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# A Longitudinal Examination of the Mediating Role of Social Problem Solving between Parental Attachment and Early Adolescents' Life Satisfaction

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A Longitudinal Examination of the Mediating Role of Social Problem  
Solving between Parental Attachment and Early Adolescents' Life  
Satisfaction

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## ABSTRACT

Both attachment theory and empirical evidence indicate that the quality of parental attachment profoundly influences many different aspects of adolescent life. However, one area that has been somewhat neglected in the literature is the discovery of the psychosocial mechanisms that account for the link between parental attachment and important adolescent developmental outcomes, such as social problem solving (D’Zurilla & Goldfried, 1971) and life satisfaction (LS: Diener, 1994). Driven by the conceptual framework of development of LS proposed by Evans (1994), Attachment Theory and Social Problem Solving Theory, a mediation model was hypothesized to explore the link between parental attachment and adolescent LS via two components of social problem solving: social problem solving orientation and social problem solving skills. A prospective design was used with a large sample of early adolescents (n=652) who participated at two time points, 6 months apart. Results showed that: 1) parental attachment significantly related to social problem solving orientation, social problem solving skills and LS; 2) the direct effect of parental attachment on later LS, accounting for baseline LS, was significant, and effect size was in the moderate range; 3) though social problem solving orientation and skill set both significantly correlated with LS, the mediated effects of social problem solving orientation and skill set in the link between parental attachment and LS were not significant, with very small effect size. These findings suggested that parental attachment is one important determinant of adolescents’ social problem solving (orientation and skill set, respectively) and LS. Possible

explanations of the non-significant results were discussed. Implications for psychological and educational services for adolescents were highlighted. Limitations and recommendations for future research were also provided.

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CHAPTER I  
INTRODUCTION

**1. Importance of Subjective Well-being and Life Satisfaction**

*Psychology is not just a branch of medicine concerned with illness or health; it is larger.*

----- Seligman and Csikszentmihalyi, 2000

From the time of Aristotle (384–322 BC), the pursuit of happiness and the achievement of the “good life” have been major concerns among philosophers and theologians. Within the modern era, some Western psychologists have continued to address this question. For example, humanistic psychologists (e.g., Maslow, 1971; Rogers, 1961; Allport, 1961) have pointed to a wide array of topics and issues relevant to the understanding of the “good life” and optimal human functioning. The issues have included a critique of the medical model of mental illness, which historically is deficit-based, wherein the underlying criterion of mental health is the absence of psychological deficits. There has been an increasing dissatisfaction with deficit models of mental health (e.g., Cowen, 1983; McCullough & Snyder, 2000; Seligman & Csikszentmihalyi, 2000). For example, Kazdin (1993) argued that the mental health of youth should encompass two domains: the absence of dysfunction and optimal functioning in psychological domains.

Building on these important historical efforts, Seligman and Csikszentmihalyi (2000) have called for a science of positive psychology to complement psychology’s historical emphasis on psychopathological conditions. In their seminal work, they stated

that “At this juncture, the social and behavioral sciences can play an enormously important role. They can articulate a vision of the good life that is empirically sound while being understandable and attractive. Psychology should be able to help document what kinds of families result from children who flourish, what work settings support the greatest satisfaction among workers, what policies result in the strongest civic engagement, and how people’s lives can be most worth living. ” Subsequently, research in the field of positive psychology has been increasing and has led to an improved understanding of human strengths and a good life; and more effective preventive behavioral health work. Indeed, what psychologists have learned over 50 years is that the disease model does not move psychology closer to the prevention of serious problems in mental health. Instead, the major strides in prevention have come largely from a perspective focused on systematically building competency, not on correcting weakness (Seligman & Csikszentmihalyi, 2000).

Notions of positive psychology can be instrumental in mental health professionals’ conceptualization of services provided to children, parents, teachers, and other school professionals. Moreover, building strengths, enhancing skills, and coalescing resources in children’s lives should be among the benchmark functions for these professionals, including, but not limited to, school psychologists, counselors and social workers. Well-being research on environmental and intrapersonal factors can be particularly useful for guiding practical efforts in mental health service with the aim of enhancing youth well-being. Thus, the current study investigated the psychosocial mechanisms that may account for the link between external resources (parental attachment) and adolescents’ internal outcomes (life satisfaction), by hypothesizing the

mediated effect of an intrapersonal factor (social problem solving) in this link. A literature review of research on each main construct used in the present study is provided in following sections.

### **1.1 Subjective Well-being**

It is natural for humans to pursue happiness. Interestingly, interpretations of the term *happiness* have been inconsistent in the human sciences. From a hedonic perspective, *happiness* should center on subjective reports of quality of life, and this account incorporates subjective well-being (SWB), which is perhaps the most widely used construct in the field of positive psychology. Specifically, SWB accounts incorporate both hedonic experiences (positive and negative affects) and cognitive evaluations of how well a person's life is going generally (Diener, 1994; Dolan & White, 2006; Veenhoven, 2006). Again, SWB is subjective and distinguishable from objective indicators of well-being, such as wealth, educational achievement, and risk behavior levels.

The model of SWB was developed for the purpose of studying adults' well-being (see Diener, 1994). However, this model has been extended to apply to late childhood and adolescence (aged eight and above) in a number of studies (Huebner, 1991b; Huebner, 1997; Huebner & Dew, 1996). As a cognitive component of SWB, global life satisfaction (LS) reflects a cognitive judgment of one's satisfaction with his or her life as a whole (Diener & Diener, 1995). LS also can be assessed in different subdomains, such as the satisfaction of family, school, friends, self and living environment (Huebner, 1994), particularly for school age children and adolescents. The two affective components of SWB (positive affect and negative affect) represent individual differences

in the frequency of experienced emotions (e.g., joy, pride, guilt, and sadness). However, given the greater stability of LS reports relative to affect reports (Huebner, Suldo, & Gilman, 2006), LS has been studied the most in assessing SWB in adults (e.g., the Satisfaction with Life Scale, SWLS, Diener et al., 1985) and youth (e.g., Students' Life Satisfaction Scale, SLSS, Huebner, 1994). Major findings from youth LS studies will be summarized in the following sections.

## **1.2 Life Satisfaction in Youth**

Research on adolescent groups has consistently shown that lower LS is negatively related to many dysfunctional outcomes, such as social stress, anxiety (Gilman & Huebner, 2006), depression (Lewinsohn, Redner, & Seeley, 1991; Gilman & Huebner, 2006), suicidal ideation (Valois, Zullig, Huebner, & Drane, 2004), risk-taking or deviant behavior (e.g., carrying a weapon, fighting, or drunk driving; Valois, Zullig, Huebner, & Drane, 2001; Suldo & Huebner, 2003), alcohol (Newcomb, Bentler, & Collins, 1986; Raphael, Rukholm, Brown, Hill-Bailey, & Donato, 1996), sexual risk-taking (Valois, Zullig, Huebner, Kammermann & Drane, 2002), and drug use (Zullig, Valois, Huebner, Oeltmann, & Drane, 2001). A few longitudinal studies have also revealed that global LS predicted adolescents' levels of depression, stress, social anxiety (Huebner, Funk & Gilman, 2000) and externalizing behavior longitudinally (Suldo & Huebner, 2004a). These results are important because they suggest that low LS might be a precursor of more serious pathological symptoms, which could be helpful in preventive efforts in mental health work.

In contrast, person-centered studies have found that, in comparison to students who reported low levels of satisfaction, adolescents who have high level of LS tends to

exhibit less internalizing and externalizing behaviors (Huebner & Alderman, 1993; Suldo & Huebner, 2004a; Suldo & Huebner, 2004b; Suldo & Huebner, 2006); higher levels of academic performance, interpersonal relationships, and intrapersonal functioning (Gilman & Huebner, 2006). Furthermore, high LS is also associated with a number of positive attributes, such as increased self-efficacy and self-esteem (Gilman, Huebner & Laughlin, 2000; MacDonald, Piquero, Valois, & Zullig, 2005; Valois, et al., 2001) and youth developmental assets (Valois, Zullig, Huebner & Drane, 2009) and perceived youth empowerment (Paxton, Valois & Drane, 2005).

LS has also been suggested to serve as one psychosocial mechanism which accounts for the relationship between environmental conditions and adaptive outcomes. For example, research has shown that LS mediates the relationship between social support-involvement, as one dimension of authoritative parenting, and adolescent problem behavior (Suldo & Huebner, 2004b). Furthermore, results from another study (Suldo & Huebner, 2004a) showed that LS moderated the relationship between stressful life events and adolescents' subsequent externalizing behaviors, which suggested that positive LS could buffer against the negative effects of stress and lower the chance of subsequent psychopathological problems.

Based on these findings, scholars have suggested that LS can be an important protective factor for youth to reduce negative effects or risks experienced from stress or problem behaviors (Huebner, Suldo & Valois, 2005). As Huebner et al. (2004b) suggested, a child's perceived quality of life is a psychological strength that should be a paramount focus to prevent pathology and promote positive changes across multiple settings. However, the amount of research attention devoted to children and adolescents'

SWB has been far less than that devoted to adults. Much more SWB research with young people is needed to understand individual differences in youth LS.

### **1.3 Correlates of LS**

Discovery of the benefits of LS in adolescents' development has driven researchers in the field to study its determinants, correlates, and mediators in order to understand the nature of LS as well as the intervention pathways to promotion. This section provides a comprehensive review of the cumulative findings on correlates of youth LS. It also provides a foundation for the more detailed elaboration of parental attachment and social problem solving in later sections.

#### **1.3.1 Basic Demographics**

The relationship between socio-demographics (e.g., age, gender, and SES) and LS has often been found to be weak, although several studies noted some modest associations (see Proctor et al., 2009).

**Age.** Results on age differences in LS are conflicting in existing cross-sectional research. In some studies there were non-significant relationships between age and LS (Ash & Huebner, 2001; Dew & Huebner, 1994; Huebner, 1991a; Huebner & Alderman, 1993; Sastre & Ferriere, 2000), whereas a number of studies have shown that global LS tend to slightly decrease from with the onset and progression of adolescence (Chang, McBride-Chang, Stewart, & Au, 2003; Demo & Acock, 1996; Flouri & Buchanan, 2002; Marks, Shah, & Westall, 2004; Suldo & Huebner, 2004b). Similar findings are also reported in studies conducted in several countries other than the US, such as Israel (e.g., Ullman & Tatar, 2001), South Korea (e.g., Park, 2005), and China (e.g., Chang et al., 2003; Leung, McBride-Chang, & Lai, 2004).

**Gender.** The findings related to the relation between children's global LS and gender are inconsistent. Many studies indicate that overall LS is fairly constant across gender (e.g., Ash & Huebner, 2001; Huebner, Drane & Valois, 2000; Chang, et al., 2003; Dew & Huebner, 1994; Gilman, Ashby, Sverko, Florell, & Varjas, 2005; Huebner, 1991; Huebner, 1994; Huebner & Alderman, 1993; Phinney & Ong, 2002; Sastre & Ferriere, 2000); while other studies suggest gender differences, with girls reporting lower LS as compared to boys (e.g., Neto, 1993).

**Race and SES.** Conclusions on the effects of race and SES on youth LS are inconsistent. The majority of studies reported no significant difference in mean levels of global LS between ethnic groups (Ash & Huebner, 2001; Adelman, Taylor, & Nelson, 1989; Huebner, 1994; Gilman & Huebner, 1997; Huebner, Drane, & Valois, 2000). Although some studies have reported modest difference between African Americans and Caucasians, with lower levels of LS in African American youth (Huebner, 1994; Gilman, 2001; Huebner, Valois, Paxton, & Drane, 2005), some of them reported non-significant correlations between LS and socio-economic status (SES) (Sam, 1998; Gilman & Huebner, 1997; Wilson, Henry, & Peterson, 1997). However, some other studies reported that students whose families have higher SES (e.g., using the indicator of receiving free or reduced lunch at school or not) tend to have higher levels of satisfaction (Ash & Huebner, 2001; Dew & Huebner, 1994; Huebner & Alderman, 1993).

### **1.3.2 Environmental factors**

#### **1.3.2.1 Living environment**

**Family vs. residential placement.** Not all children and adolescents live with their biological parents or bio-related caregivers. Studies have shown that children's LS is

related to differences in caregiving environments. For instance, compared with children who lived in group homes via foster care because of extreme deterioration of their own families, children who lived at home with their parents reported twenty percent higher mean levels of global LS (Sastre & Ferriere, 2000).

**Family composition.** For those children and adolescents who live in non-residential center environments, researchers have investigated the impact of family composition on their LS. First, students who live in intact families are more likely to experience higher levels of LS than those who are from divorced, single-parent families or step families, as the findings revealed in the studies in US (Huebner, Seligson, Valois, & Suldo, 2006; Demo & Acock, 1996), UK (Flouri & Buchanan, 2002), and Norwegian youth (Storksen, Roysamb, Moum, & Tambs, 2005). However, this conclusion is not consistent across studies. For instance, one study with urban African-American adolescents showed adolescents who resided with their single mother and extended family members showed the highest LS compared to other groups (Zimmerman, Salem, & Maton, 1995). This finding suggests that there could be other factors accounting for greater impact on adolescents' LS within the familial context, beyond family composition or marital status. Quality of the actual parent(s)-child relationships or interactions has been considered as the primary determinant of adolescents' LS, a topic which will be returned to later in the section on "interpersonal relationships".

**Neighborhoods.** In a longitudinal study of rural adolescents from the Appalachian region in the US, researchers found that among economically disadvantaged youth, besides family SES, and perceived disparity between the desired number of children and actual number of children in the home, several other living environment related variables

were predictors of LS, such as community size and perceived discrepancy between desired residence and actual residence (Wilson et al., 1997). In a related study in Australia, researchers found that children from distressed neighborhoods (e.g., high crime/violence levels, reside on industrial or commercial streets or in poorly maintained houses, and/or in rented accommodations) reported lower overall LS compared to children who lived in healthy residential areas (Homel & Burns, 1989).

Other than “where,” “who” live in a neighborhood appear to matter to adolescents’ LS as well. One study with American adolescents suggested that those who lived in neighborhoods with a relatively homogenous ethnic composition reported higher LS than adolescents who resided in more ethnically diverse communities (Sam, 1998). Another study with immigrant adolescents in Portugal revealed similar findings: residence in a neighborhood in which most inhabitants were of the adolescents’ same ethnic identity predicted increased LS (Neto, 2001). However, before formulating conclusions about the effects of heterogeneity of ethnic composition in the neighborhoods, more studies are needed, along with a deeper examination of the role of local cultural factors (i.e., religion, community climate).

**Life events.** Research has shown that recent experiences of major life events such as changing schools, parental divorce, and change in SES accounted for significant variance in adolescents’ LS scores, even after controlling for important personality traits (McKnight, Huebner, & Suldo, 2002). In general, studies suggested that major life events (e.g., parents’ divorce, death of a family member) and minor life events (e.g., daily hassles, everyday stressors) exert a modest to moderate effect on youth’s LS (Ash & Huebner, 2001; McCullough, Huebner, & Laughlin, 2000). McCullough and colleagues

(2000) also found positive daily events (e.g., hobbies, frequent opportunities to help others) better predicted LS than the accumulation of major or daily life stressors. In fact, research indicates that positive daily events may be the most crucial contributor to LS variance when only the impact of major and daily events on LS is considered (McCullough, et al., 2000).

**Culture.** Much of the research on youth LS has been published in studies with participants from Western cultures. Relatively few cross-cultural comparisons have been undertaken to analyze the influence of culture. In one study, Japanese students reported less happiness, considerably lower levels of LS, along with higher numbers of physical and psychiatric symptoms, and more stressful life events than Swedish adolescents (Tanaka, Mollborg, Terashima, & Borres, 2005). Similarly, Park and Huebner (2005) compared the LS reports of Korean and American students and found that Korean students reported lower LS than their American counterparts; results which are consistent with those reported in studies of adults (e.g., Diener & Diener, 1995).

When researchers used domain-based LS measures rather than measures of global LS, more interesting findings were found. The greatest differences seem to exist in the Self and School domains, though the findings of other domain comparisons are not completely consistent. For example, Liu and colleagues (2005) found that Chinese students scored higher on the dimensions of Friends and School than American students and Irish students. Similarly, in another study, Korean students reported significantly less satisfaction in the Self domain, and higher satisfaction in School domain, whereas American students reported higher satisfaction in the Self domain and less satisfaction in the School domain (Park & Huebner, 2005). Moreover, studies with American students

found that the School domain was the weakest indicator for global LS reports and was ranked lower in importance than the Family, Friends, Self, or Living environment domains (Liu et al., 2003).

### **1.3.2.2 Social relationships**

**Parent-child relationships.** Parent-child relationship variables are among the strongest correlates of LS during youth. Grossman and Rowat (1995) found that a perceived poor parental relationship, and not family marital status, was associated with reduced LS among a group of Canadian adolescents. Moreover, frequency and magnitude of parent-adolescent disagreements are inversely related to LS in adolescents from European American and Vietnamese American cultures (Phinney & Ong, 2002) as well as in Chinese youth (Shek, 1997). Conversely, it is not surprising that more positive relations with parents are strongly associated with higher levels of LS (Dew & Huebner, 1994; Gilman & Huebner, 2006; Gilman et al., 2000; Leung & Zhang, 2000). Particularly, compared to other interpersonal relationships (e.g., peer relationships, teacher-student relationships), the quality of the parent-child relationship has been found to be the strongest interpersonal relationship predictor of LS among youth ages 8 to 18 (Dew & Huebner, 1994; Huebner, Seligson, Valois, & Suldo, 2006; Suldo & Huebner, 2004b). These results are supported by similar research using different indicators of parent-child relationships. For instance, LS is closely linked to parent attachment (Nickerson & Nagle, 2004) and perceived family functioning (Heaven, Searight, Chastain, & Skitka, 1996). Theoretical foundation and empirical evidence of the importance of parental attachment on youth LS are reviewed in details in later sections.

**Peer relationships.** The interaction with peers not only significantly contributes to adolescents' socialization, but also their SWB. In general, children with higher quality of peer relationships score higher on measures of global LS (Huebner & Alderman, 1993; Oberle, Schonert-Reichl, & Zumbo, 2011) and measures of specific life domains (Nickerson & Nagle, 2004). Similarly, adolescents who report high levels of LS typically feel that they receive more social support from both friends and classmates (Suldo & Huebner, 2006). In contrast, students who experience negative interactions with their peers report lower levels of LS (DeSantis- King, Huebner, Suldo, & Valois, 2006; Martin & Huebner, 2007). Particularly, students who are relationally victimized (e.g., teased by peers or purposefully excluded from peer groups) experience significantly less frequent positive emotions in school and lower global LS (Flouri & Buchanan, 2002; Martin, & Huebner, 2007; Martin, Huebner, & Valois, 2008). Besides purposeful acts of physical or relational victimization, another relatively passive, but still negative peer interaction, neglect, also could lower the levels of SWB. For instance, one study showed that students who received few prosocial acts were more likely to experience low global LS than those who received frequent prosocial acts from peers (Martin & Huebner, 2007).

**Teacher-student relationship.** There are only a few studies examining the effect of teacher-student relationship on students' global subjective well-being. For instance, by studying three groups of adolescents with high, average and low LS, Suldo and Huebner (2006) found that adolescents with high LS perceived higher mean ratings of social support from teachers than their peers with average or very low LS, who did not differ in their levels of teacher support. A series of studies conducted by Huebner and his colleagues appeared to support the conclusion that the quality of the teacher-student

relationships is not the strongest predictors of overall LS (Siddall, Huebner & Jiang, 2013), but is the strongest predictor of school satisfaction in adolescents (Jiang, Huebner & Siddall, 2013). Obviously, more research is needed to determine the total contribution of teacher-student relationship to LS to adolescents' subjective well-being.

### **1.3.3 Intrapersonal factors**

#### **1.3.3.1 Personality traits**

**Personality.** Research has indicated that personality traits contribute to LS, especially extraversion and neuroticism. Similar to the findings from adult studies, extraversion is positively associated with LS while neuroticism is negatively associated with LS in adolescents (Fogle, Huebner, & Laughlin, 2002; Heaven, 1989; Huebner, 1991a).

Further, neuroticism has been found to be one of the strongest personality traits that correlate with LS in children (Heaven, 1989; Huebner, 1991a). Both psychoticism and introversion are negatively related to LS in children, but these correlations were not strong in Heaven's (1989) study.

**Locus of control.** Another personal trait that is strongly and consistently correlated with LS is locus of control. Internal locus of control, which reflects individuals' beliefs that they are personally responsible for the events in their lives, is associated with higher levels of LS, whereas external locus of control, which reflects individuals' beliefs that their life events are attributable to external causes, has moderately negative correlations with LS (Ash & Huebner, 2001; Huebner, 1991a; Huebner, et al., 2000; Dew & Huebner, 1994; Huebner & Dew, 1993; Gilman et al., 2000; Gilman & Huebner, 2006; Shogren, Lopez, Wehmeyer, Little, & Pressgrove, 2006). Ash and Huebner's study (2001) also showed that locus of control mediated the relationship between

environmental stressors and LS, providing evidence that environmental variables and intrapersonal variables likely interact in determining LS.

**Self-esteem and self-concept.** The empirical evidence has consistently shown that LS positively relates to self-esteem, and the correlations are moderate to strong among normally developed children and adolescents (e.g. Dew & Huebner, 1994; Huebner, 1991a; Neto, 1993; Gilman & Huebner, 2006; Gilman et al., 2000); and among several diverse groups, such as inner-city African American adolescent males (Zimmerman, et al., 1995), and elementary students who are at risk academically (Huebner & Alderman, 1993). Significant positive correlations also exist between LS and global self-concept (McCullough, et al., 2000; Huebner, 1991a; Terry & Huebner, 1995; Gilman & Huebner, 1997) as well as with multiple domains of self-concept (Dew & Huebner, 1994; Gilman & Huebner, 1997).

### **1.3.3.2 Cognitive-Motivational factors**

**Self-efficacy.** Self-efficacy, the personal belief in what one can do, or is capable of doing, is an important determinant of behavior and influences whether and how one perseveres against the obstacles and challenges of life (Maddux, 2002). General self-efficacy beliefs, which combine adolescents' self-efficacy in family, school and peer contexts, were found to be among the most consistent predictors of LS among adolescents from five sociocultural groups living in America (i.e. European, African, Chinese, Mexican, Dominican) (see Bradley & Corwyn, 2004). Beyond general self-efficacy, researchers also have studied self-efficacy in specific domains, including social self-efficacy (Muris, 2001; Zullig, Teoli & Valois 2011), academic self-efficacy and emotional self-efficacy

(Muris, 2001; Valois, Umstaddt, Zullig & Paxton, 2008; Valois & Zullig, 2013; Valois, Zullig, Kammermann & Kershner, 2013; Valois, Zullig & Hunter, 2014).

**Social self-efficacy.** Fogle, Huebner, and Laughlin (2002) compared social self-efficacy (children's perception of their own competence in the social context) with objective social competence (as rated by teachers) in predictions of young adolescents' LS. This study revealed a moderate correlation between social self-efficacy (self-perception) and LS. In contrast, they found that social competence rated by teachers was unrelated to children's LS. Suldo and Huebner (2006) found that the highest levels of social self-efficacy were present among middle and high school students who also had the highest level of LS. In addition, Fogle and colleagues(2002) found that the relationship between extraversion and LS was mediated by perceived social self-efficacy.

**Academic self-efficacy.** The studies of self-efficacy in the context of schooling reveal that self-perceptions of academic abilities have yielded moderate relations with LS (Huebner & Alderman, 1993; Huebner, 1991a). Additionally, academic self-efficacy is the highest among middle and high school students who also have high levels of LS, and it is the lowest among students with low levels of LS. In Suldo and Huebner's (2006) study of adolescents with high LS, more than 85% of individuals with very high LS also reported above-average academic self-efficacy, which led to the authors' conclusion that academic self-efficacy should be identified as a necessary criterion for high LS. Researchers also found that a similar construct "academic self-concept" was moderately correlated with both global and domain-specific LS among students in in Hong Kong (Leung, et al., 2004; Leung & Zhang, 2000).

**Emotional self-efficacy.** LS is associated with adolescents' perception of their ability to control their emotions, including coping with negative emotions. For example, adolescents with very high LS have substantially higher levels of emotional self-efficacy than those with average levels of LS, and individuals who have very low levels of LS reported the lowest levels of emotional self-efficacy (Suldo & Huebner, 2006). In an Italian study with late adolescents and young adults, researchers found that self-efficacy beliefs in managing negative affect at 19 years contributed significant variance to reports of self-esteem, LS, and optimism at age 21 years (Caprara, Alessandri, & Barbaranelli, 2010).

**Optimism.** Optimism is a generalized expectancy that one will experience a favorable outcome in the future (Scheier & Carver, 1985). Two main theoretical constructs have developed to define optimism: dispositional optimism (Scheier & Carver, 1992) and explanatory or attributional style (Buchanan & Seligman, 2003). The former definition of optimism (as a disposition) is concerned with how people pursue goals with the global expectation that good things will be plentiful in the future and bad things will be scarce (Peterson, 2000). In contrast, the latter definition of optimism (as explanatory or attributional style) is concerned with how an individual explains bad and good life events (Peterson, 2000).

Most of the studies on optimism employed the conceptualization of a personality disposition. Significant associations between optimism and well-being have been found in both cross-sectional and longitudinal studies. For instance, dispositional optimism has been found to be negatively associated with depression (i.e., Chang, 1998a, 1998b; Scheier & Carver, 1992) and positively associated with LS in adult samples (i.e., Chang,

1998a, 1998b, 2002; Wrosch & Scheier, 2003; Curbow, Somerfield, Baker, Wingard, & Legro, 1993). The relations between optimism and LS generalizes to childhood and adolescents (e.g., Extremera, Durán, & Rey, 2007; Oberle, et al., 2011), although the number of empirical studies is fewer than those for adults (Deptula, Cohen, Phillipsen, & Ey, 2006). Similar findings have been also reported in an adolescent sample in Hong Kong (Ho, Cheung & Cheung, 2010), and young adults in mainland China (Yuan, Zhang, Zhao & Liu, 2006) and in Turkey (Yalçın, 2011), respectively.

A few studies applied the conceptualization of optimism as attribution style and explored its relationship with LS. In a sample of high school students, Rigby and Huebner (2005) found a positive correlation between LS and the adaptive attribution style for positive events, and a negative correlation between LS and the maladaptive attribution style for negative events. Further, adolescents' causal attributions for good events mediated the relationship between emotional stability and LS. Optimism was also found to partially mediate the relationships between various sources of social support (school, family, peer, and overall) and LS among urban youth (Alder, 2007).

**Hope.** According to a modern hope theory, hope incorporates three components: goals thinking, agency thinking, and pathways thinking (Snyder, Cheavens, & Sympson, 1997). In addition to the capacity to conceptualize goals, hope also involves the belief that one can generate workable routes to goals (pathway thinking), and has the motivation to be able to begin and sustain the effort necessary to follow a particular pathway (agency thinking; Lopez, Snyder, Magyar-Moe, Edwards, Pedrotti, & Janowski, 2004). A few studies have examined hope among children and adolescents. For example, one study showed that hope was positively correlated with adolescents' global LS and inversely

correlated with internalizing and externalizing behaviors (Valle, Huebner & Suldo, 2004). Using various psycho-educational and psychological indicators of school adjustment in the study of hope, Gilman, Dooley, and Florell (2006) also found that both the Pathways and Agency subscales of the Children's Hope Scale (CHS; see Snyder et al. 1997) were positively correlated to global LS, personal adjustment, and grade point average (GPA), but negatively correlated to indicators of psychological distress, and school maladjustment. Expanding on previous hope work, Valle et al.'s (2006) study showed that hope functions as a buffer (i.e., moderator) between stressful life events and adolescent global LS. Jiang and colleagues (2013) found that hope also mediated the relationship between parental attachment and LS in early adolescents.

Interestingly, a few LS studies examined the effect of multiple cognitive-motivational factors such as hope and optimism at the same time. For instance, hope and optimism were significant predictors of SWB indices in various groups, including low-income, urban, ethnic minority adolescents (Vacek, Coyle & Vera, 2010), Mexican-American adolescents (Edwards, 2004) and secondary school students from Singapore, even after controlling for hope and optimism, respectively (Wong & Lim, 2009).

**Personal Goals.** Personal goals are the consciously embraced, personally meaningful objectives that individuals pursue in their daily lives (Emmons, 1986; Little, 1983). Conscious goal pursuit has long been linked with increased subjective well-being and happiness in empirical research; however, the samples are almost limited to adults. For example, college students' perception of personal goals striving importance and instrumentality (low conflict) were the strongest predictors of life satisfaction (Emmons,

1986). Moreover, goal importance and goal attainment are positively related to both positive affect and LS (Emmons 1986; Emmons & Diener, 1986).

**Extrinsic vs. Intrinsic goals.** The pursuit and attainment of personal goals usually involve the processes of value application, value pursuit, and value achievement, with the underlying purpose to fulfill needs and attain happiness (Locke, 2002). As Deci and Ryan (2000) hypothesized, there are two major, distinguishable types of goals with quite distinct values. Extrinsic goals are primarily focused on the attainment of external rewards (i.e., money, possessions) and other people's approval (i.e., admiration, praise), whereas intrinsic goals derive from basic psychological needs and are engaged in for the inherent satisfaction obtained from the activity itself, such as striving for personal growth, intimacy, and contribution to the community.

Research on the effect of extrinsic goals vs. intrinsic goals on youth well-being is rare. With a sample of Spanish adolescents aged 12 to 16, researchers investigated how satisfaction of life domains and overall LS, values, internal/external perceived control influenced the option of planning or by chance searching information on the Internet. Results showed that satisfaction with life as a whole positively correlated with non-materialistic values (see Casas, Gonzalez, Figuer, & Coenders, 2004). Relatedly, adolescents who admired materialistic characteristics or put a high priority on being rich were especially likely to have a variety of DSM diagnoses, including conduct disorder, attention deficit disorder, separation anxiety disorder, and personality disorders (e.g., borderline) (Cohen & Cohen, 1996). Such evidence supports the hypothesis that intrinsic goals are likely to have a positive effect on well-being and vice versa. But obviously,

more research is needed to explore positive indicators of well-being in adolescents, including LS.

#### **1.4 Summary of LS Correlates and Gap in Research**

In general, it appears that many variables serve as important correlates of adolescents' LS. However, research has shown that demographic variables are typically relatively weak predictors of youth global LS (Gilman & Huebner, 2003; Huebner & Gilman, 2004; Huebner, Suldo, Valois, Drane, & Zullig, 2004b; Huebner, Valois, Paxton, & Drane, 2005), whereas contextual and intrapersonal factors serve as stronger predictors in adolescents' LS (Ma & Huebner, 2008).

Besides comparing the impact of individual variables on youth LS, it is also important to investigate how multiple variables influence LS in the same model. Based on a review on life satisfaction in adult studies, Evans (1994) proposed a biosocial-cognitive model to guide this investigation. This model suggests that personality / dispositional factors along with environmental factors affect the cognitive appraisal (e.g., LS) both directly and indirectly. The indirect effect implies that there are a variety of cognitive and behavioral factors that may serve as mediators of the relation between LS and the dispositional and environmental factors. Though it has derived from adult studies, this comprehensive model may also prove useful in the study of youth LS development. A modified model for school age children is shown in Figure 1). The basis for the modifications is described subsequently.

As the pathways in Evan's model suggested, researchers have paid attention to the mechanisms in simplified linear relationships in development of youth LS. For example, findings from youth LS studies have indicated that perceived social self-efficacy

mediated the relationship between extraversion and LS (Fogle, et al., 2002); optimism mediated the relationship between emotional stability and LS (Rigby & Huebner, 2005); and locus of control mediated the relationship between environmental stressors and LS (Ash & Huebner, 2001).

Regarding the effect of environmental factors on youth LS, researchers have consistently found that parent-child relationships significantly contribute to individual differences in adolescents' LS (e.g., Suldo & Huebner, 2004b; Ma & Huebner, 2008); however, one area that has been somewhat neglected in the literature is the explication of the psychosocial mechanisms that may account for the link between parent-child relationships and LS. Based on Evan's (1994) model, it is reasonable to hypothesize that the intrapersonal factors, such as the cognitive-motivational factors, function as the mediators between parent-child relationship and adolescents' LS. Although rare, existing evidence has provided support for the mediation role of some cognitive-motivational factors, such as optimism (Alder, 2007) and hope (Jiang, et al., 2013) in the link between various sources of social support (school, family, peer, and overall) and LS in adolescents. It is worthwhile to note that hope is an intrapersonal variable reflecting moderately enduring, cross-situational subjective appraisals of goal-related capabilities. Specifically, in addition to the capacity to conceptualize goals, hope also involves the belief that one can generate workable routes to goals (pathway thinking), and has the motivation to be able to begin and sustain the effort necessary to follow a particular pathway (agency thinking) (Lopez et al., 2004). This construct conceptualizes a broad goal-related capability within the cognitive-motivational domain. However, it does not specify the situation when the goal-related capability is needed, nor does it cover the

behavioral component in the goal-related capability (e.g., how the individual actually behaves). To provide a more in-depth analysis of the function of goal-related capabilities in youth's development of LS, one construct "social problem solving," which comprises cognitive, affective and behavioral components, will be examined in the present study.

This study aimed to fill the gap in the research on the relationship between youth goal-related capability and their LS. Since social problem solving is an individual factor conducive to change (i.e., educational and psychological intervention; see Elias & Clabby, 1992; Elias & Tobias, 1996), from a practical standpoint, this study will further the understanding of the mechanisms that account for the association between environmental situation or change and youth LS, and consequently may have relevance to intervention efforts. To provide a theoretical foundation for the proposed mediated model, major theories, including Attachment theory and Social Problem Solving theory, are reviewed next.

## **2. Parental Attachment**

### **2.1 Attachment Theory**

Attachment theory provides a theoretically rich and empirically- validated model for the parent-child relationship (Ainsworth, 1989; Hazan & Shaver, 1987, 1994).

According to attachment theory, a supportive, encouraging, and cooperative parent (or caretaker) who is available as a source of support fosters the development of a secure parent-child attachment bond. This attachment bond, in turn, provides the child with a secure base from which to explore the environment and develop personal and interpersonal competencies (Bretherton, 1992). Specifically, children who experience secure attachment relationships are also provided with assurances that they are worthy of

being loved and cared for. Feelings of worth and value become internalized as part of the child's attachment cognitions, as "internal working models," which lead to positive feelings about themselves, others and the world; and beliefs about one's worthiness and competence as well as expectations regarding the availability and likely responsiveness of significant others in one's life (Ainsworth, 1989); while insecure attachment relationships have the opposite effect. According to Bowlby (1969/1982), these working models are postulated to become more organized and complex with development, and their influence to become more habitual and automatic. This theoretical perspective implies that attachment quality is quite stable during adolescence, especially in a relatively constant caregiving environment (Thompson, 2000). Integrated research findings in early adolescence (Ammaniti, Van, IJzendoorn, Speranza, & Tambelli, 2000), middle to late adolescence (Allen, McElhaney, Kuperminc, & Jodl, 2004; Zimmermann & Becker-Stoll, 2002), and young adulthood (Kirkpatrick & Hazan, 1994; Scharfe & Bartholomew, 1994), indicate that this view is supported.

## **2.2 Assessing parental attachment in adolescence**

The multidimensional character of attachment is implicit in attachment theory and research (Parkes & Stevenson-Hinde, 1982). Two major dimensions of attachment are suggested by the literature; behavioral aspects and affective/cognitive aspects (Hinde, 1982). Studies of infants or very young children usually use observational methods to assess the former dimension, from which affective experience is inferred. To assess adolescent attachment, a self-report instrument is more commonly used, mainly because adolescents are able to report their behaviors (e.g., adolescents' proximity seeking and support seeking) and the affectively toned cognitive expectancies that are part of the

“internal working model” by which the individual represents attachment figures (Bretherton, 1985).

One commonly used measure to assess attachment in adolescents is the Inventory of Parent and Peer Attachment (IPPA) developed by Armsden and Greenberg (1987). They have defined attachment as an enduring affectionate bond that may be signaled by feelings of security, trust, good communication and acceptance. Based on this conceptualization, this measure assesses three broad dimensions of attachment: degree of trust (10 items), quality of communication (8 items) and alienation (7 items) (Armsden & Greenberg, 1987). These constructs are highly correlated and serve as measures of the affective and cognitive dimensions of parental attachment. The total summary score is the most useful measure of attachment security and it conceptualizes adolescent attachment as a continuum of security ranging from high to low. Also, the IPPA includes three scales which are designed to assess adolescents’ feelings toward different attachment figures, namely, Mother Attachment, Father Attachment and Peer Attachment. In the present study the focus was parental attachment, therefore only the Mother Attachment Scale and Father Attachment scale were used.

Attachment security has been conceptualized and assessed both categorically and continuously in the literature. Categories of children’s attachment usually include secure, anxious-ambivalent, and avoidant styles. Research with adolescents using these categories has shown that relative to avoidant and anxious-ambivalent adolescents, securely attached adolescents experience significantly less general anxiety, dysthymia, and depression (Cooper, Shaver, & Collins, 1998; Mickelson, Kessler, & Shaver, 1997; Roberts, Gotlib, & Kassel, 1996). However, a more commonly used method is

measuring level of attachment on a continuum as from insecure to secure, and this is the measure applied in the present study. Research findings using this method are reviewed in the next section.

### **2.3 Attachment and LS**

The influence of parental attachment is profound and pervasive in many different aspects of individuals' lives. Research has shown that adolescents who are securely attached to their parents display higher academic success (Bell, Allen, Hauser, & O'Conner, 1996; Cutrona, Cole, Colangelo, Assouline, & Russell, 1994); interpersonal functioning (Black & McCartney, 1997; Carr, 2009; Berlin, Cassidy, & Appleyard, 2008); lower likelihood for delinquency (Higgins, Jennings, & Mahoney, 201.), less general anxiety, dysthymia, and depression (Cooper, et al. 1998; Mickelson et al., 1997; Roberts, et.al., 1996), lower psychological distress (Bradford & Lyddon, 1994) and higher LS (Armsden & Greenberg, 1987; Nickerson & Nagle, 2004; Ma & Huebner, 2008). Regarding the subjective well-being indicator of LS specifically, there has been evidence of a link between parental attachment and adolescents' LS. To date, a number of studies have shown that secure attachment is significantly associated with higher LS among adolescents (Armsden & Greenberg, 1987; Nickerson & Nagle, 2004; Ma & Huebner, 2008; Jiang, et al., 2013). Thus, in the present study it was hypothesized that parental attachment would be significantly related to early adolescents' LS.

Parental attachment is also hypothesized to be significantly associated with social problem solving. The theoretical foundation and empirical support for this hypothesis are elaborated in the following section.

### **3. Social Problem Solving**

Positive youth development (PYD) is an emerging perspective in the field of positive psychology. PYD asserts that the deficit view of youth has dominated the fields of psychology, education, public health, sociology, and other fields for too long time. Thus, scholars need to move beyond this dominant view of the twentieth century, toward a view of the positive qualities of youth — their agency, insights, capabilities and contributions; and the positive outcomes (e.g., a happy child with a flourishing life). With this goal in mind, several molecular constructs can contribute to the concept of “positive youth development” such as “resilience” (see Masten, 2007) and “coping” (see Compas, Connor-Smith, & Jaser, 2004). In both instances, particular attention has been given to abilities and skills needed in negative environmental situations or life events such as abuse, trauma, or chronic illness in order for children and adolescents to produce positive responses. However, less attention has been paid to positive responses in more pervasive types of problems in life. As some scholars claimed, social problem-solving and decision-making skills are primary, without which success in social and vocational spheres is impossible (Elias & Tobias, 1996).

Some researchers called for a major research effort in this area decades ago (e.g., D’Zurilla & Goldfield, 1971), encouraging inquiry into the role of social problem-solving in adjustment and the importance of problem-solving training from a preventive perspective. Specifically, D’Zurilla and Goldfield (1971) argued that improving social problem-solving through training would enable individuals to enhance their functioning in a positive direction and help deal more effectively with future problems. In turn, this improved functioning would lead to more positive, generalized, and durable behavior

changes. However, the majority of research on social problem solving, including assessment and intervention studies, has been focused on clinical populations, such as individuals with anxiety disorders (Albano et al. 1995), depression (Nezu, 1986), and suicidal tendencies (Clum, Yang, Febbraro, & Canfield, 1996). Because the dominant paradigm in psychology has been to “repair” individual’s functioning (e.g., social problem-solving skills) only after “deficits” have been demonstrated, systematic training in such skill development has not been made widely available to all children. Ironically, these skills are part of everyday life, thus there are abundant opportunities for children to learn and practice effective strategies. Clearly, there is a need for mental health professionals and educators to recognize the value of proactively promoting students’ social problem solving in general education, not waiting until the occurrence of serious difficulty.

Furthermore, from a positive psychology perspective, psychologists should not limit the goals of mental health service to mere reduction or prevention of psychological problems; instead, we should foster strengths and positive qualities in students who will become responsible adults for a diversity of social roles. Leaders in many fields have recognized that among the skills that all children will need are those that enable them to think clearly, make thoughtful decisions, and resolve in a satisfactory manner the many problems and challenges they will face in and out of school (Elias & Clabby, 1992). This view is also in concordance with the national educational goals that emphasize the development of problem solving and thinking skills, rather than rote learning (Children's Defense Fund, 1992). Not surprisingly, development of social problem solving ability relates directly to the fundamental mission of the schools – preparing youth to function

effectively in society, and the schools should provide an optimal learning environment for students to acquire, practice and enhance this ability.

### **3.1 Social Problem Solving**

According to D’Zurilla and Nezu (1982), social problem solving (SPS) refers to a self-directed, cognitive-affective-behavioral process people use to solve problems that occur in everyday life. During this process, a person attempts to identify or discover potentially effective solutions for a particular problem and increases the probability of selecting the most effective solution from among the various alternatives (D’Zurilla & Goldfried, 1971). Depending on the problem solving goals, the aim of this process may be changing the problematic situation for the better, reducing the emotional distress that it produces, or both. As this definition implies, SPS is a conscious, rational effortful, and purposeful activity (D’Zurilla & Goldfried, 1971; D’Zurilla, 1986). The specific terms used in this concept are defined in the following paragraphs.

*Problem.* Problems are evitable in everyone’s life. According to D’Zurilla and Goldfried (1971), “Problem” is defined as “*any life situation or task that demands a response for adaptive or effective functioning*” (p.107). The demands in these situations may originate in the environment (e.g., objective task demands) or within the person (e.g., a personal goal, needs, or commitment). This definition emphasizes that a problematic situation is not just the source of stress and “problems”, but includes a response on the part of the individual.

*Social.* The adjective “social” in the term of social problem-solving is not meant to limit the study of problem solving to any particular type of problem (e.g., interpersonal problems). It is used in this context only to highlight problem solving that influences

one's adaptive functioning in the real-life social environment. Specifically, it can be severe negative environmental situations or life events such as abuse, trauma, or chronic illness, but it can also include less severe but more pervasive problems in ordinary life, from a single time-limited event (e.g., missing a bus to school, transferring to a new school, conflict with a classmate), to a series of similar or related events (e.g., repeated unreasonable demands from a peer, falling behind in a subject), or a chronic, ongoing situation (e.g., continuous pressure from parents, or feelings of difficulty related to reaching a certain goal). Moreover, the demands in these situations may originate in the environment (e.g., objective task demands) or within the person (e.g., a personal goal, needs, or commitment). Hence, social problem solving deals with all types of problems that might affect a person's overall functioning. The rationale behind this is the general-situation theory of problem solving has been emphasized by multiple researchers (e.g., D'Zurilla & Sheedy, 1992; Shure & Spivack, 1972). To these researchers, problem solving was a more general process, which means that a person who had good problem solving ability in one area would have good problem solving ability in other areas as well. For example, though the important features of effective problem solving dealing with failing an exam at school and with an argument with one's parents may differ substantially, both may be characteristic of an adolescent who is capable of dealing purposefully and effectively with the wide-ranging demands encountered in daily life (Campas, 1987).

Much of the research on social problem-solving and problem-solving therapy has used the prescriptive model of social problem solving originally introduced by D'Zurilla and Goldfried (1971), and later expanded and revised by D'Zurilla and his colleagues (i.e.

D'Zurilla & Nezu, 1990; D'Zurilla & Nezu & Maydeu -Olivares, 2002). The original process model has also been adopted and modified by a different group of scholars (Frauenknecht & Black, 1995). Three important models will be illustrated in following sections.

### **3.2 Original Social Problem Solving Process Model**

One of the major assumptions of this theory is that social problem solving ability is not a unitary construct, but a multidimensional construct consisting of several different, albeit related, components. In the original model describe by D'Zurilla and Goldfried (1971), social problem solving ability was assumed to consist of two broad, partially independent components: problem orientation and problem-solving skills (later referred to as “problem solving proper” by D'Zurilla and Nezu, 1999; and then “problem style” by D'Zurilla et al., 2002). See the theoretical model of this process model in Figure 2.

Social problem solving orientation was described as a metacognitive process involving the operation of a set of relatively stable cognitive-emotional schemas that reflect a person’s general beliefs, appraisals, and feelings about problems in living, as well as his or her own problem-solving ability. This process was believed to serve an important motivational function in social problem solving.

Social problem-solving skills, on the other hand, referred to the cognitive and behavioral activities by which a person attempts to understand problems and find effective “solutions” or ways of coping with them. D’Zurilla and Goldfried (1971) asserted the following five-stages best represented a consensus viewpoint of the rational problem solving process: (a) defining and formulating of problems, (b) generating

alternative ideas, (c) deciding what course of action to take, (d) implementing the decision, and (e) verification. A description of the whole process follows.

Defining and formulating problems involves operationalizing problems into relevant or irrelevant information (D’Zurilla & Nezu, 1982). This process allows an individual to draw more accurate conclusions about a situation in order to generate more appropriate solutions in the next stage. Individuals can produce many traditional and contemporary ideas in order to identify the best solution for a particular situation. Subsequently, an individual has to scrutinize his or her objective or goal in the presenting situation to make decisions on what will be the best course of action in order to achieve the goal. Once a decision has been made, the course of action is implemented. Upon the implementation of the selected action, a verification process is needed to test if the action results in an optimal outcome. If the optimal solution is reached, the rational problem solving process is concluded; however, if not, the problem solving process should continue until one is reached. Notably, although the process is divided into five stages, the authors emphasize that effective problem solving does not necessarily occur in a sequential order, rather, the stages may “overlap and interact” (D’Zurilla & Goldfried, 1971, p.12). In addition, the value of this process is not limited to producing optimal solutions solely; yet, the process is more about evolving as an individual gains more knowledge and new experiences.

Based on this theoretical process model, D’Zurilla and Nezu (1990) developed a self-report measure of social problem-solving, called the *Social Problem-Solving Inventory* (SPSI). The SPSI consists of 70 Likert-type items rated on a 5-point scale, and is divided into two major scales: the Problem Orientation Scale (POS), and the Problem

solving Skills Scale (PSSS). The Problem Orientation Scale (POS) is comprised of three subscales “Cognition Subscale (CS)”, “Emotion Subscale (ES)”, “Behavior Subscale (BS)”; while the Problem solving Skills Scale (PSSS) was divided into four subscales, “Problem Definition and Formulation Subscale (PDFS)”, “Generation of Alternative Solutions Subscale (GASS)”, “Decision Making Subscale (DMS)”, “Solution Implementation and Verification Subscale (SIVS)”. Detailed descriptions of this scale can be found in Maydeu -Olivares and D’Zurilla (1995).

### **3.3 The Expanded Social Problem Solving Process model**

The original model of the social problem-solving process (D’Zurilla & Goldfried, 1971) was later adopted and expanded by Frauenknecht and Black (1995) to guide the development of a social problem-solving intervention (stress management) for adolescent populations. In accordance with the idea from the original process model (D’Zurilla & Goldfried, 1971), social problem-solving ability in Frauenknecht and Black’s (2003) model consists of two components: social problem-solving orientation and skills, but the factors of problem-solving orientation and stages of problem-solving skills are slightly different from those described in D’Zurilla et al. (2002) (see Figure 3).

In Frauenknecht and Black’s (1995) model, the concept of problem orientation is considered to be the motivational component of social problem solving and reflects three sets in the cognitive, emotional, and behavioral domains, including an individual’s self-efficacy in his or her intellectual capacities to engage in the process (a cognitive set), positive feelings a person experiences when faced with the need to solve a problem (an emotional set), and the willingness of the person to approach rather than avoid the process (a behavioral set) (Frauenknecht & Black, 2003). In all, youth must be

affectively *oriented* to problem solve; in other words, they must value the process and believe that the time and effort expended will produce desirable outcomes (Frauenknecht & Black, 2003).

Problem-solving skills, like those defined in the original process model, refer to the cognitive and behavioral activities by which a person attempts to understand problems and find effective “solutions” or ways of coping with them. Frauenknecht and Black (2003) divided social problem-solving skills into following nine stages (instead of five in the original process model). Descriptions of each stage are as follows.

*Step a, b, c*

- a). general problem identification,
- b). specific problem identification,
- c). problem selection,

General problem identification is the primary means of identifying that a problem exists. According to Frauenknecht and Black (2003), “Problems” are identified through “cues” or attitudes, emotions, behaviors, and/or physiologic “tests of reality.” These “tests” indicate a general overall discomfort without one’s knowing the specific source of the discomfort. Once the person recognizes that a “general” problem exists, in the next step the individual uses self-knowledge, self-monitoring, and self-questions to help isolate the specific problem. During this step, it also is critical to determine how much control over the problem the person has in order to determine what further actions should be taken. These more specific skills incorporate the first stage “Problem Definition and Formulation” in the original process model.

*Step d, e, f*

- d). alternative generation,
- e). consequence predication,
- f). alternative selection,

These three steps correspond to the stages of “Generation of Alternative Solutions” and “Decision Making” in the original process model. Generating alternative options or solutions requires the cognitive skills of brainstorming, free-associating, or freewheeling, the skills which help an individual “step outside” his or her typical way of thinking and usual approaches to problems. Once an individual has a list of alternatives, he or she should predict consequences or weigh the advantages and disadvantages of each option. Then the individual should identify decisional criteria and apply them to each option in order to make the decision. At the completion of these tasks, a person should be able to identify and select the best solution or solutions based upon how these options have met criteria.

*Step g, h, i*

- g). strategic plan implementation,
- h). progress evaluation, and
- i). reorganization.

Steps *g* and *h* in this model are equal to the last stage of “Solution Implementation and Verification” in the original process model. Step *g* is to implement the selected solution by creating a strategic plan of action. In this step, the problem solver needs to have the knowledge of resources or information in order to initiate the action and actually complete the action. Upon the completion, problem solvers start evaluating progress

toward the solution. During this step, a person reflects on what has happened with regard to each question posed in the development of the strategic action plan. If these standards have been met, then the result is problem resolution. If the standards have not been met, then the next step should be reorganization or recycling, which indicates that a person goes backward through each prior step and engages in self-reflection regarding the effectiveness of each step, thus learning from experience.

Based on the process model of social problem solving as well as the Social Problem Solving Inventory (SPSI) for adults, Frauenknecht and Black (1995) developed a social problem solving measure called Social Problem Solving Inventory-Adolescents (SPSI-A, Frauenknecht & Black, 1995, 2003). The SPSI-A has favorable psychometric properties with adolescents and a proper reading level for adolescents. Thus, Frauenknecht and Black's (2003) model and scale (SPSI-A) was used in the present study. More detailed information for this scale is provided in the Method section.

### **3.4 The Social Problem Solving Dimensional Model**

Both models above conceptualize social problem-solving as consisting of two components "problem solving orientation" and "problem solving skills." In later studies, Maydeu-Olivares and D'Zurilla (1995; 1996) conducted exploratory and confirmatory factor analyses on the SPSI. Although the results showed moderate support for the original two-factor model (as measured in the SPSI), a better five-factor model emerged. In the new model there are two factors of problem-orientation (positive orientation and negative orientation) and three factors of problem-solving styles (previously referred to as problem-solving skills). Three problem-solving styles include rational problem solving, impulsivity/carelessness problem solving, and avoidance problem solving. The

rational problem solving style is basically the problem solving skills in the original process model. Two newly added styles are impulsivity style and avoidance style, which are both dysfunctional. According to this model, effective problem solving is postulated to be dependent on both a positive orientation towards problem solving (problem orientation), and the effective application of rational problem-solving skills, plus the management of dysfunctional behavioral styles such as impulsiveness and avoidance. Based on these empirical studies, D'Zurilla, Nezu and Maydeu-Olivares (2002) modified the SPSI and developed a *revised Social Problem Solving Inventory* (SPSI-R) for adults. Although the dimensional model is the most updated version of social problem solving model, the present study used the process model since one of researcher's primary interests is the rational problem solving. Also, the measure based on Frauenknecht and Black's (2003) model was developed specifically for adolescents, thus the SPSI-A is used.

### **3.5 Social problem-solving and adolescent development**

Adolescence is a particularly important stage for the development of social problem-solving. First, the cognitive development during early adolescence enables these young individuals to have basic abilities to perform problem solving as described in the process model. For example, cumulative evidence from neuroscience has shown that the prefrontal cortex is associated with a higher level of cognitive skills such as reasoning, decision making, and self-control and coordination of thoughts and behavior (e.g., executive functions) (Luria, 1966; Shallice, 1982). During adolescence, there are specific developments in the prefrontal cortex, though with an equally significant role for rapidly expanding linkages to the whole brain (Donald, 2001; Luna. et al., 2001;

Newman & Grace, 1999). Regardless of the underlying processes, during early adolescence, individuals indeed show marked improvements in reasoning (especially deductive reasoning), information processing (in both efficiency and capacity), and expertise (Keating, 2004). As a result of these gains, individuals become more capable of abstract, multidimensional, planned and hypothetical thinking as they develop from late childhood into middle adolescence, although less is known about cognitive changes during late adolescence (Steinberg, 2005). Therefore, it is expected that early adolescents with normal cognitive development can apply these cognitive abilities in the process of rational problem solving, such as generating multiple solutions, predicting consequence, and evaluating outcomes.

Second, to ensure healthy development, it is important for adolescents to acquire social problem-solving ability as a protective factor when encountering challenges during this developmental stage. During early adolescence (ages 11–14; Holmbeck, Paikoff, & Brooks-Gunn, 1995), individuals face many challenges, including the transition to puberty, shifts in social relationships (e.g., parent–child and peer relationships), changes in school environments, peer social pressures and so on. These transitional tasks require as well as shape their maturity of cognition, emotion, and behavior. In western cultures, adolescence is often the so-called “time of turmoil and personal uncertainty”, reflecting the risks and struggles due to the challenges and limited abilities to handle all the challenges. For instance, it is not a coincidence that a significant increase in mortality associated with risk taking occurs at early adolescence (Irwin, 1993). As some scholars suggest, risk taking behaviors usually entail rational choices (Lopes, 1993), thus reflecting the difficulties in effective problem solving at this developmental stage.

In all, early adolescence is a developmentally appropriate time for individuals to acquire social problem-solving and this ability is needed to reduce risks as well as protect healthy functioning in these young people. In the following sections, the relations between social problem-solving and mental health outcomes are reviewed. Due to the lack of research on relations between social problem-solving and positive-focused developmental outcomes (e.g., well-being) in youth, the literature review is primarily focused on negative-focused outcomes (e.g., psychopathology).

Research has shown a significant association between deficit problem-solving skills and adolescent problem behaviors, such as aggression (Deluty, 1981; Lochman, Wayland, & White, 1993; Richard & Dodge, 1982), risky driving (Jaffee & D’Zurilla, 2003), delinquency and substance use (Allen et al., 1990b, 1994; Hains & Herrman, 1989; Pont, 1995). Deficits in problem-solving have been shown to be associated with a variety of clinical problems in adolescents, such as an increased risk for depression and suicidality (e.g., Becker-Weidman, Jacobs; Erdur-Baker, 2009; Clum & Febraro, 1994; Dixon, Heppner, & Anderson, 1991; Fremouw, Callahan, & Kashden, 1993; King, Segal, Naylor, & Evans, 1993; Reinecke et al., 2001; Reinecke, Silva, March, 2010; Rotheram-Borus, Trautman, Dopkins, & Shrout, 1990; Rudd, Rajab, & Dahm, 1994; Sadowski & Kelley, 1993; Specken & Hawton, 2005; Spirito, Overholser & Stark, 1989).

Longitudinal studies have revealed that deficits in problem-solving skills predicted future depression but depression did not predict future skills in college students (Dixon, Heppner, Burnett, Anderson, & Wood, 1993), suggesting that depression might be a consequence of low problem-solving skills rather than a cause. Researchers also found an interaction between stress and problem-solving skill in predicting future depression,

even after controlling for baseline depression (Nezu & Ronan, 1988). This result suggests that adults with poorer problem-solving skills tend to react more poorly to stress, and experience greater levels of depression.

Some studies indicated the importance of problem solving orientation on mental health outcomes, particularly negative states. For example, in a 3-wave longitudinal study, researchers found that adolescents who were high in negative Problem Orientation (NPO) experienced increases in fear, sadness, and hostility, and decreases in joviality compared with adolescents who were low in NPO with the same baseline levels of affect (Ciarrochi, Leeson, & Heaven, 2009). Nezu and Perri (1989) found that depressed individuals who received problem-solving therapy with problem-solving orientation training experienced significantly greater decreases in depression than did those who received problem-solving therapy alone (Malouff, Thorsteinsson, & Schutte, 2007; Nezu & Perri, 1989). Further, a meta-analysis study showed problem-solving therapy that included training in problem-solving orientation had larger effect sizes than studies without problem-solving orientation training (Malouff et al., 2007). To sum up, empirical evidence has suggested that the problem-solving orientation component might be particularly critical in interventions targeting problem-solving to improve mental health outcomes.

A number of studies have shown that social problem-solving ability, either by itself, or together with social support, can reduce or minimize the impact of life stress on individuals (Dubow & Tisak, 1989; Dubow, Tisak, Causey, Hryshko, & Reid, 1991; D’Zurilla & Sheedy, 1991; Esposito & Clum, 2002; Goodman, Gravitt, & Kaslow, 1995). In addition, social problem-solving training has been described as the *sine qua non* of

behavior change programs for youth (Frauenknecht & Black, 2004). Research has shown that social problem-solving training can help children and adolescents to manage stress (Elias et al., 1986) reducing social adjustment problems, and prevent or manage depression (Frauenknecht & Black, 2004; Frye & Goodman, 2000; Nezu, 2004).

In all, much of the available research on social problem-solving has resulted in elucidating what and how specific social problem-solving processes are related to psychological dysfunction and disorders (e.g., depressive symptoms, anxiety, and suicidal ideation). As mentioned earlier, within a positive psychology framework, it would also be important to understand what and how specific social problem-solving processes are related to positive psychological functioning in illuminating potential paths to promote positive psychological functioning. There have been a few studies on the relationship between problem solving and indicators of subjective well-being, such as LS, though all have been done with adult samples. For example, using the dimensional model, D’Zurilla et al. (2002) found that all five social problem-solving dimensions were significantly associated with adult LS. For instance, using the dimensional measure of a *revised Social Problem Solving Inventory (SPSI-R)*, researchers found that both social problem- solving orientations (positive and negative problem- solving orientation) and problem- solving styles (rational problem-solving style, impulsivity carelessness style and avoidance style) were correlated with LS in the small to moderate range (absolute *rs* ranged from .15 to .46) in the US (e.g., D’Zurilla et al., 2002; Chang, Downey, & Salata, 2004; Bulut, 2007) and in Turkey (Hamarta, 2009). Based on this limited literature, it is reasonable to hypothesize that positive problem-solving orientation and rational problem-solving skills are significantly correlated with adolescents’ LS as well. In testing this

hypothesis, an important gap in research between social problem-solving and subjective well-being in adolescents may be filled.

### **3.6 Adolescent social problem solving and parental attachment**

The negative impact of deficits in social problem-solving and the benefit of positive well-developed social problem-solving have driven researchers to explore possible determinants or facilitators of social problem solving. Social problem-solving abilities, within a broader concept of social competence, result from complex interactions between the child and his or her environment. Among different sources of environmental influence, family provides the primary socialization context and is the first primary foundation for influencing how children acquire the ways they think and act in life, as social scientists for most of the twentieth century have asserted (e.g., Baumrind & Black, 1967; Sullivan, 1953). For example, before children master the ability to solve problems on their own, they must refer to their parents and other caregivers for guidance in acquiring the cognitive and emotional skills to deal with unfamiliar and ambiguous tasks. Specifically, emotional support may include encouraging the children to attempt to solve a problem on their own and praising these attempts; and cognitive support may involve breaking the task into smaller pieces of information that children can understand. Doing this consistently and repeatedly has the potential to improve developmental outcomes (Shure, 2001; Hodges, Hernandez, & Nesman, 2003; Logsdon, 2003; Ruffolo, Kuhn, & Evans, 2005). In all, parental role models, child-rearing practices, and day-to-day interactions between parents and children teach both a general orientation to everyday problems and the skills necessary for solving them (Gauvain, 2001).

As mentioned previously, to study parental influence on their adolescent children's social problem-solving development, the construct and measurement of "attachment" are used in the present study. According to Attachment Theory, on the basis of repeated parent-child interactions, the child forms a cognitive model of the availability and supportiveness of the caregiver that affects his or her future actions, such as filtering information selectively, evoking responses from other people, selecting niches, and appraising experience (Belsky & Cassidy, 1994). These actions directly influence how children cope with stress and solve everyday problems (Bowlby, 1973). In a broad view of attachment, attachment relationships affect the development of many personal and interpersonal competencies, such as social competence and emotional adjustment (e.g., Engels, Finkenaurer, Dekovic, & Meeus, 2001), and theoretically include social problem solving ability. Individuation theory underlines that adolescents still need a close and supportive relationship with their parents but in Western cultures, the parent-child relationship often changes into a less hierarchical, more partner-like relationship over time (Collins & Steinberg, 2006). Studies also document that parent-adolescent interactions increase in conflict (for example, bickering) from early to mid-adolescence (Kim, Conger, Lorenz, & Elder, 2001; McGue, Elkins, Walden, & Iacono, 2005) and that positive maternal affect declines over this period (Loeber, Drinkwater, Yin, Anderson, Schmidt, & Crawford, 2000). Across later adolescence, the parent-child relationship appears to reorganize such that the overall picture is a decline in conflict across the entire adolescent period (Loeber et al., 2000). One interesting research question to ask is how this attachment relationship influences adolescents' social problem

solving given the remarkable changes in the relationship with parents which emerges in early adolescence.

Unfortunately, there is not much research studying how parental attachment impacts their adolescents' social problem-solving directly, but clues can be found from empirical studies using constructs related to parental attachment and/or social problem-solving. For example, some initial evidence showed that children's perceptions of their parenting experiences were related to their social problem-solving and their reported social distress (Domitrovich & Bierman, 2001). Richard (2002) investigated the role of a set of familial variables in the development of social problem-solving skills of adolescents, and found that the quality of the mother-child attachment and mothers' levels of differentiation of self are positively associated with better social problem solving skills in adolescents. Furthermore, mother-child attachment displayed a significant unique influence on the prediction of these skills. Also, two of the steps in the problem solving process were found to be significantly associated with the familial variables: problem orientation and evaluation. In addition, attachment cognitions were found to affect social problem-solving abilities among college women (Davila, Hammen, Burge, Daley, & Paley, 1995). Specifically, women with secure attachment cognitions showed better social problem-solving ability relative to women with insecure attachment beliefs as measured by the number of effective strategies for solving hypothetical interpersonal problems.

Regarding domains of parent-child relationships as reflected in parental attachment measures for adolescents (IPPA), namely, "communication, trust and alienation," there has been empirical support for the effect of the single or combined

domains on adolescents' social problem solving. Taking one type of ineffective problem solving (i.e., "adolescents' aggressive behavior") as an example, research has shown the importance of the closeness as well as communication between parent and child in adolescents' development in handling problems. For instance, Pettit and colleagues (1991) found that intrusive parent-child interactions predicted aggressive child problem-solving orientations and aggressive child social behavior at school entry, whereas warm, responsive, and involved parenting practices predicted prosocial child problem-solving strategies and prosocial behavior with peers. Loeber and Dishion (1985) compared the family environments of adolescent boys who were consistently aggressive across home and school settings to the environments of boys who were aggressive in only one of these domains. They found that the families of the boys who were consistently aggressive were characterized by less effective problem solving, more parental rejection, and more marital conflict. In another study targeting problem solving in the families of aggressive and nonaggressive adolescent girls, Pakaslahti and colleagues (1998) found that the parents of the nonaggressive girls were more likely to discuss problems with their daughters, whereas the parents of the aggressive girls were either indifferent to their daughters' problems or they simply reprimanded them for poor problem solving. In contrast, parents of aggressive children were more indifferent (i.e., they would do nothing to help their child but would punish if the child caused problems) or tended to divert responsibility to someone else (i.e., the teacher; Pakaslahti et al., 1996; Pakaslahti & Keltikangas-Järvinen, 1998). Moreover, Hart, Ladd, and Burleson (1990) examined children's problem-solving in terms of their outcome expectations for friendly and unfriendly strategies to solve problems. Results indicated that mothers who were more

power assertive had children who expected to get their way when using unfriendly-assertive strategies to solve problem. In contrast, parenting behaviors such as parental praise, positive involvement, and demonstrations of affection and warmth predict child displays of prosocial behavior (Brody & Shaffer, 1982; Radke-Yarrow, Zahn-Waxler, & Chapman, 1983), and low levels of child aggression at home and at school (Attili, 1989; Pettit, Bates, & Dodge, 1993; Rothbaum, Schneider-Rosen, Pott, & Beatty, 1995). Previous research also has shown that adolescents who report communicating with their parents are better able to negotiate high-risk social situations (Pick & Palos, 1995; Hutchinson & Cooney, 1998; Farrell & White, 1998; Somers & Paulson, 2000; Traube, Chasse, McKay, Bhorade, Paikoff & Young, 2007).

Positive parent-child interaction also reflects on many supportive parenting practice strategies, such as positive response and constructive communication. For example, Elias, Ubriaco, and Gray (1985) used a case study analysis to examine this relationship and found that parents can facilitate problem-solving through direct questioning. Freund (1990) demonstrated that social interaction between a mother and child during a problem-solving task leads to subsequent improved problem-solving performance of the child. Further, one study with 164 urban, African American adult caregivers and their 9 to 11 year old children revealed that children were frequently using constructive problem solving and help seeking behaviors when confronted by difficult social situations and that there was a significant relationship between the frequency and intensity of parent-child communication and youth help seeking social problem solving approaches (Traube, et al., 2007). Relatedly, parents who engage in positive problem

solving behaviors, such as responsive listening, have been found to encourage the development of social skills (Henderson et al., 2000).

Apparently, parents play an important role in the development of adolescents' competence of solving problems in their lives. Technically, positive parent-child interaction, such as communication between parents and adolescents, may be one of the most effective ways for caregivers to protect their adolescents from making poor decisions (Mueller & Powers, 1990; Holtzman & Rubinson, 1995). Parents can serve as role models to show adolescents how to solve problems in a positive and rational way. This is a learning process for adolescents and it may result in adolescents' enhanced self-efficacy and problem solving ability, which leads them become better problem solvers in all social situations.

### **3.7 Establishing the mediation model**

Based on Evans's (1994) proposed model, the current study aimed to simultaneously examine determinants and presumed psychosocial mechanisms related to the development of individual differences in adolescent life satisfaction. To sum up, the literature review above provided the evidence of the direct effect of parental attachment on adolescents' LS and the effect of parental attachment on adolescents' social problem solving. It also offered the evidence to support the potential linkage between social problem solving and LS. Therefore, Direct and indirect effects between parental attachment and LS were modeled, with social problem solving orientation and skill set as two mediators. In addition, a short-term, two-wave longitudinal design was applied in the present study, to move toward models that account for dynamic change processes between social problem solving and LS within individuals.

According to Attachment Theory, the structure and support of secure attachments to role models, particularly parents, provides children with internal working models to guide and influence their future experiences, such as allowing individuals to anticipate the future and make plans, thereby operating most efficiently (Bowlby, 1982). Based on the theory, it appears that learning occurs and is cognitively stored through direct interaction with parents. By forming internal models through the interaction with others, these learning experiences may serve as a source for future actions, and have an indirect effect on children's developmental outcomes including mental health. Specifically, the literature clearly supports the view that parental attachment is one of a number of important determinants of psychological adjustment in adolescents, including LS (Armsden & Greenberg, 1987; Nickerson & Nagle, 2004; Ma & Huebner, 2008). However, not surprisingly, the internal working model originated from attachment experiences also impacts the development of early adolescents' cognitive as well as behavioral capacity of problem solving. The cognitive-behavioral characteristics acquired by youth from their early learning experiences may influence these outcomes more directly as mediators of the effect of parental attachment.

A few studies have tested a similar mediation models, incorporating the variables of parental attachment or other parenting factors, social problem solving, and psychopathology. For example, in a study examining the relations among parental attachment, social problem solving and psychopathological symptoms with a sample of middle and late adolescents (ages of 14 and 19 years old), Carroll (1996) found that social problem- solving orientation, but not social problem- solving skills, mediated the relationship between parental attachment and psychopathology. This suggested that the

two components of social problem-solving, Problem Orientation, and Problem Solving Skills, might function differently in the link between parental attachment and adolescent psychological outcomes in a deficit-focused approach. However, it was unknown if the role of each social problem solving component would be consistent in the link between parental attachment adolescent psychological outcomes with a positive focus. Another study using the constructs of social problem solving, adult suicidal ideation and family rigidity, with a group of college students and their parents, showed that family rigidity had an indirect effect on adolescent suicidal ideation through its effect on adolescent social problem- solving deficits (Caris, Sheeber & Howe, 1998). These two studies of psychopathology appeared to support the mediated role of social problem solving; however, in both of these studies the constructs of parenting, adolescent problem solving, and adolescent psychopathology were assessed concurrently. Thus, the assumption of temporal precedence of variables in the mediation chain (X before M before Y) was potentially violated (MacKinnon, 2008, p.64), and limiting the ability to derive causal inferences regarding the mediated effect of social problem-solving. Clearly, more research is needed to test the relations among between social problem-solving, environmental factors (e.g., parenting) and mental health outcomes (both psychopathology and well-being).

In sum, Attachment Theory and empirical studies of both adolescents and young adults provide a basis from which to hypothesize that parental attachment levels may directly impact psychological outcomes, such as LS; while simultaneously parental attachment may also indirectly impact LS through the cognitive-behavioral mediating variables of social problem solving.

#### 4. Research Questions

The present study aimed to address the gap in the child well-being literature by empirically testing a theoretical model of LS with a sample of middle school students. The model represented the hypothesized direct and indirect relationships of parental attachment at Time 1, two components of social problem-solving at Time 1 and LS at Time 2 (see Figure 4).

The major questions are “Does social problem-solving orientation mediate the relationship between parental attachment and global LS?” and “Does social problem-solving skill set mediate the relationship between parental attachment and global LS?” Specifically, I tested the direct and indirect effect of parental attachment in predicting LS when two mediators, problem-solving orientation and problem-solving skill set were included in the model. The following subquestions and corresponding hypotheses would be answered in the analyses.

*1. Is there a significant relationship between parental attachment at Time 1 and life satisfaction at Time 2, controlling for LS at Time 1 and demographics?*

*Hypothesis:* Research findings have shown a positive relationship between parental attachment and LS (e.g., Armsden & Greenberg, 1987; Nickerson & Nagle, 2004). Therefore, it is hypothesized that parental attachment at baseline significantly predicts higher mean levels of LS at Time 2.

*2. Is there a significant relationship between parental attachment and problem-solving orientation at Time 1, controlling for demographics and problem-solving skills?*

3. *Is there a significant relationship between parental attachment and problem-solving skill set at Time 1, controlling for demographics and problem solving-orientation?*

*Hypotheses:* Attachment theory provides a strong theoretical support for the hypothesis that parental attachment is a significant predictor of adolescents' social problem-solving. Though the study examining parental attachment and adolescents' social problem-solving directly is rare, empirical support still can be found in a few studies (e.g., Richard, 2002; Domitrovich & Bierman, 2001; Davila, et al., 1995). In addition, studies using similar constructs (e.g., parent-child relationship, parenting practice) converge to support the same hypothesis (e.g., Pettit, Harrist, Bates, & Dodge, 1991; Pakaslanti et al., 1998; Traube, et al., 2007; Henderson et al., 2000). Therefore, I hypothesize that parental attachment at baseline predicts adolescents' problem-solving orientation and skill set, respectively.

4. *Is there a significant relationship between problem-solving orientation at Time 1 and global life satisfaction at Time 2, controlling for LS at Time 1, demographics, parental attachment and social problem-solving skills?*

5. *Is there a significant relationship between problem-solving skill set at Time 1 and global life satisfaction at Time 2, controlling for LS at Time 1, demographics, parental attachment and social problem-solving orientation?*

*Hypotheses:* Research findings from adult studies suggest that both social problem-solving orientation and skill set have a direct effect on LS, respectively. In general, using the dimensional model of social problem-solving, these studies showed that positive problem-solving orientation and rational problem-solving

style were positively correlated, whereas negative problem solving orientation, an impulsivity carelessness style, and avoidance style were all negatively correlated with LS (e.g., D’Zurilla et al., 2002; Chang, et al., 2004; Hamarta, 2009; Bulut, 2007). Therefore, a positive relationship is hypothesized between problem-solving orientation and mean levels of LS as well as problem-solving skill set and LS across time.

6) *Does parental attachment have an indirect effect on LS at Time 2 through problem-solving orientation at Time 1, beyond its direct effect on LS at Time 2, controlling for LS at Time 1, demographics and problem-solving skills?*

7) *Does parental attachment have an indirect effect on LS at Time 2 through problem-solving skills at Time 1, beyond its direct effect on LS at Time 2, controlling for LS at Time 1, demographics and problem solving orientation?*

*Hypotheses:* Indirect effects provide information about causal mechanisms underlying the relationship between the predictors and outcome variable. Evans’ (1994) model, attachment theory and social problem-solving theory together provide a conceptual foundation for the hypothesized mechanism in the link of parental attachment and adolescents’ LS. Empirically, researchers using a deficit-focused framework have found that family rigidity has an indirect effect on adolescent suicidal ideation through its effect on adolescents’ overall problem-solving deficits (Caris , Sheeber & Howe, 1998); and problem orientation, but not problem solving skills, mediated the relationship between parental attachment and adolescents’ psychological adjustment (Carroll, 1996). Since the empirical evidence is limited, the examination of the mediated effect of social problem-

solving in a longitudinal study is still exploratory in nature. The tentative hypotheses are: 1) social problem-solving orientation and skills together positively mediate the relation between parental attachment and adolescents' LS and the total mediated effects of social problem-solving are significant; 2) social problem-solving orientation positively mediates the relation between parental attachment and adolescents' LS and the mediated effect of is significant; and 3) social problem-solving skills positively mediate the relation between parental attachment and adolescents' LS and the mediated effect is also significant.

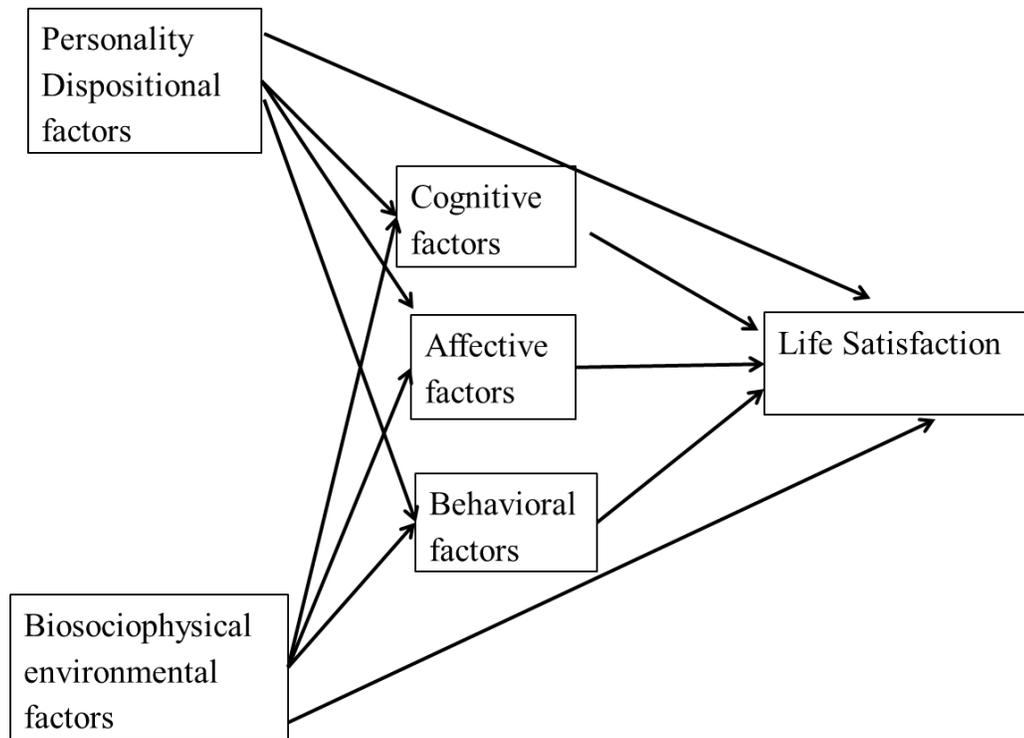


Figure 1.1 A modified version of Evan's model of factors affecting life satisfaction

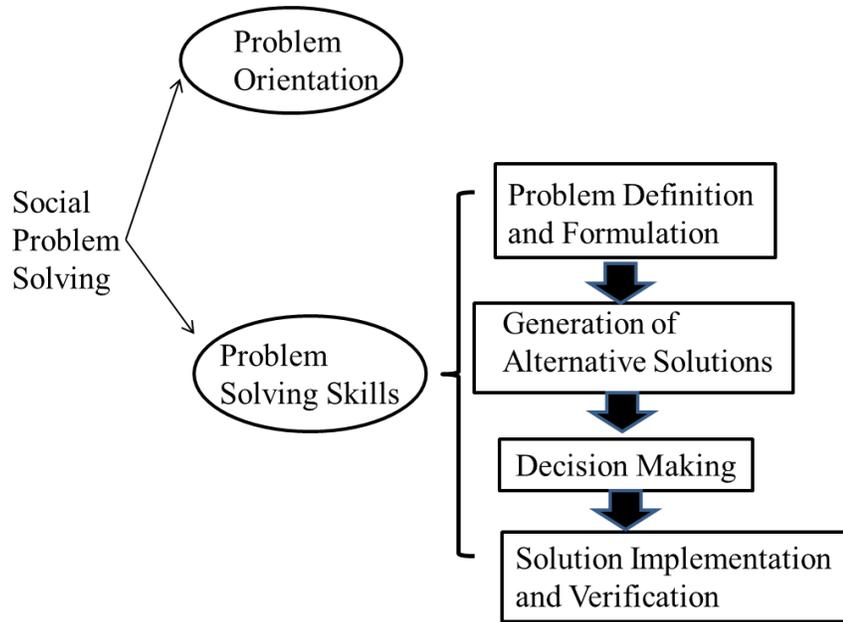


Figure 1.2 Original social problem solving process model

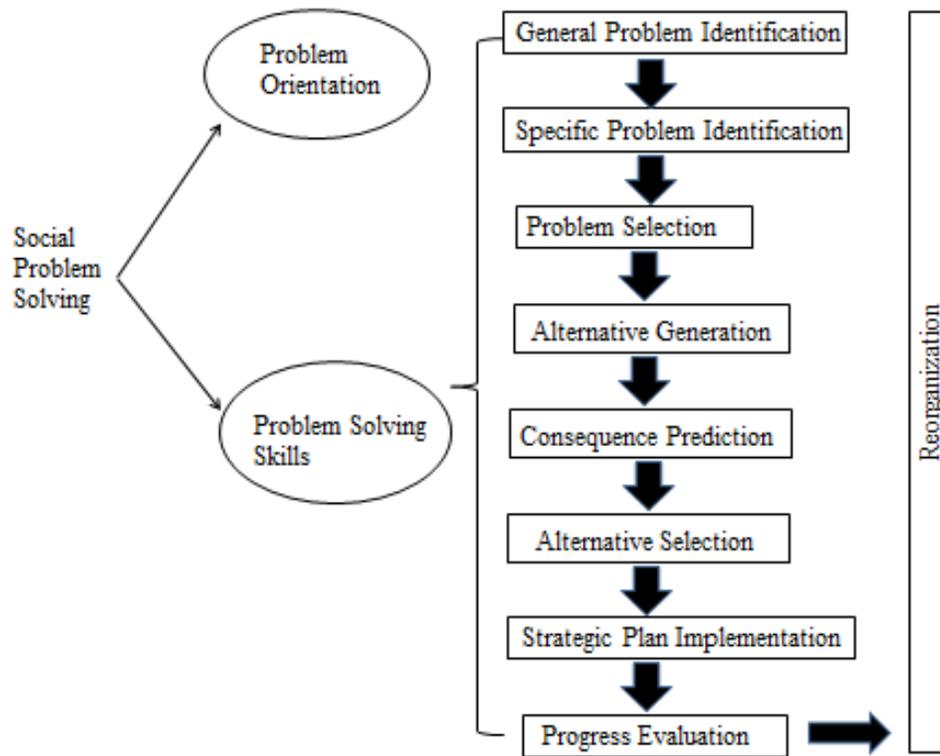


Figure 1.3 The Process model of social problem solving

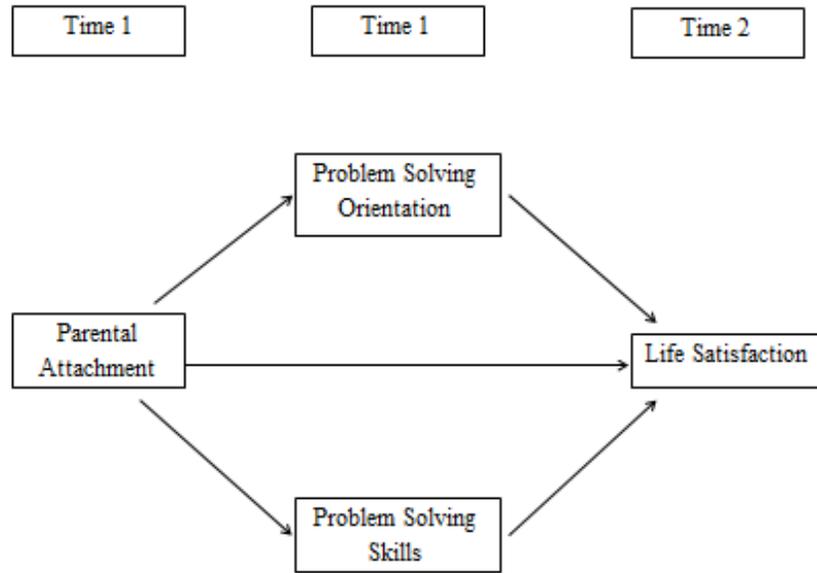


Figure 1.4 A Conceptual Mediation Model for the Present Study

## CHAPTER II

### METHOD

#### **Participants**

At Time 1, the questionnaires composed of a variety of scales were distributed to 739 regular education students in grades 6-8 at a middle school in an urban area in the Southeastern United States. Participants needed to answer at least 80% the items of a scale to be considered as providing valid responses to the particular scale. If they answered less than 80% of the items of a scale, their scores for that scale were removed and treated as missing data. If a participant provided valid responses to at least one scale, this participant (or case) was retained. Following this procedure, the number of cases used in the present study at Time 1 was 652. The number of students in each gender group was approximately equal (male,  $n=323$ ; female,  $n=329$ ). The numbers of students in 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade were 193, 195 and 264, respectively. In terms of racial group, the majority of study participants were White ( $n=610$ ) with a few African Americans ( $n=14$ ), other races ( $n=17$ ), and unidentified racial identity ( $n=11$ ). Status of free or reduced price lunch at school was used as an indicator of the social-economic status (SES) of the student. Only a minority of the students were considered low SES, as they have free or reduced price lunch plan ( $n=69$ ). At Time 2, using the aforementioned rule of valid responses, the number of cases with valid response to at least one scale was 481; however, all the cases from Time 1 were retained at Time 2 in analyses.

Attrition analyses were conducted using independent t-tests and chi-square tests to determine differences between the full baseline sample (652) and the analysis sample (481; 73.8% retention rate), which consisted of fewer observations due to attrition. There were no significant differences in the distribution of all main variables between the participants at both Time 1 and 2 and the participants only at Time 1. There was also no difference in the frequency of the main demographic variables (gender, grade, estimated SES by lunch status and racial groups) between the two groups.

### **Procedure**

Data were collected as part of a school-wide survey of school climate and student well-being conducted by the school administration. Authorization for the study was obtained from local school district and university institutional research boards. Parent consent and student assent were obtained prior to the study. The archival data set was provided with all identifying information removed from the student data prior to receipt of the dataset by the research team.

Three brief instruments were administered as part of this school-based survey of school climate, student engagement, and student well-being conducted by the school administration. The questionnaires were administered to students by school personnel in a regular classroom setting during one approximately 30-40 minute session during October of the fall semester and during April of the spring semester. Two of the instruments, the *Students' Life Satisfaction Scale (SLSS)* and the *Social Problem Solving Inventory for Adolescents (SPSI-A)* were administered on both occasions.

## Measures

The survey packets given to the students included the following measures listed below, along with several others that were not related to this study. Demographic information about participants' gender and age were obtained from school records.

*The Students' Life Satisfaction Scale (SLSS: Huebner, 1991).* The SLSS is a seven-item, self-report scale designed to measure global youth life satisfaction (see Appendix I). Participants respond to statements about their perceived quality of life using a 6-item Likert scale (0 = "Strongly Disagree," 1 = "Moderately Disagree," 2 = "Mildly Disagree," 3 = "Mildly Agree," 4 = "Moderately Agree," 5 = "Strongly Agree"). The seven items on the SLSS are domain free and do not address specific areas of satisfaction (e.g. satisfaction with school or family). Rather, the SLSS is meant to measure a child's global, or overall, life satisfaction. Student responses are summed and averaged and higher average scores are considered an indication of higher levels of life satisfaction. Studies have shown the SLSS to have good validity and reliability for elementary, middle, and high school students. The internal consistency of SLSS was .84 (Huebner, 1991b), .88 (Gilman & Huebner, 2006) and .83 (Saha, Huebner, Suldo & Valois, 2010) in different studies with independent samples. SLSS scores have correlated significantly with other measures of LS, parent reports of their children's LS, and teacher ratings (Bender, 1997; Proctor, et al., 2009). The  $\alpha$  coefficients for the SLSS in this study were .81 at Time 1 and .86 at Time 2.

*The Social Problem Solving Inventory for Adolescents (SPSI-A; Frauenknecht & Black, 1995)* is a self-report scale of social problem-solving ability for adolescents. The SPSI-A (see Appendix II) is score on a 5-point Likert-type scale of 0 = "Not at All True

of Me”, 1 = “Slightly True of Me”, 2 = “Moderately True of Me”, 3 = “Very True of Me”, 4 = “Extremely True of Me.” Frauenknecht and Black (1995) developed the SPS measure based on their model by adapting and modifying an adult measure of SPS (D’Zurilla & Nezu, 1990). The SPSI-A consists of three scales: Automatic Process Scale (APS), Problem Orientation Scale (POS), and Problem-Solving Skills (PSSS). The final version of the SPSI-A included 64 items, with 8 items in APS, 14 items in POS, and 32 items in PSSS. The authors report that the SPSI-A is a reliable and valid measure of problem-solving with alphas for the SPSI-A total score, POS score, and PSSS score were  $\alpha = .82, .93,$  and  $.95,$  respectively (Frauenknecht & Black, 1992). To assess its construct validity, an additional problem-solving measure, Problem-solving Inventory (PSI; Heppner & Peterson, 1982) was administered and correlated with the SPSI-A ( $n = 316$ ). The correlation between the SPSI-A and PSI was  $r = .82, p < .001$  (Frauenknecht & Black, 1992). The SPSI-A was significantly correlated with the Personal Problems Checklist for Adolescents (PPC-A; Schinka, 1989) and the Brief Symptoms Inventory (BSI; Derogatis & Spencer, 1982) in the expected direction, providing preliminary evidence for concurrent validity (Frauenknecht & Black, 1992).

A short version was developed to reduce administration time and fatigue from test taking. The 30-item short version provides a brief analysis of social problem solving attitudes and skills, using 3 items from the APS subscale, 9 items from the POS subscale, and 18 items from the PSSS subscale. Among the items from the PSSS subscale, 3 items was from each problem solving step, including Problem Identification, Alternative Generation, Consequence Prediction, Implementation, Evaluation and Reorganization. The internal consistency coefficients (i.e.,  $\alpha$ s) for the total score on the short version

were .91 and .94. Cronbach alphas for the subscale scores of the short version were .77 and .80 (POS), and .92 and .95 (PSSS) in two studies (Frauenknecht & Black, 2003).

The validity study on the short version of SPSI-A is rare, perhaps due to the fact that Frauenknecht and Black condensed the full version for practitioners as a quick screening tool of SPS behaviors. Some initial support for its validity was found in a series of studies on development of a Social Problem-Solving intervention for young athletes (Frauenknecht & Brylinsky, 1996). These researchers slightly modified ten of the 30 items in the original short version to assess SPS behaviors specific to problems that young athletes might encounter in a competitive sports program. For example, the item “Complex problems make me very angry or upset” was reworded as “Difficulty problems such as not getting along with my teammates make me very angry or upset.” The other 20 items were unchanged. The criterion variables are the total score from the National Adolescent Student Health Survey (American School Health Association, 1989), as well as the scores of each category in the Health Survey. The categories of health-related behaviors include: injury prevention, violence prevention, emotional health, drug health, disease prevention, and nutritional health. They found that SPSI-A total scores were positively and significantly correlated with the Total Health Scores ( $r = .35, p < .05$ ); the POS and PSSSS subscale scores were also significantly correlated with the Total Health Score ( $r = .32, p < .05$  and  $.27, p < .05$ , respectively). The SPSI-A total scores had significant and positive correlations with five categories of the health behaviors ( $r$ s range from .19 to .41). The POS subscale scores significantly correlated with four categories ( $r$ s range from .21 to .41); and the PSSS subscale scores had significant correlations with four categories ( $r$ s range from .24 to .29). A detailed report

can be found in Frauenknecht and Brylinsky (2003). These data provided initial evidence to support the criterion validity of the short version scale.

Researchers also used the short version of the SPSI-A to measure the efficiency of an SPS intervention program called the “POWER Problem-Solving Curriculum” (Frauenknecht, & Brylinsky, 1996). This program targeted improving children and adolescents’ skills in the following steps within the SPS process: (a) Problem identification, (b) Option generation, (c) Weighing consequences, (d) Enacting a plan, and (e) Reflecting and Recycling. Pre- and post- test results showed that players who completed all six modules of the POWER curriculum significantly increased scores on the SPSI-A total score and two subscale scores (APS and PSSS). The POS subscale scores did not show significant improvements, and this was the component that was not included in the intervention. These results provided initial evidence of the social validity of the short version SPSI-A scale.

To reduce the length of testing, the short version was used in the present study. According to the authors, The Automatic Process represents the use of automatic strategies that have been successful in an individual’s previous problem solving, when the person will not need to “formally” problem solve (Frauenknecht & Black, 2003). Because the primary interest in the present study was to investigate the role of “formal” problem solving, which consists of a series of conscious, effortful and rational actions, the Automatic Process Scale was not included. The Cronbach  $\alpha$  coefficients of the Problem Solving Orientation Subscale (9 items) were .83 at Time 1 and .79 at Time 2. The Cronbach  $\alpha$  coefficients of the Problem Solving Skills Subscale (18 items) were .96 at Time 1 and .95 at Time 2.

*The Inventory of Parent and Peer Attachment* (IPPA; Armsden & Greenberg, 1987) was utilized to measure attachments to parents (see Appendix III). The abbreviated version of the IPPA, consisting of 12 items for mother attachment and 12 items for father attachment, was used for this study. An example of a question measuring the dimension of trust is “My mother (father) respects my feelings”. These items were chosen on the basis of their factor loadings and item-total correlations (M. T. Greenberg, personal communication, 2009). Students responded to each item using a five point response format, where 0 = “Almost Never or Never True,” 1 = “Not Very Often True,” 2 = “Sometimes True,” 3 = “Often True,” and 4 = “Almost Always or Always True.” The overall parent attachment score was the mean of the 24 items on both the mother and father attachment scales (with some items reverse scored). Internal consistency reliabilities have been reported as 0.82 for combined parent attachment (Williams & McGee, 1991). Validity has been supported by high correlations with the Family Self-concept subscale (0.78) of the Tennessee Self-Concept Scale (Fitts, 1965) and the Family Environment Scale (Armsden & Greenberg, 1987).

The abbreviated scale has been used in prior research (Elmore & Huebner, 2010; Laible, Carlo, & Roesch, 2004; Ma & Huebner, 2008) and has demonstrated adequate reliability and validity (Laible, Carlo, & Raffaelli, 2000). The Cronbach  $\alpha$  coefficients were .88, .89, and .90 of the IPPA- mother scale, father scale, and mother-father combined scale in the present study. Only the mother-father combined scores were used in the analyses.

## CHAPTER III

### RESULTS

#### **Preliminary analyses**

Prior to examining the descriptives, the dataset was screened for normality and outliers using skewness and kurtosis, histograms, QQ plots and boxplots. All variables, except gender and grade, were converted to z-scores ( $M = 0$ ;  $SD = 1$ ) in order to allow the effects to be interpreted on a standard metric.

All variables were slightly negatively skewed except the Social Problem Solving Skills scale at Time 1, which was almost perfectly normal distributed. The magnitude of skewness for parental attachment, social problem solving orientation and social problem solving skills was within the acceptable range (between -1 and 1) or slightly over the acceptable range for LS at Time 1 (LS1) and LS at Time 2 (LS2) (-1.15 and -1.20). To assess univariate normality, the skewness and kurtosis of the measures were calculated. According to criteria set forth by Lomax (2001), skewness and kurtosis for all scores were within acceptable limits, as all values fell between negative and positive two (see Table 1).

#### **Descriptives**

The means and standard deviations of all variables for the total sample are shown in Table 1. The mean level of parental attachment was 2.93 on a 5-point scale (from 0 to 4), suggesting a relatively high level of attachment between early adolescents and their parents in this sample. This result is similar to that reported by Jiang, Huebner and Hills

(2013). The mean level of LS at Time 1 is 3.83, and 3.91 at Time 2 on a 6-point scale (from 0 to 5), which indicated a positive attitude towards life in general in this group of early adolescents, which is consistent with previous findings (Ma & Huebner, 2008; Elmore & Huebner, 2010). The mean level of problem solving orientation was 2.81 on a 5-point scale (from 0 to 4), suggesting overall early adolescents' problem solving orientation is positive (above the neutral point). Interestingly, the distribution of problem solving skills was almost perfectly normal, and the mean score of 2.07 is very close to the median score of 2. This distribution indicated only a small portion of students reached the relatively high level of rational problem solving skills at this developmental stage.

### **Correlations**

In order to identify relationships between all major variables, Pearson product-moment coefficients were calculated (see Table 1). In general, all the correlations were in the expected direction, except the non-significant correlation between problem solving orientation and problem solving skills at Time 1. As predicted, parental attachment was positively correlated with all other variables at a moderate magnitude (0.261 – 0.470,  $p < .01$ ). This finding indicated that adolescents who perceived more secure attachment with parents tended to report higher levels of positive social problem solving orientation, problem solving skills and global LS. Social problem solving orientation correlated with LS1 and LS2 at a moderate level ( $r = 0.352, p < .01$  and  $r = 0.236, p < .01$ ); the correlations between social problem solving skill set and LS at both times were smaller ( $r = .159, p < .01$  and  $r = .126, p < .01$ , respectively). The correlations suggested that higher levels of problem solving orientation and skills were associated with higher levels of LS; and the relationship between problem solving orientation and LS was stronger than the

relationship between problem solving skills and LS. Interestingly, positive problem solving orientation did not relate significantly to rational problem solving skills ( $r = -.009, p > .05$ ).

### **One-way Analysis of Variance (ANOVA)**

One-way Analyses of Variance (ANOVAs) for main variables were calculated for the two demographic variables of, gender and grade. ANOVAs for main variables based on racial groups and estimated SES groups (by free or reduced lunch status) were not applied due to significantly unequal sample sizes among racial groups (95.6% of the sample were Caucasians) and estimated SES groups (89.4% of the sample do not have free or reduced lunch status), which violated the homogeneity of variance assumption. In addition, two demographic variables, gender and grade (as an estimator of age) were controlled as covariates in the path analyses, because some empirical evidence suggested these two variables influence levels of either LS or SPS. Racial groups and estimated SES status were not included as covariates because of the highly homogenous sample. The current research findings did not support significant differences in the levels of LS or SPS among different race or SES groups.

### *Demographic Differences in Parent Attachment*

One-way between-group ANOVAs were used to detect significant difference in the mean levels of parental attachment across the three grades (6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>) and between gender groups (male vs. female). Results showed that the differences in parental attachment across grades was significant ( $F(2, 468) = 13.05, p < .01$ ). Specifically, 6<sup>th</sup> graders reported higher levels of parent attachment ( $M = 3.19$ ) than 7<sup>th</sup> graders ( $M = 2.83$ ) and 8<sup>th</sup> graders ( $M = 2.81$ ). Bonferroni post-hoc tests showed that the difference between

6<sup>th</sup> graders and 7<sup>th</sup> graders, and the difference between 6<sup>th</sup> graders and 8<sup>th</sup> graders were both significant at .01 level. This finding suggested a slight decline in parent attachment from 6<sup>th</sup> to 7<sup>th</sup> and 8<sup>th</sup> grade, which is consistent with previous findings (e.g., Jiang, Huebner, Hills, 2013). No significant difference between gender groups was found ( $F(1, 469) = .013, p = .91$ ).

#### *Demographic Differences in Adolescent Problem Solving Orientation and Problem Solving Skills*

There was no significant difference in the mean level of social problem solving orientation between grades ( $F(2,509) = 1.072, p = .34$ ) or between gender groups ( $F(1,510) = 3.93, p = .53$ ). However, significant differences in the mean level of SPSS were found across grades ( $F(2,460) = 11.77, p < .01$ ). Specifically, 6<sup>th</sup> graders reported higher levels of social problem solving skills ( $M = 2.39$ ) than 7<sup>th</sup> graders ( $M = 2.09$ ) and 8<sup>th</sup> graders ( $M = 1.87$ ). Bonferroni post-hoc tests showed that the difference between 6<sup>th</sup> graders and 7<sup>th</sup> graders was significant at 0.05 level, and the difference between 6<sup>th</sup> graders and 8<sup>th</sup> graders was significant at 0.01 level. This finding suggests that the level of self-reported rational problem solving skills tended to decrease from 6<sup>th</sup> grade to 7<sup>th</sup> and 8<sup>th</sup> grade. There were no significant differences between gender groups ( $F(1, 461) = 3.03, p = .08$ ).

#### *Demographic Differences in Adolescent Life Satisfaction*

There were no significant differences in the mean levels of adolescents' LS at Time 1 across grade ( $F(2, 645) = .103, p = .902$ ) or gender ( $F(1, 646) = 1.107, p = .293$ ). Similar results were also found regarding the mean level of LS at Time 2, namely, no

significant differences were observed across grade ( $F(2, 47) = .858, p = .425$ ) or gender ( $F(1, 471) = 2.926, p = .088$ ).

### Path Analyses

The mediation model was examined through path analyses procedures using *Mplus* statistical software (Muthén & Muthén, 1998-2007). Path analysis allows all regression equations in the mediation model to be estimated simultaneously. The mediation modeling procedures used full information maximum likelihood estimation (FIML, Schafer & Graham, 2002) as implemented in *Mplus* to yield more accurate estimates while adjusting for the uncertainty associated with the missing data (Schafer & Graham, 2002). FIML requires that data be at least missing at random (MAR). The process works by estimating a likelihood function for each individual based on the variables that are present so that all the available data are used. The statistical procedure for the FIML approach of handling missing data can be found in Schafer and Graham (2002). Figure 5 illustrates the conceptual pathway of the hypothesized mediation model with coefficient paths indicated.

$$Y = i_1 + c'X + b_1 M_1 + b_2 M_2 + e_1 \quad (1)$$

$$M_1 = i_2 + a_1 X + e_2 \quad (2)$$

$$M_2 = i_3 + a_2 X + e_3 \quad (3)$$

*Note:*  $e_1, e_2,$  and  $e_3$  represent error variability and the intercepts are  $i_1, i_2,$  and  $i_3$ .

$X$  = the predictor variable,  $Y$  = the criterion variable,  $M_1$  = the first mediator,  $M_2$  = the second mediator.

### *Tests for Potential Moderation Effect in the Mediated Model*

Because there was a significant difference across grade levels for the variables of parental attachment and social problem solving skills, the study addressed whether or not a proposed mediation effect remained constant across different grade levels. For example, social problem solving orientation and skill set could mediate the parental attachment → LS relationship for 6<sup>th</sup> graders, but not for 7<sup>th</sup> and 8<sup>th</sup> graders. Thus, prior to the pure mediation model analysis, a model combining the mediation and moderation effects was analyzed. Relying on the symbolic representation of the moderated mediation in Figure 6, the moderation effects included:

1. If grade (W) affects the *a1* and *a2* paths;
2. If grade (W) affects the *b2* path;
3. If grade (W) affects the *c* path.

These possibilities are presented in the statistical path diagrams in Figure 7. The basic moderated mediation model was estimated with the following multiple regression equations:

$$Y = i_4 + c_1' X + c_2' W + c_3' XW + b_1 M_1 + b_2 M_2 + b_{22} M_2W + e_4 \quad (4)$$

$$M_1 = i_5 + a_{11} X + a_{21} W + a_{31} XW + e_5 \quad (5)$$

$$M_2 = i_6 + a_{12} X + a_{22} W + a_{32} XW + e_6 \quad (6)$$

Tests for moderated mediation were conducted following the models and *Mplus* code in Preacher, Ruchker and Hayes (2007). No significant moderation effect for grade was determined. This result supported the assumption of no interaction between X variable (Parental Attachment) and M variables (Problem Solving Orientation and Problem Solving Skills) in the original mediation model. Therefore, it was valid to test

mediation using the sample with students in three grade levels combined as originally proposed. Results from path analyses of the mediation model follow.

*Tests for mediation effects.*

Tests for mediation were conducted using procedures outlined for the product of coefficient tests by MacKinnon and colleagues (2002). According to this procedure, a variable can be tested as a mediator by dividing the estimate of the product of paths  $a*b$  by its corresponding standard error and comparing this value to a standard normal distribution to determine significance (see paths illustrated in Figure 5). The product of these two parameters  $a*b$  is the mediated or indirect effect, and the coefficient  $c$  relating the X variable to the Y variable adjusted for the mediator is the non-mediated or direct effect. Following MacKinnon (2008), the significance test for the mediated effects was conducted using asymmetric confidence limits that more accurately capture the mediated effect distribution. Specifically, asymmetric bootstrapped Confidence Intervals (CIs) for each mediated pathway were obtained in *Mplus* (Muthén & Muthén, 1998-2007).

Relative to other tests of mediation, the product of coefficients test with asymmetric confidence intervals is among the best methods for testing mediation in terms of having the most power and accurate *Type I* error rates (MacKinnon et al., 2002). Results of the conventional significance test based on the product of coefficients were also reported.

Three regression equations used to investigate mediation in this model are outlined below. The mediation models adjusted for demographic covariates (gender and grade) and baseline predictor variable scores (LS at Time 1) in all equations.

Unstandardized estimates for these paths (i.e.  $a$ ,  $b$  and  $c'$ ) and their standard errors are presented in Figure 8.

The coefficients of *a* paths indicated that parental attachment significantly predicted adolescents' social problem solving orientation ( $a_1 = .256$ ,  $SE = .050$ ,  $p < .01$ ; ACL [.136, .385]) and social problem solving skills ( $a_1 = .201$ ,  $SE = .052$ ,  $p < .01$ ; ACL [.067, .331]), respectively. The coefficients of the *b* paths show that social problem solving orientation did not significantly predict mean levels of LS2 ( $b_1 = -.002$ ,  $SE = .045$ ,  $p = .971$ ; ACL [-.112, .117]), neither did social problem solving skills predict mean levels of LS2 ( $b_1 = -.009$ ,  $SE = .055$ ,  $p = .872$ ; ACL [-.148, .139]).

The direct effect of parental attachment on mean levels of LS2 was significant ( $c = .239$ ,  $SE = .058$ ,  $p < .01$ ; ACL [.091, .385]). However, the total mediated effects of problem solving as  $(a_1b_1 + a_2b_2) = -.002$  ( $SE = .016$ ,  $p = .948$ ; ACL [-.043, .045]), were non-significant. Furthermore, the specific mediated effect of social problem solving orientation ( $a_1b_1) = 0$  ( $SE = .012$ ,  $p = .996$ ; ACL [-.031, .033]) and the specific mediated effect of social problem solving skills ( $a_2b_2) = -.002$  ( $SE = .011$ ,  $p = .926$ ; ACL [-.035, .031]) were not statistically significant.

## **Effect Size**

### *Effect size of the individual paths*

Estimates of effect size describe the practical significance of an effect, independent of sample size. The effect size of individual paths in the mediation model focused on the relation between two variables in the mediation model. The effect size of *a* paths which indicated the effect of parental attachment on each mediator, were evaluated using the squared correlations:

$$r_{XM1}^2 = (.363)^2 = .1318$$

$$r_{XM2}^2 = (.269)^2 = .0724$$

In other words, 13.18% of the variance in social problem solving orientation was explained by parental attachment; and 7.24% of the variance in social problem solving skills was explained by parental attachment.

The effect size of the  $b$  paths, which showed the effect of the mediator on LS at Time 2 were calculated using squared partial correlations:

$$r_{M1Y.XM2}^2 = (.095)^2 = .0090$$

$$r_{M2Y.XM1}^2 = (.021)^2 = .0004$$

Thus, 0.9% of the variance in LS at Time 2 was uniquely explained by the mediator of social problem solving orientation, controlling for the effect of parental attachment and the other mediator (social problem solving skills). Only 0.04% of the variance in LS2 was explained by social problem solving skills accounting for parental attachment and social problem solving orientation.

The  $c$  path, which is the effect of parental attachment on LS at Time 2, was also calculated using squared partial correlations:

$$r_{XY.M1M2}^2 = (.385)^2 = .1482$$

Therefore, 14.82% of the variance in LS2 was uniquely explained by parental attachment accounting for the two mediators in the model.

#### *Effect size of the mediated effect*

Two effect size measures for the overall mediated effect were considered for the present study: the proportion mediated and  $R^2$  mediated measure. The first effect size measure is interpreted as the proportion of a total effect that is mediated (e.g., Alwin & Hauser, 1975; MacKinnon, Warsi, & Dwyer, 1995; Ditlevsen, Christensen, Lynch,

Damsgaard, & Keiding, 2005). The measure is computed by taking the ratio of the mediated effect to the total effect, as follows

$$\frac{\hat{a}\hat{b}}{\hat{c}} = \frac{\hat{a}\hat{b}}{\hat{a}\hat{b} + \hat{c}'}$$

However, this measure of effect size has flaws that may limit its use in research. First, it is highly unstable from sample to sample (MacKinnon et al., 1995) and it should only be used with sample sizes that are greater than or equal to 500 due to instability in the estimate (MacKinnon, Fairchild, Yoon, & Ryu, 2007). Second, a proportion is by definition between 0 and 1, yet this measure is not so constrained. When either  $ab$  or  $c$  is negative but not both, the proportion mediated will be negative, thus make the results uninterpretable. This has been an identified issue in the area of mediational research (e.g., Hayes, 2013, p.189). Therefore, although the sample size of current study was large enough ( $n > 500$ ), the negative value of  $b$  coefficients inhibited the use of the proportion mediated as the appropriate effect size measure. Thus, another effect size measure of “the  $R^2$  mediated” for the mediated effect was utilized. Though this too has flaws, it is possible to have negative estimates (a mathematical artifact of the equation).

The  $R^2$  mediated measure is able to illustrate the practical significance of a mediated effect in the way that it quantifies the proportion of variance in the outcome that is common to both X and M but cannot be attributable to either predictor alone (Fairchild, MacKinnon, Toborga, & Talor, 2009). The  $R^2$  mediated effect size measure was computed by using the squared bivariate correlations and the overall model  $R^2$  from a model in which Y is predicted from both X and M, as follows

$$r_{MY}^2 - (R_{Y,MX}^2 - r_{XY}^2)$$

where  $r_{MY}^2$  is the squared correlation between the outcome and the mediator,  $r_{Y.MX}^2$  is the overall model  $R^2$  from the regression equation where Y is predicted from X and M (i.e., Eq. (1)), and  $r_{XY}^2$  is the squared correlation between the criterion and the predictor variable (i.e., X). The  $R^2$  mediated effect size measure for the first mediator social problem solving orientation was

$$r_{M1Y}^2 - (R_{Y,M1X}^2 - r_{XY}^2) = (.234)^2 - [.215 - (.458)^2] = .0496$$

which means that 4.96% of the total variance explained in LS at Time 2 was attributable to the mediated effect through social problem solving orientation . Applying Cohen's (1988) benchmark values for  $R^2\Delta$  (i.e., .02, .13, and .26), the effect size of the non-significant mediated effect of social problem solving orientation was in the small range.

The  $R^2$  mediated effect size measure for the second mediator social problem solving skills was

$$r_{M2Y}^2 - (R_{Y,M2X}^2 - r_{XY}^2) = (.130)^2 - [.212 - (.462)^2] = .0183$$

which indicated that 1.83% of the total effect of the parental attachment on LS2 is mediated through social problem solving skills , and the effect size of the non-significant mediated effect of social problem solving skills was also in the small range.

Table 3.1 Means, standard deviations, and correlations among variables

	1	2	3	4	5
1. PA	1				
2. LS1	.470**				
3. SPSO	.352**	.367**			
4. SPSS	.261**	.159**	-.009		
5. LS2	.450**	.572**	.236**	.126**	
M	2.93	3.83	2.81	2.07	3.91
SD	.73	.92	.78	.98	.94
Skewness	-.66	-1.03	-.63	.04	-1.19
Kurtosis	.11	.74	-.04	-.56	1.44

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

Note: PA= parental attachment, LS1= life satisfaction at Time 1, SPSO= social problem solving orientation, SPSS=social problem solving skills, LS2= life satisfaction at Time 2

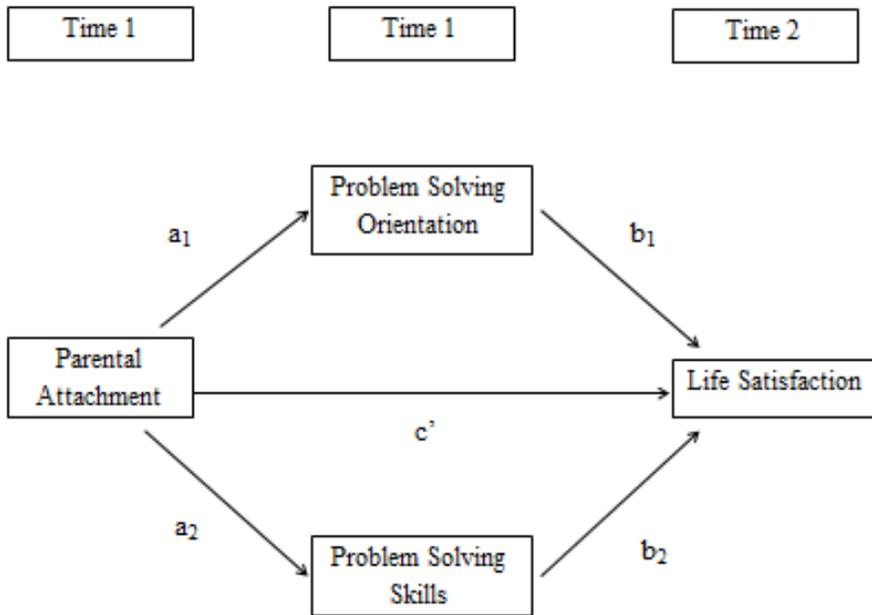


Figure 3.5 Conceptual mediation pathway with paths indicated by letter

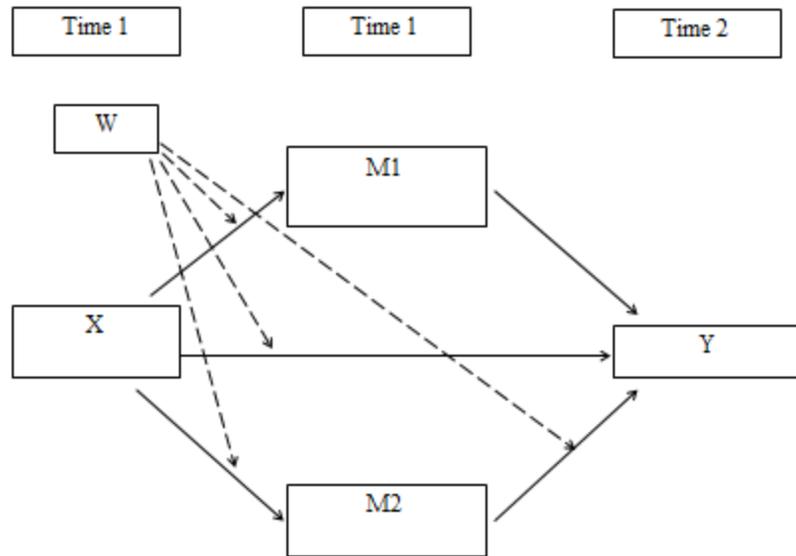


Figure 3.6 Path diagram for the moderated mediated model

Note: X= the predictor variable, Y=the criterion variable, M1= the first mediator, M2=the second mediator, W= the moderator

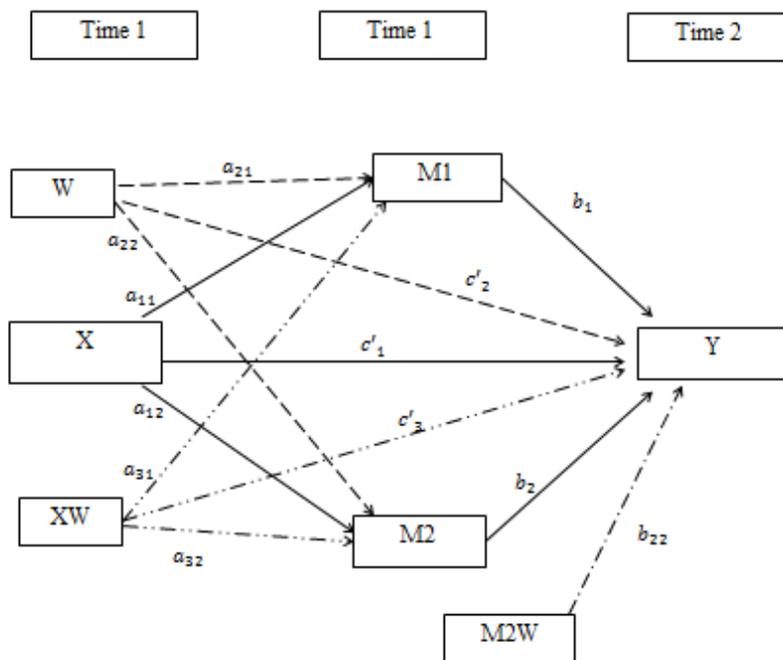


Figure 3.7 Statistical diagram of the moderated mediation model

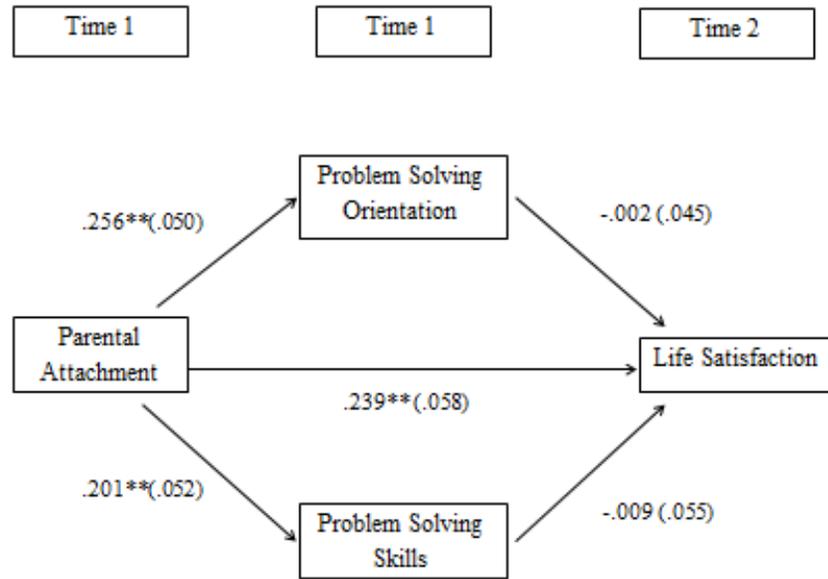


Figure 3.8 Mediation pathway with path coefficients indicated by number

## CHAPTER IV

### DISCUSSION

The previous chapter systematically evaluated the relations among parental attachment, social problem solving (both orientation and skills) and life satisfaction reports from a sample of early adolescents in the US. This chapter summarizes the major findings and discusses their meaning. Limitations, suggestions for future research, and implications for professional practice are also provided.

#### **Summary of major findings**

The major findings were twofold. First, individual differences in early adolescents' levels of attachment to their parents showed direct effects on their life satisfaction (LS) at Time 2, controlling for baseline effects of LS. Second, neither social problem solving orientation nor skills mediated the relation between parental attachment and early adolescents' LS. Measures of problem-solving orientation and problem-solving skills both failed to significantly predict mean levels of LS at Time 2. A more in depth discussion of the meanings of these findings is provided in the following section.

#### **Discussion of the findings**

The significant association between parent attachment and LS indicates that a close relationship with parents continues to be a crucial ecological asset for an early adolescent's overall LS, even though the typical developmental milestone of gradual increasing autonomy from the family begins during this time period. This finding is consistent with conclusions based on previous cross-sectional studies on parental

attachment and adolescents' LS (e.g., Armsden & Greenberg, 1987; Nickerson & Nagle, 2004) and research on other related parenting factors (e.g., parental support) and adolescents' LS (e.g., Suldo & Huebner, 2004; Dew & Huebner, 1994). A major contribution of the present study is revealing the relatively enduring effect of parental attachment in the development of adolescents' LS by using a longitudinal design, albeit a short-term design.

In contrast to researchers' intensive interest in investigating the correlates and consequences of social problem solving, surprisingly little research has been carried out on the antecedents of individuals' social problem-solving ability. Though parental attachment and two components of social problem solving were measured at the same time in the present study, the theoretical support for the precedence of parental attachment to adolescents' social problem solving (e.g., Bretherton, 1992) as well as the consistency and stability of the quality of parental attachment (Thompson, 2000) was strong. Therefore, the findings of the present study contribute to the literature that parental attachment is one of the crucial determinants of adolescents' social problem solving. This conclusion is supported by some evidence from the coping literature. For example, a longitudinal study that followed a sample of adolescents from age 14 to age 21 found that a secure attachment with parents was associated with the use of more active coping strategies (e.g., talking about problems and seeking emotional assistance), use of more internal coping strategies (e.g., searching for solutions, recognizing one's own limitations, willingness to accept compromises), and less use of withdrawal or avoidance strategies when faced with stressors (Seiffge-Krenke, 2006; Seiffge-Krenke & Beyers, 2005). In fact, securely attached teens showed large developmental gains in both active

and internal coping strategies over time, whereas the insecurely attached groups did not demonstrate increases in these types of coping (Seiffge-Krenke & Beyers, 2005).

Another important finding from this study was that parent attachment demonstrated a stronger association with social problem-solving orientation than social problem-solving skills. Considering the major features of social problem solving orientation and social problem-solving skills, one as a motivational-affective-cognitive process and the other as a cognitive-behavioral process, it seems that problem-solving orientation benefits more from a secure attachment relationship. Technically, the acquisition of social problem-solving skills reflects a more complex process, compared to that of problem-solving orientation, since the cognitive-behavioral steps in skill development may demand more conscious and effortful learning. As for the contribution from parents in this learning process, it is possible that more purposeful and systematic cognitive and behavioral support from parents is needed, above and beyond the facilitation of harmonious parent-child relationships. For instance, it may require adults' own rational problem solving behaviors, instruction, guidance, and modeling of effective application in real life. Based on social learning theory, behavior theory, and incidence learning theory, children are able to learn the skills in the rational problem-solving process, such as goal setting and selecting the best solution, through observation, modeling, reinforcement, and personal experience; while the premise for this learning process to occur is the social environment, primarily important adults in the child's life, which provides the opportunity for children to observe, imitate, experience, and be reinforced. For instance, Hastings and Grusec (1998) found that parents who negotiated and compromised with their children during daily problematic situations help to extend

their children's ability to rationalize, whereas parents who used punitive and controlling behaviors did not. Future research is needed to explore why it is relatively harder for parents to influence adolescents' problem-solving skills, and what specific quality or strategy parents need to perform to facilitate adolescents' learning of rational problem-solving skills.

Some cross-sectional studies have indicated a positive association between social problem solving and LS in adult samples (Bulut, 2007; D'Zurilla & Nezu, 1999; Elliott, Shewchuk, Miller, & Richards, 2001; Hamarta, 2009). However, there has been no other longitudinal study of either adults or adolescents available to compare the findings of the present study. To my knowledge, this is the first study revealing the relations between social problem solving and LS in adolescents. Thus, the present study contributes to the literature by revealing the effects of social problem solving orientation and skills, on the levels of early adolescents' LS over time, although the effects were very small. However, this finding does not imply that social problem solving is not important in the development of adolescents' subjective well-being; instead, it merely suggests that after controlling for the baseline level of LS, the positive associations between social problem solving orientation/skills and LS were not reflected in the differences in rank orders of early adolescents' LS sixth months later. This result leads to the plausible hypothesis that other factors might influence the positive impact of social problem-solving orientation and social problem-solving skills on LS across time.

Considering the longitudinal and intervention research on adolescent social problem solving and psychopathology (see literature review in the Introduction) and the results from the present study together, the tentative conclusion may be that adolescents

who maintain a positive orientation and use rational problem-solving skills show a reduced possibility of developing psychopathology in non-clinical samples or elevating the severity of existing psychopathological symptoms in clinical samples. However, a positive problem-solving orientation and skill set may not be sufficient to enhance overall life satisfaction over time in normally developing adolescents. In other words, if adolescents have deficits in problem-solving orientation and skills, there is a risk of developing poor or poorer mental health; however, having average or higher problem-solving ability alone does not guarantee increased LS. If this tentative conclusion is supported by future research, it will have important implications for mental health providers. It may be necessary for mental health providers to adopt the goal of wellness promotion in existing problem-solving training programs, because it cannot be taken for granted that by improving individuals' social problem solving abilities, the individuals will also automatically gain improved subjective well-being, even if psychopathological symptoms have been reduced.

The finding that the relation between social problem-solving orientation and LS was stronger than that of social problem-solving skills and LS, suggested that compared to rational problem-solving skills, a positive orientation towards problems exerts a larger influence on overall LS. There are no similar studies of adolescents with which to compare, and the findings from adult studies are not conclusive. Thus, although the available research supports the conclusion that the magnitude of the association between social problem-solving orientation and LS is in the small to moderate range, it is not quite clear how strongly the problem-solving skill set relates to LS. Specifically, the strength of the relation between problem-solving skill set and LS was comparable to that between

problem-solving orientation and LS in a few studies (e.g., Hamarta, 2009), while the strength was much weaker in some studies (e.g., Eskin, Akyol, Yilmaz C-Elik & Gultekin, 2013). This unclear relationship between rational problem solving and psychological outcomes also exists in the research on adolescents' social problem solving and psychopathology. For instance, some researchers have found that adolescent suicide attempters had significant deficits in both problem-solving orientation and skill set when compared to normal controls (Sadowski & Kelly, 1993). However, other researchers have found that rational problem-solving was not significantly correlated with severity of depression or hopelessness, whereas negative problem-solving orientation and avoidant or impulsive problem-solving style were associated with depression severity among inpatient adolescents (Reinecke, DuBois, & Schultz, 2001). These mixed findings may stem from differing research methods, including differences in participants, constructs, measures, and research design (e.g., with or without a comparison group of normal children). However, taken together, these studies suggest that the motivational factor (one's orientation toward problems), as opposed to the cognitive-behavioral factor (one's ability to rationally derive solutions), might be a more influential factor in the etiology of psychopathology, such as depression. In a similar vein, results of the present study suggest that problem-solving orientation tends to make a larger contribution to adolescents' LS than rational problem-solving skills. However, more research is needed to examine the consistency of this pattern of relations. Additionally, it is also an intriguing question to ask if rational problem solving relates to well-being and psychopathology in different ways with different magnitudes of effect.

The mediation results in the present study contributed to the literature by revealing the role of social problem solving components in the mechanism between parental attachment and adolescents' LS, though the mediated effects of both social problem solving components were very small. This is the first mediation study to my knowledge that using a longitudinal design and focused on SPS and a positive outcome in early adolescents' development. Two mediation studies of psychopathology reviewed in the introduction (Carroll, 1996; Caris, et al., 1998) appeared to support the mediated role of SPS; however, in both of these studies the constructs of parenting, adolescent problem solving, and adolescent psychopathology were assessed concurrently, thus the assumption of temporal precedence of variables in the mediation chain (X before M before Y) was potentially violated (MacKinnon, 2008, p.64), thus limiting the ability to derive causal inferences regarding the mediated effect of social problem solving. Clearly, more research is needed to test the relations among between social problem solving, contextual factors (e.g., parenting) and mental health outcomes (both psychopathology and well-being).

Alternative explanations exist for the non-significant findings in the current study of the mediated effect of social problem solving orientation and skills in the link between parental attachment and future LS. First, the underlying assumption of the mediators of problem-solving orientation and skills derived from the Social Problem-Solving Process Model is that they both represent individual's problem-solving ability in real life. However, there might be a gap between one's self-reported "ability" and his or her actual problem solving ability. There are several possible reasons for this gap to occur:

1. The conceptualization of social problem solving in D'Zurilla's (1986) model has placed very heavy emphasis on individual's own ability to solve the problem, which ignored the use of support from other sources. For early adolescents, it may be unrealistic for such young people to solve major problems completely on their own; instead, it is often necessary to seek support from parents, teachers, and peers. As a matter of fact, realizing one's limitations, being open to resources available, and knowing when, where and how to ask for help, all reflect one's awareness and skills to solve problems. Thus, the conceptualization of social problem solving in the current model might be too narrow, thus failing to be a sensitive indicator of appropriate problem- solving abilities in this age group. If this proposition is appropriate, researchers may need to reconsider the conceptualization of social problem solving in theory, and develop new measurements to capture a more comprehensive definition of this ability.
2. As is the problem with any self-report technique, students' questionnaire responses may not necessarily yield an accurate picture of how they actually behave in real life situations. This conclusion has been supported by observational, experimental research, and intervention studies. For example, Putallaz (1983) examined differences in children's ability to generate alternative solutions to social problems and their actual behavior in such situations, and he discovered that some children knew the right responses, but did not practice them. This discrepancy was evident in their sociometric status and their scores on the social problem solving measure. The reverse problem of interpretation of

self-report measures may also be true, in that children's social awareness might not receive enough credit based on responses to the questionnaire. There is also substantial evidence that adolescents may know and understand the risks involved in dangerous activities, but still engage in them (Benthin, Slovic, Moran, Severson, Mertz, & Gerrard, 1995; Cauffman & Steinberg, 1995; Slovic, 1987, 1998, 2000). Moreover, a number of studies on the evaluation of problem-solving training and therapy programs for children and adults, have found that participants learned effective problem-solving skills during the training program, but they did not apply these skills adequately or consistently in real-life settings, resulting in the failure to obtain significant or durable improvements in adaptive functioning (D'Zurilla, Chang, & Sanna, 2004).

3. Another possible reason for the aforementioned gap between “Knowing and Doing”, of special relevance to adolescents, is that adolescents’ thinking in the real world is not only a function of cognitive, but also social and emotional processes (Keating, 2004). The problem- solving process, particularly rational problem solving conceptualized in the current model, is a highly “cold” cognitive process, in which thinking processes occur under conditions of low emotion and/or arousal. This “cold” thinking process contrasts with ‘hot’ cognition, which refers to thinking under conditions of strong feelings or high arousal and which therefore may be much more important to understanding risky choices in real-life situations (Bechara, Damasio, Damasio, & Lee, 1999; Bechara, Damasio, & Damasio, 2000; Steinberg, 2005). To “cool down” the “hot” cognitive processing requires self-regulation (Eisenberg, Fabes, Guthrie,

& Reiser, 2000) or executive control to enable deliberate performance (Happaney, Zelazo, & Stuss, 2004). However, the interaction between cognitive and emotional-motivational development during adolescence tends to complicate this “cold” cognitive process. Observations about brain development in adolescence have shown that changes in arousal and motivation brought on by pubertal maturation precede the development of regulatory competence in a manner that creates a disjunction between the adolescent’s affective experience and his or her ability to regulate arousal and motivation (Steinberg, 2005). One reasonable speculation, which has yet to be confirmed, describes vividly the changes in arousal and motivation that precede the development of regulatory competence – the developments of early adolescence may well create a situation in which one is starting an engine without yet having a skilled driver behind the wheel (Dahl, 2001). Because rational problem solving itself must be managed and controlled enabling the thinking system to function, weak emotional inhibition, or executive control, makes it difficult to temporarily inhibit one’s irrational beliefs or strong emotions, so as to enable the reasoning process to operate independently of them, causing relatively poor problem- solving outcomes. Thus, emotional self-regulation or executive control may moderate the relationship between problem solving process and problem- solving outcome in adolescents.

Second, the broadly defined “problem” in the current model might confound the results. It is possible that respondents referred to different types of problems when reporting their problem-solving process; and the problem-solving process measured by

this scale might not sufficiently capture the abilities needed in managing different types of problems. This hypothesis, which challenged the general-situation problem solving model proposed by D’Zurilla and Sheedy (1992), has been supported by some initial findings. Specifically, Al-Abdulla (1995) examined the validity of two different approaches to the measurement of social problem solving (academic problem solving and interpersonal/social relationship problem solving) in a college student sample and found that academic problem solving had a stronger association with academic competence than with social competence, and social relationship problem solving had a stronger association with social competence than with academic competence. Thus, the evidence from this study provided greater support for the situation-specific problem solving model (Lazaus & Folkman, 1984) than for D’Zurilla and Sheedy’s (1992) general problem solving model. Based on this study, it seems that researchers may benefit from using context-specific measures of social problem-solving ability to obtain the most valid results.

Above and beyond the conclusions from Al-Abdulla’s (1995) study, I would argue that it may be necessary to differentiate the problems that mainly concern one’s “self” (including academic- related problem and other self-development issues, such as skill development or career planning) from those problems heavily involved with other people (such as establishing, maintaining or recovering interpersonal relationships), because each type of problem may require some other abilities that are beyond the scope covered in the SPSI-A measure. For example, researchers have suggested that when individuals solve interpersonal problems, they need to use a variety of strategies before they use formal problem solving strategies (e.g., rationalize), based on a socio-

cognitive information-processing approach (Crick & Dodge, 1994; Dodge & Crick 1990; Huesmann, 1988; Huesmann & Eron, 1989). Specifically, for children to function competently, prior to setting up the goal of problem solving in the social situation, children need to understand the behavior of others. This understanding includes a variety of abilities, for example, knowing that others potentially have different perspectives, intentions, and knowledge (Astington & Jenkins, 1999; de Villiers & Pyers, 2002; Slomkowski & Dunn, 1996); being aware of social conventions; understanding social consequences of alternate actions (Channon, 2004); altering their strategies on the basis of the feedback received from a social partner; creating new strategies for use in novel situations and self-monitoring in order to inhibit behaviors that are not appropriate for the demands of the social context (Carlson & Moses, 2001). Unfortunately, none of these abilities were represented in the current Social Problem Solving model or associated measures.

When the problem concerns primarily one's self, such as preparing for an exam, or achieving a personal goal, successful problem solving may require other abilities besides a positive orientation and rational thinking, such as self-regulation, perseverance, flexibility and optimism. Still, none of these strengths was captured in the current Social Problem Solving model. Clearly, research using a strength-based approach is still at its early stage, and these hypotheses need to be further examined. More broadly speaking, these hypotheses suggested a new direction in the problem-solving research, which investigates how positive qualities influence problem solving and vice versa. For example, considering the essential qualities of a successful problem solver (e.g., goal-orientation, self-regulation, consistency between thoughts and action), it is an interesting

question to ask if good problem-solving ability in adolescents leads towards development of future high-achievement, leadership, and contribution to society.

### **Strengths and limitations**

The present study was an improvement over previous research in the relevant areas in several important ways. First, it filled the gap in studying the relations between social problem solving and positive psychological constructs (e.g., life satisfaction) in an early adolescent sample. Second, it applied a mediation model to examine the mechanisms between the parenting factor (parental attachment) and adolescents' subjective well-being, adding evidence to an area that has been rarely explored. Third, the relatively large sample size and the use of the longitudinal design afford more confidence in interpretations of the hypothesized causal linkages. Fourth, the present study reported effect sizes for all individual paths and the mediated effects, which inform non-significant findings and enhance understanding of the practical utility of statistically significant effects (Fairchild & McQuillin, 2010).

Despite these strengths, several limitations of this study must be delineated, which also shed light on directions for future research. First, this study relied exclusively on self-report measures of the main variables, raising the issue of method bias. As discussed previously, the issue of the gap between "Knowing and Doing" is salient during adolescence, and a major disadvantage of the problem-solving measure (i.e., SPSI-A) is that it might not reflect adolescents' problem solving ability in real, specific problem situations. Thus, to more accurately capture an adolescent's actual social problem-solving ability, the use of more objective measures (e.g., rating scales completed by adults,

observational methods in natural or laboratory settings) should be considered in future research efforts.

Second, the database in the present study consisted of a largely high income, Caucasian white sample from a suburban environment, which did not adequately represent the ethnic and SES makeup of the United States, and thus perhaps restricted the generalizability of the findings. More research on samples from different racial/ethnic populations and different SES levels is needed. In addition, the research in this area has focused primarily on western cultures, and it may be important to note that most measures of positive psychological functioning have been based on Western or Eurocentric ideals that have tended to emphasize self-enhancement and independence from others (e.g., autonomy, environmental mastery), compared to Eastern or Asian ideals that tend to emphasize interdependence and self-criticism (Kitayama, Markus, Markus, & Norasakkunkit, 1997). Therefore, it would be interesting to examine how social problem solving relates to indexes of positive psychological functioning that may be more meaningful and indigenous to youth population in different cultures (e.g., Eastern Asian). In addition, the present study was based on a normal sample of middle school students, thus the conclusions may not generalize to other age groups (e.g., older adolescents or adults), or those with clinically significant problems. Hence, it is recommended that future studies apply longitudinal designs to track the developmental trajectory of social problem solving and its relation with LS in other developmental age groups (e.g., across early, middle, late adolescence and young adults). It also will be beneficial to examine the generalizability of the present findings to clinical samples.

Third, the model proposed in this study was relatively simple. Although conducting studies looking at the simple mechanisms between contextual factors and positive psychological functioning remains important and fundamental to this area of research, there is supporting evidence for researchers to propose more complex models in order to investigate the relations among parenting, social problem-solving and LS. For instance, increasing understanding of cognitive-emotional interactions in adolescence (e.g., Keating, 2004) has suggested that researchers should give more recognition to the importance of the role of emotions in the problem-solving process in this age group. Additionally, other individual-difference variables, like personality, have been found to predict social problem-solving (e.g., Jaffee & D’Zurilla, 2009) and LS (Heaven, 1989; Huebner, 1991b). Considering the personality/dispositional factor in Evan’s model of LS development, which was not tested in the present study (see literature review in the Chapter I), it is plausible to incorporate the personality factors as predictors in the mediation model. Also, a number of other variables have been identified in the general psychological literatures as potentially important correlates or determinants of positive psychological functioning, such as optimism (Scheier & Carver, 1985), hope (Snyder et. al., 1991), and self-efficacy (Bandura, 1977). Thus, it shall be of critical interest for researchers to determine how social problem solving relates to these positive psychological variables and if and how different positive psychological factors explain the mechanism between parental attachment and LS beyond social problem solving. Studies of potential moderators of the relations between social problem solving and LS also seem warranted.

### **Future directions in research**

Given that problem-solving orientation and skills are theoretically related, but distinguishable variables, it was interesting to note that problem-solving orientation and skills at Time 1 were not correlated ( $r = -.009$ ) in the present study. Specifically, D’Zurilla et al. (2002) proposed a theoretically sound assumption that persons who show optimal problem solving ability should display both positive orientation towards problems and rational problem-solving style, based on the dimensional SPS model. A previous study, which used the same measure, showed a statistically significant, but small correlation ( $r = .27, p < 0.01$ ) between these two components in a high school student sample (Frauenknecht & Black, 1995). In the present study, since problem-solving orientation and skills were also measured in the second wave of the dataset, their correlation was calculated, and it was significant,  $r = .145, p < 0.05$ . This change of the direction and magnitude of the correlation coefficient from Time 1 to Time 2 suggested that the relations between problem-solving orientation and skills were not stable during this relatively short-term period. This finding also suggested the necessity of including orientation factor in assessing social problem solving, since researchers hardly assume that one has positive orientation toward problem solving regardless of his or her skill level in solving the problem, at least during early adolescence. Future research is needed to examine possible developmental changes in the levels and the relations between problem-solving orientation and skills across time.

Second, a significant grade effect was found for social problem-solving skills, with the highest scores in 6<sup>th</sup> graders and declining scores in 7<sup>th</sup> graders and 8<sup>th</sup> graders. Research on adults’ social problem solving has suggested that social problem-solving abilities tend to increase with age from adolescence to young adulthood to middle-age

and then decline somewhat in elderly individuals, with the greatest decrease occurring in problem orientation. However, few studies have investigated developmental changes in social problem-solving skills among children and adolescents. In a series of studies conducted by Frauenknecht and Black (2003) using the SPSI-A, they found that 6<sup>th</sup> graders reported a slightly higher level of social problem-solving skills ( $M = 2.00$ ) than 7<sup>th</sup> graders ( $M = 1.77$ ). This finding was similar to that of the present study, although the sample sizes of the age groups in their study were small ( $n_{6th} = 75$ ,  $n_{7th} = 41$ ) and they did not report whether the difference was statistically significant. Obviously, more research is needed to determine the developmental trajectory of social problem solving during adolescence.

Third, parental attachment was conceptualized in this study as a higher-order construct reflecting secure versus insecure attachment relationships. However, it should be noted that the construct of parental attachment can be conceptualized in a multidimensional fashion, including three lower-order components of “trust, alienation and communication” (Armsden & Greenberg, 1987). Interestingly, Nickerson and Nagle (2004) found that of the three components, the component of “trust,” had the strongest relation with adolescents’ LS. The same question remains for the association between parental attachment and adolescents’ social problem solving: does each of these components of parental attachment contribute equally to adolescents’ social problem solving? To provide more specific recommendations for training on parenting to improve adolescents’ social problem solving, it also may be helpful to examine the effect of *specific* parenting strategies on adolescents’ social problem solving. Further, it may also be meaningful to track the use of parenting strategies at earlier stages (e.g., childhood) to

see how they influence children's problem solving later on in adolescence. The findings will be beneficial for professional practice, since though parents still play very important roles across adolescence, research has revealed that the influence of caregivers decreases with increasing age of adolescents (Berndt & Keefe, 1995), suggesting that caregivers have more influence during pre-adolescence, before their children are in the midst of the stressors of adolescence. In addition, transactional models emphasize continual change in children and parents in response to recurring, reciprocal interchanges (Sameroff, 1975). Thus, other than assuming parent-child relationships or parenting are the causal influence of children's social problem solving, it is also important to investigate if the influence between parental-child relations (and/or parenting behavior) and children's social problem solving is bidirectional.

Fourth, results of the present study suggested that social problem solving unlikely accounts for much of the effect of parental attachment on future levels of adolescents' LS. It can be helpful for researchers to explore other psychosocial mechanisms that may account for the relation between the parental attachment and LS link based on the concept of "internal working models" from Attachment Theory (Bretherton, 1985). It is worthy to note that besides the effects on attachment security via the internal working model, there are also several other potential mechanisms conveying the impact of attachment to developmental outcomes, such as temperamental effects, continuity in the quality of the caregiving environment, and emotion regulation styles (Thompson, 1999). There has been evidence supporting each of these processes, particularly in early childhood research; and they are not mutually exclusive with the notion of the internal working model. The importance of the internal working model has received strong empirical

support; however, it is possible that other mechanisms also play a role in the relation between parental attachment and developmental outcomes. Therefore, researchers are also encouraged to test different causal mechanisms underlying attachment relationships and later child well-being.

Fifth, though the current results showed that positive problem-solving orientation and rational problem-solving skills did not predict adolescents' LS over time, the results do not imply that social problem solving is unimportant for understanding adolescents' well-being. An alternative approach to the study of well-being is through the model of "psychological well-being", which is differentiated from subjective well-being. According to Ryff (1991), psychological well-being is defined by a broader set of well-being variables, including self-acceptance, autonomy, positive interpersonal relations, purpose in life, and personal growth). In a study with college students using measures of both psychological well-being and subjective well-being (e.g., life satisfaction), Chang (1999) found that whereas the social problem-solving model was found to account for 11% of the variance in LS, it was found to account for more than twice the amount of variance across the six dimensions of psychological well-being. Additionally, each of specific problem-solving components of rational problem solving was significantly associated with the psychological well-being constructs, including greater self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and greater personal growth. However, only decision making and solution implementation and verification were found to be significantly associated with greater LS. These findings tend to support the hypothesis that the social problem-solving model proposed by D'Zurilla and his colleagues (2002) appears to have important, if not greater,

relevance for understanding the various dimensions involved in psychological well-being than in subjective well-being (Chang et al., 1999). Such findings suggest the importance of future research to determine whether social problem solving and psychological well-being have similar relations in adolescents, as those shown in the adult study; and if and how social problem solving developed during adolescence influences psychological well-being in later life.

Last, but certainly not least, like most of the studies examining subjective well-being, the present study conceptualized LS as the consequence of the individual-difference factor of social problem solving. However, this assumption has been challenged by some scholars in positive psychology. Lyubomirsky, King, and Diener (2005) proposed a conceptual model of “happiness leading to success” based on a comprehensive literature review. Specifically, they showed that the alternative causal pathway—that happy people are likely to acquire favorable life circumstances — is at least partly responsible for the associations found in the literature. This idea has been supported by Fredrickson’s (1998, 2001) “broaden and build” theory, which suggested that happy people—those who experience a preponderance of positive emotions, can expand their thought-action repertoire for future use, or they can rest and relax to rebuild their energy after expending high levels of effort. Empirical evidence is also available to support this idea when use the constructs of positive affect and problem solving. For instance, in a series of experiments, Isen, Daubman, and Nowicki (1987) demonstrated that positive (vs. neutral) affect elicited greater creativity by individuals completing problem-solving tasks requiring ingenuity (e.g., Duncker, 1945 candle task). Similarly, Greene and Noice (1988) found that positive mood facilitates performance on creative

insight problems. In other studies, positive affect has been linked to more novel thinking by individuals in the context of word association tasks (Isen, Johnson, Mertz, & Robinson, 1985) and more cognitive flexibility in the context of categorization tasks (Isen & Daubman, 1984; Kahn & Isen, 1993). Positive mood also has been found to facilitate the fluency of idea production (Vosburg, 1998) and the generation of alternative behavioral choices (Fredrickson & Branigan, 2005). Recently, recent studies, Nelson (2009) also found that positive (vs. neutral) affect promotes greater interpersonal perspective taking and empathy between individuals with divergent perspectives. Furthermore, Nelson and Sim (2014) found that *a*) participants induced to experience a positive (vs. neutral) affective state generated a greater number of relevant steps to solve fictitious interpersonal problems as well as more effective solutions to the problems; and *b*) participants induced to experience a positive (vs. negative) affective state generated more functional solutions to their own social problems. To sum up, evidence from diverse sources suggests that positive affect affords many psychological, social, and cognitive advantages, and consequently facilitate a positive problem solving process.

Although the construct of life satisfaction is not identical to positive affect, they are both indicators of subjective well-being (Diener, 1994); and life satisfaction and positive affect have been found to moderately correlated in undergraduates (around .40 to .50, Lucas, Diener, & Suh, 1996) and in adolescents (.66, Huebner, 1991b). In adult populations, life satisfaction and positive/negative affect are predictors of physical and mental health (for a review, see Diener, Oishi, & Lucas, 2003). However, only a few studies have investigated the predictive power of early adolescents' life satisfaction for later development (Huebner, 2004). So far, longitudinal studies have shown that life

satisfaction predicts both externalizing problems (Suldo & Huebner, 2004a) and internalizing problems (Huebner, Funk, & Gilman, 2000) in early adolescents. Based on the theory of “happiness leads to success” and corresponding empirical support, it is plausible to hypothesize that higher level of LS may lead to positive developmental outcomes, including social problem solving. If this reverse causation hypothesis is supported in future research, namely, adolescents’ success in the problem solving domain may be in large part a consequence of their higher level of global life satisfaction, it will offer important implications for interventions that are designed to enhance adolescents’ social problem solving.

### **Implications in practice**

There are important implications for practice based on the conclusions from the present study. First, the present study provided convergent evidence of the predictive power of parental attachment in adolescents’ development (both social problem solving and LS), and thus offer school professionals a clearer idea of where to focus their efforts in terms of youth -focused prevention and intervention targets. More specific strategies are provided as follows.

First, along the general effort of increasing parental involvement in school (e.g., informative meetings or printed materials sent home, parenting training or educational class), psychologists can use these opportunities to help parents understand their continuing importance in their early adolescents’ lives, teach parents better communication skills with their adolescent children, and facilitate mutual understanding between parents and adolescents, as a pathway to increase early adolescents’ social problem solving and LS.

Second, when providing early intervention for students who have been identified as at risk of developing problematic behaviors, mental health professionals need to take greater effort to involve parents, particularly for students who have compromised relationships with their parents. For example, in the format of consultation, mental health professionals can provide parents with knowledge of adolescent's development and the implications of the knowledge, such as the need for balancing supervision and autonomy granting; and specific methods for having more effective communication with adolescent child, such as listening skills, questioning, encouragement and recognition. It can be a useful concept that parents can turn a stressful situation, such as parent-child conflict, into a learning opportunity for adolescents. Both parties in the family will benefit from trainings to better handle conflicts with each other. These skills should be able to generalize to non-conflict situation which expand adolescents' opportunities for learning social problem solving.

Third, regarding remedial intervention programs, the present study suggests the importance of including parents in the intervention process as well. Though social problem solving training has been established for a long time, few offered official training to help parents in order to improve their child's social problem-solving ability. Multiple resources for professionals to obtain information on intervention programs including the parenting component are available, such as the "Raising a Thinking Child" program (Shure, 2001), the Coping Power Program (Lochman, & Wells, 2002a, 2002b), and the Linking the Interest of Families and Teachers (LIFT) Program (Reid, Eddy, Fetrow & Stoolmiller, 1999). For more information, readers can refer to these resources.

Besides the individual strategies of improving parents' knowledge and skills in effective parenting mentioned in earlier discussion, it is also important to shift the service paradigm to the systems level with the aim of enhancing parents' role in adolescents' development. The relatively new concept of "family-centered positive psychology" (FCPP) provides promising guidance in this direction, as it emphasizes the participation of families and the promotion of strengths and capacity building within individuals and systems, rather than one focusing on the resolution of problems or remediation of deficiencies (Sheridan, Warnes, Cowan, Schemm, & Clarke, 2004). One applicable way to achieve this goal, as these scholars suggest is "Conjoint Behavioral Consultation (CBC)", which has been defined as "a structured, indirect form of service-delivery, in which parents and teachers work together to address the academic, social, or behavioral needs of an individual for whom both parties bear some responsibility" (Sheridan & Kratochwill, 1992, p. 122). For detailed information, please refer to Sheridan et al. (2004).

Second, the present study focused on students in regular education and implied the importance of providing opportunity for students to improve social problem solving in their day-to-day schooling. Training in social problem solving is commonly used in remedial programs in schools, particularly for students with externalizing behavioral problems, with the purpose of promoting the quality of social relationships (Shure, 2001) and the management of anger and aggressive behavior (Frey, Hirschstein, & Guzzo, 2000) in children and adolescents. However, providing interventions only when the problems become severe is a passive approach, and access to such services is not always equitable. Moreover, it will cost a lot more to help children after the problem reaches

clinical significance. From a positive psychology standpoint, a proactive approach could be taken to increase students' social problem solving ability, before paying the harsh price of "starting too late". Furthermore, since social problem solving is most aptly applied to self-defined problems that the children perceive as significant, concrete situations in their lives, then a school-based skills development and application approach can potentially benefit all students as well as outside school setting. Several school programs currently exist designed to increase children's social problem-solving skills. For more information about Social Problem Solving Interventions in the schools, please refer to Elias and Tobias (1996).

Next, the present study highlighted the necessity of including the problem-solving orientation promotion in the training or curriculum targeting social problem solving. Most programs for children are based on the model described by Spivack, Platt, and Shure (1976), which does not include a problem orientation component. These trainings for adolescents' social problem-solving often focus on the development of rational problem-solving skills based on current cognitive and behavioral approaches (Lerner & Clum, 1990). For instance, the most common problem-solving training involves instruction and practice in the basic steps of defining and formulating the problem: seeking problems to solve, identifying one to try to solve, setting a measurable goal, generating a list of possible solutions, choosing at least one possible solution, implementing the idea, evaluating the outcome, and repeating parts of the process as needed (D'Zurilla & Goldfried, 1971). Yet, when assessments of social problem solving skills evaluate the adequacy of problem solving efforts, motivational processes that generate those efforts are often overlooked (D'Zurilla & Goldfried, 1971; D'Zurilla &

Maydeu-Olivares, 1995; White, 1959). Although acquisition of these cognitive-behavioral skills is beneficial, it appears that more attention also should be directed toward creating a positive problem orientation, in addition to targeting the rational problem solving skills. It is recommended for training providers to use cognitive-behavioral strategies that increase adolescents' motivation, such as those applied in motivational interviewing (see Miller, Rollnick, 2012; Wagner, Ingersoll, 2012). Therapists may also want to consider incorporating techniques from problem-solving therapy (PST; see D'Zurilla & Nezu, 1999, 2007), which has been found to be an effective treatment for depression (Bell & D'Zurilla, 2009) and focuses equally on problem orientation and problem-solving skills.

## **Conclusions**

There are a number of conclusions can be drawn from the results of the present study. First, the significant effects of parental attachment on both social problem solving ability and life satisfaction indicate the crucial role of parents in early adolescents' positive development. Second, the weak predictive power of social problem solving ability on future life satisfaction as measured by the instruments used in this study, suggest that the self-perceived social problem-solving process is unlikely to be the source of maintaining or enhancing life satisfaction over time. We are also aware that other explanations for these results are plausible. Third, compared to social problem solving skills, the consistently larger contribution of problem solving orientation in the relations with parental attachment and life satisfaction, respectively, as well as larger effect size of its mediated effect in the overall model, suggest the necessity of assessment and/or intervention efforts targeted to both components of social problem solving in

psychological services. Finally, this study was exploratory in nature, due to the lack of theory and research on social problem solving and positive psychological constructs in adolescents; thus researchers should address the research questions derived from its tentative conclusions, alternative explanations, and methodological limitations in more depth in the future.

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## APPENDIX A: Students' Life Satisfaction Scale

Direction: We would like to know what thoughts about life you have had during the past several weeks. Think about how you spend each day and night and then think about how your life has been during most of this time. Here are some questions that ask you to indicate your satisfaction with your overall life. Circle the words next to each statement that indicate the extent to which you agree or disagree with each statement.

Circle **0** if you **STONGLY DISAGREE** with the sentence

Circle **1** if you **MODERATELY DISAGREE** with the sentence

Circle **2** if you **MILDLY DISAGREE** with the sentence

Circle **3** if you **MILDLY AGREE** with the sentence

Circle **4** if you **MODERATELY AGREE** with the sentence

Circle **5** if you **STRONGLY AGREE** with the sentence

1. My life is going well	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
2. My Life is just right	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
3. I would like to change many things in my life	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
4. I wish I had a different kind of life	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
5. I have a good life	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
6. I have what I want in life	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
7. My life is better than most kids'	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

APPENDIX B: Social Problem-Solving Inventory for Adolescents (SPSI-A)

Direction: Below are statements that reflect how you respond to problems and how you think and feel about yourself afterward. You should think of **serious problems** that are related to your family, health, friends, school, and sports. You should also try to think about a serious problem that you had to solve recently as you reply to these statements.

Circle **0** if the statement is **Not at All TRUE** for you

Circle **1** if the statement is **Slightly TRUE** for you

Circle **2** if the statement is **Moderately TRUE** for you

Circle **3** if the statement is **Very TRUE** for you

Circle **4** if the statement is **Extremely TRUE** for you

	Not at all true	Slight true	Moderately	Very true	Extremely true
1. When I have a problem, I think of the ways that I have handled the same kind of problem before.	0	1	2	3	4
2. To solve a problem, I do what has worked for me in the past.	0	1	2	3	4
3. When I solve a problem, I use the skills I have developed that have worked for me in the past.	0	1	2	3	4
4. When I can't solve a problem quickly and easily, I think that I am stupid.	0	1	2	3	4
5. I often doubt that there is a good way to solve problems that I have.	0	1	2	3	4
6. When faced with a hard problem, I believe that, if I try, I will be able to solve it on my own.	0	1	2	3	4
7. I feel afraid when I have an important problem to solve.	0	1	2	3	4
8. Complex problems make me very angry or upset.	0	1	2	3	4
9. I often become sad and do not feel like doing anything when I have a problem to solve.	0	1	2	3	4
10. I put off solving a problem for as long as I can.	0	1	2	3	4
11. I avoid dealing with problems in my life.	0	1	2	3	4
12. I put off solving problems until it is too late to do anything about them.	0	1	2	3	4

13. When I have a problem, I find out if it is part of a bigger problem that I should deal with.	0	1	2	3	4
14. I try to solve a complex problem by breaking it into smaller pieces that I can solve one at a time.	0	1	2	3	4
15. Before I solve a problem, I gather as many facts about the problem as I can.	0	1	2	3	4
16. When I solve a problem, I think of a number of options and combine them to make a better solution.	0	1	2	3	4
17. I try to think of as many ways to approach a problem as I can.	0	1	2	3	4
18. When I solve a problem, I think of as many options as I can until I can't think of any more.	0	1	2	3	4
19. When I decide which option is best, I predict what the outcome will be.	0	1	2	3	4
20. I weigh the outcomes for each of the options I can think of.	0	1	2	3	4
21. I think of the short-term and long-term outcomes of each option.	0	1	2	3	4
22. Before I try to solve a problem, I set a goal so I know what I want to achieve.	0	1	2	3	4
23. Before solving a problem, I practice my solution to increase my chances of success.	0	1	2	3	4
24. I write a specific objective down so I know how to solve my problem.	0	1	2	3	4
25. After solving a problem, I decide if the situation is better.	0	1	2	3	4
26. After I solve a problem, I decide if I feel better about the situation.	0	1	2	3	4
27. I often solve my problems and achieve my goals.	0	1	2	3	4
28. If the solution to a problem fails, I go back to the beginning and try again.	0	1	2	3	4
29. When a solution does not work, I try to determine what part of the process went wrong.	0	1	2	3	4
30. I go through the problem-solving process again when my first option fails.	0	1	2	3	4

APPENDIX C: Inventory of Parent and Peer Attachment (IPPA)

Mother Attachment

Direction: Some of the following statements ask about your *feelings* about your **MOTHER** or the person who has acted as your mother. If you have more than one person acting as your mother (e.g. natural mother and a step-mother) answer the questions for the one that you feel has most influenced you.

Please respond to each of the items below by circling the *ONE* number that **MOST CLOSELY** tells how true the statement is for you.

Circle **0** if the statement is **ALMOST NEVER TRUE OR NEVER TRUE** for you

Circle **1** if the statement is **NOT VERY OFTEN TRUE** for you

Circle **2** if the statement is **SOMETIMES TRUE** for you

Circle **3** if the statement is **OFTEN TRUE** for you

Circle **4** if the statement is **ALMOST ALWAYS OR ALWAYS TRUE** for you

1. My mother respects my feelings.	0	1	2	3	4
2. My mother accepts me as I am.	0	1	2	3	4
3. My mother can tell when I am upset about something.	0	1	2	3	4
4. I get upset a lot more than my mother knows about.	0	1	2	3	4
5. When we discuss things my mother cares about my point of view.	0	1	2	3	4
6. My mother trusts my judgment.	0	1	2	3	4
7. My mother has her own problems so I don't bother her with mine.	0	1	2	3	4
8. I tell my mother about my problems and troubles.	0	1	2	3	4
9. My mother helps me to talk about my difficulties.	0	1	2	3	4
10. My mother doesn't understand what I am going through these days.	0	1	2	3	4
11. I can count on my mother when I need to get something off of my chest.	0	1	2	3	4
12. My mother understands me.	0	1	2	3	4

APPENDIX D: Inventory of Parent and Peer Attachment (IPPA)

Father Attachment

Direction: Some of the following statements ask about your *feelings* about your **FATHER** or the person who has acted as your father. If you have more than one person acting as your father (e.g. natural father and a step-father) answer the questions for the one that you feel has most influenced you.

Please respond to each of the items below by circling the *ONE* number that *MOST CLOSELY* tells how true the statement is for you.

Circle **1** if the statement is **ALMOST NEVER TRUE OR NEVER TRUE** for you

Circle **2** if the statement is **NOT VERY OFTEN TRUE** for you

Circle **3** if the statement is **SOMETIMES TRUE** for you

Circle **4** if the statement is **OFTEN TRUE** for you

Circle **5** if the statement is **ALMOST ALWAYS OR ALWAYS TRUE** for you

1. My father respects my feelings.	0	1	2	3	4
2. My father accepts me as I am.	0	1	2	3	4
3. My father can tell when I am upset about something.	0	1	2	3	4
4. I get upset a lot more than my father knows about.	0	1	2	3	4
5. When we discuss things my father cares about my point of view.	0	1	2	3	4
6. My father trusts my judgment.	0	1	2	3	4
7. My father has his own problems so I don't bother him with mine.	0	1	2	3	4
8. I tell my father about my problems and troubles.	0	1	2	3	4
9. My father helps me to talk about my difficulties.	0	1	2	3	4
10. My father doesn't understand what I am going through these days.	0	1	2	3	4
11. I can count on my father when I need to get something off of my chest.	0	1	2	3	4
12. My father understands me.	0	1	2	3	4