peer intervention research reviewed above has focused on a unidimensional conceptualisation of the self-concept construct and thus has not accounted for the multidimensionality of the self-concept construct. This has resulted in paradoxical findings. As discussed earlier, previous meta-analyses (P. A. Cohen et al., 1982; Cook et al., 1985) indicate a small effect of peer tutoring on global self-concept, since they included research mainly adopting unidimensional self-concept measures. However, these meta-analyses have not accounted for multiple domains of self-concept nor employed a construct validity approach to the study of intervention effects. Hence, as suggested in Chapter 2, there is a need to conduct an updated meta-analysis to establish the effects of academically-orientated peer tutoring on multidimensional facets of self-concept. In addition, the updated meta-analysis will examine what student characteristics and intervention features predict the effectiveness of the intervention in order to inform intervention design in general and in relation to the academically-orientated peer support intervention of Study 3 in the present study. In addition, since previous meta-analysis studies (O’Mara et al., 2004; Valentine et al., 2004) showed that mean effect size for specific self-concept facets most relevant to the goal of intervention was higher than facets less relevant to the goal of intervention, it is anticipated that the construct validity approach to the study of peer tutoring intervention effects in this meta-analysis will be supported.

**Summary**

In summary, this chapter has presented an overview of self-concept research
and explored the relation of self-concept, social support, and other outcomes. Past and current models of self-concept provided evidence supporting the multidimensional nature of self-concept. The domain-specificity of different facets of self-concept and other constructs has been demonstrated. Hence, it is important to adopt a construct validity approach to evaluate self-concept enhancement interventions. The relation between self-concept and social support, and between self-concept and peer tutoring was also explored. It was suggested that there is a need to conduct an updated meta-analysis to establish the effect of academically-orientated peer tutoring on multidimensional facets of self-concept, adopting a construct validity approach.

In the next chapter, the aims, hypotheses and research questions, the rationale for the hypotheses and research questions for the five studies in the present investigation are presented separately.
CHAPTER 4

AIMS, HYPOTHESES, RESEARCH QUESTIONS AND THEIR RATIONALE

Introduction

Research examining the relation of social support and self-concept has been plagued with theoretical and methodological flaws (see Chapter 3). To address the limitations of previous research, five studies were designed. Study 1 comprised an updated and comprehensive meta-analysis evaluating the impact of academically-orientated peer tutoring interventions on academic outcomes. Study 2 involved testing the structure and cross-cultural validity of an English and Chinese translated version of a multidimensional self-concept measure. In addition, the structure of a peer support measure and its relation with multiple dimensions of self-concept was examined. Studies 3 and 4 consisted of an evaluation of the impact upon multiple dimensions of self-concept and peer support of an academically-orientated peer support intervention and a socially-orientated intervention conducted in Australia, whereas Study 5 consisted of an evaluation of the impact upon multiple dimensions of self-concept of a socially-orientated intervention conducted in China. The purpose of this chapter is to present separately
for each study: the nature of the problem to be addressed, the aims, a statement of the hypotheses and research questions to be assessed, and a rationale for the hypotheses and research questions, based upon theory and previous research.

**Study 1:**

A Meta-Analysis of the Impact of the Academically-Orientated Peer Tutoring Interventions on Tutee Academic Outcomes

**The Problem**

To what extent do academically-orientated peer tutoring interventions impact upon academic achievement and self-concept facets of tutees relevant to the goals of the intervention? What features of academically-orientated peer tutoring interventions moderate the effects of these types of interventions on academic achievement and self-concept of tutees? What features determine the effectiveness of interventions on academic achievement and self-concept of tutees?

**Aims**

The aims of Study 1 are to synthesise previous research in order to critically:

1. Evaluate the overall impact of academically-orientated peer tutoring interventions on academic achievement of tutees;

2. Identify the characteristics of academically-orientated peer tutoring
interventions (e.g., student characteristics, methodology, intervention parameters, and intervention outcomes) that moderate the effects of these types of interventions on academic achievement of tutees, and examine effective features of interventions including research design (e.g., duration of treatment sessions) and methodology (e.g., group assignment procedures, intervention type, tutor training) in order to identify potentially potent determinants of successful interventions on academic achievement and effective research methodology;

3. Evaluate the overall impact of academically-orientated peer tutoring interventions on self-concept of tutees;

4. Evaluate the effect of matching between nature of intervention (academically-orientated peer tutoring interventions in the present meta-analysis) and self-concept outcome measures on self-concept of tutees;

5. Evaluate the impact of academically-orientated peer tutoring interventions on target and non-target facets of self-concept of tutees relevant to the goals of specific interventions; and

6. Evaluate whether different characteristics of academically-orientated peer tutoring interventions (e.g., student characteristics, methodology, intervention parameters and intervention outcomes) moderate the effects of these types of interventions on tutees' self-concept; and examine effective features of interventions including research design (e.g., duration of treatment) and methodology (e.g., group assignment procedures, intervention type, tutor training)
in order to identify potentially potent determinants of successful interventions on self-concept and effective research methodology.

Statement of the Hypotheses and Research Questions

_Hypothesis 1.1: Overall post-intervention impact of academically-orientated peer tutoring interventions on tutee academic achievement._

Academically-orientated peer tutoring interventions will impact positively on academic achievement outcomes relevant to the goals of the intervention, which will be demonstrated by a positive effect size of these interventions upon academic achievement.

_Research Question 2.1: Constructs that moderate the impact of academically-orientated peer tutoring interventions on tutee academic achievement._ What variables moderate the effects of academically-orientated peer tutoring interventions on academic achievement of tutees?

_Research Question 2.2: Constructs that determine the effectiveness of academically-orientated peer tutoring interventions on tutee academic achievement._ Which moderator variables predict the effectiveness of academically-orientated peer tutoring interventions on academic achievement of tutees?

_Hypothesis 3.1: Overall post-intervention impact of academically-orientated peer tutoring interventions on tutee self-concept._ Academically-orientated peer tutoring interventions will impact positively on self-concept of tutees, which will be
demonstrated by a positive effect size of these interventions upon self-concept.

**Hypothesis 4.1: Effect of matching between nature of intervention (academically-orientated peer tutoring interventions in the present meta-analysis) and self-concept outcome measures on tutee self-concept.** The effect sizes will be larger for those academically-orientated interventions with multidimensional self-concept measures than for unidimensional measures.

**Hypothesis 5.1: Post-intervention impact of academically-orientated peer tutoring interventions on target and non-target self-concept of tutees.** The construct validity approach to the study of intervention effects will be supported in that effect sizes will be systematically larger for components of self-concept most logically related to academically-orientated interventions and smaller for components of self-concept not targeted by the intervention.

**Research Question 6.1: Constructs that moderate the impact of academically-orientated peer tutoring interventions on tutee self-concept.** Are there any variables that moderate the effects of academically-orientated peer tutoring interventions on self-concept of tutees?

**Research Question 6.2: Constructs that determine the effectiveness of academically-orientated peer tutoring interventions on tutee self-concept.** Which moderator variables predict the effectiveness of academically-orientated peer tutoring interventions on self-concept of tutees?
Rationale for the Hypotheses and Research Questions

Rationale for Hypothesis 1.1: Overall post-intervention impact of academically-orientated peer tutoring interventions on tutee academic achievement. Early meta-analyses have suggested that academically-orientated peer tutoring interventions impact positively on academic achievement (see Chapter 3). For example, P. A. Cohen et al. (1982) showed that academically-orientated peer tutoring interventions had a positive impact on the academic performance of those who received tutoring. Hence it is anticipated that these results will be replicated in this updated meta-analysis using current methodology in meta-analysis, comprehensive subject content, and a wide range of participants.

Rationale for Research Question 2.1: Constructs that moderate the impact of academically-orientated peer tutoring interventions on tutee academic achievement. Previous meta-analyses have found that some variables moderate the effect of academic-orientated peer tutoring interventions on academic achievement. For example, a meta-analysis conducted by Rohrbeck et al. (2003) elucidated that ethnicity and tutee grade moderated the effect of tutoring on achievement. In addition, Elbaum, Vaughn, Hughes, and Moody (2000) showed that the effect of adult-delivered one-to-one tutoring on reading outcomes was moderated by several variables, such as tutor training, intervention duration, group assignment procedure, and grade level of tutee. Given that previous meta-analyses have identified moderating variables, a research question was posed to ascertain whether the effect of academic-orientated peer tutoring on academic achievement is moderated by other constructs.
Rationale for Research Question 2.2: Constructs that determine the effectiveness of academically-orientated peer tutoring interventions on tutee academic achievement. Previous meta-analyses of peer tutoring have not examined which moderator variables predict the effectiveness of academically-orientated peer tutoring interventions on academic achievement. Hence, no specific prediction is made, and a research question was posed to explore this issue.

Rationale for Hypothesis 3.1: Overall post-intervention impact of academically-orientated peer tutoring interventions on tutee self-concept. Previous meta-analyses indicate that the effect of peer tutoring on self-concept is small. P. A. Cohen et al.’s (1982) classical meta-analysis reported that the average effect size of tutoring on the self-concept of tutees was small, although 7 out of 9 studies had positive impact on self-concept while only 2 studies favored those did not receive tutoring. A meta-analysis conducted by Cook et al. (1985) also showed that tutoring had little or no effect on self-concept. However, these studies did not employ recent methodological advances in meta-analysis nor account for the multidimensionality of the self-concept construct (see Chapter 3) and thus the impact of peer tutoring on self-concept remains obscure.

Conversely, recent studies using a multidimensional self-concept measure showed that peer tutoring had a positive effect on self-concept. For instance, Ginsburg-Block and Fantuzzo (1997) measured the impact of reciprocal peer tutoring in mathematics on self-concept using two subscales (social acceptance and behavioural conduct) of the Harter instrument (Harter, 1985). They found that the treatment group that received peer tutoring had higher social acceptance and
behavioural conduct self-concepts. Ginsburg-Block and Fantuzzo (1998) also adopted two subscales of the Harter instrument (Harter, 1985; scholastic competence and social acceptance) for measuring the impact of peer tutoring. They found that the treatment group that received peer tutoring had higher scholastic competence and social acceptance. Fantuzzo et al. (1995) utilised three subscales: scholastic competence, social acceptance, and behavioural conduct. They found that the treatment group had higher scholastic competence, social acceptance, and behavioural conduct in comparison to the control group. Hence, it is anticipated that academically-orientated peer tutoring interventions will be consistent with previous research results and therefore have a positive impact on self-concept in the present meta-analysis, employing recent methodological advances in meta-analysis and including multidimensional measures of self-concept.

**Rationale for Hypothesis 4.1: Effect of matching between nature of intervention (academically-orientated peer tutoring interventions in the present meta-analysis) and self-concept outcome measures of tutee self-concept.** A meta-analysis on self-concept enhancement interventions (O’Mara et al., 2004) demonstrated that effect sizes were larger for those interventions focused on specific domains of self-concept with multiple multidimensional self-concept measure than those with a global or unidimensional measure. Since the present investigation examined academically-orientated peer tutoring interventions with a particular focus on certain outcomes such as academic aspect, it is anticipated that the effect sizes will be larger for those interventions with a multidimensional self-concept measure relevant to the goals of the intervention rather than for a unidimensional measure.
Rationale for Hypothesis 5.1: Post-intervention impact of academically-orientated peer tutoring interventions on target and non-target self-concept of tutees. Advances in self-concept theory and research demonstrate that self-concept cannot be adequately understood if its multidimensionality is ignored (Marsh & Craven, 1997). However, previous meta-analyses examining the impact of academically-orientated peer tutoring interventions have focused on a unidimensional self-concept construct and thus have not accounted for the multidimensionality of the construct. This has resulted in paradoxical findings. Craven et al. (2003) advocate a construct validity approach to the study of self-concept intervention effects and have demonstrated that facets of self-concept logically targeted by self-concept enhancement interventions have been enhanced. Hence it is anticipated that the construct validity approach to the study of intervention effects will be supported, whereby target facets of self-concept most relevant to the goal of the interventions will have greater effect size than non-target facets of self-concept less relevant to the interventions.

Rationale for Research Question 6.1: Constructs that moderate the impact of academically-orientated peer tutoring interventions on tutee self-concept. Previous meta-analyses have not examined whether there were some variables that moderate the effect of academic-orientated peer tutoring interventions on self-concept. However, as mentioned in a preceding section, it was found that some variables (e.g., tutor training, intervention duration) moderated the effect of academic-orientated peer tutoring interventions on achievement. Moreover, a recent meta-analysis on self-concept enhancement intervention (O’Mara et al., 2004) has demonstrated that certain variables moderate the effect of self-concept intervention. Given this recent meta-analysis examining self-concept interventions has identified
moderating variables, a research question was posed to ascertain whether the effect of academically-orientated peer tutoring on self-concept is moderated by other constructs.

**Rationale for Research Question 6.2: Constructs that determine the effectiveness of academically-orientated peer tutoring interventions on tutee self-concept.** Previous meta-analyses of peer tutoring have not examined which moderator variables predict the effectiveness of academically-orientated peer tutoring interventions on self-concept. Hence, no specific prediction is made, and a research question is posed to explore this issue.

**Study 2:**

**The Structure and Cross Cultural Validity of Self-Concept, Peer Support, and Their Relation**

**The Problem**

Are the multi-dimensional SDQII and the translated version of this instrument in Chinese, reliable and valid measures of self-concept for both Australian and Chinese samples? Is the structure of Chinese students’ self-concept similar to that for Australian students? Is a newly adapted peer support subscale of a social support instrument a reliable and valid measure of peer support? What is the relation between peer support and specific facets of self-concept?
Aims

The aims of Study 2 are to:

1. Evaluate whether both the English and Chinese versions of the SDQII are reliable and valid instruments;

2. Compare the factor structure of the SDQII for Chinese students with the factor structure of the SDQII for Australian students to test the cross-cultural validity of the self-concept instrument;

3. Test the psychometric properties of a newly adapted peer support scale; and

4. Examine the relation between peer support and multiple dimensions of self-concept.

Statement of the Hypotheses

Hypothesis 1.1: Psychometric properties of the English version of SDQII.

The English version of the SDQII will be a reliable and valid measure of Australian participants’ self-concepts as demonstrated by acceptable reliability of each scale and confirmation of the a priori 11-factor structure of this instrument (see Figure 4.1).
Figure 4.1  A Priori II-Factor Structure of Self-Concept
Hypothesis 1.2: Psychometric properties of the Chinese version of SDQII. The Chinese version of the SDQII will be a reliable and valid measure of Chinese participants’ self-concepts as demonstrated by acceptable reliability of each scale and confirmation of the a priori 11-factor structure of this instrument (see Figure 4.1).

Hypothesis 2.1: Factorial invariance of the SDQII across Chinese and Australian population samples. The factor structure (factor loading, factor correlation, factor variance, factor covariance, and uniqueness) of the SDQII across Chinese and Australian population samples will be invariant, therefore demonstrating the cross-cultural validity of this instrument.

Hypothesis 3.1: Psychometric properties of the peer support subscale. The peer support subscale of a social support instrument will be a reliable and valid measure as demonstrated by acceptable reliability and confirmation of the a priori 1-factor structure of this instrument.

Hypothesis 4.1: Relation between peer support and self-concept. Peer support will display a positive relation with all facets of self-concept as measured by the SDQII, but have more positive correlations with Same-Sex Relations self-concept, Opposite-Sex Relations self-concept, Emotional Stability self-concept, and General self-concept compared with the other facets of self-concept, with Same-Sex Relations self-concept being the highest relation.
Rationale for the Hypotheses

Rationale for Hypotheses 1.1-1.2: Psychometric properties of the English version and Chinese version of SDQII. Extensive research findings have shown that the reliability, factor structure, and construct validity of the English version of SDQII are sound (e.g., Marsh, 1992b; Marsh, 1994; Marsh, Plucker, & Stocking, 2001). Hence, it is predicted that the English version of the SDQII employed in Study 2 will be a reliable and valid measure of the self-concepts of Australian participants.

Given a Chinese study (Kong, 2000) utilising the Chinese version of the SDQII has demonstrated the reliability of the SDQII for Grade 8 and 9 Chinese participants was reasonably high, and that the factor structure was distinct and comparable to the normative data reported in the SDQII test manual (Marsh, 1992b), it is anticipated that the Chinese version of SDQII will also prove a reliable and valid measure of self-concepts for Chinese participants in Study 2. In addition, it is also predicted that Chinese students will display similar multi-dimensional self-concepts to those of Australian participants in Study 2.

Rationale for Hypothesis 2.1: Factorial invariance of the SDQII across Chinese and Australian population samples. Previous research (Kong, 2000) has not compared the factor structure of the English and Chinese versions of the SDQII using rigorous multiple group comparison procedures based upon CFA of factorial invariance. However, given the similar reliability and factor structure of both English and Chinese versions of the SDQII based upon comparisons of the findings of previous research (Kong, 2000), it is predicted that the factor structure (factor
loading, factor correlation, factor variance, factor covariance, and uniqueness) of the Chinese version of the SDQII in comparison to responses to the English version of the SDQII will be invariant, therefore supporting the cross-cultural validity of this measure.

**Rationale for Hypothesis 3.1: Psychometric properties of the peer support subscale.** The social support instrument, SS-A, employed in Study 2 has been used extensively in previous research (Vaux, Phillips et al., 1986). Although previous research (Vaux, Phillips et al., 1986) has not examined the factor structure using rigorous procedures such as CFA, this body of research has demonstrated that this scale – the friend subscale – showed good internal consistency providing support that it is a distinct subscale (Vaux, Phillips et al., 1986). Hence it is predicted that this subscale will be a reliable and valid measure of peer support for Study 2 participants.

**Rationale for Hypothesis 4.1: Relation between peer support and self-concept.** Peer support has been found to be strongly associated with various domains of self-concept. For example, Keefe & Berndt (1996) found that positive features of friendships were strongly related with global self-worth, social acceptance, behavioural conduct, and scholastic competence. Marsh, Parada, Craven et al. (2004) have found that being victims of bullying was negatively associated with all eleven facets of self-concept as measured by the SDQII. Thus, positive features of friendships were strongly associated with various domains of self-concept.

Research has also shown that victims of bullying were particularly low on
Same-Sex Relations self-concept, Opposite-Sex Relations self-concept, Emotional Stability self-concept, and General self-concept, with Same-Sex Relations self-concept being the lowest relation (Marsh, Parada, Craven et al., 2004; Marsh et al., 2001). These findings indicate that negative peer relations are associated with poor Same-Sex Relations self-concept, Opposite-Sex Relations self-concept, Emotional Stability self-concept, and General self-concept. It is thus envisaged that positive peer support has significantly higher positive relation with Same-Sex Relations self-concept, Opposite-Sex Relations self-concept, Emotional Stability, and General self-concept, with Same-Sex Relations self-concept being the highest relation.

**Study 3:**

**The Impact of an Academically-Orientated Peer Tutoring Intervention on Multiple Dimensions of Self-Concept and Peer Support of Tutees in an Australian Sample**

*The Problem*

What is the impact of academically-orientated peer support intervention on multiple target and non-target dimensions of self-concept and peer support? Do participants who experience an academically-orientated peer support intervention, compared to participants who do not experience such an intervention display a) An increase in specific target self-concept facets associated with the goals of the intervention and peer support, and b) no statistically significant increases in facets of self-concept that are unrelated to the goals of the intervention? Does the effect of the intervention generalise to both males and females?
Aims

The aims of Study 3 are to capitalise on recent advances in self-concept theory and research to:

1. Critically analyse the impact of an academically-orientated peer support intervention administered to Australian students on target and non-target facets of self-concept;

2. Critically analyse the impact of an academically-orientated peer support intervention administered to Australian students on peer support and;

3. Test whether the impact of an academically-orientated peer support intervention can be generalised to both males and females.

Statement of the Hypotheses and Research Question

Hypothesis 1.1: Post-intervention impact of an academically-orientated peer tutoring intervention on target self-concept. Participants who have experienced an academically-orientated peer tutoring intervention, compared to participants who have not experienced this intervention will display statistically significant higher Verbal self-concepts.

Hypothesis 1.2: Post-intervention impact of academically-orientated peer tutoring intervention on non-target self-concept facets. Participants who have experienced an academically-orientated peer tutoring intervention compared to
participants who have not experienced this intervention will display no significant
effects for facets of self-concept not targeted by the intervention (Physical Ability,
Physical Appearance, Opposite-Sex Relations, Same-Sex Relations,
Honesty-Trustworthiness, Parent Relations, Emotional Stability, General
self-concept, Mathematics, and General School).

**Hypothesis 2.1: Post-intervention impact of academically-orientated peer
tutoring intervention on peer support.** Participants who have experienced an
academically-orientated peer tutoring intervention compared to participants who
have not experienced this intervention will not display statistically significant higher
peer support.

**Research Question 3.1: Generalisability of the post-intervention impact of
academically-orientated peer tutoring intervention on self-concept over gender.**
To what extent do the effects of an academically-orientated peer tutoring intervention
generalise to both males and females?

**Rationale for the Hypotheses and Research Question**

**Rationale for Hypotheses 1.1 & 1.2: Post-intervention impact of
academically-orientated peer tutoring intervention on target and non-target
self-concept.** Meta-analyses of academically-orientated peer tutoring interventions
have demonstrated that this type of intervention has impacted positively on academic
domains (see P. A. Cohen et al., 1982; Rohrbeck et al., 2003). It is thus postulated
that particular types of peer support interventions will have an impact on specific
outcome domains that are most relevant to the goals of the intervention. That is,
academically-orientated peer support interventions are hypothesised to have a positive influence, mainly on academic-related outcomes.

Recent self-concept enhancement research has demonstrated that specific facets of self-concept relevant to the goals of the intervention can be enhanced (see Craven et al., 2003). For instance, research has found a positive relation between academic self-concept, academic achievement (Marsh & Craven, 2005, 2006), and academic locus of control, and little relation of these constructs to non-academic domains (Marsh, 1984). Hence, academic self-concept has a strong association with specific academic-related outcomes. It is thus posited that an academically-orientated peer support intervention will have a positive impact on academic facets of self-concept and have little or no impact on non-academic facets of self-concept unrelated to the goals of the intervention.

In addition, the construct validity approach adopted by Marsh et al., (1986a, 1986b) to study intervention effects provides a promising direction. This approach has demonstrated that the facets of self-concept most relevant to the intervention’s goals are most affected and less relevant domains are least affected (Craven, 1989; Craven et al., 1991; Marsh & Richards, 1988; Marsh et al., 1986a, 1986b; Craven et al., 2003). Hence, in the present study, it is hypothesised that academically-orientated peer tutoring will have a positive effect mainly for the academic domains of self-concept most logically related to the intervention’s goals, whereas non-academic domains of self-concept will be less affected. Since the present investigation focuses on an academically-orientated peer support intervention designed to enhance participants’ verbal skill, it is postulated that participants will display a positive change mainly in Verbal self-concept, as measured by the SDQII.
**Rationale for Hypothesis 2.1: Post-intervention impact of academically-orientated peer tutoring intervention on peer support.** Adolescents usually nominated their peers of similar age as their friends (Smith & Inder, 1990; French, 1987). Since the academically-orientated peer tutoring intervention does not aim at promoting the interaction between tutees and their age mate peers, it is predicted that this type of intervention will have no significant impact on peer support.

**Rationale for Research Question 3.1: Generalisability of the post-intervention impact of academically-orientated peer tutoring intervention on self-concept over gender.** To date, few studies have examined the generalisability of the intervention effect of academically-orientated peer tutoring over gender. Pillen, Jason, and Olson (1988) found that tutored girls increased their self-concepts, whereas boys’ self-concepts declined. However, Lampe, Rooze, & Tallent-Runnels (1996) revealed that boys’ self-concepts were higher than girls’ in a cooperative learning intervention involving peer tutoring. Since the results of previous research in regard to this issue are inconclusive, no specific predictions have been made, and a research question has been posed to explore this issue further.
Study 4:
The Impact of a Socially-Orientated Peer Support Intervention on Multiple Dimensions of Self-Concept and Peer Support in an Australian Sample

The Problem

What is the impact of socially-orientated peer support intervention on multiple target and non-target dimensions of self-concept and peer support? Do participants who experience a socially-orientated peer support intervention compared to participants who do not experience such an intervention display: a) An increase in socially-related target self-concept facets associated with the goals of the intervention and peer support, and b) no statistically significant increases in facets of self-concept that are unrelated to the goals of the intervention? Does the effect of the intervention generalise to both males and females?

Aims

The aims of Study 4 are to capitalise on recent advances in self-concept theory and research to:

1. Critically analyse the impact of a socially-orientated peer support intervention administered to Australian students on target and non-target facets of self-concept;

2. Critically analyse the impact of a socially-orientated peer support intervention
3. Test whether the impact of a socially-orientated peer support intervention can be generalised to both males and females.

**Statement of the Hypotheses and Research Question**

**Hypothesis 1.1: Post-intervention impact of socially-orientated peer support intervention on target self-concept.** Participants who have experienced a socially-orientated peer support intervention in comparison to participants who have not experienced this intervention will display higher Same-Sex Relations self-concept.

**Hypothesis 1.2: Post-intervention impact of socially-orientated peer support intervention on non-target self-concept.** Participants who have experienced the socially-orientated peer support intervention compared to participants who have not experienced this intervention will display no significant effects for facets of self-concept not targeted by the intervention (Physical Ability, Physical Appearance, Opposite-Sex Relations, Honesty-Trustworthiness, Parent Relations, Emotional Stability, General self-concept, Verbal, Mathematics, and General School self-concept).

**Hypothesis 2.1: Post-intervention impact of socially-orientated peer support intervention on peer support.** Participants who have experienced the socially-orientated peer support intervention in comparison to participants who have not experienced this intervention will display higher peer support.
Research Question 3.1: Generalisability of the post-intervention impact of socially-orientated peer support intervention on self-concept over gender. To what extent do the effects of the socially-orientated peer support intervention generalise to both males and females?

Rationale for the Hypotheses and Research Question

Rationale for Hypotheses 1.1 & 1.2: Post-intervention impact of socially-orientated peer support intervention on target and non-target self-concept.

It is hypothesised that a socially-orientated peer support intervention will have positive effects upon the non-academic domains of self-concept most logically related to the intervention’s goals whereas academic domains of self-concept will be less affected. Since the present investigation focuses on a socially-orientated peer support intervention designed to enhance social and communication skills, it is anticipated that this intervention will have a positive impact mainly on peer relation self-concept as measured by the SDQII. Research has shown that same-sex peers are a greater source of companionship for adolescents (Buhrmester & Furman, 1987), and adolescents reported more companionship with their same-sex peers than opposite-sex peers (Kuttler, La Greca, & Prinstein, 1999). Same-sex peers may be more effective in meeting children’s social needs (Dusek, 1991). Therefore, same-sex relations are the primary source of peer relation for early adolescents. It is thus anticipated that particularly Same-Sex Relations self-concept as measured by the SDQII will be enhanced, instead of the Opposite-Sex Relations self-concept.

Rationale for Hypothesis 2.1: Post-intervention impact of socially-orientated peer support intervention on peer support.

Since the socially-orientated peer
support intervention facilitates the interactions among peer group members of same-age, it is predicted that this type of intervention has a significant impact on peer support.

**Rationale for Research Question 3.1: Generalisability of the post-intervention impact of socially-orientated peer support intervention on self-concept over gender.** To date, few studies have examined the generalisability of the intervention effect of socially-orientated peer support intervention over gender. Hence, no specific predictions have been made and a research question has been posed to explore this issue further.

**Study 5:**

The Impact of a Socially-Orientated Peer Support Intervention on Multiple Dimensions of Self-Concept in a Chinese Sample from Hong Kong

*The Problem*

Can the effects of the socially-orientated peer support intervention (Study 4) be generalised to Chinese culture? Do the effects of the socially-orientated peer support intervention (Study 4) generalise to both Chinese males and females? Are the effects of the socially-orientated peer support intervention (Study 4) on Chinese students maintained after the intervention has concluded?
**Aims**

The aims of Study 5 are to capitalise on recent advances in self-concept theory and research to:

1. Critically analyse the impact of the socially-orientated peer support intervention (Study 4) administered to Chinese students on target and non-target facets of self-concept;

2. Test whether the impact of the socially-orientated peer support intervention (Study 4) administered to Chinese students can be generalised to both males and females; and

3. Test whether the impact of the socially-orientated peer support intervention (Study 4) administered to Chinese students are maintained over time.

**Statement of the Hypotheses and Research Question**

**Hypothesis 1.1: Generalisability of the post-intervention impact of the socially-orientated peer support intervention on self-concept in Study 4 to Chinese participants.** The intervention effect of the socially-orientated peer support intervention on Same-Sex Relations self-concept in Study 4 can be generalised to Chinese participants.

**Research Question 2.1: Generalisability of the post-intervention impact of the socially-orientated peer support intervention on self-concept in Study 4 over**
gender in Chinese participants. Can the intervention effect of the socially-orientated peer support intervention on Same-Sex Relations self-concept in Study 4 be generalised to both males and females in Chinese participants?

**Hypothesis 3.1: Maintenance effect of the post-intervention impact of the socially-orientated peer support intervention on self-concept in Study 4 in Chinese participants.** The intervention effect of the socially-orientated peer support intervention on Same-Sex Relations self-concept in Study 4 can be maintained after withdrawal of treatment for the experimental group.

**Rationale for the Hypothesis and Research Question**

**Rationale for Hypothesis 1.1: Generalisability of the post-intervention impact of the socially-orientated peer support intervention in Study 4 on self-concept to Chinese participants.** Building up harmonious relationships with others is important, and one’s self-esteem is more dependent on such relationships in Chinese culture. In other words, the relational and situational salience of Chinese is likely to play a crucial role in the maintenance of self-identity (Markus & Kitayama, 1991), and self-esteem is group-orientated (Gabrenya & Wang, 1983). Hence, a person who can build up a good relationship with others is likely to have higher self-esteem in Chinese culture. C. F. Chang (1982) found that individuals with positive self-concept are correlated with satisfactory relationship with others. In contrast, creating conflicting relationships is detrimental for one’s self-esteem since it is socially undesirable and conceived as antisocial or deviant behaviour. Moreover, Hamid and Cheng (1995) revealed that undergraduate Chinese participants with high self-esteem gave greater importance to socially related attributes than participants with low
self-esteem. Therefore, it is predicted that Chinese participants in the present investigation who have participated in a socially-orientated peer support intervention will apply the communication and social skills learnt from the intervention to build up a harmonious relationship with their peers. It is thus predicted that the intervention effect of the socially-orientated peer support intervention on Same-Sex Relations self-concept in Study 4 can be generalised to Chinese participants.

**Rationale for Research Question 2.1: Generalisability of the post-intervention impact of the socially-orientated peer support intervention in Study 4 on self-concept over gender in Chinese participants.** Chinese culture is remarkably different from Western culture. In Western culture, individualistic values are emphasised, whereas in Chinese culture, collectivist values are stressed. For example, Li, Zhang, Bhatt and Yum (2006) found that Chinese were more interdependent than Canadians in construing their relationships with other people including closest family member, family members, friends, other relatives, colleagues and neighbours in a sample of 220 Canadians and 196 Chinese. Wang (2001) revealed that American were more self-oriented while Chinese were more group-oriented in a sample of 119 American and 137 Chinese university students. No gender differences were found in the American and Chinese samples. These results indicated that Chinese were more collectivistic while people from Western countries were more individualistic. In Chinese culture, under the influence of Confucianism, a collectivist point of view is predominant, and greater emphasis is put on the maintenance of in-group integrity, interdependency of members, and harmony among people (Hofstede, 1980; Markus & Kitayama, 1991; Triandis, 1989). Hence, individuals with positive self-concept share a satisfactory relationship with others (C. F. Chang, 1982). In contrast, creating conflicting relationships is detrimental for
one’s self-esteem, since it is socially undesirable and conceived as antisocial or deviant behaviour. Moreover, those with high self-esteem will give greater importance to socially related attributes than will people with low self-esteem (Hamid & Cheng, 1995). In contrast, individualism is predominant in Western societies. Self-orientation is stressed (Yang, 1981, 1986) and hence personal goals are preferred over the group goal. The aim of social interaction is to fulfil one’s own need and explore one’s capacities. Studies have shown that the affiliation tendency is positively related to self-perceived sociometric status and to self-evaluation of the Chinese students (W. J. Chang, 1980) whereas in Western cultures, the affiliative motive is negatively correlated with interpersonal attraction (Atkinson, Heynes, & Veroff, 1954). This difference has been found to be due to the fact that individualism is emphasised in Western culture, one’s independence is highly valued, and strong interpersonal affiliations are perceived as a weakness. However, establishing and improving interpersonal relationship are considered desirable traits and make one more attractive to others in Chinese culture. Therefore, those male and female Chinese participants who have participated in the socially-orientated peer support intervention are likely to apply the communication and social skills learnt from the intervention to build up a harmonious relationship with their peers. It is thus predicted that the intervention effect of the socially-orientated peer support intervention on Same-Sex Relations self-concept in Study 4 can be generalised to both males and females in Chinese participants.

However, the individualistic feature is also common in Hong Kong. The social comparison effect was as strong in Hong Kong as in Australia (Marsh, Kong, & Hau, 2000). These results indicate that personal goals are preferred over the group goal.
Hence, the issue whether the intervention effect of the socially-orientated peer support intervention, if present, on Same-Sex Relations self-concept in Study 4 can be generalised to both males and females in Chinese participants is to be tested in the present investigation.

**Rationale for Hypothesis 3.1: Maintenance effect of the post-intervention impact of the socially-orientated peer support intervention in Study 4 on self-concept in Chinese participants.** A meta-analysis on self-concept intervention (O’Mara et al., 2004) revealed that the effect size of self-concept did not change significantly between posttest and follow-up studies. Marsh et al. (1986a, 1986b) found that positive change on the self-concept in the non-academically focused Outward Bound Standard Course was maintained in an 18-month follow-up study. Hence, it is predicted that the intervention effect will be maintained over time.

**Summary**

The purpose of this chapter was to present for each of the five studies that comprised the present investigation: the nature of the problem to be addressed, the aims of the study, a statement of the hypotheses and research questions to be assessed, and a rationale for the hypotheses and research questions based upon theory and previous research. In the next chapter the methodology utilised to fully explore the study aims, hypotheses, and research questions will be presented.
CHAPTER 5

METHODOLOGY

Introduction

The primary aim of this chapter is to present an overview of the methodology employed to investigate the hypotheses and research questions posed. The present investigation comprises five studies which have been designed to address the specified aims, hypotheses and research questions (see Chapter 4). Study 1 consisted of a meta-analysis evaluating the impact of academically-orientated peer tutoring interventions on academic achievement and self-concept of tutees. Study 2 involved testing the structure and cross-cultural validity of an English and a Chinese translated version of a multidimensional self-concept measure. In addition, the structure of a peer support subscale of a social support measure and its relation with multiple dimensions of self-concept was examined. Studies 3, 4 and 5 consisted of evaluations of the impact of an academically-orientated peer support intervention and a socially-orientated intervention conducted in Australia and a socially-orientated intervention conducted in China respectively, on multiple target and non-target facets of self-concept by utilising a construct validity approach to the study of intervention effects coupled with a strong experimental design.
The purpose of this chapter is to provide a detailed description of the methods used in each of these five studies. Firstly, a detailed description of the research design, procedures employed and data analysis procedures in Study 1 is afforded. Secondly, instrumentation in Study 2 is described, as is how the relation between peer support and multiple facets of self-concepts is assessed. Thirdly, the methodology pertaining to Studies 3, 4 and 5 is presented, including: the characteristics of participants, research design, measures adopted, procedures employed, and data analysis procedures. Hence, the primary purpose of this chapter is to demonstrate that five sound research studies were developed to address the aims, hypotheses and research question (see Chapter 4) and powerful statistical tests were employed to undertake a critical analysis of the results.

**Methodology: Study 1**

*Research Design*

Study 1 consisted of a meta-analysis designed to test the effects of academically-orientated peer tutoring interventions on academic achievement and multiple dimensions of self-concept of tutees. Academically-orientated peer tutoring interventions were characterised as including “a system of instruction in which learners help each other and learn by teaching” (Goodlad & Hirst, 1989, p. 13) or “a more able child helping a less able child in a cooperative working pair carefully organised by a teacher” (Topping, 1989, p. 489). The research design was based upon a construct validity approach to the study of intervention effects (see Craven et al., 2003 and Chapter 3 for an overview) whereby the impact of academically-orientated interventions was evaluated in relation to both target
academic-related outcomes (academic achievement in specific subjects and facets of self-concept most relevant to the goals of each intervention) and also in relation to non-target academic and non-academic facets that were less relevant to the goals of the intervention.

**Procedures**

The meta-analysis followed the guidelines established in previous meta-analysis research (Glass, McGaw, & Smith, 1981; Hedges & Olkin, 1985). It involved the following procedures: Literature search, coding of studies and computation of effect sizes.

**Selection criteria and procedures.** For the literature search, key terms including peer tutoring, peer tutee and peer tutor were used to search the following online databases: PsycLit and Educational Resources Information Centre (ERIC). The following criteria were set for the eligibility of studies: (1) the study was peer-reviewed and published in 2003 or before; (2) the form of peer tutoring needed to take place in a school setting; (3) participants were kindergarten, elementary, secondary, college or university students; (4) the targeted subject matter was academic; (5) outcome data available in the article needed to be amenable to the computation of effect sizes; and (6) studies were selected based upon experimental designs that included only an experimental group with pretest and posttest scores or both a control and experimental group with pretest and posttest scores.

**Search outcome.** A total of 75 articles were identified that met the criteria for inclusion. Eight of these articles did not report sufficient data amenable to the
computation of effect size. These articles were excluded from the present review. Hence, 67 articles (see Appendix A-1) were retained for further analysis.

**Coding of studies.** The coded features utilised in a previous meta-analysis on tutoring (P. A. Cohen et al., 1982) were used initially as a basis to develop a coding sheet. Specifically this coding schema included: (1) report information; (2) characteristics of participants; (3) methodology; (4) intervention features; and (5) outcomes assessment (see Appendix A-2).

All eligible studies were coded by the author, whereas almost half of the randomly selected studies were coded by a second coder, who is a secondary school teacher with a Master’s degree in education. The code sheets completed by the two coders were compared, to confirm the inter-rater reliability.

**Coding reliability.** Two coders used the coding sheet (see Appendix A-3) to code the articles. In order to have a common understanding of the items in the coding sheet, two pilot coding sessions were held to discuss any disparity on the coding sheet (see Appendix A-4). After the concluding consensus, each coder did the coding separately. While the author coded all the 67 studies, the second coder did the coding on 34 randomly selected studies. Interrater reliability was calculated by using percentage agreement and kappa coefficients where appropriate for these studies (see Appendix A-4). Average percentage agreement and kappa coefficient for variables were 91% and 0.93 respectively.
Data Analysis

Unit of analysis. Since independent samples were the primary unit of analysis each study contributed one independent sample to the analysis in general and one effect size was calculated. However, a shifting unit of analysis approach was adopted for determining what constitutes an independent unit of analysis (Cooper, 1998). Each effect size was first coded as if it were an independent estimate of outcome. For example, if a study reported findings on achievement separately for different subgroups such as low-achiever, average-achiever and high-achiever, these effect sizes were calculated separately. When estimating the overall effect of peer tutoring on achievement, only one effect size was calculated for that study, by averaging these effect sizes. However, when estimating the effect of peer tutoring on achievement of participants of different ability, three effect sizes were calculated for that study. Hence, in the present investigation, separate effect size would be calculated for achievement and self-concept within a single study, since the effect of peer tutoring on achievement and self-concept would be assessed separately.

Computation of standardised mean difference effect size. Standardised effect size was calculated by dividing the difference between the treatment and control group means with the pooled standard deviation of the two groups (Hedges, 1981). For those studies in which only test statistics such as t or F was available, different formulas were used for computation of effect size (Lipsey & Wilson, 2001):
(1) Calculation of effect size using group means

\[ E_{Sm} = (X_t - X_c) \]
Computation of effect size involving gain score or pre/post mean score difference. For those studies only reporting gain score (pretest, posttest and standard deviation), a standardised gain score effect size (Hedges, 1981) was calculated (see below). For computing the effect size for pre/post designs in which pretest and posttest data for experimental group were given without a control, the formula suggested by Becker (1988) was used (see below). Lipsey and Wilson (2001) emphasised that the effect size calculated in these two ways is adjusted for pretest difference, whereas the effect size statistics shown above represent unadjusted effect size estimate. Hence, mixing these two effect size estimates will lead to between-study heterogeneity and confound between-study differences among studies involving unadjusted effect size estimate. Hence, it was recommended these effect sizes should not be mixed with the effect size statistics shown above and would be allocated into a separate group for analysis.

(1) Calculation of effect size using gain score (Hedges, 1981)

\[ \text{ES}_{\text{gain}} \]
(2) Calculation of effect size using pre/post score (Becker, 1988)

$$\text{ES}_{pp} = (X_{12}$$
the underlying population mean effect size. Therefore, it is essential to weight each effect size by its sample size. A mean weighted effect size for each study was calculated, based on the principle that the greater the sample size of the study, the greater weight that should be given to the effect size of that study (Lipsey & Wilson, 1996). Mean weighted effect size was calculated by multiplying each effect size by its weight, in which it was computed as the inverse of the variance of the effect size estimate (Cooper, 1989):

\[ w = \frac{1}{\text{var}(\text{effect size})} \]
(3) Calculation of variance for standardised pre/post effect size (Cooper, Charlton, Valentine, & Muhlenbruck, 2000)

\[ v = [1 + (d_{pp}^2] \]
particular set around mean effect size is greater than would be expected by chance if
the homogeneity test is rejected. Hence, the dispersion of effect size within a
particular set does not estimate the same population mean (Lipsey & Wilson, 1996).

Homogeneity was examined by using the $Q$ statistic, which has a distribution
similar to chi-square with $k-1$ degrees of freedom where $k$ is the number of effect
sizes (Hedges & Olkin, 1985). The following formula was used:

$$Q = \sum (ES_i)$$

$Q$ is the homogeneity statistic.

$ES_i$ is the individual effect sizes for $i = 1$ to $k$ effect sizes represented in
the mean.

$w_i$ is the individual weight for the $ES_i$.

$i$ is equal to $1$…$k$, with $k$ being the number of effect sizes.

Homogeneity is rejected if $Q$ exceeds the critical value for a chi-square with
$k-1$ degrees of freedom. Subsequently, it is essential to identify the special coded
feature that is the source of heterogeneity of effect sizes. A categorical approach was
adopted (Hedges, 1982) in the present study to determine the relation between the
special coded feature of the study and the magnitude of the effect sizes. This kind of
analysis is analogous to analysis of variance (ANOVA) for effect sizes. The overall
homogeneity statistic, $Q_T$ was partitioned into a between-group homogeneity statistic,
$Q_B$ and a within-group homogeneity statistic, $Q_W$ (Hedges & Olkin, 1985).
Algebraically, $Q_T = Q_B + Q_W$. The following are formulae for computing $Q_B$ and $Q_W$:

$$Q_B = \Sigma w_j ES_j^2$$
the other hand, \( Q_w \) is used to estimate the within-group effect. A non-significant \( Q_w \) suggests that the variable appropriately groups studies into homogenous subcategories. The effect sizes under the variable are consistent across the studies.

**Interpretation of effect size and homogeneity test in relation to hypotheses and research questions.** To test whether academically-orientated peer tutoring interventions will demonstrate that this type of peer support intervention impacts positively on academic outcomes (academic achievement and self-concept) relevant to the goals of the intervention, examining the effect size and homogeneity test for academic achievement and self-concept separately is important.

First, if there is positive value of overall effect size, it shows that peer tutoring produces greater gain in the outcome measure than control group. Conversely, a negative effect size means greater gain in the outcome measure in the control group.

Regarding the magnitude of effect size, Lipsey and Wilson (1993) divided the distribution of standardised mean difference effect sizes into quartiles as shown below on the basis of over 300 meta-analyses of psychological, behavioural or educational interventions:

- **Lower quartile** \( ES \leq 0.30 \)
- **Median** \( ES = 0.50 \)
- **Upper quartile** \( ES \geq 0.67 \)

If the overall average weighted effect size falls on the lower quartile, it means that the effect of peer tutoring is small. In contrast, if the overall average weighted
effect size falls on the upper quartile, it means that the effect of peer tutoring is strong. The effect of peer tutoring is moderate if the overall average weighted effect size falls on the median.

Second, a homogeneity test allows evaluating whether the effect size of peer tutoring on academic outcomes (academic achievement and self-concept) is the same regardless of certain grouping feature such as subject content, grade or ability of tutor/tutee and type of peer tutoring. For example, a significant $Q_B$ for subject area indicates that the average effect size differs over subject content and the subject content is a significant moderator of outcome. Hence, the effect size of peer tutoring in certain subjects will be significantly greater than that in other subjects. Ideally, a non-significant $Q_w$ for a certain category suggests that the effect sizes of that subject are consistent across the studies.

**Regression analysis.** Homogeneity analyses can examine what variables moderate the effect of academically-orientated peer tutoring intervention on achievement and self-concept. However, they do not identify which variables predict outcome success. In the present investigation, only significant moderators of effect size for achievement were included in the regression analyses, using weighted least square multiple regression analyses as recommended by Lipsey and Wilson (2001). Since SPSS reports incorrect standard error of the regression coefficients and significant values (the t-test value and significant level) when conducting regression analyses on effect sizes, a macro specifically designed for use with SPSS (Lipsey & Wilson, 2001) was used. The macro performed the weighted regression analyses by specifying the inverse variance as the weight to ensure that differences in sample size are considered, with effect size as the criterion variable.
The categorical moderators were coded into a set of dummy variables for entry into regression. For instance, in the present investigation, the “education level of tutee” was coded so that there were four possible categories of responses. The first three categories were: kindergarten, elementary and secondary. Responses were dichotomised. The fourth category (college or university level) was omitted and taken as an omitted (referent) category to avoid singularity (Tabachnick & Fidell, 2001). It was represented as the “constant” unstandardised beta ($B$) coefficient in the regression analyses. Predictors for particular group of moderator were determined by examining which categories in a variable yielded significant $B$ coefficients. However, the actual unstandardised beta weight for each of these variables is the sum of the beta weight of each of these variables plus the omitted (referent) category.

After identifying the predictors from each group of moderators, all significant predictors were put into one single regression analysis to evaluate which of them represents the most significant predictors for the “best practice” of the intervention. In order to avoid multicollinearity when all the coded variables were included in the regression model, a backwards regression was used to remove the non-significant predictors sequentially until only significant predictors remained.

**Interpretation of regression analyses in relation to hypotheses and research questions.** The overall fit of a regression model was evaluated through $Q_R$ and $Q_E$ (Lipsey & Wilson, 2001). $Q_R$ represents the variability explained by the regression model, whereas $Q_E$ indicates the variability (residual or error) unexplained by the regression model. The sum of $Q_R$ and $Q_E$ equals to the $Q$ total computed for homogeneity analysis. $Q_R$ is analogous to the $F$-test for the regression model and a significant $Q_R$ value indicates significant variability in effect sizes. Hence, at least
one regression coefficient is significantly different from zero. A significant $Q_E$ value indicates significant variability across effect sizes after removing the variability explained by the predictor variables. Hence, it is preferable to have significant $Q_R$ and non-significant $Q_E$. Predictors for particular groups of moderators were determined by examining which variables in a category had a significant $B$ coefficient.

Publication Bias

Since only published articles were included in the meta-analysis, it was probable that effect size was overestimated because published material would be more likely to report significant findings or findings in support of the hypothesis. To estimate whether this bias occurred, a fail-safe sample size (FSN) was calculated (Rosenthal, 1979). A fail-safe sample size (FSN) is the number of unpublished studies with no significant effect size that would be needed to overturn the overall effect size to a trivial level (Orwin, 1983). The FSN is:

$$K_o = k|ES_k$$
achievement was 0.69. It was defined that a trivial effect size was 0.10. Hence, the FSN was equal to 389. In other words, an additional 383 studies with no effects would be needed to decrease the overall effect size of the present study to an non-significant level. Such a large number of unpublished studies with null results is rather unlikely. Moreover, using published material has the advantage that the methodology employed is presumably more rigorous.

Regarding self-concept, the overall weighted mean effect size was 0.71. It was defined that a trivial effect size was 0.10. Hence, the FSN was equal to 31. It means that 31 additional studies with no effects would be required. Such a large number of unpublished studies with null results is rather unlikely.

**Methodology: Study 2**

*Participants*

**Australian participants.** Participants were 244 early adolescent students (n = 199 in Year 7 and n = 45 in Year 11) from two high schools in metropolitan Sydney, New South Wales, Australia. The age of the participants ranged from 11 to 16 (M = 12.52, SD = 1.38). The sample comprised 93 males (38.1%) and 151 females (61.9%). Participants derived primarily from working class and middle class families. The vast majority (> 90%) of students were Caucasian.

**Chinese participants.** Participants were 344 Year 7 (n = 165) and 8 (n = 179) students from a Chinese high school in Hong Kong. The participants were all Chinese and ranged in age from 12 to 19 years (M = 14.24, SD = 1.20). The sample
comprised 194 males (56.4%) and 150 females (43.6%). Participants derived primarily from working class and middle class families. It should be noted that the questionnaires for the Australian sample were completed in the beginning of the academic year and for the Chinese sample, near the completion of the academic year. Hence, this explains why there is a year difference in age of Year 7 students between Australian sample and Chinese sample. Moreover, there are considerable numbers of mainland immigrants who have completed senior form in mainland China coming to Hong Kong to start at more junior form. Some students were frequent repeaters even in primary school. This explains why the age range is higher in the Chinese sample.

**Instrumentation**

The Australian participants completed the English version of the SDQII (Marsh, 1992b) and SS-A (Vaux, Phillips et al., 1986) while the Chinese participants completed the Chinese version of the SDQII (Kong, 2000)

**English version of the SDQII.** The SDQII was designed to measure 11 areas of the self-concept of adolescents (Marsh, Parker et al., 1985; Marsh, 1992b). The SDQII measures seven non-academic self-concept scales (Opposite-Sex Relations, Same-Sex Relations, Parent Relations, Honesty-Trustworthiness, Emotional Stability, Physical Appearance, Physical Ability) and three academic self-concept scales (Verbal, Mathematics, General School self-concept) and General self-concept (see Table 5.1 for a summary of scales and example items). The measure consists of 102 declarative sentence items and approximately half of the items are negatively worded (see Appendix B-1 for details). Responses to declarative statements are rated on a response scale that ranges from 1 (*false*) to 6 (*true*).
### Table 5.1 Summary of the Eleven Self-Concept Subscales on the SDQII

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Abilities</td>
<td>Student’s perceptions of their skills and interest in sports and physical activities</td>
<td>“I enjoy things like sports, gym, and dance”; “I can run a long way without stopping”</td>
</tr>
<tr>
<td>Physical Appearance</td>
<td>Student’s perceptions of their physical attractiveness</td>
<td>“I have a nice looking face”; “Other people think I am good looking”</td>
</tr>
<tr>
<td>Opposite-Sex Relations</td>
<td>Student’s perceptions of their interactions with peers of the opposite sex</td>
<td>“I have lots of friends of the opposite sex”; “I get a lot of attention from members of the opposite sex”</td>
</tr>
<tr>
<td>Same-Sex Relations</td>
<td>Student’s perceptions of their interactions with peers of the same sex</td>
<td>“I have good friends who are members of my own sex”; “I enjoy spending time with my friends of the same sex”</td>
</tr>
<tr>
<td>Parent Relations</td>
<td>Student’s perceptions of their interactions with parents</td>
<td>“I get along well with my parents”; “My parents treat me fairly”</td>
</tr>
<tr>
<td>Honesty-Trustworthiness</td>
<td>Student’s perceptions of their truthfulness and dependability</td>
<td>“I sometimes cheat”; “Honesty is very important to me”</td>
</tr>
<tr>
<td>Emotional Stability</td>
<td>Student’s perceptions of their emotional wellbeing and freedom from psychopathology</td>
<td>“I am usually relaxed”; “I get upset easily”</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Student’s perceptions of their ability, enjoyment, and interest in mathematics and reasoning</td>
<td>“Mathematics is one of my best subjects”; “I look forward to mathematics classes”</td>
</tr>
<tr>
<td>Verbal</td>
<td>Student’s perceptions of their ability, enjoyment, and interest in English and reading</td>
<td>“I get good marks in English”; “I’m not very good at reading”</td>
</tr>
<tr>
<td>General School</td>
<td>Student’s perceptions of their ability, enjoyment, and interest in school subjects</td>
<td>“People come to me for help in most school subjects”; “I do well in tests in most school subjects”</td>
</tr>
<tr>
<td>General Self</td>
<td>Student’s perceptions of their self-worth, self-confidence, self-satisfaction</td>
<td>“Most things I do, I do well”; “I can do things as well as most people”</td>
</tr>
</tbody>
</table>
**Chinese version of the SDQII.** Given Study 5 was conducted with Chinese participants, the Chinese version of the 11 SDQII subscales (Kong, 2000; Marsh et al., 2000) was also utilised in the context of the present investigation. The Chinese version of the SDQII is a translation of the original 11 SDQII subscales into Chinese. Items for each subscale of the Chinese version of the SDQII are shown in Appendix B-2.

**Modified Social Support Appraisal (SS-A).** The SS-A scale (Vaux, Phillips et al., 1986) was designed on the basis of Cobb’s (1976) concept of social support which is defined as information leading an individual to believe that he/she is cared for and loved, esteemed, and a member of a network of mutual obligation. This scale was designed to tap the extent to which the individual believes that he or she is loved by, esteemed by, and involved with family, friends, and others. These beliefs constitute the subjective appraisal of information provided by the existence of supportive relationships and the occurrence of supportive interactions. The SS-A consists of three subscales: Family, friends and others. There are 8 items for the family subscale (e.g., “My family cares for me very much”), 7 items for the friend subscale (e.g., “My friends look out for me”), and 8 items for other subscales (e.g., “I am respected by other people”). Responses to declarative statements are rated on a response scale that ranges from 1 (false) to 6 (true).

In the present study, only the friend support subscale was used. Since this scale was designed for use with undergraduates and adults in America, and given the adolescent sample comprising the current study, item wording was simplified or rephrased (e.g., “I feel a strong bond with my friends” was rephrased to “I am close to my friends”). Finally, 7 items comprising the friend support subscale were
adapted for purposes of the present investigation. Items for the resulting friend support subscale are shown in Appendix B-3.

**Procedures**

*Australian participants.* The SDQII and SS-A measures were administered to Year 7 and 11 participants in the school hall during the third and fourth lessons of the day, which were held prior to lunch. In one of the two participating schools, the school vice-principal read aloud the instructions and questions to the participants, and participants completed the questionnaire silently in their seats. The author assisted by circulating and collecting the questionnaires, and answered questions raised by the participants. For the other participating school, the teacher-in-charge read aloud the instructions and questions to the participants, and participants completed the questionnaire silently in their seats. The other teachers assisted by circulating and collecting the questionnaires, and answered questions raised by the participants. Prior to administration of the questionnaires, teachers were briefed on how to administer the questionnaire. Questionnaires were returned to the school office for the author to collect after finishing the questionnaires.

*Chinese participants.* The SDQII measure was administered to all Year 7 and 8 participants in classrooms during the first and second lessons of the day, which were held prior to recess. The class teacher read aloud the instructions and questions to the participants and participants completed the questionnaire silently in their seats. The class teacher circulated and collected the questionnaires, and answered questions raised by the participants. Prior to administration of the questionnaires, teachers were briefed on how to administer the questionnaire. Questionnaires were returned to the
school office for the author to collect after finishing the questionnaires.

Data Analysis

**Reliability of the SDQII and SS-A.** Cronbach’s Alpha estimate of reliability, which ranges from 0 to 1 and has been adopted in many studies, was used in this study.

**Factor structure of the SDQII and SS-A.** CFA was conducted to examine the factor structure of the multidimensionality of the SDQII scales and the SS-A scale by using the maximum likelihood method with LISREL 8.54 (Jöreskog & Sörbom, 2003). CFA tests the model fit between a sample variance matrix and a hypothesised a priori matrix. A covariance matrix of the raw data was first produced and subsequent analyses of the covariance matrix were undertaken utilising LISREL (Jöreskog & Sörbom, 1993). Maximum likelihood was the method of estimation used for the models, since it is robust in relation to violations of assumptions of normality. The parameters estimated in CFA typically consist of factor loadings of each measured variable on corresponding latent factor, factor variances and covariances, uniqueness of each measured variable.

Assessing the goodness of fit of the models was based on evaluations of various fit indices. The fit indexes, Tucker-Lewis Index (TLI) and Relative Noncentrality Index (RNI), as well as chi-square test statistics were examined, as is recommended by previous research (Marsh, Balla, & Hau, 1996; Marsh, Balla, & McDonald, 1988). Both TLI and RNI are independent of sample size and systematically reflect variation of model misspecification. Beside TLI and RNI, Root
Mean Square Error of Approximation (RMSEA) is also considered as a measure of goodness of model fit.

The TLI and RNI vary along a 0-to-1 continuum in which values greater than .90 and .95 are typically taken to reflect acceptable and excellent fits to the data respectively. RMSEA values of less than .05 are taken to reflect a close fit, while RMSEA values less than .08 suggest a reasonable fit. The RNI contains no penalty for a lack of parsimony, so that improved fit due to the introduction of additional parameters may reflect capitalisation on chance, whereas the TLI and RMSEA contain penalties for a lack of parsimony (Marsh et al., 1996).

Alternative models of the factor structure were also assessed, based on these indices. There is support for the hypothesised model if the hypothesised model fits the data better than alternative models.

For the SDQII, in the present study, it was hypothesised that the a priori 11-factor model with factors corresponding to the 11 subscales of SDQII would provide a good fit to the data, and correlated uniquenesses among measured variables were constrained to zero. The critical parameter measures need to be reasonable and significant factor loadings of measured variables in each target factor, and show modest correlations between SDQ subscales. Although hypothesised multiple factors in a priori model were tested, a single-factor model in which all the measured variables across all scales were converged to one factor, was also compared. The purpose of including single-factor models following corresponding multi-factorial models was to further support the hypothesis that the multi-factorial models should fit the data much better than the corresponding single-factor models.
As in factor analysis in research with SDQ instruments (Marsh, 1990b, 1992b), the analyses in the present study were conducted with item parcels. The items for each subscale were divided into thirds in a way that the first three items in each subscale were averaged to form the first item parcel, the next three were averaged to form the second item parcel, and the remaining items were averaged to form the third item parcel. There was a total of 33 item parcels formed and therefore, a 33 x 33 covariance for SDQII was constructed for CFA. Using item parcels for analyses has the merits that item parcels are more reliable and valid, more normally distributed and have less idiosyncratic variance than do individual items (Marsh, 1990b; Marsh & O’Neill, 1984). In addition, it is recommended that there should be at least five times as many participants as variables in factor analyses (Tanaka, 1987). Hence, it is more appropriate to use item parcels for analyses compared with individual items since the number of items is large (N = 102) while the sample size is small (N < 250) in the present study.

For tests of the SS-A, the seven items were converged to an a priori 1-factor model. Similar to analyses based upon the SDQII, the correlated uniquenesses among the seven measured variables were constrained to zero. The critical parameter measures need to be reasonable and significant factor loadings of measured variables in one factor. As discussed above, the goodness of model fit is evaluated on the basis of TLI, RNI and RMSEA fit indices.

**Factorial invariance.** CFA of factorial invariance was conducted to examine whether the English version of the SDQII would have an equivalent structure to that of the Chinese version of the SDQII in the present study. Tests of factorial invariance examine the invariance of the solution for these two versions of the SDQII by
requiring any one, any sets or all parameter estimates to be the same in the two versions of the instrument. Traditionally, a hierarchy of invariance constraints is employed. Since invariance of factor loadings is the primary concern (Bentler, 1988; Bollen, 1989; Byrne, 1989; Jöreskog & Sörbom, 1993) and is used as the minimal criterion of factorial invariance, constraining factor loadings to be invariant was the first step of this hierarchy. Then factor correlations, factor variances and factor covariances were added separately and constrained to be invariant, and finally uniquenesses were also constrained (Bentler, 1988; Byrne, 1989; Marsh, Barnes, et al., 1985). Fit indices of TLI, RNI and RMSEA mentioned above were assessed to indicate whether there was support for the invariance of the parameters. If introduction of invariance constraints leads to substantial decline in fit indices when comparing with the model with no invariance constraint, the invariance constraints are not supported. Alternatively, if adding invariance constraints does not lead to substantial decline in fit indices when comparing with the model with no invariance constraint, there is support for the invariance constraints. Hence, in the present investigation, invariance tests of the English and Chinese versions of the SDQII involved assessing the fit indices for a series of models.

**Relation between peer support and self-concept.** CFA was conducted to examine the relation between self-concept as measured by multidimensionality of the SDQII scales and peer support as measured by the SS-A scale, by using the maximum likelihood method with LISREL 8.54 (Jöreskog & Sörbom, 2003). As mentioned previously, the parameters estimated in CFA typically consist of factor loadings of each measured variable on corresponding latent factors, factor variances and covariances, and uniqueness of each measured variable. The goodness of fit of the models was assessed based on evaluations of various fit indices including TLI,
RNI, chi-square test statistics and RMSEA (see discussion above).

In the present study, it was hypothesised that an a priori 12-factor model with factors corresponding to the 11 subscales of the SDQII and 1 subscale for the SS-A. The relation between peer support and self-concept was evaluated by testing the correlation between the peer support factor and multiple facets of self-concept. A positive correlation shows that peer support is associated with positive self-concept. In addition, the size of correlation was compared, to evaluate the hypothesis that peer support has significantly higher positive relation with specific facets of self-concept (Opposite-Sex Relations, Same-Sex Relations, Emotional Stability and General self-concept) compared to other facets of self-concept.

**Methodology Study 3:**

**Australian Academically-Orientated Intervention**

*Participants*

The participants \( n = 35 \) for the Australian academically-orientated intervention component of Study 3 were a subsample of Year 7 students from one of the two Australian schools participating in Study 2. The age of Year 7 students ranged from 11 to 14 \( (M = 12.06, SD = 0.84) \). The sample comprised a total of 19 males (54.3%) and 16 females (45.7%). In addition, there were 16 Year 11 participants, whose age ranged from 15 to 16 \( (M = 15.31, SD = 0.48) \). The Year 11 sample comprised a total of 8 males (50.0%) and 8 females (50.0%). The vast majority (> 90%) of students were Caucasian.
**Research Design**

This study applied an experimental design to study the effect of an academically-orientated peer tutoring intervention on the self-concept of Year 7 tutees. This type of intervention is called cross-age peer tutoring, since it involved the experimental group of Year 7 tutees receiving tutoring on a one-to-one basis, administered by Year 11 tutors. Since the Year 7 tutees were assessed by the school English teacher as in need of remedial work in English lessons, the key tasks for the tutors were to provide academic assistance to tutees with learning materials and assignments, and with clarification and revision of content covered in English lessons. It also allowed the tutees to raise any questions that had arisen from their regular school English lessons.

**Procedures**

Year 7 students participating in the intervention were assessed by the school English teacher as in need of remedial work in English lessons. A sample of 16 Year 11 students who volunteered to serve as peer tutors was recruited in the intervention by the teacher-in-charge of student welfare. Year 7 students \((n = 35)\) participating in Study 2 were randomly assigned to either an experimental group \((n = 16)\) or control group \((n = 19)\).

Prior to implementing the intervention, the tutors were required to attend one training session for a period of 80 minutes. The training session was conducted by the teacher-in-charge of student welfare. The teacher-in-charge explained the nature of the tutoring, the rationale behind the tutoring, the role of tutor, and the importance
of the establishment of rules. The teacher-in-charge also taught the tutors some tutoring techniques including: Teaching tutors how to pause to give tutees opportunity to self-correct their answers, how to prompt with clues when tutees made errors, and how to praise tutees’ correct responses and avoid criticism. Besides the training session, there were regular weekly consultations on a group basis between the teacher-in-charge and the tutors, to discuss issues that arose in the tutoring sessions. And each tutoring session was closely monitored by the teacher-in-charge.

The author discussed with the teacher-in-charge the content of training prior to the training session and the content of the whole course of tutoring intervention. In addition, the author talked informally with both Year 7 tutees and Year 11 tutors after the conclusion of the intervention, to elucidate their perceptions of the strengths and limitations of the intervention. However, since the focus of the present investigation is to collect quantitative data for statistical analyses rather than a qualitative study, and these discussions were informal no qualitative data were collected. To ensure treatment fidelity, the author also engaged in ten observations of all tutoring sessions to check whether the tutors applied the tutoring techniques properly and provided appropriate assistance to the tutees. The author also liaised with the teacher-in-charge biweekly to check the progress (such as interactions between tutors and tutees, dedication of tutors/tutees) and to see whether there were any problems and difficulties (such as frequent absenteeism and dropout) encountered during the intervention. As mentioned previously, the progress of the intervention was monitored by the teacher-in-charge in weekly meetings with the tutors, where tutors’s questions were answered and corrective feedback on tutoring procedures was provided.
The SDQII and SS-A measures administered in Study 2 served as the pretest measure (Time 1). This measure was administered one week prior to implementation of the intervention during Term 1 of the school year. The tutoring intervention was administered over a period of one school term (9 weeks). Peer tutoring took place in the library during the lunch break as a supplement for the normal classroom instruction. Tutoring sessions comprised 20 minutes per day and 4 days per week for 9 weeks.

At the end of Term 1 (Time 2), the posttest measures of the SDQII and SS-A were administered to participants in the school hall. Again, the teacher-in-charge read aloud the instructions and questions to the participants, and participants completed the questionnaire silently in their seats. Other teachers also assisted by circulating to answer any questions raised by the participants, and collected the completed questionnaires.

**Independent and Dependent Variables**

The independent variables were the peer tutoring intervention and the gender of Year 7 participants. Dependent variables were multiple self-concept facets (including Opposite-Sex Relations, Same-Sex Relations, Parent Relations, Honesty-Trustworthiness, Emotional Stability, Physical Appearance, Physical Ability, Verbal, Mathematics, General School self-concept and General self-concept) measured by the SDQII and peer support as measured by the SS-A.
Data Analysis

Initial analyses comprised a series of t-tests to test for pre-test differences between the experimental and control groups in order to examine whether the random assignment was successful. A series of repeated measures of Multivariate Analysis of Variance (MANOVA) were conducted to examine the effect of peer support intervention on the different facets of self-concept and peer support respectively. The independent variables include between-subject variables and within-subject variables. Time (Time 1 and Time 2) was the within-subject factor whilst the peer tutoring intervention group (experimental group or control group) and gender (male and female) were the between-subject factors, whereas different facets of self-concept and peer support were the dependent variables.

Methodology Study 4: Australian Socially-Orientated Intervention

Participants

The participants \((n = 114)\) for the Australian socially-orientated peer support intervention component of Study 4 were a subsample of Year 7 students from another Australian school participating in Study 2. The age of Year 7 students ranged from 11 to 13 \((M = 11.89, SD = 0.45)\). The sample comprised a total of 41 males (36.0%) and 73 females (64.0%). In addition, there were 8, Year 11 participants whose age ranged from 15 to 17 \((M = 15.88, SD = 0.64)\). The Year 11 sample comprised a total of 2 males (25.0%) and 6 females (75.0%). The vast majority (> 90%) of students were Caucasian.
**Research Design**

This study applied an experimental design to study the effect of a socially-orientated peer support intervention on the self-concept of Year 7 students. The experimental group of Year 7 students received the socially-orientated peer support intervention administered by Year 11 students. Each session was structured to cover a specific theme designed to promote social and interpersonal relationship skills (see Table 5.2).

**Table 5.2 Outline of Each Peer Support Intervention Session**

<table>
<thead>
<tr>
<th>Intervention Session</th>
<th>Name of Activity</th>
<th>Activity Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Getting to know you</td>
<td>To help participants learn about each other, begin new friendships and establish group rules</td>
</tr>
<tr>
<td>2</td>
<td>Listening and communication</td>
<td>To improve listening and communication skills</td>
</tr>
<tr>
<td>3</td>
<td>Working together</td>
<td>To promote co-operation among members</td>
</tr>
<tr>
<td>4</td>
<td>Assertiveness</td>
<td>To stand up for one’s rights without being aggressive and deal with pressure in a positive way</td>
</tr>
<tr>
<td>5</td>
<td>Peer pressure</td>
<td>To deal with negative peer pressure</td>
</tr>
<tr>
<td>6</td>
<td>Self-awareness</td>
<td>To improve one’s self-worth</td>
</tr>
<tr>
<td>7</td>
<td>What is a friend</td>
<td>To discover the qualities of friendship</td>
</tr>
<tr>
<td>8</td>
<td>Group decision making</td>
<td>To learn how to work as a group in making a decision</td>
</tr>
<tr>
<td>9</td>
<td>Winding up</td>
<td>To consolidate the sessions</td>
</tr>
</tbody>
</table>
Procedures

There were pastoral care groups for Year 7 students in the school. Each pastoral care group consisted of a group of 6 to 8, Year 7 students. All students from these pastoral care groups were involved in the study. These pastoral care groups were randomly divided into experimental and control groups by the teacher-in-charge of student welfare. Each peer support group was led by one Year 11 student, who volunteered to serve as group leader and was recruited in the intervention by the teacher-in-charge of student welfare.

Prior to implementing the intervention, the Year 11 group leaders were required to attend two training sessions each for a period of 80 minutes. The training sessions were conducted by the teacher-in-charge. The teacher-in-charge explained the nature of and rationale behind the peer support intervention, the role of group leader and the importance of establishing group rules and norms. The teacher-in-charge also provided an overview of the content of the peer support intervention. Group leaders were also taught some group leading techniques including: How to establish rapport at the beginning of the intervention, how to promote group cohesion by building up trust, cooperation and communication among group members, how to lead the intervention activity, and how to encourage group members to share their opinions and feelings. Lastly, the group leaders role-played all the intervention activities and discussed how to implement the activities effectively. In addition to the training sessions, there were regular weekly consultations on a group basis between the teacher-in-charge and the group leaders to discuss any issues that arose in each session.
The author discussed with the teacher-in-charge the content of training prior to the training session and the content of the whole course of peer support intervention. In addition, the author talked with both the Year 7 group members and Year 11 group leaders after the conclusion of the intervention to elucidate their perceptions of the strengths and weaknesses of the intervention. Five observations were also made by the author during tutoring sessions to check if the group leaders followed the procedures and covered the content when conducting the intervention activities. The author also discussed biweekly with the teacher-in-charge to check the progress (such as topics covered, interactions between leader and group members and group cohesion) and to see whether there were any problems and difficulties (such as discipline and dropouts) encountered during the intervention. The progress of the intervention was monitored by the teacher-in-charge and she was available for answering leaders’s questions and giving corrective feedback to leaders.

The SDQII and SS-A measures administered in Study 2 served as the pretest measure (Time 1). This measure was administered one week prior to implementation of the interventions during Term 1 of the school year. The peer support intervention was administered over a period of 9 weeks. The peer support intervention took place in the classroom or activity hall during the first and second lessons. Each session comprised a period of 35 to 40 minutes per week for a period of 9 weeks. Each group leader was given a Leader’s Guide which was compiled by the teacher-in-charge and contained detailed instructions for each activity (see Appendix C1-C9). The program activities have been run successfully in this school for several years.

At the end of Term 1 (Time 2), the posttest measures of the SDQII and SS-A were administered to participants in the school hall. Again, the vice-principal read
aloud the instructions and questions to the participants and participants completed
the questionnaire silently in their seats. The author assisted by circulating and
collecting the questionnaires, and answered questions raised by the participants.

Independent and Dependent Variables

The independent variables were the peer support group intervention and gender
of the Year 7 participants. Dependent variables were multiple self-concept facets
(including Opposite-Sex Relations, Same-Sex Relations, Parent Relations,
Honesty-Trustworthiness, Emotional Stability, Physical Appearance, Physical Ability,
Verbal, Mathematics, General School self-concept and General self-concept)
measured by the SDQII, and peer support measured by SS-A.

Data Analysis

Initial analyses comprised a series of t-tests to test for pre-test differences
between the experimental and control groups in order to examine whether the
random assignment was successful. A series of repeated measure MANOVAs were
conducted to examine the effect of peer support intervention on the different facets
of self-concept. The independent variables included between-subject variables and
within-subject variables. Peer support intervention group (experimental group and
control group) and gender (male and female) were between-subject factors, and time
(Time 1 and Time 2) was the within-subject factor, whereas different facets of
self-concept and peer support were the dependent variables.
Methodology Study 5:
Hong Kong Socially-Orientated Intervention

Participants

The participants for the final component of Study 5 ($N = 40$) were Year 7 students from a Hong Kong secondary school. Their age ranged from 12 to 15 ($M = 13.10$, $SD = 0.81$). The sample comprised a total of 22 males (55.0%) and 18 females (45.0%). In addition, there were 3, Year 11 participants whose age ranged from 16 to 17 ($M = 16.67$, $SD = 0.58$). The sample comprised a total of 1 male (33.3%) and 2 females (66.7%). All participants were Chinese.

Research Design

This study was designed to replicate the second component of Study 4 in that the socially-orientated intervention was conducted in an Eastern context, with Chinese participants instead of Australian participants. Hence, the research design is the same as that for Australian participants. However, unlike the study with Australian participants, a follow-up administration of instrumentation took place 4 months after the intervention concluded to enable the examination of maintenance effects.

Procedures

Year 7 students ($N = 40$) were selected and randomly assigned to either an experimental group ($n = 21$) or control group ($n = 19$). These students came from the
same class and were recommended to participate in the intervention by the class teacher on the basis that they needed to improve social and interpersonal relationship skills. A sample of 3, Year 11 students who volunteered to serve as peer leaders was recruited in the intervention by the guidance teacher.

Prior to implementing the intervention, the group leaders were required to attend two training sessions each for a period of 80 minutes. The training sessions for group leaders followed the same procedures as for the study with Australian participants. In addition, monitoring of the implementation of the intervention by the author was undertaken utilising the same procedures as for the study with Australian participants.

The pretest measure (Time 1) of the Chinese version of the SDQII was administered to the Year 7 participants one week prior to implementation of the intervention during Term 1 of the school year. The peer support intervention was administered over a period of 9 weeks. The peer support intervention took place in the activity hall during the lunch break. Since the content of intervention is the same as for the Australian study, each session comprised a period of 35 to 40 minutes per week for a period of 9 weeks.

At the end of Term 1 (Time 2), the posttest measure of the Chinese version of the SDQII was administered to participants. In order to study the maintenance effect of the intervention, a follow-up posttest measure of SDQII (Time 3) was also undertaken at the middle of Term 2 (4 months after the intervention). In each administration of the measure, the guidance teacher read aloud the instructions and questions to the participants and participants completed the questionnaire silently in
their seats in the activity hall. The author assisted by circulating and collecting the questionnaires, and answered questions raised by the participants.

Data Analysis

Data analysis procedures were the same as those described in the parallel study with Australian participants. Initial analyses involved a series of t-tests for pre-test differences between the experimental and control groups, in order to examine whether the random assignment was successful. A series of repeated measure MANOVAs were conducted to examine the effect of the peer support intervention on the different facets of self-concept measured by the Chinese version of the SDQII. The independent variables included between-subject variables and within-subject variables. Peer support intervention group (experimental group and control group) and gender (male and female) were between-subject factors, and time (Time 1, Time 2 and Time 3) the within-subject factor, whereas different facets of self-concept were the dependent variables.

Unlike the parallel intervention with Australian students, a follow-up administration of the Chinese version of the SDQII took place 4 months after the intervention (Time 3) to examine maintenance effects of the intervention. The three levels of the within-subject effect of time (Time 1, Time 2, and Time 3) were used to construct two orthogonal (single degree-of freedom) contrasts: I (Time 1 versus the average of Time 2 and Time 3); II (Time 2 versus Time 3). Thus, Contrast I examines whether there was an effect of the intervention, whereas Contrast II evaluates whether this effect of the intervention increased or decreased over the follow-up period following the intervention.
Summary

This chapter provided an overview of the methodology involved in evaluating the hypotheses and research question presented in Chapter 4. Five complementary research studies were designed to test fully the hypotheses and research questions posed. These studies comprised a meta-analysis of the effects of academically-orientated peer tutoring interventions, an academically-orientated peer support intervention conducted in Australia, and a socially-orientated peer support intervention conducted in both Australia and China. Pretests and posttests utilised to evaluate the effects of the interventions were designed to ensure strong statistical tools could be employed to investigate the effects of two different types of peer support interventions. Instrumentation with demonstrated psychometric properties was utilised. Hence, a strong research methodology was employed to address some of the limitations of previous research.
CHAPTER 6

STUDY 1 RESULTS:
A META-ANALYSIS OF THE IMPACT OF
ACADEMICALLY-ORIENTATED PEER TUTORING
INTERVENTIONS ON ACADEMIC OUTCOMES AND
SELF-CONCEPT OF TUTEE

Introduction

This chapter presents the results of a meta-analysis investigation into the impact of academically-orientated peer tutoring interventions on academic outcomes and self-concept of tutees. Results are presented in the order and context of the hypotheses and research questions posed in Chapter 4. First, the distribution of effect sizes is examined. Demographic features of students and descriptive results of the methodological, intervention and outcome variables are presented. Then the effect size analyses are assessed. Specifically, the overall effectiveness of academically-orientated peer tutoring on academic achievement and self-concept of tutees is evaluated. Moderator variables and their predictive ability on the effectiveness of academically-orientated peer tutoring on academic achievement and self-concept of tutees are identified. Finally, implications for the design of
academically-orientated peer tutoring in Study 3 in the present investigation are discussed.

**Results:**

**Profile of Effect Size and Descriptive Features of Academically-Orientated Peer Tutoring Interventions of Tutee**

*Profile of Effect Size*

There were 67 studies yielding a total of 179 effect sizes, with 150 effect sizes for achievement of tutees and 29 effect sizes for self-concept of tutees. Some of these studies reported findings separately for different subgroups (e.g., elementary and secondary level), different treatment groups or multiple outcome measures; they would contribute more than one effect size for these studies. Since independent samples were the primary unit of analysis, each study contributed one independent sample to the analysis in general, and one effect size on achievement was calculated (see Chapter 5 for details). Hence, analyses at the effect size unit of analysis entail 150 effect sizes for achievement, whereas at the independent samples unit of analysis 66 effect sizes for achievement were used.

By using the shifting unit of analysis approach (see Chapter 5 for details), each study with self-concept as an outcome measure was treated as an independent sample for examining the effect of academically-orientated peer tutoring on self-concept of tutees. Therefore, there were 5 independent samples for self-concept since out of these 5 studies, with 4 reported both self-concept and achievement, and 1 reported only self-concept. Analyses at the effect size unit of analysis for self-concept entail
Examining the distribution of the unweighted effect size to reveal any outliers was important. Outliers were defined as those effect sizes that were more than three interquartile ranges beyond the 75th percentile (called positive outliers) or more than three interquartile ranges below the 25th percentile (called negative outliers), based on Tukey’s definition (Tukey, 1977). These outliers were winsorised by setting their values to three interquartile ranges beyond the 75th percentile for positive outliers and below the 25th percentile for negative outliers. This procedure reduced the undue impact of these outliers on the subsequent effect size analyses but their large size was still accounted for (Tabachnick & Fidell, 2001; Durlak & Lipsey, 1991). For achievement in the present investigation, 4 positive effect sizes from 2 studies met this criterion and were considered as outliers. These effect sizes were winsorised by setting their values to three interquartile ranges beyond the 75th percentile. After winsorising these 4 extreme effect sizes, the unweighted mean effect size for the 150 effect size for academic achievement was 0.70 (SD = 0.88). Using the 66 independent samples as the unit of analysis, the unweighted mean effect size was 0.83 (SD = 0.84). Regarding self-concept, there were no outliers and the unweighted mean effect size for the 29 effect sizes was 0.58 (SD = 0.71). Using the 5 independent samples as the unit of analysis, the unweighted mean effect size was 0.82 (SD = 0.49).

Examining the distribution of the sample size for checking outliers was necessary, since weighting of effect size was based on sample size and hence, extremely large sample sizes would have an undue effect on the findings. A total of 2
studies for achievement and 1 study for self-concept met the criteria as outliers. These samples were winsorised by setting their values to three interquartile ranges beyond the 75th percentile. After winsorising these extreme sample sizes, the average sample size for the present investigation for academic achievement was 59.00 (SD = 50.05). Regarding the self-concept, the average sample size was 26.35 (SD = 16.16).

Since studies with large sample sizes provide more reliable estimations of population effect size, each effect size was weighted by the inverse of their variance (Cooper & Hedges, 1994; Hedges & Olkin, 1985). This weighting procedure gave greater weight to studies with larger sample sizes and smaller weight to those with smaller sample sizes. Hence, it provided more efficient estimation of true population effect size. The weighted effect size for each study was obtained by multiplying unweighted effect size with weight calculated. The weighted average effect size was obtained by summing all the weighted effect sizes and dividing this sum by the sum of the weights. The weighted mean effect size for independent samples in the present investigation for achievement was 0.69. Regarding self-concept, the weighted mean effect size was 0.71.

Demographic Characteristics of Students

Most of the studies (85.0%, n = 57) came from 1980-1999. All the studies reported the grade level of the tutees ranging from kindergarten to university. A total of 74.6% of the studies (n = 50) engaged tutees in elementary grade, 14.9% (n = 10) of the studies engaged tutees in secondary school grade, and only a few studies engaged tutees in kindergarten grade (3.0%, n = 2) or in college or university grade (7.5%, n = 5).
A similar pattern was found for the tutors since most of the studies (74.6%, \( n = 50 \)) adopted same-age peer tutoring. Even in cross-age peer tutoring, the education level of tutor and tutee belongs to the same category of education level, except three studies. Hence, there was a very high correlation (.96, \( p < .001 \)) between education level of tutor and tutee. All the studies reported the grade level of the tutors ranging from kindergarten to university. A total of 70.1% \( (n = 47) \) of the studies engaged tutors in elementary grade, 17.9% \( (n = 12) \) of the studies engaged tutors in secondary school grades, only a few studies engaged tutees in kindergarten (3.0%, \( n = 2 \)) and 7.5% \( (n = 5) \) were in college or university. In addition, one study engaged tutors from both elementary and college levels.

Most of the studies reported the range of age of tutee (74.6%, \( n = 50 \)) and tutors (76.1%, \( n = 51 \)). However, only 40.3% \( (n = 27) \) of the studies reported the age of tutee, whereas 44.8% \( (n = 30) \) of the studies reported the age of tutor. The mean age of tutees was 11.57 \( (SD = 6.16) \) and of tutors was 12.07 \( (SD = 5.93) \). Since most of the studies (74.6%, \( n = 50 \)) adopted same-age peer tutoring, the mean age of tutor and tutee was similar.

A total of 40.3% \( (n = 27) \) of the studies reported the SES of participants. 22.4% \( (n = 15) \) of the studies included participants of low SES, 17.9% \( (n = 12) \) of the studies with mixed SES, and none of the studies reported participants having middle or high SES. Regarding the ethnicity of participants, 34.3% \( (n = 23) \) of the studies reported the ethnicity of participants. Some 17.9% \( (n = 12) \) of the studies included Caucasian participants, 14.9% \( (n = 10) \) of the studies Afro-American participants and 1.5% \( (n = 1) \) of the studies Hispanic participants.
A total of 74.6% \((n = 50)\) of the studies reported the academic ability of the tutees. Also 44.7% \((n = 30)\) of the studies engaged tutees of low ability, 29.9% \((n = 20)\) tutees with mixed ability and none of the studies characterised tutees as having average ability or high ability. For tutors, a similar pattern was found, since most of the studies \((74.6\%, n = 50)\) adopted same-age peer tutoring, as mentioned previously. Hence, there was a very high correlation \((.88, p < .001)\) between academic ability of tutor and tutee. A total of 73.1\% \((n = 49)\) of the studies reported the academic ability of the tutors. 41.7\% \((n = 28)\) of the studies included tutors of low ability and 29.9\% \((n = 20)\) tutors with mixed ability. Only 1.5\% \((n = 1)\) of the studies included tutors with high ability and none of the studies included tutors with average ability.

The mean number of tutees was 57.63 \((SD = 60.92)\), ranging from 4 to 282, whereas the mean number of tutors was 56.43 \((SD = 61.63)\), ranging from 3 to 282. A total of 41.8\% \((n = 28)\) of the studies reported the gender of tutee. There were 60.9\% males and 39.1\% females. Similarly, a total of 41.8\% \((n = 28)\) of the studies reported the gender of tutor. There were 59.5\% males and 40.5\% females.

**Characteristics of Methodology Parameters**

As mentioned above, 74.6\% of the studies \((n = 50)\) were same-age peer tutoring, 20.9\% \((n = 14)\) adopted cross-age peer tutoring and only 3 studies \((4.5\%)\) implemented a mixed mode of peer tutoring. Most of the studies \((86.6\%, n = 58)\) were monitored or led by a teacher and only a few studies \((13.4\%, n = 9)\) were monitored by other people (e.g., research assistant). While most of the studies \((97.0\%, n = 65)\) did not involve parents, only two studies engaged parents in the intervention. A total of 77.6\% \((n = 52)\) of the studies adopted structured tutoring,
only a few studies (17.9%, \( n = 12 \)) did not and three studies implemented both structured and unstructured tutoring. A fidelity check of the intervention was reported for 68.7% \( (n = 46) \) of the studies. A total of 62.7% \( (n = 42) \) of the studies controlled for author bias, by using standardised tests, 34.3% \( (n = 23) \) of studies did not, and two studies adopted both standardised and unstandardised tests. Regarding the control for instructor bias, by using same instructor for treatment and control groups, 13.4% \( (n = 9) \) of the studies controlled for instructor bias and 59.7% \( (n = 40) \) of studies did not.

Regarding tutor training, most of the studies (85.1%, \( n = 57 \)) reported that there was training. Also, most of the studies (77.6%, \( n = 52 \)) did not use tutoring as a substitute for the original classroom instruction.

Most of the studies (73.1%, \( n = 49 \)) adopted either a control group or a comparison group. For those with comparison or control group, 6.0% \( (n = 4) \) of the studies adopted an equivalent comparison group, 16.3% \( (n = 11) \) used a non-equivalent comparison group, 23.9% \( (n = 16) \) randomly assigned individuals to control and experimental groups, 23.9% \( (n = 16) \) randomly assigned participants to control and experimental groups based upon a group or class basis and 3% \( (n = 2) \) adopted two types of assignment of participants, whereas none of the studies used a matched-subject design.

**Characteristics of Intervention Parameters**

A total of 80.6% \( (n = 54) \) of the studies reported duration of tutoring with an average of 16.17 weeks \( (SD = 17.99) \). For intervention setting, most of the studies
(92.5%, n = 62) reported the data. In addition, 70.1% (n = 47) reported that the intervention took place during school lessons, 19.4% (n = 13) took place in non-classroom periods (e.g., lunch time), whereas only one study (1.5%) took place after school and one study (1.5%) during a mixture of school lesson and other school periods.

**Characteristics of Outcome Parameters**

For achievement, most of the studies (38.8%, n = 26) conducted an intervention targeting reading, followed by mathematics (25.4%, n = 17) and other subjects (e.g., spelling, writing, education; 26.9%, n = 18). There were two studies conducted that targeted intervention on both mathematics and reading, one study targeted mathematics and other subjects and, two studies targeted mathematics, reading and other subjects.

For self-concept, similar to academic achievement, none of the 5 studies adopted a construct validity approach (see Chapter 3) in studying the effect of academically-orientated peer tutoring. Regarding the self-concept measurement instrument, 25% (n = 1) of the studies used a unidimensional scale created by the researcher and 75% (n = 4) of the studies used Harter’s Self-Perception Profile for Children multidimensional scale.

Regarding the data derived for calculating effect size, most of the studies (73.1%, n = 49) were derived from treatment-control posttest mean difference or treatment-control gain score and only 18 studies (26.9%) were derived from pretest-posttest-change score without control group.
Results Hypothesis 1.1:
The Overall Post-Intervention Impact of Academically-Orientated Peer Tutoring Interventions on Tutee Academic Achievement

Overview

Hypothesis 1.1 predicted that academically-orientated peer tutoring intervention will impact positively on academic achievement outcomes relevant to the goals of the intervention and that this would be demonstrated by a positive effect size of these interventions upon academic achievement (see Chapter 4). In order to test this hypothesis, a meta-analysis synthesising previous research of peer tutoring in a more comprehensive way, adopting current methodological advances was undertaken (see Chapter 6 for detailed methodology).

Results: Effect Size Analysis

Since independent samples were the primary unit of analysis, only one overall effect size was calculated for that study by averaging these effect sizes (see Chapter 5). Using the 66 independent samples as the unit of analysis, the unweighted mean effect size was 0.83 ($SD = 0.84$). For overall academic achievement, the weighted mean effect size was 0.69 ($n = 66$, $p < .001$, 95% confidence interval [CI] = 0.63 – 0.75). Since the CI did not include zero, the effect size was significantly different from zero at the 5 percent level of significance. The positive effect size denoted that there was a greater improvement for treatment groups in comparison to control groups. Regarding the magnitude of effect size, on the basis of Lipsey and Wilson’s
(1993) classification it was high in magnitude. This suggested that peer tutoring had a high positive effect on academic achievement.

Summary

The overall positive effect size supports the a priori hypothesis that academically-orientated peer tutoring had a positive impact on academic achievement.

Results Research Question 2.1:

Homogeneity Analyses Showing Constructs that Moderate the Impact of Academically-Orientated Peer Tutoring Interventions on Tutee Academic Achievement

Overview

To examine whether the effect sizes for achievement would be moderated by certain variables (see Chapter 4), homogeneity analyses were conducted to assess the moderators regarding the participant parameters, methodology parameters and intervention parameters and outcome parameters. Homogeneity was examined by using the $Q$ statistic, which has a distribution similar to chi-square with $k-1$ degrees of freedom where $k$ is the number of effect sizes (Hedges & Olkin, 1985; see Chapter 5 for details).
**Results: Analysis of Significant Moderators of Effect Size**

*Participants features.* In essence, education level of tutee ($Q_B = 32.93, p < .001$) and tutor ($Q_B = 34.59, p < .001$) and ethnicity ($Q_B = 4.23, p < .05$) were all significant moderators of achievement outcome. In studies with tutees or tutors from secondary school, participants of Caucasian ethnicity displayed larger effect sizes in comparison to those of other education levels and ethnicities (see Table 6.1). It was noted that a similar pattern of distribution of effect sizes was found for education levels of tutee and tutor since most of the studies (74.6%, $n = 50$) adopted same-age peer tutoring. Even in cross-age peer tutoring, the education level of tutor and tutee belongs to the same category, except three studies as mentioned previously.

However, academic ability of tutee ($Q_B = 1.37, p > .05$) and tutor ($Q_B = 2.27, p > .05$), and SES of participants ($Q_B = 0.40, p > .05$) were not significant moderators of effect size, such that tutee and tutor of different academic abilities, and participants of different SES displayed similar effect sizes.
Table 6.1 Homogeneity Analyses and Mean Effect Size for Possible Participant Parameters as Moderators for Tutee Achievement (k = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$k$</th>
<th>$Q_B$</th>
<th>$Q_W$</th>
<th>Mean Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education level of tutee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>2</td>
<td>1.70</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>49</td>
<td>289.16***</td>
<td>0.66***</td>
<td></td>
</tr>
<tr>
<td>Secondary school</td>
<td>10</td>
<td>95.57***</td>
<td>1.11***</td>
<td></td>
</tr>
<tr>
<td>College or University</td>
<td>5</td>
<td>16.94***</td>
<td>0.35**</td>
<td></td>
</tr>
<tr>
<td>Education level of tutor $^a$</td>
<td></td>
<td>34.59***</td>
<td>0.70***</td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>2</td>
<td>1.70</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>46</td>
<td>279.41***</td>
<td>0.66***</td>
<td></td>
</tr>
<tr>
<td>Secondary school</td>
<td>12</td>
<td>101.32***</td>
<td>1.11***</td>
<td></td>
</tr>
<tr>
<td>College or University</td>
<td>5</td>
<td>16.94***</td>
<td>0.35**</td>
<td></td>
</tr>
<tr>
<td>(mixed level $k = 1$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity (Main proportion) of participants $^a$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>12</td>
<td>4.23*</td>
<td>120.77***</td>
<td>0.76***</td>
</tr>
<tr>
<td>Afro-American</td>
<td>10</td>
<td></td>
<td>26.29**</td>
<td>0.57***</td>
</tr>
<tr>
<td>(unspecified group $k = 43$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Non-significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic ability of tutee $^a$</td>
<td></td>
<td>1.37</td>
<td>0.62***</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>30</td>
<td>167.18***</td>
<td>0.66***</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>20</td>
<td>73.34***</td>
<td>0.57***</td>
<td></td>
</tr>
<tr>
<td>(unspecified group $k = 16$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic ability of tutor $^a$</td>
<td></td>
<td>2.27</td>
<td>0.64***</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>28</td>
<td>160.46***</td>
<td>0.69***</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>20</td>
<td>72.46***</td>
<td>0.57***</td>
<td></td>
</tr>
<tr>
<td>(unspecified group $k = 17$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SES of participants $^a$</td>
<td></td>
<td>0.40</td>
<td>0.70***</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>15</td>
<td>123.82***</td>
<td>0.72***</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>12</td>
<td>101.79***</td>
<td>0.66***</td>
<td></td>
</tr>
<tr>
<td>(unspecified group $k = 39$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. A significant $Q_B$ indicates a significant moderator whereas a non-significant $Q_W$ shows that the variable can be grouped into homogenous subgroups. $k = \text{number of effect sizes.}$

$^a$ These categories include unspecified groups or subcategories which have df equal to 0. For this reason, the overall value of $k$ for the test of this moderator variable is smaller than the total number of independent samples (i.e., 66). This also explains why the overall mean effect size for these variables is different from the mean of 0.69 reported elsewhere.

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

Methodology parameters. Type of peer tutoring ($Q_B = 6.22$, $p < .05$), involvement of teacher ($Q_B = 4.88$, $p < .05$) structured tutoring ($Q_B = 21.02$, $p < .001$), nature of test administered for controlling author bias ($Q_B = 57.42$, $p < .001$), training to tutor ($Q_B = 16.01$, $p < .001$), substitution to classroom instruction ($Q_B = \ldots$)
66.49, \( p < .001 \) and adoption of random assignment \( (Q_B = 9.12, \ p < .01) \) were all significant moderators of achievement outcome. More specifically, same-age reciprocal peer tutoring displayed larger effect sizes when compared with same-age non-reciprocal peer tutoring and cross-age peer tutoring; involvement of teacher displayed larger effect sizes when compared with no involvement of teacher; adoption of structured tutoring displayed larger effect sizes when compared with adoption of unstructured tutoring; use of unstandardised test displayed larger effect sizes when compared with using standardised test for controlling author bias; provision of tutor training displayed larger effect sizes when compared with non-provision of tutor training; non-use of tutoring as substitute for classroom instruction displayed larger effect sizes when compared with using peer tutoring as a substitute for regular classroom instruction; and adoption of random assignment displayed larger effect sizes when compared with adopting non-random assignment (see Table 6.2).

However, adoption of fidelity check \( (Q_B = 3.25, \ p > .05) \) and control for instructor bias by using same instructor for treatment and control group \( (Q_B = 0.61, \ p > .05) \) were not significant moderators of effect size, such that similar effect sizes were found whether there was adoption of fidelity check or not; and whether same instructor was engaged for treatment and control groups for controlling instructor bias or not.

**Intervention parameters.** Both duration of tutoring \( (Q_B = 2.89, \ p > .05) \) and intervention setting \( (Q_B = 2.78, \ p > .05) \) were not significant moderators of effect size, such that all groups displayed similar effect sizes within a particular category. (see Table 6.3).
### Table 6.2 Homogeneity Analyses and Mean Effect Size for Possible Methodology Parameters as Moderators for Tutee Achievement (*k* = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th><em>k</em></th>
<th><em>Q_b</em></th>
<th><em>Q_w</em></th>
<th>Mean Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of peer tutoring b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-age peer tutoring</td>
<td>16</td>
<td>70.62***</td>
<td>0.52***</td>
<td>0.68***</td>
</tr>
<tr>
<td>Same-age reciprocal peer tutoring</td>
<td>38</td>
<td>306.23***</td>
<td>0.73***</td>
<td></td>
</tr>
<tr>
<td>Same-age non-reciprocal peer tutoring</td>
<td>15</td>
<td>64.65***</td>
<td>0.62***</td>
<td></td>
</tr>
<tr>
<td>Involvement of teacher (teacher-led or monitor)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58</td>
<td>428.25***</td>
<td>0.70***</td>
<td>0.69***</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>3.17</td>
<td>0.57***</td>
<td></td>
</tr>
<tr>
<td>Structured tutoring b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54</td>
<td>380.44***</td>
<td>0.75***</td>
<td>0.67***</td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>56.16***</td>
<td>0.43***</td>
<td></td>
</tr>
<tr>
<td>Control for author bias b (standardised test used)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44</td>
<td>202.48***</td>
<td>0.50***</td>
<td>0.67***</td>
</tr>
<tr>
<td>No</td>
<td>24</td>
<td>193.18***</td>
<td>1.00***</td>
<td></td>
</tr>
<tr>
<td>Tutor training</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>56</td>
<td>361.59***</td>
<td>0.76***</td>
<td>0.69***</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>30.14***</td>
<td>0.45***</td>
<td></td>
</tr>
<tr>
<td>Substitute to classroom instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15</td>
<td>26.83*</td>
<td>0.26***</td>
<td>0.69***</td>
</tr>
<tr>
<td>No</td>
<td>51</td>
<td>342.98***</td>
<td>0.84***</td>
<td></td>
</tr>
<tr>
<td>Random assignment b c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33</td>
<td>74.91***</td>
<td>0.49***</td>
<td>0.40***</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>50.55***</td>
<td>0.26***</td>
<td></td>
</tr>
<tr>
<td>(no control group <em>k</em> = 18)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Non-significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fidelity check</td>
<td>3.25</td>
<td>353.49***</td>
<td>0.72***</td>
<td>0.69***</td>
</tr>
<tr>
<td>Yes</td>
<td>46</td>
<td></td>
<td>0.72***</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>79.56***</td>
<td>0.59***</td>
<td></td>
</tr>
<tr>
<td>Control for instructor bias b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(same instructor for treatment and control group)</td>
<td>0.61</td>
<td></td>
<td>0.42***</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>8.56</td>
<td>0.50***</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>94.10***</td>
<td>0.41***</td>
<td></td>
</tr>
<tr>
<td>(no control group <em>k</em> = 18)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** A significant *Q_b* indicates a significant moderator whereas a non-significant *Q_w* shows that the variable can be grouped into homogenous subgroups. *k* = number of effect sizes.

b Some individual samples contributed effect sizes to more than one group of this moderator variable (see discussion of “Unit of Analysis” in methodology in Chapter 5 for details). For this reason, the overall value of *k* for the test of this moderator variable is greater than the total number of independent samples (i.e., 66). This also explains why the overall mean effect size for these variables is different from the mean of 0.69 reported elsewhere.

c These categories exclude those without control groups, which are not applicable for the analysis. For this reason, the overall value of *k* for the test of this moderator variable is smaller than the total number of independent samples (i.e., 66). This also explains why the overall mean effect size for these variables (e.g., control for instructor bias) is different from the mean of 0.69 reported elsewhere.

*p* < .05.  **p** < .01.  ***p*** < .001.
Table 6.3 Homogeneity Analyses and Mean Effect Size for Possible Intervention Parameters as Moderators for Tutee Achievement (k = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th>k</th>
<th>$Q_k$</th>
<th>$Q_w$</th>
<th>Mean Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-significant Moderator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of tutoring * (number of week)</td>
<td>2.89</td>
<td>0.70***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 12 weeks</td>
<td>27</td>
<td>143.55***</td>
<td>0.62***</td>
<td></td>
</tr>
<tr>
<td>&gt; 12 weeks</td>
<td>26</td>
<td>232.36***</td>
<td>0.74***</td>
<td></td>
</tr>
<tr>
<td>(median = 12 weeks;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unspecified group k = 13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention setting *</td>
<td>2.78</td>
<td>0.72***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>During school lesson</td>
<td>46</td>
<td>362.83***</td>
<td>0.73***</td>
<td></td>
</tr>
<tr>
<td>Non-classroom period</td>
<td>13</td>
<td>35.45**</td>
<td>0.56***</td>
<td></td>
</tr>
<tr>
<td>(unspecified group k = 5;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>after school k = 1; mixed setting k = 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. A significant $Q_k$ indicates a significant moderator whereas a non-significant $Q_w$ shows that the variable can be grouped into homogenous subgroups. $k$ = number of effect sizes.

* These categories include unspecified groups or subcategories which have df equal to 0. For this reason, the overall value of k for the test of this moderator variable is smaller than the total number of independent samples (i.e., 66). This also explains why the overall mean effect size for these variables is different from the mean of 0.69 reported elsewhere.

**p < .01. ***p < .001.

Outcome parameters. Subject content (QB = 19.59, p < .001) and data type for calculating effect size (QB = 139.44, p < .001) were all significant moderators of achievement outcome. In particular, use of other subjects (i.e., spelling, writing, language, physical education, psychology, education, science, history, geography and conglomerate test) and use of pretest-posttest change scores for calculating effect sizes displayed larger effect sizes in comparison to other groups within the particular category (see Table 6.4).
Table 6.4  Homogeneity Analyses and Mean Effect Size for Possible Outcome Parameters as Moderators for Tutee Achievement (k = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$k$</th>
<th>$Q_B$</th>
<th>$Q_W$</th>
<th>Mean Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target subject matter on achievement $^b$</td>
<td>19.59***</td>
<td>66.60***</td>
<td>104.40***</td>
<td>306.45***</td>
</tr>
<tr>
<td>Mathematics</td>
<td>22</td>
<td>66.60***</td>
<td>104.40***</td>
<td>306.45***</td>
</tr>
<tr>
<td>Reading</td>
<td>30</td>
<td>104.40***</td>
<td>306.45***</td>
<td>306.45***</td>
</tr>
<tr>
<td>Data derived for calculation of effect size</td>
<td>139.44***</td>
<td>64.80**</td>
<td>15.39*</td>
<td>216.67***</td>
</tr>
<tr>
<td>Treatment-control posttest mean difference</td>
<td>39</td>
<td>64.80**</td>
<td>15.39*</td>
<td>216.67***</td>
</tr>
<tr>
<td>Treatment-control gain score</td>
<td>9</td>
<td>15.39*</td>
<td></td>
<td>216.67***</td>
</tr>
<tr>
<td>Pretest-posttest change score</td>
<td>18</td>
<td>216.67***</td>
<td></td>
<td>216.67***</td>
</tr>
</tbody>
</table>

Note. A significant $Q_B$ indicates a significant moderator whereas a non-significant $Q_W$ shows that the variable can be grouped into homogenous subgroups.

$k$ = number of effect sizes.

$^b$ Some individual samples contributed effect sizes to more than one group of this moderator variable (see discussion of "Unit of Analysis" in methodology in Chapter 5 for details). For this reason, the overall value of $k$ for the test of this moderator variable is greater than the total number of independent samples (i.e., 66). This also explains why the overall mean effect size for these variables is different from the mean of 0.69 reported elsewhere.

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

**Summary.** Results showed that the effect of academically-orientated peer tutoring on academic achievement was moderated by certain variables. In essence, regarding the participant parameters, education level of tutee and tutor, and ethnicity of participants were all significant moderators of achievement outcome. For the methodology parameters, type of peer tutoring, involvement of teacher, adoption of structured tutoring, nature of test administered, training to tutor, substitution to classroom instruction and adoption of random assignment were all significant moderators of achievement outcome. For the intervention outcome parameters, subject content and data type for calculating effect size were all significant moderators of achievement outcome. However, SES of participants, academic ability of tutee and tutor, fidelity check, control for instructor bias by using same instructor
for treatment and control group, duration of tutoring and intervention setting were not significant moderators of effect size.

**Results Research Question 2.2:**
Regression Analyses Showing Constructs that Predict the Impact of Academically-Orientated Peer Tutoring Interventions on Tutee Academic Achievement

*Overview*

Although homogeneity analyses were conducted to assess the moderators for each category, these analyses did not evaluate the predictive ability of these moderator variables within each category. Hence, regression analyses were conducted to assess which of the moderators within each category can predict the effect size of achievement (see Chapter 5 for details).

*Results (i): Regression Analysis of Possible Predictors among Significant Moderators of Tutee Academic Achievement*

*Participants features.* As mentioned previously, education level of tutee and tutor, and ethnicity of participants were all significant moderators of achievement outcome of tutees. All the subcategories based on the ethnicity of participants were found to be positive significant predictors, such that Caucasian participants had the greatest unstandardised beta ($B$) coefficient. The values of the unstandardised beta coefficient were in the following descending order: 0.758 for Caucasian participants and 0.568 for Afro-American participants.
However, for the other category, only some subcategories were found to be positive significant predictors: tutee from elementary ($B = 0.656$), secondary school ($B = 1.108$) and college or university level ($B = 0.348$) such that tutees from secondary school had the greatest unstandardised beta coefficient; tutor from elementary ($B = 0.657$), secondary school ($B = 1.100$) and college or university level ($B = 0.339$) such that tutors from secondary school participants had the greatest unstandardised beta coefficient (see Table 6.5). It was noted that there is a similar pattern of predictive ability of each moderator for education level of tutee and tutor, as explained in the preceding section.

**Methodology parameters.** As mentioned previously, type of peer tutoring, involvement of teacher, structured tutoring, nature of test administered, training to tutor, substitution to classroom instruction and adoption of random assignment were all significant moderators of achievement outcome. Involvement of teacher ($B = 0.730$), adoption of structured tutoring ($B = 0.755$), provision of tutor training ($B = 0.756$) and random assignment ($B = 0.494$) were positive significant predictors, and had the greater unstandardised beta coefficient when compared with no involvement of teacher, adoption of unstructured tutoring, non-provision of tutor training and adopting non-random assignment. But using standardised test ($B = 0.505$) and using peer tutoring as a substitute for regular classroom instruction ($B = 0.255$) had smaller unstandardised beta coefficients when compared with using unstandardised tests for controlling author bias and using peer tutoring as a supplement for regular classroom instruction even though they were positive significant predictors (see Table 6.6). However, cross-age peer tutoring and same-age reciprocal peer tutoring were not significant predictors as compared with same-age non-reciprocal peer tutoring.
**Outcome parameters.** As mentioned previously, subject content and data type for calculating effect sizes were all significant moderators of achievement outcome. And all the subcategories in these categories were found to be positive significant predictors (see Table 6.7) such that using treatment-control posttest mean difference \((B = 0.322)\) and treatment-control gain score \((B = 0.788)\) had smaller unstandardised beta coefficients as compared with pretest-posttest change score \((B = 1.114)\); reading \((B = 0.608)\) and mathematics \((B = 0.453)\) had smaller unstandardised beta coefficients as compared with other subjects \((B = 0.773)\).

<table>
<thead>
<tr>
<th>Variable</th>
<th>(k)</th>
<th>(B)</th>
<th>(\beta)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level of tutee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>2</td>
<td>0.071 (0.419)</td>
<td>.013</td>
<td>ns</td>
</tr>
<tr>
<td>Elementary</td>
<td>49</td>
<td>0.308 (0.656)</td>
<td>.191</td>
<td>.050</td>
</tr>
<tr>
<td>Secondary</td>
<td>10</td>
<td>0.760 (1.108)</td>
<td>.393</td>
<td>.001</td>
</tr>
<tr>
<td>College or University (omitted category)</td>
<td>5</td>
<td>0.348</td>
<td>.000</td>
<td>.010</td>
</tr>
<tr>
<td>Education level of tutor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>2</td>
<td>0.079 (0.418)</td>
<td>.013</td>
<td>ns</td>
</tr>
<tr>
<td>Elementary</td>
<td>46</td>
<td>0.318 (0.657)</td>
<td>.204</td>
<td>.001</td>
</tr>
<tr>
<td>Secondary</td>
<td>12</td>
<td>0.771 (1.100)</td>
<td>.382</td>
<td>.001</td>
</tr>
<tr>
<td>College or University (omitted category)</td>
<td>5</td>
<td>0.339</td>
<td>.005</td>
<td>.010</td>
</tr>
<tr>
<td>Ethnicity (Main Proportion) of participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>12</td>
<td>0.190 (0.758)</td>
<td>.167</td>
<td>.050</td>
</tr>
<tr>
<td>Afro-American (omitted category)</td>
<td>10</td>
<td>0.568</td>
<td>.000</td>
<td>.001</td>
</tr>
</tbody>
</table>

*Note.* These categories were coded with dummy coding (see J. Cohen & Cohen, 1983) and the beta weights of these categories were interpreted in relation to the omitted category. Hence, the actual unstandardised beta weight for each of these categories is the sum of the beta weights of each of these categories and the omitted category. For example, actual unstandardised beta weight for the “secondary level of tutee” is 0.760 (the unstandardised beta weight) + 0.348 (the “constant” term in the unstandardised regression equation that represents the omitted category) = 1.108.

\(k\) = number of effect sizes.
### Table 6.6  Weighted Standard Multiple Regression Analysis for Possible Methodology Parameters as Moderators for Predicting Peer Tutoring Effectiveness in Tutee Achievement (k = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th>k</th>
<th>B</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of peer tutoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-age peer tutoring</td>
<td>16</td>
<td>-0.103 (0.515)</td>
<td>-.051 ns</td>
<td></td>
</tr>
<tr>
<td>Same-age peer reciprocal tutoring</td>
<td>38</td>
<td>0.114 (0.732)</td>
<td>.086 ns</td>
<td></td>
</tr>
<tr>
<td>Same-age peer non-reciprocal tutoring (omitted category)</td>
<td>15</td>
<td>0.618</td>
<td>.000</td>
<td>.001</td>
</tr>
<tr>
<td>Involvement of teacher</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58</td>
<td>0.255 (0.730)</td>
<td>.106</td>
<td>.050</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>8</td>
<td>0.475</td>
<td>.000</td>
<td>.001</td>
</tr>
<tr>
<td>Structured tutoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54</td>
<td>0.324 (0.755)</td>
<td>.214</td>
<td>.001</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>15</td>
<td>0.431</td>
<td>.000</td>
<td>.001</td>
</tr>
<tr>
<td>Control for author bias</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44</td>
<td>-0.492 (0.505)</td>
<td>-.356</td>
<td>.001</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>24</td>
<td>0.997</td>
<td>.000</td>
<td>.001</td>
</tr>
<tr>
<td>Tutor training</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>56</td>
<td>0.308 (0.756)</td>
<td>.192</td>
<td>.001</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>10</td>
<td>0.448</td>
<td>.000</td>
<td>.001</td>
</tr>
<tr>
<td>Substitute to classroom instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15</td>
<td>-0.585 (0.255)</td>
<td>-.390</td>
<td>.001</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>51</td>
<td>0.840</td>
<td>.000</td>
<td>.001</td>
</tr>
<tr>
<td>Random assignment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33</td>
<td>0.232 (0.494)</td>
<td>.260</td>
<td>.010</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>17</td>
<td>0.262</td>
<td>.000</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note. These categories were coded with dummy coding (see J. Cohen & Cohen, 1983) and the beta weights of these categories were interpreted in relation to the omitted category. Hence, the actual unstandardised beta weight for each of these categories is the sum of the beta weights of each of these categories and the omitted category. For example, the actual unstandardised beta weight for the “tutor training” is 0.308 (the unstandardised beta weight) + 0.448 (the “constant” term in the unstandardised regression equation that represents the omitted category) = 0.756.

k = number of effect sizes.
### Table 6.7  Weighted Standard Multiple Regression Analysis for Possible Outcome Parameters as Moderators for Predicting Peer Tutoring Effectiveness in Tutee Achievement (k = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th>k</th>
<th>B</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target subject matter on achievement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>22</td>
<td>-0.320 (.453)</td>
<td>-.209</td>
<td>.001</td>
</tr>
<tr>
<td>Reading</td>
<td>30</td>
<td>-0.165 (.608)</td>
<td>-.112</td>
<td>.050</td>
</tr>
<tr>
<td>Other Subject (omitted category; includes: Spelling, Writing, Language, Physical Education, Psychology, Education, Science, History, Geography and Conglomerate test)</td>
<td>21</td>
<td>0.773</td>
<td>.000</td>
<td>.010</td>
</tr>
<tr>
<td>Data derived for calculation of effect size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment-control posttest mean difference</td>
<td>39</td>
<td>-0.792 (.322)</td>
<td>-.607</td>
<td>.001</td>
</tr>
<tr>
<td>Treatment-control gain score</td>
<td>9</td>
<td>-0.326 (.788)</td>
<td>-.169</td>
<td>.001</td>
</tr>
<tr>
<td>Pretest-posttest change score (omitted category)</td>
<td>18</td>
<td>1.114</td>
<td>.000</td>
<td>.001</td>
</tr>
</tbody>
</table>

**Note.** These categories were coded with dummy coding (see J. Cohen & Cohen, 1983) and the beta weights of these categories were interpreted in relation to the omitted category. Hence, the actual unstandardised beta weight for each of these categories is the sum of the beta weights of each of these categories and the omitted category. For example, the actual unstandardised beta weight for the “treatment-control posttest mean difference” is -0.792 (the unstandardised beta weight) + 1.114 (the “constant” term in the unstandardised regression equation that represents the omitted category) = 0.322.

$k = \text{number of effect sizes.}$

**Summary.** When each category of the participant parameters was separately estimated in regression analyses, participants from elementary, secondary school and college or university level were found to be positive significant predictors, and participants from secondary school participants had the greater predictive ability compared with other groups within the same category. In addition, participants from Caucasian ethnicity had greater predictive ability compared with those of Afro-American ethnicity.

Regarding the methodology parameters, teacher involvement, structured tutoring, nature of test administered for controlling author bias, training of tutors, substitution for classroom instruction, and adoption of random assignment were
found to be positive significant predictors. Involvement of teacher, adoption of structured tutoring, not using standardised tests for controlling author bias, provision of tutor training, not using peer tutoring as a substitute for regular classroom instruction, and having random assignment, had greater effect when compared with no involvement of teacher, adoption of unstructured tutoring, using standardised tests for controlling author bias, non-provision of tutor training, using peer tutoring as a substitute for regular classroom instruction, and adopting non-random assignment. Regarding the intervention outcome parameters, subject content and data type for calculating effect size were found to be positive significant predictors such that using treatment-control posttest mean differences and treatment-control gain scores had smaller predictive ability as compared with pretest-posttest change score; reading and mathematics had smaller predictive ability as compared with other subjects.

**Results(ii): All-Inclusive Multiple Regression Analysis on Significant Predictors of Tutee Achievement**

As mentioned in Chapter 5, a backward procedure was used to compare predictive power among the significant predictors. All significant predictors (as determined in the regression analyses) were entered into the weighted regression model, then variables that were not significantly predictive of the model were removed sequentially until a final model comprising all significant predictors was found. In the final all-inclusive model (see Table 6.8), a significant $Q_r$ (207.78, $p < .001$) was found and it indicated that 48% variance of effect sizes were explained by the model. The final model comprises the following variables: engaging secondary students and Caucasians as tutees, provision of structured tutoring and using mathematics as a tutored subject displayed greater predictive ability, whereas
having control for author bias by using standardised tests, using tutoring as a substitute for classroom instruction, deriving data from treatment-control posttest mean difference or treatment-control gain score displayed smaller predictive ability than other predictors and intercept in the model. Since $Q_E (228.51, p < .001)$ is significant, it suggests that the effect sizes of the predictors in the final model were heterogenous and varied across studies – even after controlling for these study characteristics.

### Table 6.8 All-Inclusive Backwards Deletion Weighted Multiple Regression for All Parameters for Predicting Peer Tutoring Effectiveness in Tutee Achievement

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.899</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Secondary level of tutee</td>
<td>0.564 (1.463)</td>
<td>.292</td>
<td>.000</td>
</tr>
<tr>
<td>Caucasian</td>
<td>0.212 (1.111)</td>
<td>.142</td>
<td>.010</td>
</tr>
<tr>
<td>Structured tutoring</td>
<td>0.265 (1.164)</td>
<td>.178</td>
<td>.010</td>
</tr>
<tr>
<td>Control for author bias</td>
<td>-0.248 (0.651)</td>
<td>-.181</td>
<td>.000</td>
</tr>
<tr>
<td>Substitute to classroom instruction</td>
<td>-0.294 (0.605)</td>
<td>-.196</td>
<td>.000</td>
</tr>
<tr>
<td>Mathematics</td>
<td>0.307 (1.106)</td>
<td>.191</td>
<td>.000</td>
</tr>
<tr>
<td>Treatment-control posttest mean difference</td>
<td>-0.619 (0.280)</td>
<td>-.474</td>
<td>.000</td>
</tr>
<tr>
<td>Treatment-control gain score</td>
<td>-0.471 (0.428)</td>
<td>-.245</td>
<td>.000</td>
</tr>
</tbody>
</table>

*Note.* Since education level of tutee was strongly confounded with education level of tutor, only education level of tutee was included in the model.

**Summary.** When all the predictors were examined in a single all-inclusive model, only the following variables were included in the final model: engaging secondary and Caucasian students as tutees, adoption of structured tutoring and using mathematics as the tutoring subject displayed greater predictive ability, whereas using standardised tests for controlling author bias, using peer tutoring as a substitute for regular classroom instruction, using treatment-control posttest mean
difference and treatment-control gain score for calculating effect size displayed smaller predictive ability as compared with the intercept and the other predictors in the model.

Results Hypothesis 3.1:
The Overall Post-Intervention Impact of Academically-Orientated Peer Tutoring Interventions on Tutee Self-Concept

Overview

Hypothesis 3.1 predicted that academically-orientated peer tutoring intervention would impact positively on self-concept as demonstrated by a positive moderate effect size of these interventions upon self-concept.

Results: Effect Size Analyses

Using the 5 independent samples as the unit of analysis, the unweighted mean effect size was 0.82 (SD = 0.49) whereas the weighted mean effect size was 0.71 (n = 5, p < .001, 95% CI = 0.46 – 0.96). Since the confidence interval did not include zero, the effect size was significantly different from zero at the 5 percent level of significance. The positive effect size denotes that there was a greater improvement of self-concept for treatment groups over control groups. Regarding the magnitude of the effect size, on the basis of Lipsey and Wilson’s (1993) classification, it was high. This suggested that peer tutoring had a positive large effect on self-concept.
Summary

The overall positive effect size supports the a priori hypothesis that academically-orientated peer tutoring had positive impact on self-concept.

Results Hypothesis 4.1:
The Effect of Matching between Nature of Intervention (Academically-Orientated Peer Tutoring Intervention in the Present Meta-Analysis) and Self-Concept Outcome Measures on Tutee Self-Concept

Overview

Hypothesis 4.1 predicted that effect sizes will be larger for those interventions using multidimensional self-concept measures than unidimensional or global measures.

Results: Effect Size Analyses

The weighted mean effect size for using a multidimensional self-concept scale was 1.05 ($k = 4, p < .001, 95\% \text{ CI} = 0.68—1.43$) and 0.43 ($k = 1, p < .010, 95\% \text{ CI} = 0.09—0.77$) for using unidimensional self-concept. However, homogeneity analyses could not be conducted since the $df$ for using unidimensional self-concept is zero (i.e. there was only a single study doing so).
Summary

In sum, the a priori hypothesis that effect sizes based on scores from multidimensional instruments would yield a higher weighted mean effect size than those based on unidimensional instruments, was demonstrated.

Results Hypothesis 5.1:
The Post-Intervention Impact of Academically-Orientated Peer Tutoring Interventions on Target and Non-Target Self-Concepts of Tutee

Overview

Hypothesis 5.1 predicted that the construct validity approach to the study of intervention effects would be supported in that effect sizes would be systematically larger for components of self-concept most logically related to academically-orientated interventions and smaller for components of self-concept not targeted by the intervention.

Results: Effect Size Analyses

For the intervention’s goal on self-concept domain, the weighted mean effect size for target self-concept was 0.84 ($k = 9, p < .001, 95\% \ CI = 0.64 - 1.05$), and 0.14 ($k = 3, p > .05, 95\% \ CI = -0.43 - 0.71$) for non-target self-concepts. Homogeneity analyses showed that the focus of the intervention was a significant
moderator of effect size ($Q_B = 5.15, p < .050$). Hence, the results indicated that the effect sizes for target and non-target self-concept was significantly different. Regression analysis showed that target self-concept was a positive significant predictor of effect size whereas nontarget self-concept was not. The value of the unstandardised beta ($B$) coefficient for target self-concept was 0.842 ($p < .05$).

Summary

In sum, the a priori hypothesis that there was greater effect of the peer tutoring on target self-concept than non-target self-concept was supported.

Results Research Question 6.1:

Homogeneity Analyses Showing Constructs that Moderate the Impact of Academically-Orientated Peer Tutoring Interventions on Tutee Self-Concept

Overview

To assess whether the effect sizes for self-concept would be moderated by moderating variables (see Chapter 4), homogeneity analyses were conducted to assess the moderators regarding the participant parameters, methodology parameters, intervention parameters and intervention outcome parameters.
Results: Analysis of Significant Moderators of Effect Size

Since the sample size is too small, homogeneity analyses were conducted for only a few category variables and it was revealed that only a few variables were significant moderators of self-concept.

Methodology and Intervention Parameters

Involvement of teacher ($Q_B = 8.67, p < .01$), adoption of fidelity check ($Q_B = 5.14, p < .05$) and random assignment ($Q_B = 9.15, p < .01$) were all significant moderators of self-concept outcome, such that involvement of teacher, adoption of fidelity check and random assignment displayed larger effect sizes in comparison to no involvement of teacher, no adoption of fidelity check and non-random assignment (see Table 6.9).

However, it was found that using peer tutoring as substitute to classroom instruction ($Q_B = 0.11, p > .05$) and duration of tutoring ($Q_B = 0.30, p > .05$) were not significant moderators (see Table 6.10).
<table>
<thead>
<tr>
<th>Variable</th>
<th>$k$</th>
<th>$Q_B$</th>
<th>$Q_W$</th>
<th>Mean Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement of teacher</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>0.01</td>
<td>1.29**</td>
<td>0.71***</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>1.36</td>
<td>0.47***</td>
<td></td>
</tr>
<tr>
<td>Fidelity check</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>3.84</td>
<td>1.10***</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>1.06</td>
<td>0.50**</td>
<td></td>
</tr>
<tr>
<td>Random assignment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>0.18</td>
<td>1.20***</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>0.71</td>
<td>0.41**</td>
<td></td>
</tr>
<tr>
<td><strong>Non-significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substitute to classroom instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>1.11</td>
<td>0.61</td>
<td>0.71***</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>8.82</td>
<td>0.73***</td>
<td></td>
</tr>
</tbody>
</table>

Note. A significant $Q_B$ indicates a significant moderator whereas a non-significant $Q_W$ shows that the variable can be grouped into homogenous subgroups.

$k$ = number of effect sizes.

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

---

**Table 6.10 Homogeneity Analyses and Mean Effect Size for Possible Intervention Parameters as Moderators for Self-Concept of Tutee (k = 5)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$k$</th>
<th>$Q_B$</th>
<th>$Q_W$</th>
<th>Mean Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-significant Moderator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of tutoring (number of weeks)</td>
<td>0.30</td>
<td></td>
<td></td>
<td>0.71***</td>
</tr>
<tr>
<td>≤ 7 weeks</td>
<td>2</td>
<td>5.93*</td>
<td>0.63***</td>
<td></td>
</tr>
<tr>
<td>&gt; 7 weeks</td>
<td>3</td>
<td>3.04</td>
<td>0.92***</td>
<td></td>
</tr>
<tr>
<td>(median = 7 weeks)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. A significant $Q_B$ indicates a significant moderator whereas a non-significant $Q_W$ shows that the variable can be grouped into homogenous subgroups.

$k$ = number of effect sizes.

* $p < .05$  *** $p < .001$. 

---
Summary

Results showed that the effect of academically-orientated peer tutoring on self-concept was moderated by certain variables was supported. In essence, involvement of teacher, the use of fidelity checks and adoption of random assignment were all significant moderators of self-concept outcome. However, it was found that using peer tutoring as substitute to classroom instruction, and duration of intervention were not significant moderators.

Results Research Question 6.2:
Regression Analyses Showing Constructs that Predict the Impact of Academically-Orientated Peer Tutoring Interventions on Tutee Self-Concept

Overview

Since homogeneity analyses did not evaluate the predictive ability of these moderator variables, regression analyses were conducted to assess which of the moderators can predict the effect size of self-concept (see Chapter 5 for details).

Results(i): Regression Analysis of Possible Predictors among Significant Moderators of Self-Concept of Tutee

Methodology parameters. As mentioned previously, involvement of teacher, fidelity check and adoption of random assignment were all significant moderators of self-concept outcome such that involvement of teacher \((B = 1.292)\) and adoption of
fidelity check ($B = 1.098$) and random assignment ($B = 1.195$) were significant positive predictors and displayed greater unstandardised beta ($B$) coefficients in comparison to no involvement of teacher, no adoption of fidelity check and non-random assignment (see Table 6.11).

### Table 6.11 Weighted Standard Multiple Regression Analysis for Possible Methodology Parameters as Moderators for Predicting Peer Tutoring Effectiveness in Self-Concept of Tutee ($k = 5$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$k$</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement of teacher</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>0.821 (1.292)</td>
<td>.929</td>
<td>.010</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>3</td>
<td>0.471</td>
<td>.000</td>
<td>.010</td>
</tr>
<tr>
<td>Fidelity check</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>0.601 (1.098)</td>
<td>.716</td>
<td>.050</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>2</td>
<td>0.497</td>
<td>.000</td>
<td>.010</td>
</tr>
<tr>
<td>Random assignment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>0.788 (1.195)</td>
<td>.955</td>
<td>.010</td>
</tr>
<tr>
<td>No (omitted category)</td>
<td>2</td>
<td>0.407</td>
<td>.000</td>
<td>.010</td>
</tr>
</tbody>
</table>

Note. These categories were coded with dummy coding (see J. Cohen & Cohen, 1983) and the beta weights of these categories were interpreted in relation to the omitted category. Hence, the actual unstandardised beta weight for each of these categories is the sum of the beta weights of each of these categories and the omitted category. For example, the actual unstandardised beta weight for the “involvement of teacher” is 0.821 (the unstandardised beta weight) + 0.471 (the “constant” term in the unstandardised regression equation that represents the omitted category) = 1.292.

$k = number of effect sizes.$

### Results(ii): All-Inclusive Multiple Regression Analysis on Significant Predictors of Tutee Self-Concept

As mentioned in Chapter 5, a backward procedure was used to compare predictive power among the significant predictors. All significant predictors (as determined in the regression analyses) were entered into the weighted regression model, then variables that were not significantly predictive of the model were removed sequentially until a final model comprising all significant predictors was
found. In the final all-inclusive model (see Table 6.12), a significant $Q_R$ (9.15, $p < .001$) was found and it indicated that 91% variance of effect sizes was explained by the model. The final model comprises adoption of random assignment as a positive predictor. It indicated that adoption of random assignment displayed larger predictive ability as compared with other predictors and intercept in the model. Since $Q_E$ (0.89, $p > .05$) is non-significant, it suggests that the effect sizes of the predictors in the final model were homogenous and did not vary across studies. Although this is an important finding, interpretations of this result should be tempered by the small number of studies that were considered.

**Table 6.12 All-Inclusive Backwards Deletion Weighted Multiple Regression for All Parameters for Predicting Peer Tutoring Effectiveness in Self-Concept of Tutee**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.407</td>
<td>0.000</td>
<td>0.010</td>
</tr>
<tr>
<td>Random assignment</td>
<td>0.788 (1.195)</td>
<td>.955</td>
<td>.010</td>
</tr>
</tbody>
</table>

**Summary**

When each parameter was estimated separately in regression analyses, involvement of teacher, adoption of fidelity check and random assignment were significant positive predictors such that involvement of teacher had greater predictive ability than those not involving teacher, adoption of fidelity check had greater predictive ability than not adopting fidelity check and random assignment had greater predictive ability than nonrandom assignment.

However, only adoption of random assignment was found to be a positive
predictor in the final all-inclusive model, compared with other predictors and intercepts in the model.

**Implications for the Present Investigation**

Since the present investigation examines the effect of academically-orientated peer tutoring on self-concept in Study 3, the meta-analysis conducted above has implications on the research design and methodology of these peer support interventions. However, caution should be taken when interpreting the implications from self-concept outcome since the sample size is small. Hence, the results obtained were tentative and exploratory in nature. The implications from self-concept outcomes were cross-referenced or supplemented with those from achievement outcomes, which were more comprehensive, with a larger sample size. However, the implications from self-concept outcomes are particularly important for this thesis, as this is the outcome to be examined in Study 3 in the present investigation.

**Implication 1**

1. It is clear that academically-orientated peer tutoring has a positive impact on academic outcomes, as demonstrated by the positive large effect size of these interventions upon academic achievement. In addition, unlike the findings in previous meta-analyses, academically-orientated peer tutoring has a positive impact on self-concept, as demonstrated by the positive large effect size of these interventions upon self-concept. Hence, it is reasonable to expect the academically-orientated peer tutoring in Study 3 to have a positive large impact on self-concept.
2. It is appropriate to adopt a multidimensional self-concept scale in the academically-orientated peer tutoring in Study 3 in the present investigation, since effect sizes based on scores from multidimensional instruments yielded a higher weighted mean effect size than those based on unidimensional instruments.

3. The construct validity approach to the study of intervention effects was supported in that effect sizes were systematically larger for target self-concept most logically related to academically-orientated interventions and smaller for non-target self-concepts.

In sum, on the basis of construct validity approach, it is reasonable to expect the academically-orientated peer tutoring in Study 3 has a positive impact mainly on academic self-concept as measured with a multidimensional self-concept scale. Similarly, it is reasonable to expect the socially-orientated peer tutoring in Study 4 and 5 has positive impact mainly on non-academic self-concept, as measured with the multidimensional self-concept scale.

**Implication 2**

Regarding the student characteristics, the following findings only came from achievement outcomes since there were no significant moderators associated with student characteristics for the effect size of self-concept:

1. Participants from Caucasian ethnicity produced greater effect size and displayed greater positive predictive ability than Afro-American.
2. participants (tutee or tutor) from elementary, secondary school produced greater effect sizes and displayed greater positive predictive ability than college or university level participants.

Regarding the methodology parameters,

1. involvement of teacher produced greater effect size and displayed greater positive predictive ability than no involvement of teacher for effect size for both self-concept and achievement.

2. using fidelity checks produced greater effect sizes and displayed greater positive predictive ability than studies without adoption of fidelity check for effect size of self-concept (also see Vadasy, Jenkins, Antil, Wayne, & O’Connor, 1997).

3. adoption of random assignment produced greater effect size and displayed greater positive predictive ability than no random assignment for effect size of self-concept as well as achievement. This suggests the possibility that without random assignment, less able students might have been assigned to the intervention group rather than to the control group. Although such a strategy might be appropriate on the basis of some decision parameters (e.g., need), such a strategy would compromise the interpretation of results.

4. because using peer tutoring as a substitute for regular classroom instruction had a negative effect on achievement, even though it had no effect on self-concept, this design feature of some interventions is not supported, since
peer tutoring should supplement and add to regular teaching, not substitute for, or detract from it.

5. the following findings only came from achievement outcomes:
   i. structured tutoring produced greater effect sizes and displayed greater positive predictive ability than unstructured tutoring for achievement.
   ii. provision of tutor training produced greater effect sizes and displayed greater positive predictive ability than no training for achievement.
   iii. not using standardised test produced greater effect sizes and displayed greater positive predictive ability than using standardised tests for achievement. However, adoption of a psychometrically sound instrument is important in the present investigation (see Chapter 3 for details), so it is important to use standardised tests. Although previous research also revealed that using an unstandardised test produced greater effect sizes than using standardised tests (e.g., P. A. Cohen et al, 1982; Cook et al., 1985), the results based on unstandardised tests need to be interpreted cautiously as they might be constructed (by design or inadvertently) to measure characteristics that are idiosyncratic to the particular intervention and that are not reflective of more general measures of achievement. Hence it is recommended that studies use both standardised and study-specific measures of achievement (particularly when study-specific measures are used). If significant differences between these two measures are found, then researchers should carefully consider what aspects of the study-specific tests cause this difference and offer appropriate interpretations of these results in terms of construct validity, potential bias, generalisability, and implications.
iv. since control for instructor bias was not a significant moderator, there was no significant difference whether the same teacher for treatment and control group was engaged or not.

Regarding the intervention parameters,

1. since intervention duration was not a significant moderator, there was no significant difference for the effect size of self-concept whether the intervention lasted for less than or equal to 7 weeks, or greater than 7 weeks. Similarly, there was no significant difference for the effect size of achievement whether the intervention lasted for less than or equal to 12 weeks, or greater than 12 weeks. Hence, there was no significant difference for the effect size of self-concept and achievement, whether duration of tutoring was short or long.

2. the following finding only came from achievement outcomes:

   since intervention setting was not a significant moderator for the effect size of achievement, there was no significant difference whether tutoring was held during school lessons or not (although it is important that peer tutoring should not be used as a substitute for regular classroom instruction).

   Regarding the outcome parameters, the following findings only came from achievement outcomes since there was no significant moderator for the effect size of self-concept:

1. reading and other subjects produced a greater effect size and displayed greater positive predictive ability for achievement than mathematics.
2. Using pretest-posttest change scores produced greater effect sizes than treatment-control posttest mean difference and treatment-control gain scores. All data types for calculating effect size were significant predictors for effect size of achievement, such that using pretest-posttest change scores displayed greater positive predictive ability. Although previous meta-analyses on peer tutoring have not examined this moderator, Cooper et al. (2000) revealed that using pretest-posttest change score produced greater effect size (weighted $ES = 0.24$) than treatment-control posttest mean difference (weighted $ES = 0.07$) in 93 evaluations of summer school interventions in America. However, in order to have rigorous intervention design, it is important to engage appropriate control groups. Hence, treatment-control posttest mean difference or gain scores were used for calculating the effect size in the present investigation in addition to the appropriate use of control groups.

**Implication 3**

1. As seen from the final all-inclusive model for self-concept, adoption of random assignment will be a stronger positive predictor compared with other predictors and intercepts in the model.

2. As seen from the final all-inclusive model for achievement, engaging secondary and Caucasian students as tutees and adoption of structured tutoring, will be stronger positive predictors compared with other predictors and intercepts in the model. In contrast, using tutoring as a substitute to classroom instruction, using standardised tests for controlling author bias and using treatment-control posttest mean difference and treatment-control gain scores
for calculating effect size will be weaker positive predictors compared with other predictors and intercepts in the model. However, for the reason of the importance of adopting a psychometrically sound instrument (see Chapter 3 for details), using standardised tests is preferable in the present investigation. Also, for the reason of maintaining rigorous design, control groups will still be adopted and hence data for calculating effect size will be derived from treatment-control posttest mean difference or gain scores, combining the strengths of these alternative design strategies. Regarding the subject content, mathematics will be a stronger predictor than other predictors and intercepts found in the final model. However, as mentioned previously, the subject content will not be considered in Study 3, since it examined self-concept instead of achievement as intervention outcome in the present investigation.

Overall speaking, in order to keep rigorous experimental design with adopting psychometrically sound instruments when enhancing the effectiveness of the academically-orientated peer tutoring intervention on self-concept in Study 3, the following considerations were taken:

1. Adoption of multidimensional self-concept scale and construct validity approach that incorporates both target and nontarget self-concept facets.

2. Regarding the student characteristics, the following determinants for effective interventions will be incorporated into the intervention:
   - engaging participants (tutee or tutor) from secondary school;
   - engaging Caucasian participants tends to produce larger effects although it is important to test the generalisability of these results in
studies not conducted in North America that have been the basis of most previous research.

3. Regarding the methodology parameters, the following determinants for effective interventions will be incorporated into the intervention:

- involvement of teacher;
- use of fidelity check;
- adoption of random assignment;
- structured peer tutoring;
- provision of tutor training;
- not using peer tutoring as a substitute for regular classroom instruction; and
- use of standardised tests (due to the need for adopting a psychometrically sound instrument even though it produced smaller effects compared with unstandardised tests).

4. Regarding the outcome parameters, the following determinants for effective interventions will be incorporated into the intervention:

- calculation of effect size from treatment-control posttest mean difference or treatment-control gain score (due to the need for keeping rigorous intervention design by incorporating control group).
Summary

This chapter has presented the results for Study 1, which aimed to conduct a meta-analysis to elucidate the impact of academically-orientated peer support interventions on self-concept and academic outcomes. The positive impact of academically-orientated peer support interventions on multiple domains of self-concept and academic outcomes relevant to the goals of the intervention was identified in the context of a construct validity approach to the study of intervention effects. Importantly, characteristics of effective academically-orientated peer support interventions have been identified. These characteristics served to inform the development of a researcher-devised academically-orientated peer support intervention (Study 3). In the next chapter the psychometric properties of the instrumentation employed to test the impact of a suite of researcher-devised peer support interventions are evaluated.
CHAPTER 7

STUDY 2 RESULTS:
THE STRUCTURE AND CROSS-CULTURAL VALIDITY
OF SELF-CONCEPT MULTIDIMENSIONAL MEASURE,
AND THE STRUCTURE OF THE SOCIAL SUPPORT
MEASURE AND ITS RELATION WITH
SELF-CONCEPT

Introduction

In order to improve intervention evaluations, it is critical that researchers utilise sound instrumentation (Zaslow & Takanishi, 1993). This study was specifically designed to address these needs and to advance current research practice by identifying and evaluating the psychometric properties of a self-concept and peer support measurement instrument for use with secondary school students. The purpose of this chapter is to test the hypotheses for Study 2 (see Chapter 4) in order to (a) Test the psychometric properties of the instrumentation utilised in the present study; and (b) evaluate the relation between peer support and multiple dimensions of
Results Hypothesis 1.1:
Psychometric Properties of the SDQII (English Version)

Overview

Hypothesis 1.1 posed that the English version of the SDQII will be a reliable and valid measure of self-concepts, as demonstrated by reasonable reliability and confirmation of the a priori 11-factor structure of this instrument (see Chapter 4). A series of reliability analyses and CFA were undertaken to test this hypothesis (see Chapter 5). Extensive research findings have shown that the reliability, factor structure and construct validity are established in the SDQII test manual (Marsh, 1992b). In this section, the reliability and construct validity of the SDQII (English version) utilised in the present study were evaluated with reference to the normative data reported in the manual.

Reliability of the SDQII (English Version)

The reliability for each self-concept scale measured by the SDQII (English version) is reported in the SDQII manual (see Table 7.1). The coefficient alpha estimates of reliability for the normative archive for each scale ranged from .83 to .91, with a median of .87. A series of reliability analyses were undertaken to calculate the reliability of each self-concept scale measured by the SDQII (English version) in the present study (see Table 7.1). Coefficient alpha estimates of reliability
for each scale were reasonable (see Table 7.1) and similar to those reported in the SDQII manual (Marsh, 1992b) in that coefficient alphas ranged from .82 to .93 and all are greater than .80, with median of .86 (see Table 7.1). These results offer support for Hypothesis 1.1 in regard to the reliability of the SDQII (English version) self-concept scales.

Table 7.1  Reliability of the SDQII Subscales (English Version)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Participants (N = 244)</th>
<th>Normative data (N = 5,494)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phy</td>
<td>.84</td>
<td>.85</td>
</tr>
<tr>
<td>Appr</td>
<td>.90</td>
<td>.91</td>
</tr>
<tr>
<td>Osex</td>
<td>.90</td>
<td>.90</td>
</tr>
<tr>
<td>Ssex</td>
<td>.82</td>
<td>.86</td>
</tr>
<tr>
<td>Hons</td>
<td>.83</td>
<td>.84</td>
</tr>
<tr>
<td>Prnt</td>
<td>.86</td>
<td>.87</td>
</tr>
<tr>
<td>Emot</td>
<td>.83</td>
<td>.83</td>
</tr>
<tr>
<td>Genl</td>
<td>.86</td>
<td>.88</td>
</tr>
<tr>
<td>Math</td>
<td>.93</td>
<td>.90</td>
</tr>
<tr>
<td>Verb</td>
<td>.85</td>
<td>.86</td>
</tr>
<tr>
<td>Schl</td>
<td>.89</td>
<td>.87</td>
</tr>
</tbody>
</table>

*Note.*  Phy = Physical Ability; Appr = Physical Appearance; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Hons = Honesty-Trustworthiness; Prnt = Parent Relations; Emot = Emotional Stability; Genl = General self-concept; Math = Mathematics; Verb = Verbal; Schl = General School self-concept.

Factor Structure of the SDQII (English Version)

A 33 x 33 covariance matrix for the SDQII (English version) was constructed to undertake CFA to test the hypothesised a priori factor structure of this instrument.
Goodness of fit indices (TLI, RNI, RMSEA) were calculated for the null model (no factors), 1-factor model, and the a priori 11-factor model posed. The 11-factor model provided the best goodness of fit indices. A chi square of 773.63 \((df = 440)\) was found with a TLI of .927, RNI of .939, and RMSEA of .055 (see Table 7.2). The TLI and RNI values indicate the model is a reasonable fit, since these two scores are higher than the .90 which is the criterion for acceptable fit as discussed in Chapter 5. And the RMSEA of .055 falls within the range of acceptable fit (between .05 and .08).

<table>
<thead>
<tr>
<th>Model</th>
<th>(\chi^2)</th>
<th>df</th>
<th>TLI</th>
<th>RNI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Null model</td>
<td>6,039.56</td>
<td>528</td>
<td>—</td>
<td>—</td>
<td>.320</td>
</tr>
<tr>
<td>2. 11-factor model</td>
<td>773.63</td>
<td>440</td>
<td>.927</td>
<td>.939</td>
<td>.055</td>
</tr>
<tr>
<td>3. 1-factor model</td>
<td>3,728.84</td>
<td>495</td>
<td>.374</td>
<td>.413</td>
<td>.190</td>
</tr>
</tbody>
</table>

*Note.* TLI = Tucker-Lewis Index; RNI = Relative Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation.

These results suggest that the 11-factor model provides a reasonable fit to the data with reasonable factor loadings in this study. In the 11-factor model, the target factor loadings are substantial, ranging from .65 to .92 (see Table 7.3) and are generally higher than those reported in the manual.

The correlations among the factors are modest, ranging from .05 to .63 except for the correlation between General School self-concept and Mathematics at .73,
between General School self-concept and Verbal at .80, and between General School self-concept and General self-concept at .82 (see Table 7.4). The high correlation between General School self-concept and the two specific academic domains is consistent with the patterns reported in the manual. The typically modest correlations among the SDQII factors provide preliminary support for the discriminant validity of the factors.

It should be noted that CFA was adopted in the present study while EFA was used in the normative data. In addition, the items used for constituting the item parcels in the normative data were different from those in the present study. Due to the different statistical tools utilised, caution should be taken when comparing these sets of results directly. However, these studies demonstrate similar patterns in the factor loadings and correlations among factors. Hence, these results provide support for 11 distinct factors in SDQII.
Table 7.3  CFA Completely Standardised Solution for 11 Subscales of the SDQII (English Version)

<table>
<thead>
<tr>
<th>Item parcel</th>
<th>Phy</th>
<th>Appr</th>
<th>Osex</th>
<th>Ssex</th>
<th>Hons</th>
<th>Prnt</th>
<th>Emot</th>
<th>Genl</th>
<th>Math</th>
<th>Verb</th>
<th>Schl</th>
<th>Uniq</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>.80</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.36</td>
</tr>
<tr>
<td>P2</td>
<td>.77</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.40</td>
</tr>
<tr>
<td>P3</td>
<td>.85</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.28</td>
</tr>
<tr>
<td>A1</td>
<td>0</td>
<td>.86</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.25</td>
</tr>
<tr>
<td>A2</td>
<td>0</td>
<td>.92</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.15</td>
</tr>
<tr>
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*Note.*  Phy(P) = Physical Ability; Appr(A) = Physical Appearance; Osex(OS) = Opposite-Sex Relations; Ssex(SM) = Same-Sex Relations; Hons(H) = Honesty-Trustworthiness; Prnt(PR) = Parent Relations; Emot(E) = Emotional Stability; Genl(G) = General self-concept; Math(M) = Mathematics; Verb(V) = Verbal; Schl(S) = General School self-concept. Brackets beside each subscale indicate the symbol used for the respective item parcels. Uniq = uniquenesses.
Table 7.4  CFA Correlations among 11 Subscales of the SDQII (English Version)

<table>
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<tr>
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<th>Ssex</th>
<th>Hons</th>
<th>Prnt</th>
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<th>Genl</th>
<th>Math</th>
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Note.  Phy = Physical Ability; Appr = Physical Appearance; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Hons = Honesty-Trustworthiness; Prnt = Parent Relations; Emot = Emotional Stability; Genl = General self-concept; Math = Mathematics; Verb = Verbal; Schl = General School self-concept.

Summary: Hypothesis 1.1 SDQII (English Version)

The above results demonstrate, based on the reliability and factor structure of the SDQII (English version) for responses by Australian participants in the present investigation, that this is a sound psychometric measure. Hence, Hypothesis 1.1 was accepted in relation to the SDQII (English version).
Results Hypothesis 1.2:
Psychometric Properties of the SDQII (Chinese Version)

Overview

Hypothesis 1.2 also posed that the Chinese version of the SDQII will be a reliable and valid measure of self-concept (see Chapter 4). A series of reliability analyses and CFA were undertaken to test this hypothesis (see Chapter 4). In the following section, the reliability and construct validity of the SDQII (Chinese version) utilised in the present study were evaluated with reference to the normative data reported in the SDQ manual and in comparison to previous research findings (Kong, 2000), based on a sample of 5,694 Grade 8 and 9 participants from 44 Chinese high schools in Hong Kong, China.

Reliability of the SDQII (Chinese Version)

The reliability of the Chinese version of the SDQII for the Chinese study (Kong, 2000) is shown in Table 7.5. The coefficient alpha estimates of reliability for each scale range from .73 to .92, with a median of .84 for Grade 8 participants whereas the coefficient alpha estimates of reliability for each scale range from .77 to .94 with a median of .87 for Grade 9 participants.

A series of reliability analyses were undertaken to calculate the reliability of each self-concept scale measured by SDQII (Chinese version) in the present study (see Table 7.5). Similarly to those of the English version of the SDQII for the present study, the coefficient alpha estimates of reliability for each scale of the Chinese
version of SDQII were reasonable and all are greater than .80 except Honesty-Trustworthiness and Emotional Stability, with a median of .83. In general, these reliabilities are also similar to those reported in the SDQII manual (Marsh, 1992b), the Chinese study (Kong, 2000), and the Australian study discussed in the preceding section.

**Table 7.5 Reliability of the SDQII Subscales (Chinese Version)**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Participants (N = 344)</th>
<th>Normative Data (N = 5,495)</th>
<th>Chinese Study (N = 5,964)</th>
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*Note.* Phy = Physical Ability; Aprr = Physical Appearance; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Hons = Honesty-Trustworthiness; Prnt = Parent Relations; Emot = Emotional Stability; Genl = General self-concept; Math = Mathematics; Verb = Verbal; Schl = General School self-concept.

**Factor Structure of the SDQII (Chinese Version)**

A 33 x 33 covariance matrix for the SDQII (Chinese version) was also constructed to undertake CFA to test the hypothesised a priori factor structure of this instrument. Goodness of fit indices (TLI, RNI, RMSEA) were calculated for the null model (no factors), 1-factor model, and the a priori 11-factor model posed. The
11-factor model provided the best goodness of fit indices. A chi square of 818.33 ($df = 440$) was found with a TLI of .909, RNI of .924, and RMSEA of .049 (see Table 7.6). The TLI and RNI values indicate the model is a reasonable fit, since these two scores are higher than the .90 which is a criterion for acceptable fit, as discussed in Chapter 5. An RMSEA of .049 is close to the range of acceptable fit (between .05 and .08).

Table 7.6 Goodness of Fit Summary for Alternative Models of the SDQII Subscales (Chinese Version)

<table>
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<th>RNI</th>
<th>RMSEA</th>
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Note.  TLI = Tucker-Lewis Index; RNI = Relative Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation.

These results suggest that the 11-factor model provides a reasonable fit to the data with reasonable factor loadings (see Table 7.7 and 7.8) in this study. In the 11-factor model, the target factor loadings were substantial, ranging from .56 to .89 (see Table 7.7); these are generally lower than those reported in the manual but similar to those reported in the Chinese study (Kong, 2000). The correlations among the factors are modest, ranging from -.03 to .66, except for the correlation between General School self-concept and General self-concept at .73 (see Table 7.8). This high correlation is consistent with the pattern reported in the manual and the Chinese study (Kong, 2000). Unlike the English version of SDQII in the present study, the correlation between Mathematics and Verbal is near zero. This is consistent with a
considerable number of SDQ studies (Marsh, 1986, 1990b, 1993) and the Chinese study (Kong, 2000). The typically modest correlations among the SDQII factors provide preliminary support for the discriminant validity of the factors. As discussed previously, it should be noted that CFA was adopted in the present study while EFA was used in the normative data. In addition, the items used for constituting the item parcels were different between these two sets of data. Due to the different statistical tools utilised, caution should be taken when comparing these sets of results directly. However, these studies demonstrate similar patterns in the factor loadings and correlations among factors. Hence, these results provide support that the different subscales were distinguishable from each other and the multidimensionality of self-concept of the SDQII was demonstrated.
Table 7.7  CFA Completely Standardised Solution for 11 Subscales of the SDQII (Chinese Version)

<table>
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Note.  Phy(P) = Physical Ability; Appr(A) = Physical Appearance; Osex(OS) = Opposite-Sex Relations; Ssex(SM) = Same-Sex Relations; Hons(H) = Honesty-Trustworthiness; Prnt(PR) = Parent Relations; Emot(E) = Emotional Stability; Genl(G) = General self-concept; Math(M) = Mathematics; Verb(V) = Verbal; Schl(S) = General School self-concept. Brackets beside each subscale indicate the symbol used for the respective item parcels. Uniq = uniquenesses.
Table 7. 8  CFA Correlations among 11 Subscales of the SDQII (Chinese Version)

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<th>Ssex</th>
<th>Hons</th>
<th>Prnt</th>
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Note. Phy = Physical Ability; Appr = Physical Appearance; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Hons = Honesty-Trustworthiness; Prnt = Parent Relations; Emot = Emotional Stability; Genl = General self-concept; Math = Mathematics; Verb = Verbal; Schl = General School self-concept.

Summary: Hypothesis 1.2 SDQII (Chinese Version)

The above results demonstrate that the reliability and factor structure of the SDQII (Chinese version) for responses by Chinese participants in the present investigation is a sound psychometric measure. Hence, Hypothesis 1.2 was accepted in relation to the SDQII (Chinese version).

Results Hypothesis 2.1:
Cross-Cultural Validity of the SDQII

Overview

Hypothesis 2.1 posed that the factor structure (factor loading, factor correlation,
factor variance and covariance, uniqueness) of the SDQII across Chinese and Australian population samples would be invariant, therefore demonstrating the cross-cultural validity of this instrument. To test this hypothesis, factor invariance was used to examine whether these two versions of SDQII measures had equivalent factor structures. In CFA, separate covariance matrices for each of the SDQII measures (English and Chinese versions) were computed. Subsequent analyses involved comparing a number of models in which certain parameters of the factor structure were held invariant across these two versions of SDQII measures and fit indices were assessed to indicate whether there was support for the invariance of the parameters (see Chapter 5 for detailed description of analyses). If the introduction of invariance constraints does not lead to a substantial decline in fit indices by comparing with the model with no invariance constraint, there is support for the invariance constraints.

**Test of Invariance**

Invariance testing of the SDQII in the present study involved assessing the fit indices for 6 models across Chinese and Australian population samples. The first model contained no invariance constraints across the two samples (NO IN); the second model constrained factor loadings to be invariant (LOAD= IN); the third model constrained factor loadings and factor correlations to be invariant (LOAD= IN ; CORR= IN); the fourth model constrained factor loadings, factor covariances and variances as invariant (LOAD= IN ; VAR/COV= IN); the fifth held factor loadings and uniquenesses invariant (LOAD= IN ; UN= IN); and the sixth model was the most restrictive with all parameters (factor loadings, uniquenesses, factor variances and covariances) invariant (LOAD=IN; UN= IN ; VAR/COV= IN). The fit
indices, TLI, RNI, and RMSEA were used to evaluate the appropriateness of invariance constraints (see Chapter 5).

Results generated from these six models across two population samples are presented in Table 7.9. The first model with no invariance (TLI = .919; RNI = .932; RMSEA = .051) served as the basis for comparison with the more restrictive models that impose invariance constraints. Imposing constraints on factor loadings in Model 2 produced only slight change in the fit indices of TLI, RNI, and RMSEA (TLI = .915; RNI = .928; RMSEA = .053). The results provided support for the invariance of the factor loadings. However, the fit indices of TLI and RNI in Model 3 (TLI = .904; RNI = .915), Model 4 (TLI = .899; RNI = .908), Model 5 (TLI = .897; RNI = .909) and Model 6 (TLI = .880; RNI = .887), were lower than the no-invariance model. These results suggest that support for the invariance of the factor correlations, factor variances, factor covariances and uniquenesses was weak.

Table 7.9  Invariance Tests across Culture for the 11-Factor Model of the SDQII Subscales

<table>
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<tr>
<th>Model</th>
<th>$\chi^2$</th>
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<th>RNI</th>
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<td>Model 1: No IN model</td>
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217
Nevertheless, the minimum condition for factorial invariance is the invariance of factor loadings (Marsh & Hocevar, 1985; Marsh, Smith, & Barnes, 1985; Marsh, Hey, Roche, & Perry, 1997). Hence, invariance of factor loadings is the critical feature for analysing cross-cultural validity. And these results provide reasonable support for the cross-validity of the SDQII measure.

The completely standardised solutions with a common metric for both groups in Model 2 are shown in Tables 7.10 to 7.12. Most of the factor variances and covariances in the Australian sample are higher than those in the Chinese sample. These results explain why the model fit decreased once the factor variance/covariance was held invariant. A similar pattern was also found for results pertaining to uniqueness, with most of the uniqueness terms for the Australian sample being smaller than those for the Chinese sample. Consistent with the reliability results, most of the coefficient alpha estimates of reliability for each scale in the Australian sample are higher than those for the Chinese sample. Hence, the measurement errors for most item parcels were smaller in the Australian sample compared to those for the Chinese sample. This also explained why the model fit decreased once uniquenesses were held invariant.

**Summary: Results Hypothesis 2.1 Cross-Cultural Validity of the SDQII**

The above results demonstrate that the factor loadings, which are the minimum condition for factorial invariance, were invariant across two population samples. Hence, Hypothesis 2.1 was accepted in relation to the cross-cultural validity of SDQII.
### Table 7. 10 CFA Completely Standardised Solution for 11 Subscales of the SDQII (Australian and Chinese Samples)

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**Note.** PHY(P) = Physical Ability; Appr(A) = Physical Appearance; Osex(OS) = Opposite-Sex Relations; Ssex(SM) = Same-Sex Relations; Hons(H) = Honesty-Trustworthiness; Pmt(PR) = Parent Relations; Emot(E) = Emotional Stability; Genl(G) = General self-concept; Math(M) = Mathematics; Verb(V) = Verbal; Schl(S) = General School self-concept. Brackets beside each subscale indicate the symbol used for the respective item parcels. Aust = Australian sample; Chin = Chinese sample; Uniq = uniquenesses.
### Table 7.11 CFA Factor Variances/Covariances among 11 Subscales of the SDQII  
(Australian Sample)

<table>
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<tr>
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<th>Phy</th>
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<th>Ssex</th>
<th>Hons</th>
<th>Prnt</th>
<th>Emot</th>
<th>Genl</th>
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**Note.** Phy = Physical Ability; Appr = Physical Appearance; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Hons = Honesty-Trustworthiness; Prnt = Parent Relations; Emot = Emotional Stability; Genl = General self-concept; Math = Mathematics; Verb = Verbal; Schl = General School self-concept.

### Table 7.12 CFA Factor Variances/Covariances among 11 Subscales of the SDQII  
(Chinese Sample)

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<th>Hons</th>
<th>Prnt</th>
<th>Emot</th>
<th>Genl</th>
<th>Math</th>
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<th>Schl</th>
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**Note.** Phy = Physical Ability; Appr = Physical Appearance; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Hons = Honesty-Trustworthiness; Prnt = Parent Relations; Emot = Emotional Stability; Genl = General self-concept; Math = Mathematics; Verb = Verbal; Schl = General School self-concept.
Results Hypothesis 3.1:
Psychometric Properties of the Social Support Instrument

Overview

Hypothesis 3.1 predicted that the peer support subscale of a social support instrument will be a reliable and valid measure, as demonstrated by reasonable reliability and a confirmation of the a priori 1-factor structure of this instrument. A series of reliability analyses and CFA were undertaken to test this hypothesis.

Reliability of the SS-A Subscale (English Version)

Previous studies demonstrate that the friend subscale in SS-A utilised in this investigation showed good internal consistency. The mean Cronbach alpha coefficient was .84 for the student samples and .84 for the community samples (see Chapter 4). In the present study, the original 7 items of this scale were modified. The coefficient alpha estimate of reliability for this scale in the present study (see Table 7.13) was high (alpha = .86) and consistent with estimates based on previous research. These findings provide support for Hypothesis 3.1 for the SS-A subscale (English version) in that reliability estimates for the scale measured were high.

Table 7.13 Reliability of the SS-A Subscale (English Version)

<table>
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<td>Peer</td>
<td>.86</td>
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Note. Peer = Peer Support.
Factor Structure of the SS-A Subscale (English Version)

A 7 x 7 covariance for the SS-A subscale was constructed for CFA. For the a priori one-factor model a chi square of 27.41 (df = 14) was found, with a TLI of .972, RNI of .981, and RMSEA of .060 (see Table 7.14). The TLI and RNI values indicate the model is a good fit, since these two scores are higher than .95, which is a criterion for excellent fit as discussed in Chapter 5. An RMSEA of .06 falls within the range of acceptable fit (between .05 and .08). These results suggest that the model provides a very reasonable fit to the data in this study. The target factor loadings are reasonable in that they range from .61 to .82. These factor analyses clearly identify the convergence of the 7 items to the same factor (see Table 7.15).

Table 7.14 Goodness of Fit Summary for Alternative Models of the SS-A Subscale (English Version)

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<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>TLI</th>
<th>RNI</th>
<th>RMSEA</th>
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<td>—</td>
<td>.500</td>
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<td>2. 1-factor model</td>
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<td>14</td>
<td>.972</td>
<td>.981</td>
<td>.060</td>
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</table>

Note. TLI = Tucker-Lewis Index; RNI = Relative Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation.
Table 7.15 CFA Completely Standardised Solution for 1 Subscale of the SS-A (English Version)

<table>
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<td>PEE4</td>
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<td>.54</td>
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<td>PEE6</td>
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<td>PEE7</td>
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<td>.62</td>
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</tbody>
</table>

Note. PEE = items for Peer Support subscale; Uniq = uniquenesses.

Summary: Hypothesis 3.1 SS-A (English Version)

The above results demonstrate that the reliability and factor structure of the peer support subscale of the SS-A (English version) for responses by Australian participants in the present investigation are sound psychometric measures. Hence, Hypothesis 3.1 was accepted in relation to the SS-A.

Results Hypothesis 4.1: Relation between Self-Concept and Peer Support

Overview

Hypothesis 4.1 predicted that the peer support will display a positive association with self-concept, and a significantly higher positive relation with Same-Sex Relations self-concept, Opposite-Sex Relations self-concept, Emotional
Stability self-concept, and General self-concept, with Same-Sex Relations self-concept being the highest relation in comparison to other facets of self-concept measured by the SDQII. The correlation of peer support and different facets of self-concepts were tested, based upon CFA.

**Relation between Self-Concept and Peer Support**

A 40 x 40 covariance for SDQII and SS-A items was constructed for CFA. A chi square of 1111.78 ($df = 674$) was found with a TLI of .920, RNI of .931, and RMSEA of .051 (see Table 7.16). The TLI and RNI values indicate the model is a reasonable fit, since these two scores are higher than the .90 which is a criterion for acceptable fit as discussed in Chapter 5. An RMSEA of .051 indicates close fit since it is close to .05 which is a criterion for close fit as discussed in Chapter 5.

<table>
<thead>
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*Note.* TLI = Tucker-Lewis Index; RNI = Relative Non-Centrality Index; RMSEA = Root Mean Square Error of Approximation.

These results suggest that the 12-factor model provides a reasonable fit to the data, with reasonable factor loadings (see Table 7.17) in this study. This demonstrates that SDQII subscales are distinct from the SS-A subscale. The crucial
feature was the correlation between peer support and different facets of self-concept. Peer support was positively correlated with academic (Mathematics, Verbal, and General School self-concept), non-academic (Physical Ability, Physical Appearance, Opposite-Sex Relations, Same-Sex Relations, Honesty-Trustworthiness, Parent Relations, Emotional Stability) facets of self-concepts and general domain (General self-concept). However, the correlation between peer support and Mathematics self-concept was not significant (see Table 7.18). Consistent with a priori predictions, it was found that peer support has a more positive relation with Opposite-Sex Relations, Same-Sex Relations, Emotional Stability, and General self-concept than the other facets of self-concept, with Same-Sex Relations demonstrating the strongest relation.
Table 7.17 CFA Completely Standardised Solution for 11 Factors of the SDQII Subscales and 1 Factor SS-A Subscale (English Version)

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**Note.** Phy(P) = Physical Ability; Appr(A) = Physical Appearance; Osex(OS) = Opposite-Sex Relations; Ssex(SM) = Same-Sex Relations; Hons(H) = Honesty-Trustworthiness; Prnt(PR) = Parent Relations; Emot(E) = Emotional Stability; Genl(G) = General self-concept; Math(M) = Mathematics; Verb(V) = Verbal; Schl(S) = General School self-concept; Peer(PEE) = Peer Support

Brackets beside each subscale indicate the symbol used for the respective item parcels for SDQII and item for Peer Support subscale of SS-A.

Uniq = uniquenesses.
### Table 7.18 CFA Correlations among 11 Factors of the SDQII Subscales and 1 Factor SS-A Subscale (English Version)

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*Note.* Phy = Physical Ability; Appr = Physical Appearance; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Hons = Honesty-Trustworthiness; Prnt = Parent Relations; Emot = Emotional Stability; Genl = General self-concept; Math = Mathematics; Verb = Verbal; Schl = General School self-concept; Peer = Peer Support.

*[^p]p < .05.*

### Summary: Hypothesis 4.1 Relation between Self-Concept and Peer Support

The above results demonstrate that the peer support scale displayed a positive relation with self-concept and a significantly higher positive relation with Opposite-Sex Relations, Same-Sex Relations, Emotional Stability, and General self-concept, with Same-Sex Relations self-concept being the highest relation in comparison to other facets of self-concept measured by the SDQII. Hence, Hypothesis 4.1 was accepted.
Summary

The primary aim of this chapter was to test the psychometric properties of the SDQII English and Chinese versions, and the psychometric properties of the SS-A utilised with an Australian and Chinese sample. In addition, the relation between peer support and different facets of self-concepts was tested. The results demonstrated support for the hypotheses posed, in that both instruments displayed high reliability for scales measured and the a priori factor structure posed was supported, comparably to previous studies. In addition the SDQII (English version) and SDQII (Chinese version) were shown to have similar factor structures thus demonstrating the cross-cultural validity of the SDQII in Australian and Chinese samples. Peer support was also demonstrated to be positively correlated with academic and non-academic facets of self-concepts, as well as general self-concept. Hence, this chapter has demonstrated that instruments with sound psychometric properties were employed in the present investigation.
CHAPTER 8

RESULTS OF STUDIES 3, 4, AND 5:
THE IMPACT OF AN ACADEMICALLY-ORIENTATED
AND SOCIALLY-ORIENTATED PEER SUPPORT
INTERVENTION ON SELF-CONCEPT
AND PEER SUPPORT

Introduction

The purpose of this chapter is to test the hypotheses posed in relation to Studies 3, 4 and 5 (see Chapter 4) which involved testing the impact of an academically-orientated (Study 3) and socially-orientated peer support intervention upon specific facets of self-concept and peer support in Australian samples (Study 4) and Chinese samples (Study 5). Both target and non-target facets of self-concept relevant to the goals of the intervention were examined to employ a construct validity approach to the study of intervention effects (see Chapter 4). This approach predicts that facets of self-concept most relevant to the goals of the intervention will be most affected whilst less relevant domains will be less affected (Craven, 1989; Craven et al., 1991; Marsh & Richards, 1988; Marsh et al., 1986a, 1986b). More
specifically, it was predicted that an academically-orientated peer support intervention will have a positive effect mainly on academic domains of self-concept most logically related to the goal of the intervention, whereas non-academic domains of self-concept will be less affected. Conversely, a socially-orientated peer support intervention was predicted to have a positive effect mainly for the non-academic domains of self-concept most logically related to the intervention’s goals, whereas academic domains of self-concept were hypothesised to be less affected.

**Study 3:**

**Effect of the Academically-Orientated Peer Support Intervention on Self-Concept and Peer Support of Tutees for the Australian Sample**

**Overview**

A series of Hypotheses (1.1, 1.2 & 2.1) (see Chapter 4) were posed whereby participants in an academically-orientated peer tutoring intervention were posited to display statistically significantly higher self-concepts in target facets of self-concept compared to non-target facets and would not display statistically significantly higher peer support compared to participants who did not participate in such an intervention. A Research Question (3.1) was also posed in regard to whether intervention effects would generalise to both male and females.

**Results: Effect of the Intervention**

A subsample of Year 7 students \( (n = 35) \) from the original sample \( (N = 244) \) in Study 2 participated in these interventions. The characteristics of the participants are
shown in Table 8.1. A strong experimental design was adopted and details of the methodology employed have been discussed in Chapter 5. A series of t-tests were used to evaluate the pretest differences in different facets of self-concept and peer support scores between experimental and control group. A series of repeated measure MANOVAs were used to evaluate the changes in different facets of self-concept scores and peer support.

| Table 8.1 Study 3 ( Academically-Orientated Australian Intervention): Demographic Characteristics of the Australian Participants |
|------------------|-----------------|-----------------|------------------|
|                  | Experimental Group | Control Group | Overall |
| Number           | 16               | 19              | 35      |
| Age              |                  |                 |         |
| 1. range         | 11-14            | 11-13           | 11-14   |
| 2. mean          | 12.44            | 11.74           | 12.06   |
| 3. standard deviation | 0.89          | 0.65            | 0.84    |
| Gender           | n     | %     | n     | %     | n     | %     |
| 1. male          | 8     | 50.0  | 11    | 57.9  | 19    | 54.3  |
| 2. female        | 8     | 50.0  | 8     | 42.1  | 16    | 45.7  |

A series of t-tests shown in Table 8.2 reveal that there were no significant pre-test differences between the experimental and control group in any domains of self-concepts or peer support. This indicates that the random assignment was generally successful in matching the two groups in terms of self-concepts and peer support.
As mentioned before, a series of repeated measure MANOVAs were used to evaluate the changes in different facets of self-concept and peer support scores. The independent variables included between-subject variables and within-subject variables. Peer support intervention group (experimental group and control group) and gender were the between-subject factors and time (Time 1 and Time 2) was the within-subject factor, whereas different facets of self-concept and peer support were the dependent variables.

Results Hypothesis 1.1: Effect of the Intervention on Verbal Self-Concept

The most crucial test was the group × time interaction. For self-concept, there was a significant group × time interaction \((F(1, 31) = 5.31, p < .05)\) for Verbal self-concept (see Table 8.2, 8.4, & Figure 8.1). Further analysis of the simple main effect of time for Verbal self-concept indicated that the experimental group showed a significant increase in Verbal self-concept \((F(1, 33) = 8.60, p < .01)\) whereas the control group showed a slight, non-significant decrease in Verbal self-concept (see Table 8.5 & Figure 8.1). Hence, participants who had experienced the intervention compared to participants who had not experienced this intervention displayed statistically significant higher Verbal self-concepts.
Figure 8.1 Effect of Academically-Orientated Intervention on Verbal Self-Concept for Study 3

Results Hypothesis 1.2: Effect of the Intervention on Other Aspects of Self-Concept

For the other facets of self-concept (Physical Ability, Physical Appearance, Opposite-Sex Relations, Same-Sex Relations, Honesty-Trustworthiness, Parent Relations, Emotional Stability, General self-concept, Mathematics, and General School), the results showed that there was no significant group × time interaction (see Table 8.2 & 8.6). Participants who had experienced the intervention compared to participants who had not experienced this intervention did not display significantly greater effects for these facets of self-concept not targeted by the intervention.
**Results Hypothesis 2.1: Effect of the Intervention on Peer Support**

There was no significant group × time interaction for Peer Support (see Table 8.2 & 8.6). Hence, participants who had experienced the intervention compared to participants who had not experienced this intervention did not display statistically significant higher peer support, supporting Hypothesis 2.1.

**Results Research Question 3.1: Generalisability of the Intervention Effects over Gender**

For Verbal self-concept, there was no significant group × time × gender interaction (see Tables 8.3 & 8.4). This indicates that the impact of the intervention on the Verbal self-concept for the experimental group discussed above was generalised to both males and females.

Regarding the other facets of self-concept, there were also no significant group × time × gender interactions (see Table 8.3 & 8.6). These results indicate that those who had experienced the intervention compared to participants who had not experienced this intervention displayed no significant effects for these facets of self-concept not targeted by the intervention, regardless of the gender of participants.

For peer support, there was no significant group × time × gender interaction (see Table 8.3 & 8.6). This result indicates that those who have experienced the intervention compared to participants who have not experienced this intervention displayed no significant effects for peer support regardless of the gender of participants.
Summary of Results for Study 3

In sum, the results of the findings provide support for the a priori prediction that academically-orientated peer tutoring had significant impact on Verbal self-concept. For the other facets of self-concept and peer support, there were no significant differences. Thus, these results are consistent with predictions that the domain of self-concept most logically relevant to the intervention’s goal shows positive significant gain, whereas those less relevant to the intervention’s goal were affected less. These results support a construct validity approach to the study of intervention effects. Moreover, the intervention’s impact on Verbal self-concept generalised to both males and females.
Table 8.2  Study 3 (Academically-Orientated Australian Intervention): Means and Standard Deviations of Self-Concept and Peer Support Subscales for Experimental and Control Groups at Times 1 and 2

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<th></th>
<th>Control Group (n = 19)</th>
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<th>Pretest Comparison</th>
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Note.  Math = Mathematics; Verb = Verbal; Schl = General School self-concept; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Prnt = Parent Relations; Hons = Honesty-Trustworthiness; Emot = Emotional Stability; Phy = Physical Ability; Appr = Physical Appearance; Genl = General self-concept; Peer = Peer Support.
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**Note.** Math = Mathematics; Verb = Verbal; Schl = General School self-concept; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Prnt = Parent Relations; Hons = Honesty-Trustworthiness; Emot = Emotional Stability; Phy = Physical Ability; Appr = Physical Appearance; Genl = General self-concept; Peer = Peer Support.
Table 8.4  Study 3 (Academically-Orientated Australian Intervention): MANOVAs Comparing Changes in Verbal Self-Concept Subscale by Gender for Experimental and Control Groups at Times 1 and 2

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Group


Table 8.6  Study 3 (Academically-Orientated Australian Intervention): MANOVAs Comparing Changes in Other Self-Concept and Peer Support Subscales by Gender for Experimental and Control Groups at Times 1 and 2

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Study 4:
Effect of the Socially-Orientated Peer Support Intervention on Self-Concept and Peer Support for the Australian Sample

Overview

Results for Study 3 show that academically-orientated peer tutoring had a positive effect mainly for Verbal self-concept, which was most logically related to the intervention’s goal, whereas other domains of self-concept were less affected. To further test this construct validity approach, the present study investigates the effect of a socially-orientated peer support intervention on self-concept. A subsample of Year 7 students (n = 114) from an original sample (N = 244) in Study 2 participated in this intervention. Each session was structured to cover a specific theme designed to promote social and interpersonal relationship skills. The characteristics of the participants are shown in Table 8.7. A strong experimental design was adopted and the details of the methodology employed were discussed in Chapter 5.

It was predicted that this intervention would have a positive impact mainly on peer relation self-concept, as measured by the SDQII. Specifically, Same-Sex Relations self-concept as measured by the SDQII was predicted to be enhanced since same-sex peers are the primary source of peer relation for early adolescents and non-target self-concept facets were predicted to not be influenced by the intervention (see Hypotheses 1.1 & 1.2). It was also predicted that the intervention would impact on peer support intervention (see Hypothesis 2.1). Finally a Research Question (3.1) was posed to ascertain whether the effects of the intervention would generalise to intervention to both males and females. A series of t-tests were conducted to evaluate
the pretest differences in different facets of self-concept and peer support scores between experimental and control group. Then, a series of repeated measure MANOVAs were conducted to evaluate the changes in different facets of self-concept and peer support scores.

Table 8.7  Study 4 (Socially-Orientated Australian intervention): Demographic Characteristics of the Australian Participants

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>51</td>
<td>63</td>
<td>114</td>
</tr>
</tbody>
</table>

**Age**

1. range       11-13  11-13  11-13
2. mean        11.82  11.95  11.89
3. standard deviation 0.52  0.38  0.45

**Gender**

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>n  %</td>
<td>n  %</td>
<td>n  %</td>
<td></td>
</tr>
<tr>
<td>1. male</td>
<td>17 33.3</td>
<td>24 38.1</td>
<td>41 36.0</td>
</tr>
<tr>
<td>2. female</td>
<td>34 66.7</td>
<td>39 61.9</td>
<td>73 64.0</td>
</tr>
</tbody>
</table>

Results: Effect of the Intervention

The series of t-tests shown in Table 8.8 reveal that there were no significant pre-test differences between the experimental and control groups in peer support and most domains of self-concept, except for two marginally significant differences for two scales (Honesty/Trustworthiness and General self-concept) in which the control group had slightly higher scores. This indicates that the random assignment was reasonably successful in matching the two groups in terms of self-concepts and peer support.
A series of repeated measure MANOVAs were used to evaluate the changes in different facets of self-concept and peer support scores. As mentioned in Chapter 5, the independent variables included between-subject variables and within-subject variables. Peer support intervention group (experimental group and control group) and gender were the between-subject factors and time (Time 1 and Time 2) was the within-subject factor, whereas different facets of self-concept and peer support were the dependent variables.

**Results Hypothesis 1.1: Effect of the Intervention on Same-Sex Relations**

**Self-Concept**

The most crucial test was the group × time interaction. There was no significant group × time interaction for Same-Sex Relations self-concept (see Table 8.8 & 8.10). Participants who experienced the intervention compared to participants who had not experienced intervention did not display significantly higher Same-Sex Relations self-concept. Hence, Hypothesis 1.1 was rejected.

**Results Hypothesis 1.2: Effect of the Intervention on Other Aspects of Self-Concept**

For the other facets of self-concept (Physical Ability, Physical Appearance, Opposite-Sex Relations, Honesty-Trustworthiness, Parent Relations, Emotional Stability, General self-concept, Verbal, Mathematics, and General School), there were no significant group
Results Hypothesis 2.1: Effect of the Intervention on Peer Support

There was no significant group × time interaction for peer support (see Table 8.8 & 8.13). Hence, the hypothesis that participants who had experienced the intervention compared to participants who had not experienced this intervention would display statistically significant higher peer support was not supported.

Results Research Question 3.1: Generalisability of the Intervention Effects over Gender

For Same-Sex Relations self-concept, inspection of the analyses of group × time × gender interaction shows that there was significant interaction \((F(1, 110) = 4.68, p < .05)\) (see Table 8.9 & 8.10). Further inspection of the significant group × time × gender interaction for Same-Sex Relations self-concept shows that there was a significant effect for group × time interaction \((F(1, 111) = 5.78, p < .05)\) for females (see Table 8.11). Further analyses show that there was significant simple main effect of time \((F(1, 112) = 18.09, p < .001)\) for females for the experimental group (see Table 8.12 & Figure 8.2). This indicates that female participants who have experienced the intervention compared to female participants who have not experienced this intervention displayed statistically significantly higher Same-Sex Relations self-concepts. However, there was no significant difference in Same-Sex Relations self-concepts for males between experimental and control groups (see Figure 8.3). Hence, the impact of the intervention on Same-Sex Relations self-concept for the experimental group was found in females only and this intervention was not generalised to males.
There were no significant group × time × gender interactions for other non-target facets of self-concept (see Table 8.9 & 8.13). These results indicate that those who have experienced the intervention compared to participants who have not experienced this intervention displayed no significant greater effects for these facets of self-concept not targeted by the intervention, regardless of the gender of participants.

There was no significant group × time × gender interaction for peer support (see Table 8.9 & 8.13). This indicated that those who had experienced the intervention compared to participants who had not experienced this intervention displayed no significant effects for peer support regardless of the gender of participants.

Figure 8.2 Effect of Socially-Orientated Intervention on Same-Sex Relations Self-Concept in Australian Females for Study 4
Summary of Results for Study 4

In sum, the findings provide partial support for the a priori predictions. The socially-orientated peer support intervention had no significant simple main effect impact on the increase in Same-Sex Relations self-concept nor on other facets of self-concept. However, a positive effect on Same-Sex Relations self-concept was present for female participants, whereas there was no significant change in this facet of self-concept for males. These results are thus consistent with the prediction that the domain of self-concept most logically relevant to the intervention’s goal would show positive significant gain, whereas those less relevant to the intervention’s goal were affected less for female participants. The intervention was not successful for male participants nor did it have impact on peer support.
### Table 8. 8  Study 4 (Socially-Orientated Australian Intervention): Means and Standard Deviations of Self-Concept and Peer Support Subscales for Experimental and Control Groups at Times 1 and 2

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Time</th>
<th>Experimental Group $(n = 51)$</th>
<th>Control Group $(n = 63)$</th>
<th>Pretest Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Math</td>
<td>1</td>
<td>3.84</td>
<td>1.35</td>
<td>4.18</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3.92</td>
<td>1.29</td>
<td>4.19</td>
</tr>
<tr>
<td>Verb</td>
<td>1</td>
<td>4.39</td>
<td>0.95</td>
<td>4.53</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.76</td>
<td>0.87</td>
<td>4.73</td>
</tr>
<tr>
<td>Schl</td>
<td>1</td>
<td>4.48</td>
<td>1.01</td>
<td>4.76</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.70</td>
<td>1.07</td>
<td>5.04</td>
</tr>
<tr>
<td>Osex</td>
<td>1</td>
<td>4.06</td>
<td>1.31</td>
<td>3.90</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.54</td>
<td>1.28</td>
<td>4.45</td>
</tr>
<tr>
<td>Ssex</td>
<td>1</td>
<td>4.91</td>
<td>0.84</td>
<td>5.08</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5.22</td>
<td>0.66</td>
<td>5.25</td>
</tr>
<tr>
<td>Prnt</td>
<td>1</td>
<td>5.25</td>
<td>0.80</td>
<td>5.34</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5.25</td>
<td>0.96</td>
<td>5.38</td>
</tr>
<tr>
<td>Hons</td>
<td>1</td>
<td>4.82</td>
<td>0.90</td>
<td>5.19</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.99</td>
<td>0.95</td>
<td>5.23</td>
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<td>Emot</td>
<td>1</td>
<td>4.02</td>
<td>1.26</td>
<td>4.43</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.19</td>
<td>1.09</td>
<td>4.59</td>
</tr>
<tr>
<td>Phy</td>
<td>1</td>
<td>4.84</td>
<td>0.91</td>
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</tr>
<tr>
<td></td>
<td>2</td>
<td>5.01</td>
<td>0.97</td>
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<td>Appr</td>
<td>1</td>
<td>3.77</td>
<td>1.37</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3.93</td>
<td>1.29</td>
<td>4.32</td>
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<td>Genl</td>
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<td>0.93</td>
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<tr>
<td></td>
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<td>0.96</td>
<td>5.39</td>
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<td></td>
<td>2</td>
<td>5.57</td>
<td>0.60</td>
<td>5.59</td>
</tr>
</tbody>
</table>

**Note.** Math = Mathematics; Verb = Verbal; Schl = General School self-concept; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Prnt = Parent Relations; Hons = Honesty-Trustworthiness; Emot = Emotional Stability; Phy = Physical Ability; Appr = Physical Appearance; Genl = General self-concept; Peer = Peer Support. *$p < .05$. 

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Table 8.9  Study 4 (Socially-Orientated Australian Intervention): Means and Standard Deviations of Self-Concept and Peer Support Subscales by Gender for Experimental and Control Groups at Times 1 and 2

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Time</th>
<th>Gender</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Male = 17; Female = 34)</td>
<td>(Male = 24; Female = 39)</td>
</tr>
<tr>
<td>Math</td>
<td>1</td>
<td>M</td>
<td>4.25 (1.40)</td>
<td>4.18 (1.34)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>3.64 (1.30)</td>
<td>4.17 (1.37)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>M</td>
<td>4.47 (1.30)</td>
<td>4.46 (1.31)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>3.65 (1.22)</td>
<td>4.03 (1.35)</td>
</tr>
<tr>
<td>Verb</td>
<td>1</td>
<td>M</td>
<td>4.34 (0.74)</td>
<td>4.66 (0.92)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>4.42 (1.05)</td>
<td>4.45 (1.10)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>M</td>
<td>4.73 (0.65)</td>
<td>4.88 (0.84)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>4.78 (0.97)</td>
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</tr>
<tr>
<td>Scl</td>
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<td>M</td>
<td>4.69 (0.99)</td>
<td>4.86 (0.77)</td>
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<td></td>
<td></td>
<td>F</td>
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<td>4.71 (0.88)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>M</td>
<td>4.84 (1.05)</td>
<td>5.18 (0.63)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>4.63 (1.09)</td>
<td>4.96 (0.84)</td>
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<tr>
<td>Osex</td>
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<td>M</td>
<td>4.07 (1.36)</td>
<td>4.24 (1.20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>4.05 (1.31)</td>
<td>3.69 (1.27)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>M</td>
<td>4.49 (1.46)</td>
<td>4.60 (1.27)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>4.57 (1.20)</td>
<td>4.36 (1.38)</td>
</tr>
<tr>
<td>Ssex</td>
<td>1</td>
<td>M</td>
<td>5.01 (0.74)</td>
<td>4.92 (0.80)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>4.85 (0.90)</td>
<td>5.19 (0.52)</td>
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<tr>
<td></td>
<td>2</td>
<td>M</td>
<td>5.14 (0.54)</td>
<td>5.20 (0.70)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>5.26 (0.72)</td>
<td>5.28 (0.73)</td>
</tr>
<tr>
<td>Prnt</td>
<td>1</td>
<td>M</td>
<td>5.23 (0.82)</td>
<td>5.37 (0.85)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>5.26 (0.80)</td>
<td>5.33 (0.69)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>M</td>
<td>5.34 (1.04)</td>
<td>5.45 (0.79)</td>
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<tr>
<td></td>
<td></td>
<td>F</td>
<td>5.21 (0.93)</td>
<td>5.33 (0.85)</td>
</tr>
</tbody>
</table>

Note. Math = Mathematics; Verb = Verbal; Schl = General School self-concept; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Prnt = Parent Relations; Hons = Honesty-Trustworthiness; Emot = Emotional Stability; Phy = Physical Ability; Appr = Physical Appearance; Genl = General self-concept; Peer = Peer Support.
Table 8.10 Study 4 (Socially-Orientated Australian Intervention): MANOVAs Comparing Changes in Same-Sex Relations Self-Concept Subscale by Gender for Experimental and Control Groups at Times 1 and 2

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between-subject test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>110</td>
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<tr>
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</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.31</td>
<td>0.35</td>
</tr>
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</table>
Table 8.11 Study 4 (Socially-Orientated Australian Intervention): MANOVAs Showing Simple Interaction Effect of Group and Time on Same-Sex Relations Self-Concept Subscale in Male and Female at Times 1 and 2

<table>
<thead>
<tr>
<th>Source of variation</th>
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<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error</td>
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<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1</td>
<td>3.06</td>
<td>21.10***</td>
</tr>
</tbody>
</table>

**Ssex**
Table 8.13 Study 4 (Socially-Orientated Australian Intervention): MANOVAs Comparing Changes in Other Self-Concept and Peer Support Subscales by Gender for Experimental and Control Groups at Times 1 and 2

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<thead>
<tr>
<th>Source of variation</th>
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<th></th>
<th>Verb</th>
<th></th>
<th></th>
<th>Schl</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>df</td>
<td>MS</td>
<td>F</td>
<td>df</td>
<td>MS</td>
<td>F</td>
<td>df</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>Between-subject test</td>
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<td>1.47</td>
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</tr>
<tr>
<td>Group</td>
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<td>2.25</td>
<td>0.75</td>
<td>1</td>
<td>0.40</td>
<td>0.24</td>
<td>1</td>
<td>4.33</td>
<td>2.95</td>
</tr>
<tr>
<td>Sex</td>
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<td>3.75</td>
<td>1</td>
<td>0.35</td>
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<td>1</td>
<td>2.64</td>
<td>1.80</td>
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</table>
Table 8. 13 continued

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Emot</th>
<th>Phy</th>
<th>Appr</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Between-subject test</td>
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<td>1.86</td>
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<td>2.93</td>
</tr>
<tr>
<td>Sex</td>
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<td></td>
</tr>
</tbody>
</table>

Group
Study 5:
Effect of the Socially-Orientated Peer Support Intervention on Self-Concept for the Chinese Sample in Hong Kong

Overview

For Study 4, a socially-orientated peer support intervention for an Australian sample had no overall effect on Same-Sex Relations self-concept but it had a gender
Table 8.14 Study 5 (Socially-Orientated Chinese intervention): Demographic Characteristics of the Chinese Participants

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at Time 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. range</td>
<td>12-15</td>
<td>12-15</td>
<td>12-15</td>
</tr>
<tr>
<td>2. mean</td>
<td>13.19</td>
<td>13.00</td>
<td>13.10</td>
</tr>
<tr>
<td>3. standard deviation</td>
<td>0.87</td>
<td>0.75</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Number

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time 1 to Time 2</td>
<td>21</td>
<td>19</td>
<td>40</td>
</tr>
<tr>
<td>2. Time 2 to Time 3</td>
<td>20</td>
<td>18</td>
<td>38</td>
</tr>
<tr>
<td>Dropout from Time 2</td>
<td>1 (4.8%)</td>
<td>1 (4.8%)</td>
<td>2 (5.0%)</td>
</tr>
</tbody>
</table>

Gender

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time 1 to Time 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. male</td>
<td>11</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>b. female</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>2. Time 2 to Time 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. male</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>b. female</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>

A series of t-tests shown in Table 8.15 reveal that there was no significant pre-test difference between the experimental group and the control group in all the domains of self-concept. This indicates that the random assignment was generally successful in matching the two groups in terms of self-concepts.

As in the previous study, a series of repeated measure MANOVAs were used to evaluate the changes in different facets of self-concept scores. The independent variables included between-subject variables and within-subject variables. Peer support intervention group (experimental group and control group) and gender were
the between-subject factors and time (Time 1 and Time 2) was the within-subject factor, whereas different facets of self-concept were the dependent variables.

**Results Hypothesis 1.1: Effect of the Intervention on Same-Sex Relations**

**Self-Concept**

The first analysis was the group × time interaction. Inspection of the group × time interaction as shown in Table 8.15 and 8.17 shows that there was a significant main effect ($F(1, 36) = 7.64, p < .01$) for Same-Sex Relations self-concept from Time 1 to Time 2. Further analysis of simple main effects of time for Same-Sex Relations self-concept indicated that the experimental group showed a significant increase in Same-Sex Relations self-concept ($F(1, 38) = 4.84, p < .05$), whereas there were no significant differences for the control group (see Table 8.18 & Figure 8.4). These results indicate that the intervention had a positive effect on Same-Sex Relations self-concept targeted by the intervention for the experimental group.
Figure 8. 4  Effect of Socially-Orientated Intervention on Same-Sex Relations Self-Concept in Chinese Sample from Pretest (Time 1) to Posttest I (Time 2) for Study 5

For the other facets of self-concept (Physical Ability, Physical Appearance, Opposite-Sex Relations, Honesty-Trustworthiness, Parent Relations, Emotional Stability, General self-concept, Verbal, Mathematics, and General School), the results showed that there were no statistically significant group × time interaction effects (see Table 8.15 & 8.19). Participants who experienced the intervention displayed no significantly greater effects for these facets of self-concept that were not targeted by the intervention, compared to those who had not experienced this intervention.
Results Research Question 2.1: Generalisability of the Intervention Effects over Gender

Inspection of the group × time × gender interaction shown in Table 8.16 and 8.17 indicates that there was no significant interaction for Same-Sex Relations self-concept. Hence, the intervention effect on Same-Sex Relations self-concept was generalised to both males and females.

For the remaining self-concept factors there were no statistically significant group × time × gender interactions (see Table 8.16 & 8.19). These results indicate that the predicted lack of significant effects for these non-target facets of self-concept generalised over responses by males and females.

Summary of Results for Study 5 from Pretest (Time 1) to Posttest I (Time 2)

In sum, the results of the findings provide support for the a priori prediction that the impact of the socially-orientated peer support intervention on Same-Sex Relations self-concept in Study 4 could be replicated for Chinese participants. However, unlike the Australian sample in Study 4, the impact on Same-Sex Relations self-concept generalised to both males and females for Chinese participants.
Table 8.15 Study 5 (Socially-Orientated Chinese Intervention): Means and Standard Deviations of Self-Concept Subscales for Experimental and Control Groups at Pretest (Time 1), Posttest I (Time 2) and Posttest II (Time 3)

| Subscale | Time | Experimental Group | | Control Group | | Pretest Comparison |
|----------|------|--------------------|----------------|-----------------|-------------------|
|          |      | \( M \) | \( SD \) | \( M \) | \( SD \) | \( t \) |
| Math     | 1    | 3.39 | 1.34 | 4.10 | 1.28 | -1.72 |
|          | 2    | 3.26 | 1.51 | 3.92 | 1.41 |     |
|          | 3    | 3.36 | 1.54 | 3.94 | 1.46 |     |
| Verb     | 1    | 3.50 | 1.26 | 3.62 | 1.16 | -0.30 |
|          | 2    | 3.41 | 1.08 | 3.82 | 1.23 |     |
|          | 3    | 3.47 | 0.99 | 3.86 | 1.29 |     |
| Schl     | 1    | 3.70 | 1.04 | 4.00 | 0.84 | -0.99 |
|          | 2    | 3.69 | 0.92 | 3.85 | 0.90 |     |
|          | 3    | 3.81 | 0.92 | 3.89 | 0.97 |     |
| Osex     | 1    | 3.61 | 0.98 | 3.55 | 1.12 | 0.18 |
|          | 2    | 3.80 | 0.92 | 3.63 | 1.07 |     |
|          | 3    | 3.89 | 1.02 | 3.60 | 1.18 |     |
| Ssex     | 1    | 4.53 | 0.93 | 4.92 | 0.93 | -1.33 |
|          | 2    | 4.93 | 1.01 | 4.61 | 1.02 |     |
|          | 3    | 5.09 | 0.95 | 4.53 | 1.03 |     |
| Prnt     | 1    | 4.13 | 1.16 | 4.40 | 1.17 | -0.73 |
|          | 2    | 4.13 | 1.26 | 4.11 | 1.28 |     |
|          | 3    | 4.22 | 1.40 | 4.17 | 1.37 |     |
| Hons     | 1    | 4.36 | 0.88 | 4.78 | 0.72 | -1.64 |
|          | 2    | 4.34 | 0.88 | 4.70 | 0.61 |     |
|          | 3    | 4.37 | 0.97 | 4.77 | 0.68 |     |
| Emot     | 1    | 3.94 | 1.01 | 4.41 | 1.06 | -1.44 |
|          | 2    | 4.08 | 1.02 | 4.20 | 0.89 |     |
|          | 3    | 4.21 | 1.03 | 4.29 | 0.94 |     |
| Phy      | 1    | 3.99 | 1.23 | 3.82 | 1.52 | 0.39 |
|          | 2    | 4.08 | 1.17 | 3.76 | 1.56 |     |
|          | 3    | 4.06 | 1.31 | 3.77 | 1.56 |     |
| Appr     | 1    | 3.42 | 0.93 | 3.31 | 1.24 | 0.33 |
|          | 2    | 3.48 | 0.95 | 3.25 | 1.37 |     |
|          | 3    | 3.48 | 1.00 | 3.22 | 1.46 |     |
| Genl     | 1    | 4.02 | 0.99 | 4.11 | 1.01 | -0.27 |
|          | 2    | 4.10 | 0.96 | 4.07 | 1.09 |     |
|          | 3    | 4.14 | 1.03 | 4.12 | 1.15 |     |

*Note.* Math = Mathematics; Verb = Verbal; Schl = General School self-concept; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Prnt = Parent Relations; Hons = Honesty-Trustworthiness; Emot = Emotional Stability; Phy = Physical Ability; Appr = Physical Appearance; Genl = General self-concept.

Experimental group (Time 1, 2: \( n = 21 \); Time 3: \( n = 20 \)); Control group (Time 1, 2: \( n = 19 \); Time 3: \( n = 18 \)).
Table 8.16 Study 5 (Socially-Orientated Chinese Intervention): Means and Standard Deviations of Self-Concept Subscales by Gender for Experimental and Control Groups at Pretest (Time 1), Posttest I (Time 2) and Posttest II (Time 3)

<table>
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<th>Control Group</th>
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<th>Control Group</th>
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Note. Math = Mathematics; Verb = Verbal; Schl = General School self-concept; Osex = Opposite-Sex Relations; Ssex = Same-Sex Relations; Prnt = Parent Relations; Hon = Honesty-Trustworthiness; Emot = Emotional Stability; Phy = Physical Ability; Appr = Physical Appearance; Genl = General self-concept.

Experimental group (Time 1, 2: Male = 11 Female = 10; Time 3: Male = 10 Female = 10); Control group (Time 1, 2: Male = 11 Female = 8; Time 3: Male = 10 Female = 8)
Table 8.17 Study 5 (Socially-Orientated Chinese Intervention): MANOVAs Showing Changes in Same-Sex Relations Self-Concept Subscale by Gender for Experimental and Control Groups at Pretest (Time 1) to Posttest I (Time 2)

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<td></td>
</tr>
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</tbody>
</table>
### Table 8.19 Study 5 (Socially-Orientated Chinese Intervention): MANOVAs Comparing Changes in Other Self-Concept Subscales by Gender for Experimental and Control Groups at Pretest (Time 1) and Posttest 1 (Time 2)

| Source of variation | Math | | | | | | Verb | | | | | | Schl | | | | | | df | MS | F | df | MS | F | df | MS | F |
|---------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Between-subject test|      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Error               | 36   | 3.26 | 36 | 2.78 | 36 | 1.13 |      |    |    |    |    |    |    |    |    |    |
| Group               | 1    | 6.44 | 1.97 | 1 | 1.37 | 0.49 | 1 | 0.30 | 0.27 |      |    |    |    |    |    |    |
| Sex                 | 1    | 5.29 | 1.62 | 1 | 0.14 | 0.05 | 1 | 2.56 | 2.26 |      |    |    |    |    |    |    |
\begin{table}
\centering
\begin{tabular}{lccc}
\hline
Source of variation & Emot & Phy & Appr \\
\hline
Between-subject test & & & \\
Error & 36 & 1.58 & 36 & 3.64 & 36 & 2.43 \\
Group & 1 & 1.58 & 1 & 1.67 & 1 & 0.88 \\
Sex & 1 & 0.06 & 1 & 3.59 & 1 & 0.18 \\
Group & & & & & & \\
\hline
\end{tabular}
\caption{Table 8. 19 continued}
\label{tab:example}
\end{table}
Results Hypothesis 3.1: Maintenance Effect of the Intervention

In order to test the stability of the effects of the intervention, follow up (Time 3) measures were collected. The three levels of the within-subject effect of time (Time 1, Time 2, and Time 3) were used to construct two orthogonal (single degree of freedom) contrasts: I (Time 1 versus the average of Time 2 and Time 3); II (Time 2 versus Time 3). Thus, Contrast I tests whether there was an effect of the intervention, whereas Contrast II tests whether this effect of the intervention increased or decreased over the follow-up period following the intervention.

**(1) Maintenance effect of the intervention on Same-Sex Relations self-concept**

(a) *From pretest (Time 1) to posttest average (Time 2 and 3)*

For Contrast I (see Table 8.20), there was a significant effect for the group × time interaction effect for Same-Sex Relations self-concept ($F(1, 34) = 9.55$, $p < .01$). Further analysis of simple effect of time for Same-Sex Relations self-concept indicates that the experimental group showed a significant increase in Same-Sex Relations self-concept ($F(1, 36) = 5.79$, $p < .05$) whereas the control group did not (see Table 8.21).

(b) *From posttest I (Time 2) to posttest II (Time 3)*

For Contrast II (see Table 8.20), there was also a statistically significant group × time interaction effect of peer support intervention for Same-Sex Relations self-concept ($F(1, 34) = 11.01$, $p < .01$).
Further analysis of simple main effect of time for Same-Sex Relations self-concept indicates that the experimental group showed a significant increase in Same-Sex Relations self-concept ($F(1, 36) = 10.64, p < .01$), whereas the control group did not (see Table 8.21). Table 8.15 and Figure 8.5 indicate that there was further improvement over the Time 2-Time 3 follow-up interval for the experimental group, but not for the control group. This suggests a “sleeper” effect of the intervention in which intervention effects get larger following the end of the intervention. These results suggest that the effect of intervention on Same-Sex Relations self-concept for the experimental group was maintained until the end of the intervention and even further increased in the follow-up period of intervention.
(2) Maintenance effect of the intervention on other aspects of self-concept

(a) From pretest (Time 1) to posttest average (Time 2 and 3)

For contrast I, a significant main effect for the group × time interaction effect for Verbal self-concept ($F(1, 34) = 4.35, p < .05$) (see Table 8.22) was present. However, further analysis of simple main effect of time for Verbal self-concept indicates that the experimental group did not show significant change in Verbal self-concept, whereas the control group increased significantly ($F(1, 36) = 4.80, p < .05$) (see Table 8.15 & 8.23). Consistent with our prediction, there was no significant intervention effect on Verbal
self-concept. In addition, Table 8.22 also shows that there was no significant main effect for the group × time interaction effect of peer support intervention in other facets of self-concept.

(b) *From posttest I (Time 2) to posttest II (Time 3)*

For Contrast II (see Table 8.22), there was no significant main effect for the group × time interaction effect of peer support intervention in other facets of self-concept.

(3) **Generalisability of maintenance effect of the intervention over gender**

For the analyses of group × time × gender interaction, as found in the results from Time 1 to Time 2, there was no significant effect for Same-Sex Relations self-concept and other facets of self-concept (see Table 8.20 & 8.22) in both Contrasts I and II. This shows that the maintenance effect of intervention on Same-Sex Relations self-concept was generalised to both males and females, whereas the predicted lack of significant effects for other facets of self-concept was generalised over responses by males and females.

**Summary of Results for Study 5**

In short, the experimental group showed a significant increase in Same-Sex Relations self-concept and such gain was maintained and further increased across the follow-up period of intervention. In contrast, the control group did not display a significant increase in Same-Sex Relations self-concept.
Table 8.20 Study 5 (Socially-Orientated Chinese Intervention): Contrast Comparing Changes in Same-Sex Relations Self-Concept Subscale by Gender for Experimental and Control Groups at (i) Pretest (Time 1) and Posttest Average (Time 2 and Time 3) (ii) Posttest I (Time 2) and Posttest II (Time 3)

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<th>Time 2 versus Time 3</th>
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</thead>
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<tr>
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<td>(i) Error</td>
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Table 8.22 Study 5 (Socially-Orientated Chinese Intervention): Contrast Comparing Changes in Other Self-Concept Subscales by Gender for Experimental and Control Groups at (i) Pretest (Time 1) and Posttest Average (Time 2 and Time 3) (ii) Posttest I (Time 2) and Posttest II (Time 3)

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</tbody>
</table>
Table 8.23 Study 5 (Socially-Orientated Chinese Intervention): Contrast Showing Simple Main Effect of Time on Verbal Self-Concept Subscale for Experimental and Control Groups at Pretest (Time 1) and Posttest Average (Time 2 and Time 3)

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within-subject test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Error</td>
<td>36</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>Group (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary

To conclude, the findings in Studies 3, 4, and 5 provide evidence to support that there exists domain specificity between type of peer support and particular facets of self-concept. An academically-orientated peer support intervention had a positive effect mainly for academic domains of self-concept most logically related to the intervention’s goal, whereas non-academic domains of self-concept were less affected. In contrast, a socially-orientated peer support intervention had a positive effect mainly for non-academic domains of self-concept most logically related to the intervention’s goal, whereas academic domains of self-concept were less affected. In addition, both academically-orientated and socially-orientated peer support interventions had no significant effect on peer support. In the next chapter, the results and the significance for all the five studies in the present investigation is discussed.
CHAPTER 9

DISCUSSION AND IMPLICATIONS FOR FURTHER RESEARCH AND EDUCATIONAL PRACTICE

Introduction

The primary aims of the present investigation were to: (1) conduct a meta-analysis to synthesise and critically analyse the current research literature, to elucidate the impact of academically-orientated peer tutoring interventions on tutees’ academic outcomes and multiple dimensions of self-concept; (2) identify psychometrically sound self-concept and social support instruments for use with evaluating secondary school peer support interventions in Australia and China and evaluate the relation between peer support and multiple dimensions of self-concept; and (3) test the impact of a researcher-devised academically-orientated and socially-orientated peer support intervention administered to Australian students and a socially-orientated peer support intervention administered to Chinese students on specific facets of self-concept and perceptions of peer support by employing a construct validity approach (Craven et al., 2003). In this chapter, firstly key findings of the present investigation in relation to each of these three aims are discussed. Secondly the strengths and limitations of the present investigation are presented. Finally, the implications of the findings for future research, theory, and educational
practice are discussed.

Discussion of Results

Meta-Analysis of the Impact of Academically-Orientated Peer Tutoring

Interventions on Tutee Academic Achievement and Self-Concept

Overall post-intervention impact of academically-orientated peer tutoring interventions on tutee academic achievement. The meta-analysis (Study 1) conducted as a component of the present investigation provided clear support for peer tutoring having a positive effect on academic achievement of tutees. The weighted mean effect size was 0.69 and this result indicated that there was a greater improvement for treatment groups in comparison to control groups. This result is consistent with previous meta-analysis findings. For example Cook et al. (1985) found that the average effect size of achievement of tutees was 0.65, suggesting it was moderate to high in magnitude; and P. A. Cohen et al. (1982) reported that the average effect size of achievement of tutees was 0.40, suggesting it was small to moderate in magnitude. The updated meta-analysis in the present investigation is consistent therefore with previous research.

Constructs that moderate the impact of academically-orientated peer tutoring interventions on tutee academic achievement. The present investigation also identified specific features of participants (education level of tutee and tutor, studies with tutees or tutors from secondary school, and participants of Caucasian ethnicity) that displayed larger effect sizes. These findings add to our understanding of the characteristics of effective academically-orientated peer support interventions. In
addition, consistent with previous research, it was found that academic ability of tutee and tutor, and SES of participants were not significant moderators of effect size. P. A. Cohen et al. (1982) found that there was no significant difference between tutees from low academic ability and middle level, although there was a greater effect size for tutees from low academic ability (unweighted $ES = 0.42$) than middle level (unweighted $ES = 0.33$). Similarly, Rohrbeck et al. (2003) found no significant differences between studies with more than 50% lower SES students (weighted $ES = 0.45$) and studies with less than or equal to 50% lower SES students (weighted $ES = 0.32$). Hence, the results for the updated meta-analysis are consistent with those of previous meta-analyses.

Regarding the methodology parameter, consistent with previous research, adoption of structured tutoring and unstandardised tests displayed larger effect sizes in comparison to the adoption of unstructured tutoring and standardised tests. In an earlier meta-analysis P. A. Cohen et al. (1982) reported that there was a greater effect size for structured tutoring (unweighted $ES = 0.51$) compared to unstructured tutoring (unweighted $ES = 0.26$) and for studies using unstandardised tests (unweighted $ES = 0.84$) compared to studies using standardised tests (unweighted $ES = 0.27$). Similarly, Cook et al. (1985) also reported that there was a greater effect size for studies using unstandardised tests (unweighted $ES = 0.89$) compared to studies using standardised tests (unweighted $ES = 0.45$). However, as mentioned in Chapter 6, the results based on unstandardised tests may need to be interpreted cautiously as they might be constructed (by design or inadvertently) to measure characteristics that are idiosyncratic to the particular intervention and that are not reflective of more general measures of achievement. Involvement of teacher was also a significant moderator of achievement outcome and displayed larger effect sizes in comparison
to no teacher involvement. Rohrbeck et al. (2003) reported greater, although not significant, effect size of achievement for studies involving teachers (weighted $ES = 0.36$) than studies without involvement of teachers (weighted $ES = 0.30$). The results from the present meta-analysis therefore offer stronger support than this previous meta-analysis for the involvement of the teacher being a significant moderator of achievement. Adoption of tutor training, and random assignment were also significant moderators of achievement outcome and displayed larger effect sizes in comparison to no tutor training and using non-random assignment. P. A. Cohen et al. (1982) reported greater, although not significant, effect size of achievement for studies providing tutor training (unweighted $ES = 0.41$) than those that did not provide tutor training (unweighted $ES = 0.36$), and greater, although not significant, effect size for studies adopting random assignment (unweighted $ES = 0.46$) than those that did not utilise random assignment (unweighted $ES = 0.32$). Hence, findings from the present investigation offer stronger support than this previous meta-analysis in relation to the provision of tutor training and utilising random assignment as being significant moderators of achievement.

The present investigation indicated that not using tutoring as a substitute for classroom instruction displayed significantly larger effect sizes than using tutoring as a substitute for classroom instruction. These findings are inconsistent with those of P. A. Cohen et al. (1982) who reported that there was a greater, but not significant, effect size for studies using tutoring as a substitute for classroom instruction (unweighted $ES = 0.47$) than studies using tutoring as supplementary for classroom instruction (unweighted $ES = 0.31$). However, findings from the present investigation are consistent with those of Cook et al. (1985), who found that studies using tutoring as a supplement for classroom instruction (unweighted $ES = 0.69$) displayed slightly
greater effect size than studies using tutoring as a substitute for classroom instruction (unweighted $ES = 0.66$). Perhaps the mixed results from these previous meta-analyses may be related to the methodology and the sampling approach employed. P. A. Cohen et al.’s (1982) and Cook et al.’s (1985) seminal meta-analyses were unable to capture recent methodological advances in meta-analysis such as using weighted effect size, as employed in the present study. Moreover, studies from Cook et al. (1985) were confounded with other types of intervention (e.g., cooperative learning) and the participants involved were confined to handicapped students (learning disabled, behaviourally disordered, and intellectually handicapped) as tutors of other students. Hence, the current meta-analysis offers new insights in relation to the use of tutoring as a supplement to classroom instruction being a moderator of achievement.

Same-age reciprocal peer tutoring displayed larger effect sizes in comparison to same-age non-reciprocal peer tutoring and cross-age peer tutoring. This finding contributes uniquely to peer tutoring research since no previous meta-analyses on peer tutoring have compared the effects of these types of tutoring simultaneously.

Consistent with previous research, adoption of fidelity check, and control for instructor bias by using the same instructor for treatment and control group, were not significant moderators of effect size. These results are consistent with those of Elbaum et al. (2000) who found that there was no significant difference between studies using a fidelity check and those not reported, although using a fidelity check (weighted $ES = 0.37$) produced a slightly smaller effect size than those not reported (weighted $ES = 0.43$). Similarly, P. A. Cohen et al. (1982) reported a slightly greater, but not significant, effect size of achievement for studies adopting control for
instructor bias by using the same instructor for treatment and control groups (unweighted $ES = 0.41$) than those studies that did not employ the same instructor for treatment and control groups (unweighted $ES = 0.36$). Hence, the findings of the present meta-analysis in relation to the use of a fidelity check and using the same instructor for control and treatment groups, were consistent with those of previous research.

Regarding the intervention parameter, consistent with previous research as conducted by P. A. Cohen et al. (1982), duration of tutoring was not a significant moderator of effect size. In addition, there were no significant differences in effect size in relation to the intervention setting such as whether the intervention took place in a school lesson or not.

Regarding the outcome parameter, use of the pretest-posttest change score for calculating effect size displayed larger effect sizes in comparison to using treatment-control posttest mean difference or treatment-control gain score. Although no previous meta-analytic studies on peer tutoring have examined this moderator, Cooper et al. (2000) found that using a pretest-posttest change score produced a greater effect size (weighted $ES = 0.24$) than treatment-control posttest mean difference (weighted $ES = 0.07$) in 93 evaluations of summer school interventions in America. Hence, these results extend the findings of previous intervention research to peer support intervention research.

For subject content, tutoring on subjects other than mathematics and reading displayed larger effect sizes than tutoring on mathematics and reading, although the effect size for reading was significantly greater than that for mathematics in the
present study. Previous meta-analyses have reported mixed results regarding the
effect of peer tutoring on mathematics, reading, and other subjects. P. A. Cohen et al.
(1982) reported greater effect size for mathematics (unweighted $ES = 0.60$) than
reading (unweighted $ES = 0.29$) and other subjects (unweighted $ES = 0.30$). Similarly,
Cook et al. (1985) also reported greater effect size for mathematics (unweighted $ES$
= 0.85) than reading (unweighted $ES = 0.49$). However, similar to the finding in the
present investigation, the effect size for reading was smaller than other subjects such
as language (unweighted $ES = 1.13$) and spelling (unweighted $ES = 0.51$). Also,
Rohrbeck et al. (2003) found no significant differences between mathematics
(weighted $ES = 0.27$) and reading (weighted $ES = 0.26$). The mixed findings from
previous meta-analyses may be related to the methodology and participants involved
(see previous discussion). However, the impact of peer tutoring on specific types of
subject content needs to be further elucidated by future research.

Constructs that determine the effectiveness of academically-orientated peer
tutoring interventions on tutee academic achievement. Since previous
meta-analyses of peer tutoring have not employed regression analyses to examine the
predictive ability of moderators as undertaken in the present investigation, the
present findings contribute uniquely to better understanding the determinants of
effective peer tutoring. When each category of the participant parameters was
separately estimated in regression analyses, participants from secondary school had
greater predictive ability compared with participants from elementary, college, or
university level. These results suggest that secondary school students may stand to
benefit most from peer support interventions. Furthermore, participants of Caucasian
ethnicity had greater predictive ability compared with Afro-American ethnicity.
These results suggest that peer tutoring interventions may be more beneficial for
Caucasian students, although this needs to be further elucidated by future research.

Regarding the methodology parameters, involvement of teacher, adoption of structured tutoring, not using standardised tests for controlling author bias, provision of tutor training, not using peer tutoring as a substitute for regular classroom instruction, and having random assignment had greater predictive ability compared with no involvement of teacher, no adoption of structured tutoring, using standardised test for controlling author bias, no provision of tutor training, using peer tutoring as a substitute for regular classroom instruction and having non-random assignment. These results imply peer tutoring interventions may be more effective when there is teacher involvement, tutoring is structured, unstandardised tests are used, tutor training is provided, peer tutoring is used as a supplement for regular classroom instruction, and random assignment is used. However, as mentioned earlier, the results based on unstandardised tests may need to be interpreted cautiously.

Regarding the intervention outcome parameters, using treatment-control posttest mean difference and treatment-control gain score had smaller predictive ability compared with pretest-posttest change score; reading and mathematics as tutored subjects had smaller predictive ability compared with other subjects. These results suggest that effect size would be greater when a pretest-posttest change score was used for calculating the effect size and the tutored subject is not reading or mathematics.

When all the predictors were examined in a single all-inclusive model, only the following variables were included in the final model: engaging secondary and
Caucasian students as tutees, adoption of structured tutoring, and mathematics as the tutored subject displayed greater predictive ability whereas using standardised test for controlling author bias, using peer tutoring as a substitute for regular classroom instruction, using treatment-control posttest mean difference and treatment-control gain score for calculating effect size, displayed smaller predictive ability as compared with the intercept and the other predictors in the model. Overall, these results imply that among all significant predictors, peer tutoring interventions may be more beneficial for Caucasian secondary school students, more effective when structured tutoring is used, and when peer tutoring is adopted as a supplement for regular classroom instruction. Effect size may also be greater when the tutored subject is mathematics but smaller when standardised tests are used and treatment-control posttest mean difference or treatment-control gain score is used for calculating the effect size, although this needs to be further elucidated by future research.

*Overall post-intervention impact of academically-orientated peer tutoring interventions on tutee self-concept.* Results of the current study indicated that academically-orientated peer tutoring interventions had a positive impact on overall self-concept of tutees. The weighted mean effect size for overall self-concept of tutees was 0.71, suggesting that peer tutoring had a positive large effect on overall self-concept of tutees whereby there was a greater improvement of self-concept for treatment groups over control groups. This result provided strong support for the a priori hypothesis that academically-orientated peer tutoring had a positive large impact on self-concept. These results contrast with those of previous research, which has found that tutoring had minimal effects (P. A. Cohen et al., 1982; Cook et al., 1985).
As discussed in Chapter 3, most of the earlier peer tutoring research has adopted a unidimensional self-concept scale or analysed self-concept by calculating only a total global self-concept score, often when multidimensional self-concept scales were utilised. Both of these approaches mask the effect of interventions on specific domains of self-concept most logically related to the intervention. Thus it is unsurprising that the effect size of peer interventions in relation to self-concept was small in previous research. In contrast, the present investigation included recent studies that adopted multidimensional self-concept scales and utilised a construct validity approach (Craven et al., 2003) to the study of intervention effects whereby each specific self-concept domain was considered separately in relation to the goals of the intervention. This explains why the effect sizes were larger for those academically-orientated interventions that utilised multidimensional self-concept measures rather than unidimensional measures. The weighted mean effect sizes for using multidimensional measures were 1.05, whereas it was 0.43 for a unidimensional self-concept scale. These findings are consistent with those from O’Mara et al.’s (2004) meta-analysis on self-concept enhancement interventions, where they found that effect sizes were larger for those interventions focused on specific domains of self-concept with multiple multidimensional self-concept measures than those with a global or unidimensional measure.

The results of this study offer further support for the use of multidimensional self-concept measures and for the construct validity approach in relation to peer support interventions and the self-concept theory and research on which this approach is based.
Post-intervention impact of academically-orientated peer tutoring interventions on target and non-target self-concept of tutee. Consistent with predictions based on a construct validity approach, effect sizes were systematically larger for components of self-concept most logically related to academically-orientated interventions and smaller for components of self-concept not targeted by the intervention. Hence, the construct validity approach to the study of intervention effects was supported in the current study. The weighted mean effect sizes for target self-concept were 0.84, and 0.14 for non-target self-concept. The focus of the intervention was a significant moderator of effect size, suggesting the effect size for target and non-target self-concept was significantly different. Moreover, target self-concept was a positive significant predictor of effect size whereas non-target self-concept was not, as shown in regression analysis. Hence, the a priori hypothesis that there would be a greater effect of peer tutoring on target self-concept than non-target self-concept was supported. These results are consistent with findings from O’Mara et al. ‘s (2004) meta-analysis on self-concept enhancement interventions, that effect sizes were larger for target domains of self-concept than for non-target domains of self-concept.

Constructs that moderate the impact of academically-orientated peer tutoring interventions on tutee self-concept. Since previous meta-analyses have not employed homogeneity and regression analyses to examine the moderators and their predictive ability of effect size of self-concept, as was done in the present investigation, the present findings contribute uniquely to a better understanding of the determinants of effectiveness of peer tutoring, although the findings are tempered with the sample size of the present study.
The present study demonstrated that involvement of teacher, adoption of fidelity check, and random assignment displayed larger effect sizes in comparison to no involvement of teacher, no adoption of fidelity check, and non-random assignment. However, it was found that using peer tutoring as a substitute to classroom instruction, and duration of tutoring, were not significant moderators.

**Constructs that determine the effectiveness of academically-orientated peer tutoring interventions on tutee self-concept.** When each parameter was estimated separately in regression analyses, involvement of teacher, adoption of fidelity check, and random assignment had greater predictive ability than parameters not involving teacher, not adopting a fidelity check, and studies with non-random assignment. These results suggest that these features may be useful characteristics to employ in future research. However, when all moderators were put into a single model, only adoption of random assignment was found to be a positive predictor in the final all-inclusive model. Overall, these results imply that among all significant predictors, peer tutoring interventions may be more effective when random assignment is used, although future research may verify this.

**The Structure and Cross-Cultural Validity of Self-Concept and Peer Support**

Results of the present investigation provided strong support for the SDQII as a reliable and valid measure of Australian and Chinese participants’ self-concepts, as shown by the acceptable reliability of each scale and confirmation of the a priori 11-factor structure of this instrument to measure the multidimensionality of the self-concept construct. Demonstration of the sound psychometric properties of the SDQII is essential since it ensures that the researchers can utilise instruments
confidently to measure change in self-concept accurately due to self-concept enhancement intervention.

**Reliability of the SDQII (English Version).** Results suggest that the English version of the SDQII has a reasonably high reliability for each self-concept scale. The coefficient alpha estimates of reliability range from .82 to .93, and all are greater than .80, with a median of .86. The results are similar to those reported in the SDQII manual for the normative archive from each scale, which ranges from .83 to .91 with a median of .87 (Marsh, 1992b).

**Multidimensionality of the SDQII (English Version).** Results of the current study provided evidence to support the multidimensionality of the English version of the SDQII in that there are 11 distinct factors in SDQII. The 11-factor model provides a reasonable fit to the data as shown in the goodness of fit indices with reasonable factor loadings. The target factor loadings in the 11-factor model are substantial, ranging from .65 to .92 – generally higher than those reported in the SDQII manual (Marsh, 1992b). The correlations among the factors are modest, ranging from .05 to .63, except for the correlation between General School self-concept and Mathematics at .73, between General School self-concept and Verbal at .80, and between General School self-concept and General self-concept at .82. The high correlation between General School self-concept and the two specific academic domains (Mathematics and Verbal) are consistent with the patterns reported in the SDQII manual (Marsh, 1992b).

However, the correlation between Mathematics self-concept and Verbal self-concept in the present study is higher than reported in the SDQII manual.
Although this is inconsistent with predictions from the Marsh/Shavelson model of self-concept in which a near-zero correlation between Mathematics self-concept and Verbal self-concept was proposed, a considerable number of SDQ studies have reported similar findings (Marsh, 1990d, 1992b; Marsh & Craven, 1991; Marsh, Ellis, & Craven, 2002).

CFA, the stronger statistical tool, was utilised in the present study, while EFA was used in the normative data reported in the SDQII manual (Marsh, 1992b). However, similar patterns were found in the factor loadings and correlations among factors between the English version of the SDQII in the present investigation and the SDQII manual (Marsh, 1992b). Hence, it is clear that self-concept is a multidimensional construct instead of a unidimensional construct and the findings of the present investigation offer further support for the multidimensionality of the self-concept construct.

**Reliability of the SDQII (Chinese Version).** The Chinese version of the SDQII was also demonstrated to be a reliable measure for each self-concept scale. The coefficient alpha estimates of reliability for each scale of the Chinese version of SDQII of the present study were reasonable, and all were greater than .80 except Honesty-Trustworthiness and Emotional Stability, with medians of .83. These results are similar to those reported in another Chinese study (Kong, 2000). The coefficient alpha estimates of reliability for each scale range from .73 to .92 with a median of .84 in Grade 8 participants, whereas the coefficient alpha estimates of reliability for each scale range from .77 to .94 with a median of .87 in Grade 9 participants. In addition, these results are also similar to those reported in the SDQII manual (Marsh, 1992b) and the Australian study conducted in the present investigation as discussed.
in the preceding section.

**Factor structure of the SDQII (Chinese Version).** The multidimensionality of the Chinese version of the SDQII was supported. A total of 11 distinct factors in SDQII were identified and the 11-factor model provides a reasonable fit to the data as shown in the goodness of fit indices, with reasonable factor loadings. The target factor loadings in the 11-factor model were substantial, ranging from .56 to .89; lower than those reported in the SDQII manual (Marsh, 1992b) but similar to those reported in the Chinese study (Kong, 2000). The correlations among the factors are modest, ranging from -.03 to .66, except for the correlation between General School self-concept and General self-concept at .73. This high correlation is consistent with the pattern reported in the manual and the Chinese study (Kong, 2000). Unlike the English version of SDQII in the present study, the correlation between Mathematics self-concept and Verbal self-concept is near zero. This is consistent with previous SDQ studies (Marsh, 1986, 1990b, 1993) and the Chinese study (Kong, 2000).

Similar to the English version of SDQII, although a stronger statistical tool, CFA was utilised in the present study, while EFA was used in the normative data reported in the SDQII manual (Marsh, 1992b), these studies demonstrated similar patterns in the factor loadings and correlations among factors between the Chinese version of the SDQII in the present investigation and the SDQII manual (Marsh, 1992b). Hence, the above results demonstrate that the reliability and factor structure of the SDQII (Chinese version) for responses by Chinese participants in the present investigation are sound psychometric measures.
Factorial invariance of the SDQII across Chinese and Australian population samples. The present study contributes to a better understanding of the factor structure between English and Chinese versions of the SDQII, since previous research has not compared them.

Invariance testing of the SDQII demonstrated that the factor structure of the SDQII across Chinese and Australian population samples was invariant, thus demonstrating the cross-cultural validity of this instrument. Results generated from the factor-invariant models across two population samples provided reasonable support for factorial invariance, which is the critical feature for analysing cross-cultural validity (Marsh & Hocevar, 1985; Marsh, Smith, et al., 1985; Marsh et al., 1997). Hence, these results demonstrate the cross-cultural validity of the SDQII measure although the support for the invariance of the factor correlations, factor variances, factor covariances, and uniquenesses was weak. These results imply that researchers can confidently utilise both English and Chinese versions of SDQII with Chinese and Australian samples separately and cross-culturally.

The Structure of Peer Support and Relation with Self-Concept

Results of the present investigation provide strong support that the social support measure utilised in the present investigation (SS-A) is a reliable and valid measure of peer support, as shown by acceptable reliability and a confirmation of the a priori 1-factor structure of this instrument to measure the peer support construct.

Moreover, peer support displayed a positive relation with all facets of self-concept and a significantly higher positive relation with Opposite-Sex Relations,
Same-Sex Relations, Emotional Stability, and General self-concept, with Same-Sex Relations self-concept being the highest relation in comparison to other facets of self-concept measured by the SDQII. These results suggest that peer support shares a positive relation with multiple facets of self-concept.

**Reliability of the SS-A subscale (English Version).** The friend subscale in SS-A utilised in this investigation showed good internal consistency. The coefficient alpha estimate of reliability for this scale in the present study was high (alpha = .86). It was consistent with the results based on previous research in which the mean Cronbach alpha coefficient was .84 for the student samples and .84 for the community samples. Hence, these findings provide support for the SS-A subscale (English version) in that reliability estimates for the scale measured were high.

**Factor Structure of the SS-A subscale (English Version).** Results of the a priori one-factor model indicate the model is a good fit to the data, as shown in the goodness of fit indices with reasonable factor loadings. The target factor loadings are reasonable in that they range from .61 to .82. These factor analyses clearly identify the convergence of the 7 items to the same factor.

**Relation between peer support and self-concept.** Strong statistical procedures, CFA demonstrates that SDQII subscales are distinct from the SS-A subscale. The correlation between peer support and 11 different facets of self-concepts provides clear support for peer support being positively correlated with all facets of self-concepts. It was found that peer support has a more positive relation with some facets of self-concept than with others (see previous discussion), with Same-Sex Relations demonstrating the strongest relation. This was consistent with
previous findings that peer support had positive relation with self-concept (Keefe & Berndt, 1996) whereas negative peer relation was associated with lower self-concept (Marsh, Parada, Craven et al., 2004). Also, those with negative peer relations were particularly low on Same-Sex Relations self-concept, Opposite-Sex Relations self-concept, Emotional Stability, and General self-concept, with Same-Sex Relations self-concept being the lowest relation (Marsh, Parada, Craven et al., 2004; Marsh et al., 2001).

The Impact of the Academically-Orientated and Socially-Orientated Peer Support Interventions on Multiple Dimensions of Self-Concept and Peer Support in Australian and Chinese Samples

Taken together the findings of Studies 3, 4 and 5 are consistent with the predictions based on a construct validity approach to the study of intervention effects, that facets of self-concept most relevant to the goals of the intervention will be most affected, whilst less relevant domains will be less affected (Craven, 1989; Craven et al., 1991; Marsh & Richards, 1988; Marsh et al., 1986a, 1986b). In the present investigation an academically-orientated peer support intervention displayed a positive effect mainly on academic domains of self-concept most logically related to the goal of the intervention whereas non-academic domains of self-concept were less affected. Conversely, a socially-orientated peer support intervention displayed a positive effect mainly for the non-academic domains of self-concept most logically related to the intervention’s goals whereas academic domains of self-concept were less affected.
Impact on target and non-target self-concept. Regarding the academically-orientated peer tutoring, it was postulated that participants would display a positive change mainly in Verbal self-concept as measured by the SDQII since the academically-orientated peer tutoring intervention designed to enhance participants’ verbal skill. Consistent with predictions, results demonstrated that participants who had experienced the intervention compared to participants who had not experienced this intervention displayed statistically significant higher Verbal self-concepts. The impact of the intervention on Verbal self-concept for the experimental group was also generalised to both males and females.

Conversely, participants who experienced an academically-orientated peer tutoring intervention compared to participants who had not experienced this intervention had no significant effects for facets of self-concept not targeted by the intervention (Physical Ability, Physical Appearance, Opposite-Sex Relations, Same-Sex Relations, Honesty-Trustworthiness, Parent relations, Emotional Stability, General self-concept, Mathematics, and General School), regardless of the gender of participants.

As proposed in Shavelson’s hierarchical model of self-concept, academic self-concept was divided into further self-concepts in particular content areas (Mathematics, Verbal and General School). It is plausible to suggest that changes in lower order facets of hierarchy will lead to changes in higher order facets of hierarchy. Hence, secondary impact may be occurred in higher order self-concept, the General School Self-concept or even in General Self-concept, as found by Craven et al. (1991). However, the transfer effect was not evident in a study conducted by Ellis et al. (2005). Ellis et al. (2005) conducted a peer support
intervention on a sample of 930 students in Year 7. One of the aims of intervention was to increase the English competence of the students. Consistent with predictions based on the construct validity approach, it was revealed that there was significantly higher Verbal self-concept in the experimental group compared to the control group, since it was target self-concept that was most relevant to the goal of the intervention. However, there was no significant impact on General School Self-concept, indicating that there was no transfer effect to General School Self-concept.

Guérin, Marsh, and Famose (2003) evaluated the validation of the French version of SDQII involving 480 students. Results provided clear support for the multidimensionality of the self-concept in SDQII but offered weak support for the hierarchical structure of adolescent self-concept. It was found that much of the variance of many lower-order factors was not explained by higher-order factors. Hence, the higher-order models had a poorer fit than the first-order models and the hierarchy of self-concept was so weak that the first-order structure was utilised. Hence, the notion that changes in first-order facets of hierarchy result in changes in higher order facets of hierarchy was not supported. This may help to explain why there was no transfer effect to General School Self-concept or even General Self-concept. Hence, the hierarchical structure of Shavelson’s model of self-concept remains unsubstantiated. This finding warrants further research.

Regarding the socially-orientated peer support intervention, as discussed in Chapter 4, the aim of the intervention was to enhance social and interpersonal relationship skills. Hence, it was predicted that this intervention would have a positive impact mainly on peer relation self-concept as measured by the SDQII and more specifically on Same-Sex Relations self-concept, since same-sex peers are the
primary source of peer relations for early adolescents (see Chapter 4).

In the Australian sample, partially consistent with predictions, only female participants who had experienced the socially-orientated peer support intervention, compared to those female participants who had not experienced this intervention displayed statistically significant higher Same-Sex Relations self-concepts. However, there was no significant difference in Same-Sex Relations self-concepts for males between experimental and control groups. Hence, the impact of the intervention on Same-Sex Relations self-concept for the experimental group was found in females only and the benefits of this intervention did not generalise to males. Previous research has shown that adolescent girls reported more self-disclosure (Riverbark, 1971), greater intimacy levels in their close friendships (Berndt, 1981; Buhrmester & Furman, 1987, & Furman & Buhrmester, 1985), spend more time with friends than boys (Wong & Csikszentmihalyi, 1991), and expect greater attachment and intimacy with friends (Claes, 1992). Hence, it is plausible to suggest that perhaps females may have been more likely than males to build up close interpersonal relationships during the peer support intervention and to apply the social and communication skills they learnt from the intervention to enhance their relationship with their peers. This suggestion needs further exploration in future research.

In the Chinese sample, results indicated that the socially-orientated peer support intervention had a positive effect on Same-Sex Relations self-concept, targeted by the intervention for the experimental group. In contrast, the control group did not display a significant increase in Same-Sex Relations self-concept. However, the intervention effect on Same-Sex Relations self-concept for the experimental group was generalised to both males and females. As discussed in Chapter 4, under
the influence of Confucianism, a collectivist point of view is predominant in Chinese culture, and greater emphasis is put on the maintenance of interpersonal relationships. Hence, individuals with positive self-concept share a satisfactory relationship with others (C F. Chang, 1982) and creating conflicting relationships is detrimental for one’s self-esteem. Although an individualistic feature such as the social comparison effect was as strong in Hong Kong as in Australia (Marsh et al., 2000) in that personal goals are preferred over the group goal, the collectivist value of Chinese culture is still predominant over individualistic value in Hong Kong (Bond & Cheung, 1983). For example, McFarland and Buehler (1995) found that individuals from collectivist cultures had higher collective self-esteem and were less susceptible to social comparison effects than those from an individualistic culture. Therefore, those male and female Chinese participants who participated in the socially-orientated peer support intervention in the present investigation may have applied the communication and social skills learnt from the intervention to build up a harmonious relationship with their peers. As a result, the intervention effect of the socially-orientated peer support intervention on Same-Sex Relations self-concept was generalised to both males and females for Chinese participants.

In addition, follow up measures demonstrated that the intervention effect on Same-Sex Relations self-concept was stable over time. These results indicate that the experimental group showed a further improvement on Same-Sex Relations self-concept over the follow-up interval for both male and female participants. This suggests a “sleeper” effect of the intervention in which the intervention effect gets larger following the end of the intervention (Kendall & Kessler, 2002). Ellis et al. (2005) also reported a sleeper effect in a peer support intervention for a sample of 930 Australian students in Year 7. They found that there was a significant gain in
self-confidence and self-efficacy between the end of the intervention and follow-up. Hence it is plausible to suggest that the impact of the intervention may have become more evident after the intervention since the participants gradually applied what they learned in the intervention.

These findings provide support that the impact of a socially-orientated peer support intervention on Same-Sex Relations self-concept for Australian sample could be partially replicated for Chinese participants. However, unlike the Australian sample, the impact on Same-Sex Relations self-concept generalised to both males and females for Chinese participants. Moreover, this intervention effect on Same-Sex Relations self-concept was maintained across the end of intervention and even further increased across the follow-up period of intervention for both male and female Chinese participants.

For the other facets of self-concept (Physical Ability, Physical Appearance, Opposite-Sex Relations, Honesty-Trustworthiness, Parent Relations, Emotional Stability, General self-concept, Verbal, Mathematics, and General School) not targeted by the socially-orientated peer support intervention, participants who experienced the intervention compared to participants who had not experienced it, did not display significantly greater effects for these facets of self-concept regardless of the gender of participants, in both Australian and Chinese samples. These results provide further support for the usefulness of employing a construct validity approach to the study of intervention effects.

In sum, these three intervention studies provide evidence to support that there exists domain specificity between type of peer support and particular facets of
self-concept on the basis of a construct validity approach. An academically-orientated peer support intervention had a positive effect mainly for academic domains of self-concept most logically related to the intervention’s goal, whereas non-academic domains of self-concept were less affected. In contrast, a socially-orientated peer support intervention had a positive effect mainly for non-academic domains of self-concept most logically related to the intervention’s goal, whereas academic domains of self-concept were less affected. These results therefore offer support for both the construct validity approach and the self-concept and theory on which it is based, as well as extending the usefulness of these approaches to the study of peer support interventions.

**Impact on peer support.** Results provided support for the predictions that participants who have experienced an academically-orientated peer tutoring intervention compared to participants who have not experienced this intervention displayed no statistically significantly higher peer support, regardless of the gender of participants. However, inconsistent with the predictions, participants who had experienced a socially-orientated peer support intervention, in comparison to participants who had not experienced this intervention did not display higher peer support. These findings suggest that perhaps peer support is more stable and difficult to change. For example, Brand, Lakey, and Berman (1995) conducted a preventive, psychoeducational peer support intervention to improve perceived social support of a sample of 51 single adults (divorced, widowed, separated, never married). The intervention was led by graduate students and focused on social skills training and cognitive restructuring. Results indicated that participants in the intervention group demonstrated no significant gain in perceived friend support compared with controls although there was a significant increase in perceived family support. Moreover,
there were larger changes in self-esteem than in perceived family support, suggesting that social support perceptions may be more stable than other psychosocial variables such as self-esteem. Alternatively, it might take a longer time to increase peer support through peer support intervention. This requires verification by future research.

**Strengths and Limitations of the Present Investigation**

The present study capitalised on current advances in the development in social support research, self-concept research, and the development of multidimensional self-concept measurement instruments to critically analyse the impact of peer support interventions. A key strength of the updated meta-analysis undertaken was addressing some previous methodological and theoretical flaws (see Chapters 2 & 3 for details), to demonstrate that academically-orientated peer tutoring interventions had a positive effect on academic achievement and self-concept. These results demonstrate the efficacy of extending current advances in social support and self-concept theory and research to the study of the impact of peer support interventions. Another key strength of the meta-analysis was demonstrating the importance of adopting multidimensional self-concept instruments and a construct validity approach to evaluating the impact of peer tutoring on self-concept. The current study utilised the SDQII in order to account for the multidimensionality of the self-concept construct and ensure a rigorously validated measure with sound psychometric properties was employed, since SDQ instruments have been evaluated as among the strongest multidimensional instruments available in terms of psychometric properties and construct validation research (see Chapter 3). Hence, the present investigation overcame a number of limitations of previous research by
adopting a theoretical conceptualisation of the self-concept construct as opposed to atheoretical approaches, employed a sound multidimensional measure of the self-concept construct as opposed to a unidimensional measure, and employed analyses that accounted for the multidimensionality of the self-concept construct.

The present meta-analysis also evaluated what intervention features predict the effectiveness of academically-orientated peer tutoring interventions on academic outcomes. The identification of these characteristics offers promising potential to strengthen future peer support research and practice.

Moreover, in the present study, strong statistical procedures were implemented. CFA was used to evaluate the psychometric properties of multidimensional self-concept instruments. Unlike the EFA utilised in previous research, CFA has the advantage that it allows evaluation and comparison of the a priori model against other alternative models. In addition, this permits comparison of the factor structure of self-concept for Chinese and Australian secondary students by conducting factorial invariance testing that previous research has not tested. Hence, this allows more reliable comparisons in relation to elucidating the impact of peer support intervention on self-concept for Chinese and Australian samples in the present investigation.

The interventions in the present study were designed to capitalise on current advances in the social support and self-concept research. First, only one single supportive figure (a peer) was engaged in providing supportive interventions, in order to avoid potential confounding effects based upon multiple supportive figures being involved in intervention delivery. In addition, since the same type of support
provided by different supportive figures will have different effects on a particular outcome, it is more appropriate to use one single supportive figure, the peer leaders/tutors in the present investigation, to administer the supportive interventions in order to assess the differential effects of two types of support. Otherwise, the differential effects of two types of support would be confounded by the influence of different supportive figures. Secondly, the construct validity approach was employed to assess the specific effects of different types of peer support interventions on self-concept in the present study. This allowed critical analysis of whether there was a strong effect of peer support intervention on the target facets of self-concept most relevant to the goals of the intervention, and a lesser effect on the non-target facets of self-concept less relevant to the goal of intervention. In addition, the present investigation critically analysed the impact of a socially-orientated peer support intervention on target and non-target facets of self-concept on both a Chinese sample and an Australian sample, which permitted cross-cultural comparison of the effects of peer support intervention. The follow-up data in Study 5 not only made the results of Study 5 stronger and therefore more convincing compared with Study 4, it also provided a stronger basis for evaluating the effects of interventions in Studies 3 and 4. In addition, current social support research has emphasised the consideration of social support in the context of the setting. Thus, the two types of peer support interventions (academic & social) administered in the present study were considered to serve a crucial role for the development of adolescents.

While the findings of this study provide preliminary evidence to support the domain specificity between peer support and self-concept, a number of limitations of the present investigation need to be acknowledged in interpreting the results. The present study was confined to two types of peer support interventions; hence, it is not
possible to test the generalisability of the findings to different types of peer support that will match different facets of self-concept, such as physical peer support and emotional peer support. A further limitation is that the peer support interventions in the present investigation were administered to Year 7 students, and hence the results may not generalise to other age groups. Since only small number of schools and participants were involved, caution is warranted in generalising the findings to the other settings. Hence, replication of the present investigation in other settings with larger sample size is necessary. Similarly, although the present investigation provides clear support for the cross-cultural validity of the SDQII measure for Chinese and Australian students, a major limitation is that participants in Chinese and Australian samples did not come from same grade. The latter may confound the results and explain why certain factor structure invariance (e.g. factor correlations, factor variances, factor covariances and uniquenesses) was not supported.

For the outcome measures, only self-report instruments were adopted. Future research may include assessment of change of self-concept and peer support from other objective sources such as parents, teachers, and classmates. In addition, findings of the meta-analysis conducted in the present study identified that most of the significant moderators for academic achievement contain a heterogenous cell, as indicated by significant $Q_w$ in the within-study homogeneity. This suggests that the effect sizes on these moderators vary across studies. Also, the results examining the impact of academically-orientated peer tutoring interventions on self-concept of tutees are tempered by the small sample size of articles. Future research needs to address these issues.
Implications of the Present Investigation for Theory, Research, and Practice

The present study contributes to advancing our understanding of the relation between multiple dimensions of peer support and multidimensional facets of self-concept; the impact of academically-orientated and socially-orientated peer tutoring interventions on self-concept and peer support of students, and the factor structure of self-concept for Chinese compared with Australian secondary students. It also allows more thorough evaluation of what intervention features may provide promising directions for strengthening theory, research, and practice in relation to academically-orientated peer tutoring interventions.

The results of the present investigation also lend substantial support to the domain specificity between certain types of peer support and particular domains of self-concept that previous research has so far not fully addressed. It is evident that academically-orientated peer support was associated with academic domains of self-concept, whereas socially-orientated peer support was associated with social domains of self-concept. These results suggest that peer support interventions can be distinguished into academic and social domains. Future research might examine the impact of peer support interventions on more specific academic domains (e.g., mathematics and verbal) and non-academic domains (e.g., moral, emotional, physical ability, and physical appearance), as found in the Marsh/Shavelson model of multidimensional self-concept. In sum, this calls for refinement of peer support construct into domains that are similar to those found in self-concept, since peer support is closely related with multidimensional self-concept. Previous peer support research has distinguished social support into different modes of functions such as
advice giving, emotional support, and problem solving. Perhaps it is possible that these functions are nested under the academic and social domains of peer support. This suggestion remains to be elucidated by further research.

It would also be useful to investigate whether the domain specificity between particular domains of self-concept and certain types of support would be extended to other supportive figures, such as family and teacher. Current social support research has assessed the relative influence from different sources of supportive figures (parents, teachers, classmates, and friends) on student adjustment. Future research may be able to elucidate the relative effect of academic and social domains of support from different sources of supportive figures on academic and social domains of adjustment. In addition, in the present investigation there were differential effects of the socially-orientated intervention on males and females, suggesting that the differential effects of peer support interventions on gender remain to be fully elucidated.

Findings of the present study, using rigorous multiple group comparison procedures based upon CFA of factorial invariance that previous research has not compared, suggest that the factor structure of both the English and Chinese versions of the SDQII is invariant for Chinese and Australian secondary students. This demonstrates the cross-cultural validity of the English and Chinese versions of the SDQII. Hence, this permits future research to conduct cultural generalisation of the effect of peer support intervention on self-concept across samples from English-speaking countries with Chinese cultures.

The meta-analysis conducted in the present study provides promising
directions for research assessing the impact of academically-orientated peer tutoring interventions on academic achievement and self-concept of tutees. Previous meta-analysis research suggested that academically-orientated peer tutoring interventions had almost no impact on self-concept. Conversely, the present investigation found that these interventions had a positive large effect on self-concept. These results suggest it would be useful for future research to incorporate the construct validity approach to the study of intervention effects and account for the multidimensionality of the self-concept construct when evaluating the impact of peer tutoring interventions on self-concept. Moreover, results of the meta-analysis conducted in the present study help to identify what intervention features may constitute “best practice” for academically-orientated peer tutoring interventions. Similarly, it is plausible to adopt these techniques to explore what intervention features constitute the “best practice” for other types of peer support interventions in future research.

From a practical perspective, it is vital to consider the differential effect of various types of peer support intervention. For example, an academically-orientated peer support intervention would be implemented when the intervention aims at promoting academic domains of self-concept and academic achievement. Results of the present study also demonstrated that it was more difficult to change peer support compared with change in self-concept and that educators may anticipate sleeper effects on self-concept.

The present study found that there was a significant impact of a socially-orientated peer support intervention on Same-Sex Relations self-concept of female participants only in Australian sample. However, the significant impact was
found in both male and female participants in Chinese sample. Hence, educators may need to consider differential cultural considerations more fully in regard to gender when conducting peer support intervention with samples from different cultures.

The meta-analysis conducted in the present study advances our knowledge of the effects of academically-orientated peer tutoring interventions on achievement and self-concept. It provides a strong empirical base for educational practitioners to implement academically-orientated peer tutoring interventions confidently in promoting academic gain and enhancing specific facets of self-concept. The results also suggest the usefulness of adopting a construct validity approach and accounting for the multidimensionality of self-concept in peer support intervention design. The meta-analysis also has implications for educational practice in that intervention features that produce optimal effectiveness of the academically-orientated peer tutoring interventions were identified, and these can serve to strengthen practice.

**Summary**

This chapter has discussed the findings of the present investigation, which shows that there exists domain specificity between type of peer support and particular facets of self-concept. The implications of the findings for theory, research, and practice were also discussed, along with the limitations and strengths of the investigation. Overall, the results suggest that the peer support construct can be refined into academic and social domains. It is important to adopt a construct validity approach and account for the multidimensionality of the self-concept construct when studying the impact of peer support interventions on self-concept, social support, and other outcomes relevant to the goals of the intervention. They also offer further
support for self-concept and social support theory and research. The findings also suggest that peer support interventions can impact positively on specific domains of self-concept most relevant to the goals of the intervention.
CHAPTER 10

SUMMARY AND CONCLUSIONS

Positive peer relationships are an important goal in themselves and are postulated to impact on other desirable educational outcomes such as positive social and psychological functioning, whereas negative peer relationships have been related to serious problems such as delinquency, drug abuse, and depression. As such numerous peer support interventions have been implemented in educational settings worldwide with the purpose of promoting the wellbeing of students and preventing antisocial and aggressive behaviour within the peer group.

Despite the growing popularity of school-based peer support interventions, research assessing the effect of peer support interventions has often been plagued with theoretical and methodological flaws. The present investigation provides promising directions for critically analysing the impact of peer support interventions on desirable educational outcomes capitalising on current advances in social support research, self-concept research, and the development of multidimensional self-concept measurement instruments.

Previous research evaluating the impact of peer support interventions on self-concept has often not accounted for the multidimensionality of the self-concept
construct nor employed a construct validity approach to the study of intervention effects. In addition, researchers have not felt compelled to demonstrate the psychometric properties of the self-concept instrumentation they have employed. Hence, little is known about the impact of peer support interventions on specific domains of self-concept. In order to overcome these limitations, the present investigation sought to examine the effect of peer support interventions on self-concept, adopting a multidimensional self-concept scale with sound psychometric properties and employing a construct validity approach to the study of intervention effects.

The central findings that emerged from the present study provide strong evidence for domain specificity between type of peer support and multiple domains of self-concept. The academically-orientated peer support intervention conducted in the present investigation had a positive impact mainly on academic domains of self-concept most logically related to the goal of the intervention, whereas non-academic domains of self-concept were less affected. Conversely, the socially-orientated peer support intervention had a positive impact mainly for the non-academic domains of self-concept most logically related to the intervention’s goals, whereas academic domains of self-concept were less affected. These results demonstrate that different types of peer support interventions had a differential impact on different facets of self-concept. Hence, these findings provide clear support for peer support interventions having the potential to make a significant contribution to schools’ efforts to orchestrate positive academic and social outcomes in multiple domains of self-concept.

A noteworthy contribution of the present study was to advance social support
theory and research by developing a new multidimensional construct of peer support which includes academic and social domains. These two types of peer support were considered important to evaluate in school settings, since both types of social support intervention have been shown to impact on academic and non-academic desirable educational outcomes. In addition, academic and social domains of social support are two crucial aspects for the development of adolescents.

The present study also endeavored to deliver a new standard for research assessing the impact of peer support intervention on self-concept. It was found that when evaluating peer support interventions it is important to account for the multidimensionality of the self-concept construct, to adopt multidimensional self-concept instruments with sound psychometric properties, and to employ a construct validity approach to the study of intervention effects.

In addition, the present study also provides insights on devising academically-orientated peer tutoring interventions with a strong empirical base. The meta-analysis examining the impact of academically-orientated peer tutoring interventions undertaken in the present study allows researchers to evaluate what intervention design parameters moderate and predict the effect of peer tutoring, and hence the determinants that constitute the “best practice” for intervention design could be identified. These intervention features were incorporated into the researcher-devised academically-orientated peer tutoring intervention in the present investigation to optimise its success.

More specifically, Study 1 examined the impact of academically-orientated peer tutoring interventions on tutees' academic outcomes and self-concept by
conducting a meta-analysis. Results revealed that academically-orientated peer tutoring had a positive impact on academic achievement and self-concept of tutees. These findings contrast with previous meta-analyses that have found that academically-orientated peer tutoring had almost no impact on self-concept of tutees. Consistent with current self-concept theory and research, there was a greater effect of peer tutoring on self-concept when a multidimensional self-concept scale rather than a unidimensional scale was used. Moreover, the construct validity approach to the study of intervention effects was supported in that effect sizes were systematically larger for components of self-concept most logically related to academically-orientated interventions and smaller for components of self-concept not targeted by the intervention. This demonstrated that there is a need for the adoption of multidimensional self-concept scales and a construct validity approach that incorporates both target and non-target self-concept facets in studies evaluating the effects of peer support interventions.

The effectiveness of academically-orientated peer tutoring interventions on academic achievement and self-concept was moderated and predicted by the particular intervention parameters (see Chapter 6 for details). In essence, the following intervention design parameters were incorporated into the academically-orientated peer tutoring intervention in the present investigation to optimise the success of the intervention:

- engaging participants (tutee or tutor) from secondary school;
- engaging Caucasian participants;
- the involvement of teacher;
- use of fidelity check;
- adoption of random assignment;
structured peer tutoring;
provision of tutor training;
not using peer tutoring as a substitute for regular classroom instruction;
use of standardised tests; and
calculation of effect size from treatment-control posttest mean difference or treatment-control gain score.

In Study 2, the psychometric properties of the instrument utilised in the present study and the relation between peer support and multiple dimensions of self-concept were examined. It was demonstrated that both the English and Chinese versions of SDQII were sound psychometric measures that were reliable and valid measures of participants’ self-concepts. In addition, the results provided strong evidence to support the cross-cultural validity of the English and Chinese versions of SDQII, since the factor loadings were invariant across the Australian and Chinese participants in the present study. The results also showed that the subscale of the SS-A (English version) in the present investigation was a sound psychometric measure that was a reliable and valid measure of participants’ perceptions of peer support. The relation between peer support, as measured by SS-A and self-concept, showed that peer support displayed a positive association with self-concept, with Same-Sex Relations self-concept being the highest relation in comparison to other facets of self-concept measured by the SDQII. Hence, the instruments employed in the present investigation have sound psychometric properties.

In Studies 3, 4, and 5, employing a construct validity approach, the impact of an academically-orientated and socially-orientated peer support intervention upon specific facets of self-concept and peer support in Australian and Chinese samples
was investigated, to assess the domain specificity between type of peer support and self-concept. Consistent with the predictions based on the construct validity approach, targeted facets of self-concept most logically relevant to the intervention’s goals showed positive significant increase, whereas those less relevant to the intervention’s goals were affected less. As mentioned earlier, the academically-orientated peer support intervention conducted in the present investigation had a positive impact mainly on academic domains of self-concept most relevant to the goal of the intervention, whereas non-academic domains of self-concept were less affected. Specifically, the academically-orientated peer tutoring had a significant impact on Verbal self-concept of Australian participants whereas there were no significant changes for the other facets of self-concept. Moreover, its impact on Verbal self-concept was generalised to both males and females. Conversely, the socially-orientated peer support intervention had a positive impact mainly for the non-academic domains of self-concept most logically related to the intervention’s goals whereas academic domains of self-concept were less affected. Specifically, the results of the present investigation found that the socially-orientated peer support intervention had a positive effect on Same-Sex Relations self-concept. There were no significant changes for other facets of self-concept. The impact of the socially-orientated peer support intervention on Same-Sex Relations self-concept in the present investigation was generalised to both males and females in Chinese participants. Evidence of sleeper effects was also found for Same-Sex Relations self-concept in Chinese participants. However, the impact on Same-Sex Relations was confined to female Australian participants only, whereas there was no significant change in this facet of self-concept in male Australian participants. This raised the issue of cultural generalisation of the effect of peer support intervention. Further research is needed to elucidate the issue.
Regarding the impact on perceptions of peer support, it was hard to change peer support by both academically-orientated peer tutoring and socially-orientated peer support interventions. Future research may be able to identify more effective intervention strategies for changing perceptions of peer support.

In sum, the findings in the present investigation offer substantive implications for research, theory, and practice. The findings provide sound evidence that there is domain specificity between type of peer support and particular facets of self-concept. Hence, two types of peer support interventions had differential impacts on multiple domains of self-concepts. From a practical perspective, it is vital to consider domain specificity between the type of peer support and particular facets of self-concept, when designing self-concept enhancement and peer support interventions. Findings also contribute to advancing theory and research in social support, in that a new multidimensional construct of peer support was developed. This allowed the elucidation of the relation between multiple dimensions of peer support and multidimensional facets of self-concept that was obscured in previous research due to theoretical and methodological flaws, as mentioned earlier.

The current investigation also advances our understanding of the factor structure of self-concept for Chinese compared to Australian participants. This allows more accurate examination of the impact of peer support interventions on the enhancement of self-concept cross-culturally in Australia and Hong Kong.

The meta-analysis conducted in the present study provides a solid empirical base to identify what intervention features constitute optimal effectiveness of peer support intervention. It provides clear support for researchers and educators to capitalise on these features in interventions to strengthen peer support interventions.
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Marsh, H. W., & O


APPENDICES


APPENDIX A- 2
CODING OF STUDIES

The following information was coded:

1. **report information**
   - what is the date of publication?

2. **characteristics of participants**
   - what is the education level of tutee (e.g., elementary, secondary school, college or university education)?
   - what is the education level of tutor (e.g., elementary, secondary school, college or university education)?
   - what is the academic ability of tutee (e.g., low-, average- or high-achieving)?
   - what is the academic ability of tutor (e.g., low-, average- or high-achieving)?
   - what is the total number of tutees in experimental group?

3. **methodology**
   - what type of peer tutoring is involved (e.g., same-age or cross-age peer tutoring)?
   - is tutoring structured or unstructured (i.e. tutoring with definite structure such as content and strategies adopted is classified as structured)?
   - are there any fidelity checks (i.e. implementation of the designated content and procedures)?
are there any controls for author bias by using standardised outcome measure?
are there any controls for instructor bias by using same instructor and curriculum for both treatment and control group?
is there any tutor training?
is tutoring used for substitute the normal classroom instruction?
how are control and treatment groups assigned (e.g., random assignment of individual or whole class; real control or comparison group)?

4. intervention features

what is the duration of intervention?
where is the intervention setting taken place (during school lessons inside school, non-classroom period)?

5. outcomes assessment

is construct validity approach adopted for academic achievement and self-concept?
what is the target subject matter on achievement (e.g., reading, mathematics or other subjects)?
what is the non-target subject matter on achievement (e.g., reading, mathematics or other subjects)?
what is the target self-concept?
what is the non-target self-concept?
what type of self-concept measure is used for target self-concept (e.g., Rosenberg self-esteem scale, Piers-Harris scale or Self-Descriptive Questionnaire scale)?
what type of self-concept measure is used for non-target self-concept (e.g., Rosenberg self-esteem scale, Piers-Harris scale or Self-Descriptive Questionnaire scale)?

This coding schema was further developed by adding the following coding categories:

1. what is the age range of tutee?
2. what is the mean age of tutee?
3. what is the age range of tutor?
4. what is the mean age of tutor?
5. what is the total % of male tutees?
6. what is the total % of female tutees?
7. what is the total number of tutors?
8. what is the total % of male tutors?
9. what is the total % of female tutors?
10. what is the SES of participants?
11. what is the ethnicity of participants?
12. is there involvement of teacher (i.e. teacher monitor and supervise tutoring)?
13. is there involvement of parent (e.g., parent gives rewards for tutee’s effort)?
14. how is effect size derived (e.g., from treatment-control posttest score, treatment-control gain score or pretest-posttest change score)?
## CODING SHEET

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364
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<table>
<thead>
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<th><strong>Total % of Male Tutor</strong></th>
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<tbody>
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<table>
<thead>
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<th></th>
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<tbody>
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<td>03. Cross-age peer tutoring</td>
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<tr>
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<th><strong>Involvement of Teacher</strong></th>
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<tr>
<td>21</td>
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<table>
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<tr>
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<tbody>
<tr>
<td>25</td>
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<td>03. Mixed</td>
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### Control for Instructor Bias by Engaging Same Instructor and Curriculum

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<thead>
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<tbody>
<tr>
<td>01.</td>
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<td>02.</td>
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<tr>
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### Tutor Training

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<table>
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<tr>
<td>01.</td>
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<td>02.</td>
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### Substitute to Classroom Instruction

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### Control and Treatment

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<td>03.</td>
<td>Non-equivalent comparison group of convenience</td>
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<td>04.</td>
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<tr>
<td>05.</td>
<td>Random assignment of individuals to control and experimental groups</td>
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<tr>
<td>06.</td>
<td>Random assignment of groups/classes/school to control and experimental groups</td>
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### Intervention

#### Duration of Tutoring (number of weeks)

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### Intervention Setting

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<td>During school lesson</td>
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<td>02.</td>
<td>After school</td>
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<td>03.</td>
<td>Non-classroom period</td>
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### Construct Validity Approach on Academic Achievement

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<tbody>
<tr>
<td>01.</td>
<td>yes (both target and non-target facets of academic achievement reported)</td>
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</tr>
<tr>
<td>02.</td>
<td>no (only target or only non-target facets of academic achievement reported)</td>
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</tr>
<tr>
<td>03.</td>
<td>not applicable</td>
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</tr>
<tr>
<td>Code</td>
<td>Target Subject Matter on Achievement</td>
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</tr>
<tr>
<td>------</td>
<td>-------------------------------------</td>
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<tr>
<td>33</td>
<td>00   Nil</td>
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<tr>
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<td>01   Mathematics</td>
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<tr>
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<td>02   Reading</td>
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<td>34</td>
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<tr>
<td></td>
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<td>02   Reading</td>
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<tr>
<td></td>
<td>02.  no (only target or only non-target facets of self-concept reported)</td>
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<tr>
<td></td>
<td>03.  not applicable</td>
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<table>
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<tr>
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<tr>
<td></td>
<td>01.  Rosenberg Self-Esteem Scale</td>
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<tr>
<td></td>
<td>02.  Coopersmith Self Esteem Inventory</td>
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<tr>
<td></td>
<td>03.  Piers-Harris Children’s Self-Concept Scale</td>
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<tr>
<td></td>
<td>04.  Self Descriptive Questionnaire I (Marsh)</td>
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<tr>
<td></td>
<td>05.  Self Descriptive Questionnaire II (Marsh)</td>
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<td>06.  Self Descriptive Questionnaire III (Marsh)</td>
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<td></td>
<td>07.  Self-Perception Profile for Children (Harter)</td>
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<tr>
<td></td>
<td>08.  Self-Perception Profile for Adolescents (Harter)</td>
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<td>09.  Tennessee Self-Concept Scale</td>
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<td>10.  Other _________________________</td>
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<td>Quality of Scale for Non-target Self-concept</td>
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<td>---------------------------------------------</td>
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<td>02. Treatment-control gain score</td>
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<td>03. Pretest-posttest change score</td>
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## Pilot Coding and Interrater Coding Reliability

### Pilot Coding: Procedures and Number of Articles Coded

<table>
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<th>Pilot session</th>
<th>Number of articles piloted</th>
<th>Procedure followed during each pilot run</th>
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<td>1</td>
<td>0</td>
<td>Discussion to have preliminary understanding of all codes</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>Discussion of any disparity on the coding sheet and modification of coding sheet</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Discussion of any disparity on the coding sheet and modification of coding sheet</td>
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</tbody>
</table>

After reaching consensus on the items of the coding sheet, the author coded all the 67 studies, the second coder did the coding on 34 randomly selected studies which were not coded in the pilot run.
### Interrater Reliability: Percentage Agreement and Kappa Coefficient

#### The Reviewed Studies at the Study Level (n = 34)

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<tr>
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<th>Kappa Coefficient</th>
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<tbody>
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<td>Publication date</td>
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#### Participants at the Study Level (n = 34)

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<th>Kappa Coefficient</th>
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<tbody>
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<td>0.97</td>
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<tr>
<td>Education level of tutor</td>
<td>97.06</td>
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<td>Age of tutee</td>
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<tr>
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<tr>
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<td>0.78</td>
</tr>
<tr>
<td>Ethnicity (main proportion) of participants</td>
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<td>0.79</td>
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<tr>
<td>Mean age of tutor</td>
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<tr>
<td>Total number of tutee</td>
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### Participants at the Study Level (n = 34)

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### Methodology at the Study Level (n = 34)

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### Intervention at the Study Level (n = 34)

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APPENDIX B- 1

SELF-DESCRIPTION QUESTIONNAIRE (SDQII)
**General Self-Concept**

Q3. Overall, I have a lot to be proud of

Q14. Overall, I am no good

Q25. Most things I do, I do well

Q36. Nothing I do ever seems to turn out right

Q47. Overall, most things I do turn out well

Q58. I do not have much to be proud of

Q69. I can do things as well as most people

Q80. I feel that my life is not very useful

Q90. If I really try I can do almost anything I want to do

Q97. Overall, I’m a failure

**Honesty-Trustworthiness Self-Concept**

Q4. I sometimes take things that belong to other people

Q15. I am honest

Q26. I sometimes tell lies to stay out of trouble

Q37. I always tell the truth

Q48. Cheating on a test is OK if I do not get caught

Q59. Honesty is very important to me

Q70. I sometimes cheat

Q81. When I make a promise I keep it

Q91. I often tell lies

Q98. People can really count on me to do the right thing
Physical Ability Self-Concept
Q5. I enjoy things like sports, gym, and dance
Q16. I am lazy when it comes to things like sports and hard physical exercise
Q27. I’m good at things like sports, gym, and dance
Q38. I am awkward at things like sports, gym, and dance
Q49. I’m better than most of my friends at things like sports, gym, and dance
Q60. I try to get out of sports and physical education classes whenever I can
Q71. I can run a long way without stopping
Q82. I hate things like sports, gym, and dance

Verbal Self-Concept
Q6. I’m hopeless in English classes
Q17. I look forward to English classes
Q28. I do badly on tests that need a lot of reading ability
Q39. Work in English classes is easy for me
Q50. I’m not very good at reading
Q61. English is one of my best subjects
Q72. I hate reading
Q83. I get good marks in English
Q92. I have trouble expressing myself when I try to write something
Q99. I learn things quickly in English classes

Emotional Stability Self-Concept
Q7. I am usually relaxed
Q18. I worry more than I need to
Q29. I do not get upset very easily
Q40.  I am often depressed and down in the dumps
Q51.  Other people get more upset about things than I do
Q62.  I am a nervous person
Q73.  I often feel confused and mixed up
Q84.  I get upset easily
Q93.  I am a calm person
Q100. I worry about a lot of things

**Parent Relations Self-Concept**

Q8.   My parents are usually unhappy or disappointed with what I do
Q19.  I get along well with my parents
Q30.  It is difficult for me to talk to my parents
Q41.  My parents treat me fairly
Q52.  I have lots of arguments with my parents
Q63.  My parents understand me
Q74.  I do not like my parents very much
Q85.  My parents really love me a lot

**General School Self-Concept**

Q9.   People come to me for help in most school subjects
Q20.  I’m too stupid at school to get into a good university
Q31.  If I work really hard I could be one of the best students in my school year
Q42.  I get bad marks in most school subjects
Q53.  I learn things quickly in most school subjects
Q64.  I am stupid at most school subjects
Q75.  I do well in tests in most school subjects
Q86. I have trouble with most school subjects
Q94. I’m good at most school subjects
Q101. Most school subjects are just too hard for me

**Same-Sex Relations Self-Concept**

Q10. It is difficult to make friends with members of my own sex
Q32. Not many people of my own sex like me
Q65. I have good friends who are members of my own sex
Q87. I make friends easily with members of my own sex
Q95. I have few friends of the same sex as myself
Q102. I enjoy spending time with my friends of the same sex

**Items for male participant only**

Q21. I make friends easily with boys
Q43. I am popular with boys
Q54. I do not get along very well with boys
Q76. Most boys try to avoid me

**Items for female participant only**

Q22. I make friends easily with girls
Q44. I am popular with girls
Q55. I do not get along very well with girls
Q77. Most girls try to avoid me
Opposite-Sex Relations Self-Concept

Q11. People of the opposite sex whom I like don’t like me
Q33. I’m not very popular with members of the opposite sex
Q66. I have lots of friends of the opposite sex
Q88. I get a lot of attention from members of the opposite sex

Items for male participant only

Q22. I make friends easily with girls
Q44. I am popular with girls
Q55. I do not get along very well with girls
Q77. Most girls try to avoid me

Items for female participant only

Q21. I make friends easily with boys
Q43. I am popular with boys
Q54. I do not get along very well with boys
Q76. Most boys try to avoid me
APPENDIX B-2

SELF-DESCRIPTION QUESTIONNAIRE (SDQII)
APPENDIX B- 3

SOCIAL SUPPORT APPRAISAL SCALE (SS-A)

Q1. My friends respect me
Q2. I can rely on my friends
Q3. I am close to my friends
Q4. My friends look out for me
Q5. My friends and I rely on each other
Q6. My friends and I have done a lot for one another
Q7. My friends do not care about me
APPENDIX C- 1
LEADER’S GUIDE — INTERVENTION SESSION ONE

Name of Activity: Getting To Know You

Goal:
- To find out about the programme.
- To help participants learn about each other, begin new friendships and establish group rules.
- To help students settle into their new school.

Preparation:
- Name tags
- Pens
- Paper
- List of group members

Activities:
1. Introduction
2. Name game
3. Introductions in pairs
4. Group rules
5. Quiz ‘What you always wanted to know’
6. Today I feel
1. *Introduction (5 minutes)*

   a) Introduce yourself – name and address.

   b) Explain the programme – a group where they can learn, share, discuss have fun and make new friends. Make them familiar with the facts – how often you will meet, what time the sessions will start and where you will meet.

   c) Inform them of your role.

2. *Name game (5 minutes)*

   Tell the students that this is a fun activity to help remember everyone’s name.

   a) Everyone is to give themselves a positive adjective e.g., strong Peter or lovely Susan. Alternatively, everyone is to give themselves a positive adjective that begins with the first letter of their name (e.g., Marvellous Michelle).

   b) State your name and adjective (e.g., Caring Cara).

   c) The person on your left repeats your name and adjective, before stating his/her own.

   d) Each person repeats all previous names and adjectives before adding their own.

3. *Introduction in pairs (8 minutes)*

   Your group members must be reassured that this is not a memory exercise, but a non-threatening way to get to know other group members and to let the group know about you.

   a) Split group into pairs.

   b) Pairs go off and talk about family, home, friends, hobbies, favourite pastimes etc., as much as they want the group to know.
c) When returning to the circle, everyone sits with the person they were talking to and takes turns to introduce them to the group.

4. **Group rules (5 minutes)**

   Explain to members that a group functions at its best when there is a set of guidelines for behaviour which everyone agrees to follow.
   
a) Ask the members what rules they would like and record them on paper. Encourage each member to give a rule.

   b) Discuss the list, making sure that all members are happy with all rules. Some examples are:

      One person speaks at a time
      Respect the opinion of others
      Punctuality
      Try your best to participate
      Keep private things confidential

5. **What you always wanted to know (14 minutes)**

   a) Read aloud “WHAT YOU ALWAYS WANTED TO KNOW” to students.

   b) Ask members to tell the answers.

   c) Encourage students to ask any other information which they feel is important to them.

6. **Today I feel..... (3 minutes)**

   Group participants are encouraged to share their feelings for the day. They can mention the following things:

   a) How they felt on their first day of high school?
b) Do they feel better after this Peer Support session?
c) Are they more confident about tomorrow?
d) What expectations they have for the next month?

**WHAT YOU ALWAYS WANTED TO KNOW?**

- To whom do you go to find out something you do not know?
- Who can help new students to settle into their new school?
- Where can you find your peer support group leaders?
- Can you ask other group leaders for help?
- What are the bell times and what do they mean?
- What is acceptable uniform?
- What can you definitely not do and why?
- What do you do if you are late or have been absent?
- To whom do you go with complaints?
- What do you do if you are bullied?
- Where can you leave your valuables?
- Where are the toilets? Are you allowed to go to toilets in the class time?
- Can you order your lunch in canteen? What is available in canteen? How much do things cost?
- What sort of activities can you take part in at lunch time?
- What extracurricular activities are available at the school?
Name of Activity: Listening and Communication

Goal:

- To make students aware that poor communication can give rise to misunderstandings.
- To realise that emotional issues make communication more difficult.

Preparation

- Squares sheet

Activities

1. Review
2. Making Squares
3. Building stories
4. Rumours
5. Discussion – Good versus Bad

1. **Review (5 minutes)**
   
   Review last week’s activity and things which happened during the week.

2. **Making Squares (7 minutes)**
   
   Give each group of students (2 or 3 depending on group size) one envelope containing pieces of different shape (refer to the diagram). Say to the group
“Using the pieces you have to make squares. Go!”. As any group asks for clarifying instructions stop ALL groups and refine the directions to “You have to make five squares with the pieces.”

Allow time for the groups to complete the task, then discuss the process they used to complete the squares. Point out that it was important for them to listen to each other and that they also needed to listen to the directions. Also point out how important it is to have, and to give, clear instructions.
3. **Building stories (10 minutes)**

Have the group sit in a circle. Explain that the object is to continue building the story in a way that adds to the content, feeling and tone of the previous storyteller. Begin telling a story that will spark the imagination of the group.

* e.g.,
up Jenny and Mary to provide explanation.

Jenny and Mary accused Rose of spreading an untrue
rumour. A terrible argument followed.”

Discuss the consequences of the actions in the story. Could these
consequences have been avoided?

5. Discussion
APPENDIX C-3
LEADER’S GUIDE — INTERVENTION SESSION THREE

Name of Activity: Working Together

Goal:
➢ To encourage students to understand that, for any group of people to be able to work together successfully, co-operation is essential.

Preparation:
➢ Large paper
➢ Coloured pencils
➢ Newspapers
➢ Sticky tape
➢ Scissors
➢ Writing paper

Activities:
1. Review
2. Knots
3. Furnishing a house
4. The Giant Plane / Tower

1. Review (3 minutes)

Review names and the rules. Try to get all students to repeat the names of all other group members.
Discuss the week just gone and any issues that may have arisen. Have each student state one positive / good / important thing that happened to them this week.

2. **Knots (12 minutes)**

   A fun way of co-operating in a group.

   All participants form a circle then link hands across the circle, making sure that no one is holding the hand of the person beside them and that each hand is with a different person. Now the circle is knotted. Untangle to form a circle without letting go of hands (changing grip is allowed). Members may finish up facing both in and out.

   If the knot untangles too quickly – do it again. Most importantly – enjoy the process!

3. **Furnishing a house (15 minutes)**

   The aim is to have the group members cooperate. Sit back and observe the personalities of the students. Who are the leaders, doers, watchers and followers? This will give you some insight into their personalities.

   **Instructions:**

   a) Ask group members to draw the outside walls of a house on a piece of large paper.

   b) Read the following to the group:

   “You have arrived in a city and have decided to move into a new house together. Your task is to furnish the home in consultation with all members of the group. As the group makes
decisions about furnishing, you could draw in and label the various items. Rooms will have to be allocated”

c) You cannot add extensions and MUST have it ready in 10 minutes.

d) Household chores: You now need to decide on tasks that need to be carried out in your new house. Draw up a list of these and then decide on how they will be allocated.

4a. The Giant Plane (10 minutes)

a) Split group into two teams and give each team the same amount of newspaper and sticky tape. The task is to build a paper aeroplane of one metre length. The only rule is that the plane must be ready to fly in 4 minutes. In this activity the groups are competing against each other.

b) After this activity, it is important to discuss how the whole group worked together in the first two activities ‘Knots’ and ‘Furnishing a House’, and to note any differences that arose once competition was introduced.

c) You may run out of time, but that is O.K.

4b. Tower (10 minutes) (alternative activity)

a) Split group into two teams and give each team the same amount of newspaper and sticky tape. The task is to build a paper tower which will stand up by itself. The aim is to try and make your tower as high as possible. The only rule is that the tower must be finished in 4 minutes. In this activity the groups are competing against each other.

b) After this activity, it is important to discuss how the whole group worked together in the first two activities ‘Knots’ and ‘Furnishing a House’, and to note any differences that arose once competition was introduced.
APPENDIX C- 4
LEADER’S GUIDE — INTERVENTION SESSION FOUR

Name of Activity: Assertiveness

Goal:
➢ To make us more aware of the fact that we do not have to do things against our will.
➢ To make us aware that we can stand up for our rights, without being aggressive.
➢ To learn to deal with pressure in a positive way.

Preparation:
➢ Choose which role-play you will use.

Activities:
1. Review
2. Assertive response
3. Anti-smoking role-play
4. Additional role-play

1. Review (3 minutes)
   Review last week’s session and discuss any issues raised by the group.

2. Assertive response (11 minutes)
   Explain that there are different ways in which we can act when confronted with a problem.
a) *Shy — I lose, they win.*
to three group members. Each student is to act and respond in keeping with the role he/she has been given while refusing the cigarette. Role-play the conversations.

Afterwards, discuss whether the answers suited the roles and how students felt in those roles.

4. Additional role-play (13 minutes)

Choose one or two of the following to use as role-play using assertive responses:

a) One of your friends constantly copies your work in class. You don’t like it and now he/she plans to sit next to you in the class test. What would you do?

b) You buy some groceries in a shop for your mother. When you give her the change you find you are one dollar short. What would you do?

c) You have bought a T-shirt from a shop for $6. When you try it on you find that one of the seams has not been sewn properly. Your mother could probably patch it up for you, what should you do?
Name of Activity:  Peer Pressure

Goal:

➢ To make us aware of the fact that what we do is often determined by those around us and their expectations of us.
➢ To discuss strategies for withstanding negative peer pressure.

Preparation:

➢ Photocopy questions for dilemma quiz
➢ Role-play cards
➢ Pens, pencils

Activities:

1. Review
2. Jelly Bean Ice Breaker
3. Dilemma quiz
4. Role-play cards

1. **Review (3 minutes)**

    Review last session’s activities and things happened in the week just gone.
2. **Jelly Bean Ice Breaker (10 minutes)**

Ask for a volunteer (someone who has a fairly strong personality) and ask them to go away from the group. Explain to the rest of the group that we are going to put pressure on the other person to try to make them eat one of the jelly beans. Start the group eating the beans and then go to tell the volunteer that they MUST say no to a jelly bean no matter what the group says to them and ask them to return.

Continue the pressure for a few minutes. Then it is most important that the methods of pressure are discussed and that the volunteer has a chance to discuss his/her feelings.

3. **Dilemma quiz (15 minutes)**

Read out each of the questions below and then ask students to choose the answers. Discuss reasons for particular choices.

A. Your best friend wants to give you some money which you know was stolen. You decide to:
   
   a. Take the money and pretend you don’t know
   
   b. Refuse the money and make up an excuse
   
   c. Refuse the money saying you know it is stolen

B. Someone who hears a rumour being spread about themselves should:
   
   a. Ignore the whole thing
   
   b. Tell everybody it’s a rumour and not to believe it
   
   c. Find the person who started it and talk with them
C. It’s Sunday. What will you do if
   a. your best friend wants you to go to the beach?
   b. your parents want you to go to church?
   c. your classmate wants you to see a movie?

D. Someone in your class is known to be passing drugs, you decide:
   a. To ignore it because it’s none of your business
   b. You should try to find out who did it
   c. To ask a teacher for advice

E. Which of the following is most important to you?
   a. Attractive looks
   b. Good personality
   c. Good body health

F. Which would be easier for you to do with your older brother or sister?
   a. Borrow some money from him/her
   b. Go out with him/her
   c. Talk about a problem

G. A new student asks you what would be the best sort of club to join, in
   order to make new friends. You tell him/her to join:
   a. Sporting club (e.g., basketball)
   b. Recreation club (e.g., dance club)
   c. Community club (e.g., scouts)
4. **Role-play cards (12 minutes)**

On three separate cards write the following:

Card “A”- You want your friend to have a cigarette with you behind the toilets.

You say “Oh, come on, just one! We won’t get caught.”

Card “B”- Your friend wants you to have a smoke behind the toilets. You don’t really want to smoke and are frightened you’ll get caught, but you don’t know how to say “No”. You say “What if we get caught?”

Card “C”- Your friend wants you to have a smoke behind the toilets. You don’t like smoking, as it makes you feel sick and you don’t want to get into trouble. You decide to say “No”. You say “No, I don’t want to go with you. I don’t like smoking; it makes me sick”.

**Instructions:**

This activity is to give us practice in saying “NO”.

**Start by saying to your group:**

You have the right to say “No” when people ask you to do something illegal, dishonest or against your beliefs. It is also O.K, to say “No” sometimes when you need to be alone, don’t want to join in or simply don’t feel like it.

**Now:**

a) Ask for two volunteers to start the activity.

b) Hand out Card “A” to one person and Card “B” to the other.

c) Explain that they will act out the situation in front of the group, “A” makes the request on Card “A” and “B” makes the response on Card “B” (or similar words). Explain that this response is saying “Yes” while really wanting to say “No”. Discuss this with
group. How often does this happen to us all?

d) Repeat activity with “A” making the same request, but this time “B” answers from Card “C”.

How hard was it to say “No”? Did the sky fall in? Repeat with other situations that your group may think of. The idea is that everyone has a practice at saying “No”.

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APPENDIX C- 6
LEADER’S GUIDE — INTERVENTION SESSION SIX

Name of Activity:  Self-awareness

Goal:

➢ To realise that events in our lives determine the type of person we will become.
➢ To improve our feeling of self-worth.

Preparation:

➢ One paper bag per person
➢ Paper
➢ Magazines
➢ Glue/sticky tape
➢ Scissors
➢ Coloured pencils

Activities:

1. Ice-breaker
2. Review
3. High Points
4. Paper Bag Person
5. Goals
1. *Ice-breaker* (5 minutes)
5. **Goals (2 minutes)**

   a) Group leader explains what a goal is.

   b) Ask yourself
Name of Activity: What is a Friend?

Goal:
➢ To discover together the qualities of friendship.

Preparation:
➢ Paper
➢ Pencils

Activities:
1. Eye-contact
2. “What is a friend?”
3. Trust Walk

1. Eye-contact (3 minutes)

Scatter the group. Explain that they are to make eye contact with one other person in the group (if the number is odd, then a leader should make eye contact with this student) on a given signal, the pairs are to move towards the other person without losing eye-contact.

2. “What is a friend?” (15 minutes)

Tell the group to sit back and relax and to close their eyes if they wish. Now, tell them to remember a time when they needed help from a friend because they
were in some sort of trouble (e.g., they were feeling sick, or they had a serious problem).

Allow them several minutes to think back. This friend could be any age. When they recall this situation, tell them to think the following about the friend who helped them: How did they help? What did they say or do that was so helpful? What sort of person were they? Do they still see them?

Now ask the group to open their eyes. The leader sits in the centre of the group on the floor. Ask each member to give a description of their helpful friend. This is recorded on a paper by the group leader.

Now think of a time when each member had a wonderful time with a friend. Give them several minutes to recall what the friend was like and why they were able to enjoy their company so much. Ask them to think of the qualities of this person. Were they fun-loving and humorous, or adventurous? Again the leader records each description from members of the group.

**General Discussion (10 minutes):**

- Do both these types of friends have the same qualities?
- What sort of qualities are the most valuable?
- What sort of friends would members of the group prefer?
- Ask each member in turn to say what they like about their friends, or their own particular friend.

3. **Trust Walk (15 minutes)**

Ask everyone to take a partner. If numbers are even the leader does not take part in this activity.

Explain that they will be going on a walk together. One person will have their eyes closed, the other will be guiding them. Decide who will go first.
When they have decided, tell them that the guide’s job is to make sure that their partner is safe at all times, i.e. does not bump into anything or fall over. The guides should also try to give their partner as interesting a walk as possible, describing to them where they are walking. They may take them up and down stairs, into places that have different noises, tell them walk backwards or go in circles, etc. They may also ask their partner to feel objects with different textures such as smooth glass or rough tree bark.

After 2 or 3 minutes change over.

**Discuss:**

- Were you able to trust your partner?
- Did you open your eyes?
- Which was easier, following or leading? Why?
APPENDIX C- 8
LEADER'S GUIDE — INTERVENTION SESSION EIGHT

Name of Activity:  Group Decision Making

Goal:
➢ To allow group members to become aware that every person has different values and, irrespective of what others think, we can still be friends.
➢ To give participants an opportunity to sort out their values.
➢ To work as a group in making a decision.

Preparation:
➢ Pens
➢ Paper
➢ Card

Activities:
1. Review
2. Animal Noises Ice Breaker
3. Just Suppose
4. Situations

1. Review (3 minutes)

Ask members how their week has been and how last week’s activities have helped them.
2. Animal Noises Ice Breaker (7 minutes)

Give each person a card which has a type of animal written onto it (e.g., sheep, dog, cow, horse, pig). The group members are asked to make the appropriate noise for their animal and they have to find all of the other members have animal noise the same as them. This is used to get the members into the smaller groups for the next activity so use as many animal types as are needed for your group.

3. Just Suppose (15 minutes)

Read out the questions on the “Just Suppose” sheet. Explain that they are going to make some decisions in two ways, firstly as an individual and then as part of a group.

Ask the group to think about each of the situations and write down the answers on a paper BY THEMSELVES. When all questions are completed, the group members share what they have written.

As a group, the same three questions have to be answered, with each of the three choices being agreed upon by every group member. The order must also be agreed upon. Nothing can be written unless all members agree.

Discuss what values have been expressed through the answers, and how the group came to an agreement.

**QUESTIONS FOR “JUST SUPPOSE”**

a) Just suppose you were the school principal. What three things would you do?
b) Just suppose you won $1,000,000. What three things would you do with it?
c) Just suppose you knew you only had one year to live. What three things would you do?
4. **Situations (15 minutes)**

The following are to be used as both role-play and as a basis for discussion. Read out each situation and give group members time to work out the role-play. After each role is done, use the questions as a base for discussion.

a) Mary, who is in Year 7, feels rather sorry for Jenny who is being picked on by their group. Jenny is quite good at her schoolwork and this seems to be the reason. Mary is frightened to show her sympathy for Jenny because she thinks she too will be excluded. Jenny asks Mary to her house to play her new computer games.

- What should Mary do?
- Can she help Jenny without hurting her own position in the group?

b) Peter is on a school camp. He is staying in a dormitory with 6 other boys. After dinner while in their dormitory one of the boys produced a bottle of alcohol from his bag, and asked the other boys if they would like a drink. Peter didn’t want a drink and he knew his friend Thomas felt the same.

- What should Peter do?
- Would Peter’s decision be different if Thomas wanted a drink?

c) David wants very much to join a group of Year 7 boys. However, he must first pass a test by fighting Billy whom the group doesn’t like. David feels that fighting is stupid and cruel. The group asks him to join and tells him that he has to fight Billy.

- What should he do?
- Can he state his position on fighting and still join the group?
d) Jenny invited a couple of friends over to her place after school to listen to music. When she got home there was a note from her parents saying that they wouldn’t be home until 9 p.m. One of the other girls decided it would be a good chance for them to have a cigarette. Jenny doesn’t want them smoking in her house.

- What should she do?
- Can she state her position on smoking without hurting her relationship with her friend?
Name of Activity: Winding Up

Goal:
- To finish-up nicely and evaluate the sessions.

Preparation:
- Small sheets of paper
- Safety pins/adhesive tape
- Coloured pencils

Activities:
1. Review
2. Evaluation
3. Warm Fuzzies
4. The Spiral

1. Review (3 minutes)
   Have each person say one thing they enjoyed about the sessions. Add other points if necessary.
   Have each student to write two positive comments in a paper.
2. **Evaluation (7 minutes)**

Ask each person to evaluate the following aspects and share their views with the group:

- What do you feel on the program?
- What activity do you like most and which one you learn most?
- Do you learn more how to make a friend from the program?

3. **Warm Fuzzies (15 minutes)**

It is a lovely way to finish up, creating warm feelings inside each person.

Hand out the small sheets of paper and safety pins/adhesive tape. Ask everyone to pin or stick a sheet on to their neighbour’s back. Everyone moves around writing a positive message, something they like about that person or something they enjoyed sharing with them. When all sheets are complete, ask them to read their sheet quietly.

This can also work with strips of paper. Each student has one strip for each person in the group. When everyone has finished writing the Warm Fuzzies, they then hand them to the intended person.

4. **The Spiral (15 minutes)**

Explain that this is the last session and suggest that they go through a short exercise which is done without talking.

- The group members should walk to a space in the room or outside, close their eyes and take some time to experience the feeling of being by themselves.
  
  This should be allotted 2 or 3 minutes.

- The group is then asked to form a circle and begin walking in a clockwise direction while holding hands. Make a break in the circle and lead those
following into the centre so that the circle becomes a spiral. The group will
bunch up as tightly as possible. Ask participants to notice what it feels like to
be a group. This should be allotted 2 to 3 minutes to stay tightly packed.

- The spiral will then unravel to form a circle again. The group members will
then be asked to look around at the other members once again in order to
remember the group as a whole.

- It would be best if this could be performed outside.

- When in the spiral, insist on no talking and eyes close.

- Ask “What does it feel like to be in a group?” after 3 minutes.