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An extension of the Dimensional Comparison Theory: A test of emotional intelligence self-concepts.

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ABSTRACT

According to the Dimensional Comparison Theory (DCT), individuals' self-concepts of abilities are influenced not only by external sources of evaluation within the same domain, but also internal comparisons of abilities across different domains, resulting in negative contrast effects for self-concepts in dissimilar domains and positive assimilation effects for self-concepts in similar domains. These dimensional comparisons have been primarily tested with academic domains to date, yet social-emotional learning is an important complement to academic learning. The present study sought to extend the DCT to Emotional Intelligence (EI) self-concepts in a sample of 1,069 Canadian children and adolescents, aged 9-18 years. Using parent appraisals as an external source of evaluation, and the Bar-On Emotional Quotient Inventory: Youth Version as a measure of EI self-concept, four EI domains were tested for dimensional comparisons: Intrapersonal, Interpersonal, Stress Management, and Adaptability. Age and gender were tested as moderators. Structural equation modelling revealed contrast effects between Interpersonal and Adaptability domains, and assimilation effects between Intrapersonal, Interpersonal, and Stress Management domains. Effects were only significant in the younger age groups (9-12 and 13-15 years), suggesting a weaker overall effect of dimensional comparisons on EI self-concepts of older adolescents (16-18 years). Assimilation effects were more prevalent in boys, and their EI self-concepts were less differentiated than those of girls, particularly at the younger ages. The results generally support the application of the DCT to EI domains, raising important considerations for educational programs and opening up new possibilities for future research in the field.

KEYWORDS: *Self-concept, emotional intelligence, Dimensional Comparison Theory, assimilation and contrast effects, Internal/External Frame of Reference model, children, adolescents, structural equation modelling*

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CHAPTER 1

1. Introduction

One of the predominant topics of educational research today is that of self-concept. Self-concept is a multidimensional construct encompassing an individual's beliefs about their competencies in a variety of academic and non-academic domains (Marsh & Craven, 2006; Shavelson et al., 1976). Self-concepts have been shown to have a significant causal effect on behavioural outcomes. Academic self-concepts have been shown to be significant predictors of term grades (Choi, 2005) and physical self-concepts have a causal effect on the maintenance and enhancement of physical development (Marsh & Craven, 2006). In fact, self-concepts not only affect achievement outcomes, but also how individuals react when met with failure. In a meta-analysis performed by Marsh and Craven (2006), individuals ranked as having higher self-concepts in certain domains were more likely to persevere and rely on their strengths in the face of failure or negative critiques. Given the potential benefits of higher self-concepts, researchers have found it important to study the effectiveness of interventions in improving specific domain self-concepts (O'Mara, Craven, & Marsh, 2003; O'Mara, Marsh, Craven, & Debus, 2006).

In order to form effective intervention strategies, it is essential to understand how self-concepts form and the factors that influence their development. Emerging from decades of research to address this issue is the recently developed Dimensional Comparison Theory (DCT) (Möller & Marsh, 2013), which draws together previously studied sources of influence – both external and internal – into a single comprehensive model of self-concept formation. Although studies have shown strong support for the DCT model, the existing empirical evidence is based almost exclusively on academic self-concepts (Möller et al., 2016). In order to better test the potentially wide-reaching effects of this model, it is important to look beyond academics to other

relevant domains of competence.

One of the fastest-growing areas of competency-based research is that of social-emotional learning (SEL), which encompasses the processes through which people acquire and apply knowledge and skills related to understanding and managing emotions, developing positive relationships, and making responsible decisions (Greenberg et al., 2003; Macklem, 2014). The cognitive skills developed by SEL are otherwise known as emotional intelligence (EI), originally defined by Salovey and Mayer (1990) as the ability to recognize and regulate one's own emotions, as well as perceive others' emotions in social situations and determine positive responses in turn.

Self-concepts related to EI are a particularly needed topic of current research due to increasing attempts to incorporate SEL into educational curricula (Durlak et al., 2011; Greenberg et al., 2003). However, evidence is greatly lacking, particularly in younger populations, to explain EI self-concept formation and its susceptibility to various external and internal sources of influence. The present study aimed to address this gap in the literature by applying the DCT to the domain of EI in school-aged children.

1.1 Dimensional Comparison Theory

Shavelson's (1976) original model of self-concept considered the construct to be multidimensional and hierarchical. For instance, one might rate their abilities to do different forms of mathematics, such as calculus or algebra, and then have a more general self-concept of one's overall math ability. An individual's self-concepts across several different subjects may differ, but they should have an overarching self-concept for scholastic ability. Likewise, there should be domains related to social skills, athletic abilities, etc. Each smaller domain feeds into

a larger one and at the top of the hierarchy is one's global self-concept, also known as self-esteem. Though its multidimensionality has been well established empirically (Byrne, 1984; Marsh, Relich, & Smith, 1983), there has been mixed evidence to support the model's hierarchical structure, especially as children grow older and self-concepts in different domains grow more distinct (Marsh & Shavelson, 1985). Moreover, certain academic self-concepts, such as math and verbal, were found to be so distinct from one another that they could not be incorporated into an overarching domain (Marsh & Shavelson, 1985). The latter finding was especially perplexing, because students' math and verbal achievement scores tend to be highly correlated, and their corresponding self-concepts were expected to mirror those results (Marsh, 1986). Furthermore, despite comparable math and verbal achievement scores, studies have found girls to report higher verbal self-concepts, in stark contrast to boys who report higher math self-concepts (Eccles, Adler, & Kaczala, 1982; Frome & Eccles, 1998). These observations emphasize the divide between ability and self-perception and suggest that self-concepts are likely influenced by sources other than past performance alone.

To explain how self-concepts in various domains might interact with each other and with external sources of evaluation, Marsh (1986, 2007) introduced the Internal/External (I/E) Frame of Reference Model, which proposed that people compare their abilities to both internal and external sources to help form their various self-concepts. The I/E model and its recent extension, the DCT, organized previously established types of comparisons known to affect self-concept formation and introduced dimensional comparisons to complete the picture. The following section outlines these frames of reference and their effects on self-concepts.

1.1.1 External Frames of Reference

One of the most widely accepted forms of external comparisons is Festinger's (1954) Social Comparison Theory. Social comparisons involve relating one's own abilities, opinions, or other characteristics to another person or group (Mussweiler et al., 2006). These comparisons can be directed towards higher achieving peers, in the case of upward comparisons, or towards lower achieving peers, in the case of downward comparisons (Möller & Marsh, 2013). The distinction has an impact on an individual's resulting self-concept. Upward social comparisons often have a negative effect on self-concepts (Buunk et al., 1990; Möller & Pohlmann, 2010), whereas downward comparisons often result in more positive self-concepts (Wheeler & Suls, 2005). For example, if a student compares their math test score to a peer who achieved a higher grade, their perception of their math abilities may decrease as a result. However, if the same student compares their test score to a peer who achieved a lower grade, their perception of math competency will likely increase instead. These upward and downward comparisons are particularly salient in group settings. Findings have shown that students tend to have lower academic self-concepts when attending schools where the average achievement levels are high, whereas equally achieving students will have higher academic self-concepts when attending schools where the surrounding achievement levels are lower (Marsh, 1984; Marsh, 1987; Marsh et al., 2008). This outcome is otherwise known as the big-fish-little-pond effect and has been observed across numerous academic settings and countries (Marsh & Hau, 2003; Seaton, 2007).

Developmentally, social comparison effects can be seen in greater magnitude in adolescence rather than younger childhood (Harter, 2012). The perspective-taking skills of younger children are not yet sufficiently developed to engage in meaningful social comparisons. It is in late childhood and adolescence that youth begin to compare themselves with their peers, a

process that is aided by an increase in social circle and exposure to different environments, such as extracurricular activities or part-time jobs (Harter, 2012).

Another external frame of reference derives from the looking-glass theory, otherwise known as the symbolic interactionist theory (Cooley, 1902; Felson, 1985; Mead, 1913; Yeung & Martin, 2003). This theory is concerned with the extent to which individuals incorporate others' perceptions of them into their own self-concept, whether consciously or unconsciously (Yeung & Martin, 2003). The looking-glass theory posits that individuals tend to evaluate direct feedback and indirect beliefs about what those around them think of them and these 'reflected appraisals' subsequently influence what they think of themselves (Cooley, 1902). There have been mixed findings to support this theory throughout the years, however many of the discrepancies seem to derive from whether it is the individual's perception of others' appraisals measured, or the actual appraisals themselves (Felson, 1985). Other discrepancies are due to the difficulty of measuring individuals at a vulnerable enough point in their lives that their self-perceptions are volatile and able to be significantly influenced by those around them (Yeung & Martin, 2003). Late childhood and adolescence, however, is one such time that individuals undergo identity and self-reformation and thus may be particularly susceptible to the influence of reflected appraisals (Pfeifer et al., 2009; Harter, 2012).

Another significant factor to take into consideration is the nature of the relationship between the individual and the observer whose appraisals they are internalizing. The symbolic interactionist theory declares the reflected appraisals of esteemed or older significant others to have a more profound impact on self-perceptions (Cooley, 1902; Yeung & Martin, 2003). Indeed, this claim is supported by a study by Bouchey and Harter (2005) in which the reflected

appraisals of parents and teachers were found to have an effect on early adolescents' academic self-competencies, though no effect was found from peer reflected appraisals.

Studies focusing on the effect of parent appraisals on children's motivations and self-beliefs have found abundant evidence for the symbolic interactionist theory. Whether directly or indirectly, parents communicate their beliefs about their children's competencies, which in turn serves as feedback for children to internalize (Eccles, 1993). For instance, in a focused study of adolescent girls, Leaper, Farkas, and Brown (2012) found that daughters' motivations and interests in specific academic domains were positively associated with their mothers' support in those same domains. Maternal encouragement and support for autonomy has been found to have a positive effect on academic interests (Aunola et al., 2013) and parental praise or criticism has been shown to directly affect self-worth (Kamins & Dweck, 1999). In fact, parent appraisals have even been shown to predict academic self-concepts above and beyond past achievement scores, to the point of fully mediating the relationship (Eccles et al., 1982; Frome & Eccles, 1998; Gniewosz, Eccles, & Noack, 2014). According to Gniewosz et al. (2014), parents' perceptions are likely acting as an interpretation of reality for children in late childhood and adolescence, which strengthens Harter's (2012) developmental account. At a time where children are starting to use social comparisons, but do not yet have a larger network to compare with, parents' appraisals are one of the most trusted sources of information children have to draw from to inform their own self-concepts.

It is also important to note that much like self-concepts, parents' appraisals tend to contain gender biases. Both mothers and fathers are prone to attributing their daughters' success in math to effort rather than ability, believing it to be a more difficult subject for girls than for boys overall (Eccles et al., 1982; Yee & Eccles, 1988). Parents also rate boys as being weaker in

English subjects compared to girls (Gniewosz et al., 2014). These gender biases persisted despite no actual difference in ability being found in these studies between boys and girls in either subject, suggesting that gender differences in academic self-concepts may be at least partially attributed to socialization by parents.

1.1.2 Internal Frames of Reference

Internal frames of reference refer to self-evaluations made in reference to within-self comparisons as opposed to external sources (Möller & Marsh, 2013). The Temporal Comparison Theory (TCT), proposed by Albert in 1977, details how individuals tend to compare their current abilities and achievements to those of their past selves. As with social comparisons, this can have a positive or negative effect on self-beliefs depending on the frame of reference. If downward comparisons with lower prior abilities are made, this has a positive effect on self-evaluations, whereas making upward comparisons with higher prior abilities has a negative effect. It has been shown in research by Wilson and Ross (2003), however, that individuals generally view themselves as improving over time, and subsequently evaluate past achievements or failures in ways to make them feel best about themselves in the current time. Children tend to rely heavily on temporal comparisons to form their self-concepts in early childhood, resulting in unrealistically positive self-appraisals in the absence of counter-balancing social comparison effects (Harter, 2012).

Marsh (1986) introduced dimensional comparisons as a second form of internal frame of reference when he first proposed the I/E Frame of Reference Model to explain the discrepancy between highly correlated ability scores and poorly correlated self-concept scores in the math and verbal domains. Dimensional comparisons suggest that individuals compare their

achievements in one domain to those in another to form their self-evaluations (Chiu, 2012; Marsh, 1986, 2007). As with the other types of comparisons, upward and downward comparisons often yield different results (Möller & Marsh, 2013). When a student compares his English grade downward to a lower math grade, it may bolster his English self-concept, but his math self-concept may suffer as a result (Pohlmann & Möller, 2009). Likewise, if another student compares her English grade upward to a higher math grade, this may result in a lower English self-concept and a higher math self-concept.

Evidence for the I/E model has been abundant, both in Western countries and abroad (Marsh & Hau, 2004; Marsh & Köller, 2004; Möller et al., 2009; Xu et al., 2013). Path analyses revealed past achievement scores to positively predict same-domain self-concepts (e.g., math achievement to math self-concept), and negatively predict other-domain self-concepts (e.g., math achievement to verbal self-concept). A longitudinal study by Marsh, Kong, and Hau (2001) demonstrated that English, Chinese, and math grades had positive effects on matching domains, but negative effects on non-matching domains. Furthermore, the study revealed that achievement scores between the three subjects were highly correlated while the self-concepts were nearly uncorrelated, providing further evidence of dimensional comparisons counteracting with other external frames of reference.

To provide experimental evidence for the I/E model, Möller and Köller (2001) manipulated feedback given to university students about their math abilities, and tested their math and verbal self-concepts in turn. When participants were told they had scored above average on the given math quiz, they rated their math self-concept as higher than those who were told they had scored below average. However, participants who were told they had scored above average on the math quiz also rated their verbal self-concept lower than those who were told they

had scored below average. These findings not only replicate the path-analytic studies, but provide compelling support for the causal role of dimensional comparison processes.

The majority of I/E research has thus far been conducted with secondary students, but a recent study by Marsh, Abduljabbar et al. (2015) examined the model in relation to both fourth grade and eighth grade cohorts. While overall, the I/E model proved its generalizability across age groups, the positive horizontal paths to same-domains and the negative cross-paths to different domains were significantly stronger for the eighth graders than for the fourth graders, implying greater salience of the dimensional comparison processes in adolescence than in childhood. Developmentally, younger children may not yet have the cognitive capacity to perform complex internal comparisons, as is evident from their less differentiated self-concept structure dominated by a global self-evaluative dimension (Marsh & Shavelson, 1985). In contrast, adolescence is a period of heightened self-focus, dominated by a search for the "true" self from amongst the numerous and often conflicting self-appraisals (Harter, 2012).

In an attempt to expand and generalize the applicability of the original I/E model, Möller and Marsh (2013) proposed the DCT. This new theory adds academic domains beyond math and verbal and aligns them along a continuum depending on their perceived similarity or disparity from one another. Findings show that people's beliefs about how compatible subjects are with one another affects the saliency of dimensional comparisons (Möller et al., 2006) and this perceived compatibility in turn affects where subjects are placed along the academic continuum (Jansen et al., 2015; Marsh et al., 2014; Marsh, Lüdtke et al., 2015). If subjects are close to each other on the continuum, they are less likely to contrast and negatively affect one another's self-concept – they may even positively affect one another instead (Möller & Marsh, 2013). For instance, subjects deemed to be "near" or similar to one another, such as mathematics, chemistry,

and physics, will have low contrast effects on one another's self-concepts, or indeed, have positive assimilation effects on all self-concepts. Should one of those subjects be compared to a "far" or dissimilar subject such as language and literature, however, the contrast effects will be greater, with the self-concept of the lower graded subject suffering as a result (Jansen et al., 2015; Marsh, Lüdtke et al., 2015).

The I/E Frame of Reference model, and in particular the DCT, has been tested almost exclusively with self-concepts in performance-oriented domains, such as academics and sports (Tietjens, Möller, & Pohlmann, 2005). However, researchers more recently have started applying the DCT principles to self-concepts involving everyday behaviours. For example, a diary study by Möller and Husemann (2006) revealed that both high-school and undergraduate students made frequent dimensional comparisons in their day-to-day lives. Although academic comparisons were noted as the most frequent, participants also admitted to making frequent comparisons for their interpersonal relationships, aspects of their physical appearance, and even their different personality characteristics. Indeed, it has been suggested recently to apply a generalized I/E model to any construct that may contain external and internal comparisons between subdomains (Möller et al., 2016). With this in mind, the intended contribution of the present study is to extend the principles of the DCT to the domain of EI self-concepts. Since EI competencies are strongly implicated in everyday behaviours involving interpersonal relationships and self-regulation, EI self-concepts are a likely target of internal comparisons. To date, the DCT model has yet to be tested with EI, though its success in other areas spells exciting possibilities to further our knowledge of EI self-concept formation.

1.2 Emotional Intelligence Self-Concepts

The study of EI has become a widespread area of psychology research in the past three decades, and a topic of interest in both educational and corporate domains. EI is defined as the ability to recognize and regulate one's own emotions, as well as perceive others' emotions in social situations and determine positive responses in turn (Salovey & Mayer, 1990). Distinct from IQ, EI has fascinated both researchers and members of the public in how its effects may be seen in various facets of life. EI has been shown to impact an individual's relationships, workplace, school environment, and mental and physical health (Fernandez-Berrocal & Ruiz, 2008; Lopes, Salovey, & Straus, 2003; Rosete & Ciarrochi, 2005; Schutte et al., 2007). Studies have shown higher levels of EI to be associated with greater life satisfaction (Austin, Saklofske, & Egan, 2005), and greater health and well-being (Martins et al., 2010; Mavroveli et al, 2007). High EI has also been associated with lower levels of depression and anxiety (Fernandez-Berrocal et al., 2006), lower use of illicit drugs and alcohol (Brackett, Mayer & Warner, 2004), and decreased delinquent behaviour (Berastegui, van Leeuwen, & Chabrol, 2012; Petrides et al., 2004).

The benefits of EI seem to be robust and it is for this reason that many EI training programs are now being developed to help workers deal with occupational stress (Gardner, 2005), and to teach both students and teachers in educational settings how to cope with daily emotional pressures (Fernandez-Berrocal & Ruiz, 2008; Vesely-Maillefer, 2015). Schools have taken to incorporating SEL programs into their curricula, and researchers have actively been studying the effects (Greenberg et al., 2003; Zins et al., 2007). A meta-analysis conducted by Durlak et al. (2011) on 213 SEL-based programs in elementary and secondary schools found encouraging results: overall, participants significantly improved in social-emotional competencies, prosocial

behaviours, attitudes about self and others, internalizing behaviours and conduct problems, and academic performance.

It should be noted that the chief emphasis of the various EI and SEL programs has been on improving actual EI abilities, whereas the role of EI self-concepts has been largely overlooked. This is a major oversight, because EI ability and EI self-concept are two different constructs (Keefer, 2015), and the resulting EI scores of performance-based EI tests and self-report EI questionnaires rarely agree with one another (Van Rooy, Viswesvaran, & Pluta, 2005; Warwick & Nettelbeck, 2004). Moreover, self-perceptions of one's abilities can have an independent impact on an individual's life outcomes aside from the skills themselves (Elliot & Dweck, 2005). Greater confidence in one's abilities has shown to encourage an individual to seek out new challenges and grow, whereas an underestimation of skills may lead to a fear of failure and a lack of effort (Molden & Dweck, 2006). Indeed, EI self-concepts have been often shown to predict mental health, delinquent behaviour, and academic achievement above and beyond EI abilities (Brackett & Mayer, 2003; Davis & Humphrey, 2012). For these reasons, implementing SEL programs specifically targeted at EI self-concepts could be largely beneficial. To optimize their efficacy, however, it is first essential to understand how EI self-concepts are affected by the various frames of reference outlined in DCT.

To ensure DCT is applicable to EI self-concepts, three criteria must be met: EI self-concepts must be multidimensional, they must be located on a continuum with opposing poles, and they must be related to external sources of evaluation within the same domain. The following sections will evaluate these conditions.

1.2.1 Multidimensional Structure

Several multi-dimensional instruments have been developed to measure EI self-perceptions (Bar-On, 1997; Petrides, 2009a; Salovey et al., 1995; Schutte et al., 1998). The two dominant measurement models include Bar-On's (1997) Emotional Quotient Inventory (EQ-i) and Petrides' (2009b) Trait Emotional Intelligence Questionnaire (TEIQue). The EQ-i measures self-perceptions in four EI domains: Interpersonal skills (comprising competencies such as interpersonal relationship, empathy, and social responsibility), Intrapersonal skills (comprising self-regard, emotional self-awareness, and assertiveness), Stress Management (comprising stress tolerance and impulse control abilities), and Adaptability (comprising reality-testing, flexibility, and problem-solving skills). Similar traits and competencies are assessed by the TEIQue scales of emotionality, self-control, sociability, and well-being. Both questionnaires can be administered through self-report, or filled out by an observer as a source of external evaluation.

Much like previous self-concept findings indicating multidimensionality, the EQ-i scales have been found to be only moderately inter-correlated – each domain is internally consistent, temporally stable, and theoretically meaningful and distinct (Parker, Keefer, & Wood, 2011). Although it is possible to calculate a total EI score, there has been evidence to suggest that the individual domains of EI self-concept have more predictive power in certain cases than the global score (Gardner & Qualter, 2010; Parker et al., 2011). These results explain findings such as that of Saklofske et al. (2012) where global EI self-concept was not found to associate with academic success, but there was an association found with Adaptability – the domain associated with planning and goal-setting. Different EQ-i domains have likewise been associated with different coping styles. Intrapersonal and Stress Management domains have been negatively associated with emotion-focused coping (e.g., rumination, self-blame), the Interpersonal domain

has been positively associated with social diversion coping, and Adaptability has been positively associated with task-focused coping (Austin, Saklofske, & Mastoras, 2010). Further supporting the multidimensional nature of EI self-concepts are longitudinal studies suggesting that different combinations, or profiles, of the EI domains yield different long-term effects on life outcomes (Keefer, Parker, & Wood, 2012), and that shared variance between the domains drops drastically between the ages of 10 and 16 years old, showing that they each become more distinct with age (Keefer, Holden, & Parker, 2013).

1.2.2 Gendered Continuum

The second condition EI self-concepts must meet in order to show DCT effects is that the domains must lie along a continuum with opposing poles. In order to establish these poles, it may be best to turn to dimensional contrasts found between genders. In academic self-concepts, math self-concept (traditionally located at one end of the continuum) is consistently rated higher in boys, and verbal self-concept (located at the other end of the continuum) is consistently rated higher in girls (Eccles et al., 1982; Yee & Eccles, 1988; Gniewosz, Eccles, & Noack, 2014). As such, Möller and Marsh (2013) proposed gendered dimensions as viable candidates for those opposing poles.

These gender divides are mirrored by past and current research examining differences in personality traits. Instead of dividing personality traits into purely masculine and feminine categories, however, researchers have followed a philosophy first proposed by Bakan (1966) that divides traits which all individuals possess in varying degrees into two broad categories of Agency and Communion. Agency encompasses traits such as assertiveness, competitiveness, autonomy, and a focus on the self – traits that are stereotypically associated with masculinity. Communion, on the other hand, is defined by traits such as empathy, compassion, and nurturance

– traits stereotypically associated with femininity. According to Bakan's (1966) philosophy, both Agency and Communion can be observed in each sex, but individuals will vary in the balance of their combination. In modern research, these two categories have been successfully tested as superordinate personality factors and are referred to as gender-linked personality (GLP) dimensions (Feingold, 1994; Leising & Bleidorn, 2011).

There has been some preliminary evidence of DCT effects on Agency and Communion self-concepts. Möller et al. (2016) reviewed two studies that revealed typical I/E patterns between other-rated Agency and Communion as predictors and self-rated Agency and Communion as affected self-concepts. Positive paths were found between the corresponding domains (e.g., other-rated Agency and self-rated Agency) and negative cross-paths were found between non-corresponding domains (e.g., other-rated Agency and self-rated Communion).

There is compelling evidence that EI self-concepts are also strongly gendered. Females have consistently scored higher on self-report measures of interpersonal skills, empathy, and emotional attention and awareness, whereas men have consistently scored higher in areas related to self-control, emotion regulation, and adaptability (Arteche et al., 2008; Parker et al., 2011; Petrides, 2009b; Petrides & Furnham, 2000). Females are also prone to using more interpersonally oriented coping strategies (e.g., emotion-focused, social support seeking), whereas males are more prone to externally oriented coping strategies (e.g., problem-focused) (Ptacek, Smith, & Zanas, 1992). These gender differences are evident in EI self-reports of children as young as 10 years old (Keefer, Holden & Parker, 2013).

Narrative accounts in self-concept research have also indicated a divide in emotion-related values and skills between the genders from an even younger age (Harter, 2006, 2012). Young girls tend to describe themselves in terms of relationships with others, whereas young boys

typically focus on their skills and proficiencies compared to others. Reflecting the findings in the academic domain, these gender differences in EI self-concepts do not necessarily reflect gender differences in actual EI abilities (Sanchez-Nunez et al., 2008).

A recent study by Siegling, Saklofske, Vesely, and Nordstokke (2012) measured EI abilities and self-perceptions in conjunction with the GLP domains and found results complimentary to past gender-related EI research. Even after controlling for biological sex differences, Agency was found to be uniquely associated with male-typed EI self-concepts (e.g., self-control), whereas Communion was uniquely associated with female-typed EI self-concepts (e.g., emotionality). That the same gendered associations were not replicated with a performance measure of EI abilities suggests that the polarization of EI self-concepts along the GLP continuum may be a result of dimensional comparison processes.

Based on these patterns, it is reasonable to envision a gendered EI self-concept continuum for the EQ-i model, with Interpersonal competencies, which are consistently rated more highly in females, located at one pole, and Adaptability competencies, which are consistently rated more highly in males, at the other. Intrapersonal competencies should lie closer to the Interpersonal pole, and Stress Management closer to the Adaptability pole – based on previous findings of weaker or less consistent gender differences in these domains (Keefer et al., 2013; Parker et al., 2011).

1.2.3 External Sources of Evaluation

The third consideration in applying DCT to EI self-concepts is the nature of their association with external sources of evaluation. DCT consistently predicts positive within-domain associations of self-concepts with external sources of evaluation, traditionally

represented by test scores (Möller & Marsh, 2013). Although this would suggest moderate to strong correlations between EI abilities and self-concepts, this has not been the case amongst the majority of multi-method studies, which instead found the correlations to be moderate at best (Brannick et al., 2009; Livingstone & Day, 2005; Zeidner, Shani-Zinovich, Matthews, & Roberts, 2005). It is important to keep in mind, however, that unlike for academic subjects, children and adolescents do not receive regular standardized feedback on their social-emotional competencies in school; there are no grades awarded to help inform their EI self-concepts. In the absence of grades, the most effective form of external evaluation remains the direct and indirect feedback from significant others, and particularly parents (Aunola et al., 2013; Eccles, 1993; Kamins & Dweck, 1999). Moreover, parent appraisals are known to mediate the effects of academic grades on academic self-concepts, indicating their more proximal role in shaping competence self-evaluations (Gniewosz et al., 2014). With this in mind, parent perceptions of EI are likely the most salient external source children and adolescents draw from when forming their EI self-concepts.

1.3 The Present Study

The main goal of the present study was to apply the DCT to a novel domain of EI self-concepts in a large sample of Canadian children and adolescents aged 9 to 18 years. EI domains were operationalized by the four dimensions of the EQ-i (Bar-On, 1997): Intrapersonal, Interpersonal, Stress Management, and Adaptability. Parent perceptions were used as external frames of reference and gender and age were included as potential moderators of the DCT effects.

1.3.1 Hypothesis 1: DCT and EI

EI self-concepts will reflect the same findings in regards to the DCT as academic self-concepts. External frames of reference will result in significantly positive horizontal paths between parent perceptions and corresponding self-concepts. Internal frames of reference will result in assimilation or contrast effects for domains particularly near or far from each other on the EI continuum. Assimilation effects will be seen between Intrapersonal and Interpersonal domains, and between Stress Management and Adaptability domains. Contrast effects will be seen between Interpersonal and Adaptability domains.

1.3.2 Hypothesis 2: DCT and Age

Age will act as a moderator on DCT effects. Assimilation and contrast effects will be stronger in adolescents than in children, consistent with past findings by Marsh, Abduljabbar et al. (2015) and with the developmental literature reviewed above (Harter, 2012).

1.3.3 Hypothesis 3: EI Self-Concept and Gender

Girls will report higher Interpersonal and possibly Intrapersonal self-concepts, whereas boys will report higher Adaptability and possibly Stress Management self-concepts. Due to this study being somewhat exploratory in nature, there are no specific hypotheses regarding gender as a moderator of the DCT effects.

CHAPTER 2

2. Method

2.1 Participants and Procedure

The data used in this study was a secondary dataset originally collected to study structural and mean level congruence between self and mothers' ratings on the youth version of the Emotional Intelligence Quotient Inventory (EQ-i:YV; Bar-On & Parker, 2000; Keefer, Wood, & Parker, 2009). The sample consists of children and adolescents aged 9 to 18 years and their mothers, recruited from different cities across Eastern-Central Ontario, Canada. Participants were recruited over the course of two years through advertisements at local schools, community clubs, youth and family organizations, university campuses, and word of mouth. Participation was entirely voluntary and participants received no compensation.

Only mothers were invited to fill out the Observer form of the EQ-i:YV, to avoid the confound of multiple rater-specific effects. This strategy was chosen based on past findings that the overwhelming majority of caregivers who volunteer to participate in studies of their children tend to be mothers. For example, in a population-based dataset of Canadian children and youth, Keefer et al. (2013) reported the responding caregiver to be the child's mother in 90% of the cases.

Mothers and children completed paper-and-pencil questionnaires, each taking approximately 20-40 minutes to complete. Some children were tested at their school and then took packages home for their parents to complete and return by mail. Other children took home both their parents' package and their own, and both were returned by mail. When tested at school, test administers were present to answer questions and ensure the children understood what they were being asked to do. Confidentiality was enforced by assigning each dyad an

identification number. Researchers analyzing the data for subsequent studies did not have access to the list matching names to identification numbers. Questionnaires were collected by test administrators and not made available to the schools, teachers, or community programs from which the children were recruited.

The final sample contains only those participants for whom both Parent and Self-reported EQ-i:YV data were available (N = 1,069 dyads). Participants who had more than 10% of EQ-i:YV items missing were excluded, though these cases were rare and amounted to about 1% of all respondents. For any other missing items, those values were replaced with group means stratified by gender and recruitment cohort. The final sample included children ranging from 9 to 18 years of age, the average being 14.01 years (SD = 2.50), and 58% were female. Though 51.4% of children chose not to identify their ethnicity, 47.1% identified themselves as white, and the remaining participants were mixed between black, Asian, Hispanic, Native, and other. The mothers' ages ranged from 26 to 63 years of age, the average being 43.64 years (SD = 5.33). The mothers' education level varied from having completed some high school (24.3%), possessing technical training (3.6%), having completed some college or university (23%), having completed college or university (45.3%), having completed a master's degree (2%), having completed a PhD (.5%), and unanswered (1.4%).

2.2 Measures

2.2.1 Self-Concept.

To determine children's EI self-concept scores, the Bar-On Emotional Quotient Inventory: Youth Version (EQ-i: YV) was used (Bar-On & Parker, 2000). There are 60 items in the EQ-i: YV, assessing 4 separate EI scales: Intrapersonal (6 items), Interpersonal (12 items),

Stress Management (12 items), and Adaptability (10 items), along with three other ancillary scales that were not relevant to the present study. Each item consists of a personal statement, and the participant must rate on a 4-point Likert scale how well the statement pertains to them, ranging from 1 (*very seldom true*) to 4 (*very often true*). The EQ-i:YV has been validated in a large normative sample of over 9,000 North American children and adolescents (Bar-On & Parker, 2000), and it is currently one of the most widely used self-report EI measures with school-age respondents (Humphrey et al., 2011).

For the purpose of this study, a truncated version of the EQ-i:YV (6 items per EI scale) was extracted from responses to the full-length scale and used for all data analyses. The questions extracted mirrored the items found in the EQ-i:YV-Observer (EQ-i:YV-O; Bar-On, 2000) questionnaire administered to parents. This ensured that children's self-concepts and parents' perceptions were assessed in identical ways. Correlations between the full version and the truncated scales ranged from .92 (Interpersonal scale) to 1.00 (Intrapersonal scale), strongly indicating that they were equivalent. Abbreviated items for each scale can be found in the appendix.

2.2.2 Parent Perceptions.

The EQ-i: YV-Observer form (Bar-On, 2000) was filled out by the children's mothers, asking them to rate their child on a subset of 24 items from the EQ-i:YV. Mothers were asked to rate how they believe their child acts, thinks or feels in different situations, on a 4-point Likert scale. The same four EI scales as the EQ-i:YV are assessed: Intrapersonal, Interpersonal, Stress Management, and Adaptability (6 items per scale). Preliminary correlations between this measure and children's self-reported EI have been moderate, ranging from .29 to .48 across the

different scales (Keefer et al., 2009; Wood, Parker, & Keefer, 2009). Older children's self-report EI scores have generally been more in agreement with their parents' ratings than younger children.

Both the EQ-i:YV and EQ-i:YV-O questionnaire responses were scored and tallied according to the Bar-On *Technical Manual* (Bar-On & Parker, 2000), such that higher scores on each EI scale represent more positive ratings of EI competencies.

2.3 Statistical Analysis

Descriptive statistics, internal consistencies, and mean differences were analyzed using SPSS (2012) software. The main DCT hypotheses were tested using the confirmatory factor analysis (CFA) and structural equation modelling (SEM) approach used by Jansen et al. (2015) in their application of DCT to academic self-concepts. CFA and SEM analyses were conducted in Mplus Version 7 (Muthén & Muthén, 1998-2012) with maximum likelihood (ML) estimation.

Children were divided into groups according to age. It was important that each group be sufficient in size to be able to conduct the planned SEM analyses, and the age ranges for each group needed to be developmentally meaningful. Past research focusing on emotional competencies in children and adolescents found there to be qualitative differences in the psychometric properties of self-report responses between children aged 9 to 12, 13 to 14-15, and 15-16 to 17-18 (Keefer, Holden, & Parker, 2013; Parker, Eastabrook, Keefer, & Wood, 2010). For these reasons, three age groups were formed from the current data: children aged 9-12, children aged 13-15, and children aged 16-18. All CFA and SEM analyses were performed separately for the six age-gender groups.

CFA was first used to determine if an eight-factor measurement model with correlated factors could adequately represent the data for the four parent-rated and four self-rated EI scales. Item parcels were used as indicators of the latent variables. For each latent variable, items were randomly divided into three parcels prior to analysis, with two items in every parcel. Parcelling is a common practice in SEM analyses focused on substantive hypothesis testing, to reduce the number of lower-order indicator variables (Bandalos & Finney, 2001). Other advantages of parcels include greater reliability than individual items (Cattell & Burdsal, 1975; Kishton & Widaman, 1994), distributions that more closely approach normality (Bagozzi & Heatherton, 1994), and a better measurement model fit (Bandalos & Finney, 2001).

Latent correlations between all variables were examined for patterns that would be congruent with DCT predictions. Due to the fact that the chi-square statistic is extremely sensitive and prone to Type I error when the sample size is large (Marsh, Balla, & McDonald, 1988), the model fit was determined by examining the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) with the following cut-off criteria: CFI $\geq$ .90, RMSEA $\leq$ .08, and SRMR $\leq$ .10 for acceptable fit; CFI $\geq$ .95, RMSEA $\leq$ .05, and SRMR $\leq$ .08 for good fit (Browne & Cudeck, 1993; Hu & Bentler, 1999).

Once the measurement model was established, a full SEM was estimated whereby the four EI self-concept latent variables were each regressed onto the four parent-reported EI latent variables (see Figure 1). The model additionally included six covariance parameters between the four exogenous latent variables and six covariance parameters between the four endogenous disturbance terms. Direct paths between corresponding EI variables were examined (e.g.,

Parent-Intrapersonal → Self-Intrapersonal) as well as cross-paths (e.g., Parent-Intrapersonal → Self-Adaptability) to determine significance and directionality.

CHAPTER 3

3. Results

3.1 Mean Group Differences

The descriptive statistics for all EQ-i:YV scales by age and gender grouping can be found in Table 1. Following from Nunnaly's (1978) indication that .70 is an acceptable reliability coefficient, the Intrapersonal, Adaptability, and Stress Management scales showed adequate internal consistency, with Cronbach's alphas ranging from .72 to .91. However, alphas for the Self-reported Interpersonal scale fell below .70 in four of the six groups (alphas of .65 to .69). Skewness and Kurtosis values suggest no strong deviations from univariate normality for any of the variables.

A series of 2 (gender) x 3 (age group) factorial analyses of variance (ANOVAs) revealed several significant main effects of age group and gender, with a few significant interaction effects (see Table 2). Effect sizes (partial eta-squared) were interpreted in accordance with Cohen's (1988) guidelines of .01 = small, .06 = medium, and .14 = large. In determining group mean differences, post-hoc tests were examined with the Bonferroni correction in order to counter the tendency towards significance when doing multiple comparisons. Significance was determined at an alpha level of $p<.05$.

In terms of gender differences, the largest main effects of gender were observed for the Interpersonal domain, where females were rated significantly higher than males, in both Parent and Self-concept ratings. The effect size for self-concept ratings was medium at .08, but the effect size for parent ratings was small, at .03. There were also significant gender differences found in both Parent and Self-concept ratings of the Intrapersonal domain, with females rated higher than males. However, the effect sizes were small (.01 to .02). Overall, gender differences

were more pronounced in Self-concept ratings than Parent ratings, which is not surprising. In fact, a small (.01) interaction effect on the Intrapersonal domain in the parent ratings showed that only in the oldest age group (16-18 years) was the gender difference, in favour of females, even evident. This finding replicates the consistent finding that there are more gender discrepancies in academic Self-concepts than in external evaluations (Dai, 2002).

There were no significant main effects of gender found for the Stress Management or Adaptability domains. Only a small (.01) interaction effect was found for Stress Management Self-concept: males in the 16-18 year group rated themselves significantly higher than females. This was unexpected, as Adaptability was theorized to place near the Agency end of the EI continuum, and be rated higher amongst males.

In terms of age differences, all Parent-rated domains showed significant albeit small (.01-.02) main effects. Parents rated their children as increasing in Stress Management and Adaptability with age, but decreasing in Intrapersonal and Interpersonal with age. No significant age differences were found on the Self-concept scales.

3.2 Latent Factor Correlations

All CFA measurement models showed acceptable or good fit to the data in relation to previously established guidelines (Browne & Cudeck, 1993; Hu & Bentler, 1999), as can be seen in Table 3. CFI values ranged from .937 to .969; RMSEA values ranged from .041 to .054; and SRMR values ranged from .051 to .062. Standardized factor loadings for each model can be seen in Table 4. All parcels loaded significantly onto the latent variables, with moderate to strong loadings ranging from .29 to 1.00. These models were subsequently used for further analyses.

Latent correlations between the factors were examined next and are reported in Table 4. Correlations between the four EI domains were low to moderate for both the Parent-ratings (ranging from .01 to .57) and Self-concepts (ranging from .04 to .48), supporting that although EI Self-concept is generally measured as a composite construct, some EI domains as measured by the EQ-i are correlated and others are more distinct and independent. The average correlation between domains for Parent-ratings was .26 and for Self-concepts, it was .24. These magnitudes are quite comparable, despite expectations that Parent-rated domains would be more highly correlated than Self-concepts. However, these values disregard potential age and gender differences.

When distinguished by gender, average Parent-rated correlations do not differ greatly between males (.26) and females (.27). Correlations between Self-concepts, however, are somewhat higher for males (.26) than females (.21). This indicates that females have more differentiated Self-concepts than males, and lower correlations between domains.

An interesting trend is seen when the average correlations are calculated by age group. Domain correlations as rated by Parents increase as children grow older: r = .21 (ages 9-12); r = .26 (ages 13-15); and r = .32 (ages 16-18). Domain correlations as rated by Children, on the other hand, appear to be less highly correlated as they grow older: r = .28 (ages 9-12); r = .22 (ages 13-15); and r = .21 (ages 16-18). EI domains as rated by Parents appear to grow more highly correlated with age, whereas EI Self-concepts grow more distinct.

Based on the proposed gendered EI continuum, it was expected that close, or similar, domains would be more highly related and far, or dissimilar, domains would be less so. However, with the exception of Stress Management, all domains were moderately correlated with one another. Stress Management was the least correlated with the other domains, and in

particular Adaptability, despite the suggestion of them being next to one other on the continuum. The correlations between Intrapersonal and Interpersonal domains were generally higher in males than females across the age groups, for both Parent and Self-report. Interestingly, Interpersonal and Adaptability were moderately correlated across all groups, for both Parent and Self-report. This finding was unexpected, as they were theorized to lie at opposing poles. This pattern was not consistent with trends suggested by the DCT. It would seem that at least at the bivariate level, without controlling for other factors, all domains are moderately correlated with one another, except Stress Management.

Correlations between Parent-ratings and Self-concepts on same-domains were consistent with previous findings. All correlations were moderate to strong, ranging from .22 to .59. Averaged across all groups, Stress Management had the strongest agreement between Parent and Self-ratings (average r = .53) and Intrapersonal had the weakest (average r = .33). There was no difference between the average Parent/Self correlations for females (.43) vs. males (.44). Correlations averaged by age group suggested that congruence between Parent and Self-ratings increased with age: r = .38 (ages 9-12); r = .45 (ages 13-15); and r = .48 (ages 16-18).

3.3 Testing the DCT Effects

Standardized parameter estimates for the structural paths of all SEM models can be found in Table 5. All four Parent appraisal variables showed significant positive effects on the corresponding Self-concept variables in each of the six groups (β = .22 to .58). Consistent with past DCT evidence, external frame of reference effects (within-domain paths) were stronger than dimensional comparison effects (cross-paths) for any given EI domain.

Several cross-paths between Parent appraisals and Self-concepts displayed significant assimilation (positive) and contrast (negative) effects in a predicted pattern, but they were moderated by the age group and gender. Interestingly, there were no cross-path effects found for the oldest age group (males or females), nor for females aged 13-15. The only cross-path effects found were in the 9-12 age groups (both males and females), and for males aged 13-15. This finding was unexpected, as dimensional comparison effects were hypothesized to be stronger in adolescents than in children. Interpersonal Self-concept was the domain most affected by assimilation and contrast effects, in all three groups. Intrapersonal Parent appraisals had the most consistent assimilation effect on Interpersonal Self-concept in each of the three groups (ranging from $\beta = .20$ to .22). Stress Management Parent appraisals also had assimilation effects on Interpersonal Self-concept for males aged 9-12 ($\beta = .21$) and on Intrapersonal Self-concept for males aged 13-15 ($\beta = .22$). Adaptability Parent appraisals, meanwhile, were found to have a significant contrast effect on Interpersonal Self-concept for females aged 9-12 ($\beta = -.26$). This is in line with expectations of these two domains situated at opposing poles.

CHAPTER 4

4. Discussion

The present study was the first attempt to empirically test an emerging self-concept theory, DCT, in the previously untested area of EI. Within-domain and between-domain relations between parent EI appraisals and EI self-concepts were examined for four different EI dimensions described by Bar-On (1997, 2000a) – Intrapersonal, Interpersonal, Stress Management, and Adaptability.

4.1 DCT Effects

In general, the results of this study supported the application of DCT to the domains of EI. As predicted, all associations made within domains between parent appraisals and corresponding self-concepts were positive and significant. These results mirrored past findings with the I/E Frame of Reference model where achievement in one subject (e.g., math grade) would positively predict the corresponding self-concept (e.g., math self-concept) (Möller et al., 2009; Xu et al., 2013). As such, these findings suggest parent appraisals to be a meaningful source of external evaluation to inform children's same-domain self-concepts.

In terms of internal dimensional comparisons, assimilation effects were found between Intrapersonal and Stress Management parent appraisals and Interpersonal self-concepts, and between parent appraisals of Stress Management and self-concepts of Intrapersonal and Interpersonal competencies. Furthermore, a contrast effect was found between parent appraisals of Adaptability and Interpersonal self-concepts. The results lend support to the hypothesized gendered EI continuum, with minor deviations. As predicted, Interpersonal and Adaptability

were indeed the domains most at odds with one another, indicating they lay at opposite poles. Also as predicted, Intrapersonal was the domain that had the most consistent assimilation effects on Interpersonal self-concepts, suggesting they were close to each other on the continuum. Stress Management, surprisingly, shared no assimilation effects with Adaptability, and its assimilation effects on Interpersonal and Intrapersonal self-concepts suggest it lies closer to those domains on the continuum. After reviewing these patterns, the EI continuum would appear to start with Interpersonal on one pole, followed closely by Intrapersonal and then Stress Management, and with Adaptability farther away at the opposing pole. This lends support to the theory of Interpersonal, Intrapersonal, and Adaptability being gendered EI dimensions lying along an Agency-Communion continuum. However, Stress Management appears not to be strongly linked with either pole, at least when measured with the EQ-i:YV, and should perhaps be considered as more of an androgynous competency. In general, the Agency-Communion continuum appears to be a useful framework for understanding the dimensional dynamics of EI self-concepts and future studies may even consider applying it at the facet level to see in detail how the composite domains are spread along the continuum.

It should be noted that past findings in academic domains have generally found stronger contrast effects than assimilation effects between subjects (Jansen et al., 2015; Moller & Marsh, 2013; Moller et al., 2006). In the present study, however, there were more assimilation or null effects between EI domains. Furthermore, the assimilation effects were of equal magnitude as the contrast effects, whereas previous studies only found small assimilation effects in academic domains. This result suggests that the EI domains are all relatively close to one another on the proposed continuum. With domains spread further apart, more contrast effects would be evident. Alternatively, internal dimensional comparisons may simply be less salient for EI self-concepts

compared to academic self-concepts, instead being more strongly shaped by various external frames of reference. Indeed, the overall support for the DCT was not as strong for EI self-concept as previously found in academic domains, and there are a variety of explanations that should be considered. To begin, social-emotional competences and behaviours differ from academic performance. While academic abilities can be easily measured by performance tests, researchers studying EI abilities have long had difficulty finding equivalent objective measures (Petrides, 2011). Additionally, without regular standardized feedback, individuals have fewer sources of evaluation to draw from to form their EI self-concepts, instead going by the more ambiguous social feedback that is often communicated indirectly and thus more amenable to self-enhancing interpretations. Parent appraisals, while relevant, are the only external source examined in the present study. Other external influences that would need to be tested include appraisals by other people in the adolescents' social circle (e.g., friends, teachers), as well as upward and downward social comparison effects.

Nevertheless, EI self-concepts should be included in future studies of dimensional comparisons within the broader self-concept research. As evidenced by Möller and Husemann's (2006) diary study, dimensional comparisons in everyday life are frequently made not just within domains (e.g., academic-academic, social-social), but also across domains (e.g., academic-social). With this in mind, future tests of the DCT should consider including EI self-concepts alongside other domains such as academia, athleticism, or personality. The dimensional comparison processes might be more salient when EI is pitted against cognitive intelligence or other traits commonly perceived to be incompatible with emotionality.

4.2 Moderation by Age and Gender

The general expectation that age would work as a moderator of the DCT effects was supported, but contrary to the predicted direction (Marsh, Abduljabbar et al., 2015), the assimilation and contrast effects were seen primarily in the youngest age group, and not at all in the oldest. Coupled with the finding of stronger within-domain effects of parent appraisals at older ages, this suggests that older adolescents may rely less on internal comparisons and more on external frames of reference to inform their EI self-concepts. As seen in previous research, older adolescents may draw more from social comparisons, and appraisals from their increased social network (Harter, 2012). Adolescents also tend to gradually transfer their emotional attachment from parents to peers over time, shifting their primary frame of reference to peer social comparisons and appraisals (Harter, 2012; Hay & Ashman, 2003; Marsh, Abduljabbar et al., 2015). Due to the qualitatively different kinds of external feedback available for academic versus social-emotional abilities (as discussed above), the developmental progression of dominant frames of reference might also differ for the two self-concept domains. When one's abilities can be objectively quantified on a common metric, it is much easier to evaluate one's standing across different domains. However, when the external feedback is ambiguous and diversified, internal comparisons become more challenging and less informative. This would be particularly the case for older adolescents, whose social and emotional experiences are more complex than those of pre-adolescents. Further research is needed to confirm this trajectory, using longitudinal and multi-method designs.

Gender acted as a relatively weak moderator of the DCT effects – cross-domain effects of Intrapersonal appraisals on Interpersonal self-concepts were similar for boys and girls, but boys' Intrapersonal and Interpersonal self-concepts were additionally affected by Stress Management

appraisals. Furthermore, the contrast effect of Adaptability on Interpersonal self-concept was only seen in girls. Assimilation effects were seen in boys aged 13-15, but neither assimilation nor contrast effects were seen in girls of that age group. Correlational results suggest that EI self-concepts become more distinct with age, and that girls have more differentiated EI self-concepts than boys. These findings point to the possibility that EI self-concepts may still be too similar and integrated for boys in the 13-15 age group, and girls' EI domains grow more distinct at an earlier age. It is also possible that girls begin relying on other frames of reference to form their self-concepts earlier than boys. This is a point that should be examined in future studies.

4.3 EI Domain Trends

This study has not only shed light on DCT effects on EI self-concepts, but has also highlighted interesting findings and implications for general EI research. Results showed age differences on all EI scales when rated by parents. Parents rated older children as having increased Stress Management and Adaptability, but lower Intrapersonal and Interpersonal skills. This focus on stress tolerance, flexibility, and problem-solving skills suggests that parents believe older adolescents use more logic-based or task-focused reasoning – characteristics typically associated with Agency personality traits (Siegling et al., 2012). Interestingly, no age differences were found on the EI self-concept scales. This is somewhat unexpected as self-concepts generally undergo a U-shape pattern during adolescence (Harter, 2012; Keefer et al., 2013). This finding suggests that youth rate themselves similarly in specific EI domains at different ages, though as this study is cross-sectional and not longitudinal, it cannot speak to a true developmental trajectory.

Gender differences in EI self-concepts appeared to be more pronounced than those in parent appraisals. The gap between girls' and boys' self-ratings was consistently greater than that in parent ratings. This indication of greater gender bias in EI self-concepts versus appraisals is in line with previous research in academic domains where abilities are generally gender-neutral and academic self-concepts contain biases (Dai, 2002), and reinforces the concept of using parent appraisals as an external source of reference.

In terms of relations between EI domains, results showed parent-rated scales becoming more integrated with age, whereas self-concepts became more distinct. Previous research has consistently shown the distinctness of EI self-concept domains (Keefer et al., 2013; Parker, et al., 2011), and though parent-ratings have generally been moderately correlated with corresponding self-concepts, this trend is a new and interesting finding that further distinguishes more external measures of EI evaluation from EI self-concepts.

It is also interesting to note that Stress Management was the domain the least correlated with the other EI scales. It is unclear why it showed so much disparity with the other domains at the bivariate level, but this may be due in part to its semantic nature. When administered in the EQ-i:YV (Bar-On & Parker, 2000), Stress Management is the scale that includes the most negatively-keyed items. This method effect may indirectly affect participants' responses and attenuate its relationships with the other EI domains.

4.4 Limitations and Future Directions

Some limitations to this study are noted here. First of all, the data used were cross-sectional and only capture a snapshot in time. Therefore, no specific predictions of causality may be inferred and in truth, directionality could be going either way. Instead of parent

appraisals positively or inversely affecting EI self-concepts, EI self-concepts could very well be affecting parent appraisals. A similar study with a longitudinal design could provide a more accurate picture, particularly with regards to age trends.

Past studies testing the I/E frame of reference model have also used experimental study designs to see how manipulated feedback regarding academic proficiency affects future self-concepts (Möller & Köller, 2001). Manipulating appraisal feedback in regards to EI in a similar design could provide valuable insight into the causal effects on EI domain-specific self-concepts. Another valuable source of information to explain continuum effects might be participants' ratings on how similar they perceive the EI domains to be, or how personally important the domains are to them. It has been suggested that perceptions of domain similarity on an individual's part often lead to greater assimilation effects (Möller & Marsh, 2013). Likewise, it may very well be that if an individual views certain domains as more significant or important than others, this may lead to a buffer effect against contrast effects.

Another limitation of the current research is in the nature of parent appraisals as an external source. Though their overall effect has been shown to be significant, the degree of feedback that reaches and is interpreted by children is unclear and could be different for each child. To find a more accurate assessment of children's internalizations, it might be prudent to measure reflected appraisals instead (i.e., what children believe their parents think of their competencies). Several studies have examined the effect of appraisals and reflected appraisals on self-perceptions (Brownfield & Thompson, 2005; Bois et al., 2005; Bouchey & Harter, 2005). Both have been found to significantly influence individuals' competency beliefs in both academic (Bouchey & Harter, 2005) and sports-related domains (Bois et al., 2005), even after actual abilities were controlled for. However, in their year long longitudinal study, Bois et al.

(2005) found that reflected appraisals played a mediating role between observers' actual appraisals and individuals' self-perceptions about their own sports-related competencies. This suggests reflected appraisals may contribute to the formation of self-perceptions more so than observers' actual appraisals. Future studies should perhaps take this into account and test the DCT using reflected parent appraisals as an external source.

4.5 Concluding Remarks

The present study was the first of its kind to apply the DCT to find patterns related to EI self-concept formation. The preliminary findings support the theory of a gendered continuum, with Interpersonal and Adaptability domains at opposing poles. The saliency of both internal comparison effects and parent appraisals as external sources differs with gender and age, and should be taken into account when planning future studies. Age and gender should also be considered if educational programs are to apply these findings to boost EI self-concepts through social-emotional learning programs. Preferred frames of reference for internalized evaluations appear to evolve with age, and at a different rate for boys and girls. It may be prudent to tailor EI curriculum for each grade, and shift the focus of intervention depending on the primary frame of reference of that age group. At the ages where dimensional comparisons are particularly potent, it is highly recommended that one domain not be promoted over another. Drastic differences in EI abilities are likely to sharpen contrast effects and decrease the self-concept of the lower domain even further.

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Table 1. Descriptive Statistics

	Mean	*SD*	Skewness	Kurtosis	Cronbach's α
			Males, Age 9-12; N=136		
P_Intrapersonal	16.27	3.55	-0.48	0.52	.88
P_Interpersonal	20.07	2.50	-0.28	-0.02	.72
P_Stress Management	16.94	4.22	-0.66	-0.06	.87
P_Adaptability	17.46	3.25	-0.11	-0.19	.87
S_Intrapersonal	14.35	4.00	0.06	-0.13	.80
S_Interpersonal	19.54	3.28	-0.94	1.13	.80
S_Stress Management	15.88	4.16	-0.41	-0.43	.80
S_Adaptability	17.29	3.90	-0.63	0.43	.85
			Females, Age 9-12; N=183		
P_Intrapersonal	16.73	3.48	-0.17	0.11	.84
P_Interpersonal	20.83	2.34	-0.76	0.26	.76
P_Stress Management	17.24	3.73	-0.39	-0.33	.82
P_Adaptability	18.04	3.45	0.05	-0.48	.90
S_Intrapersonal	15.46	3.57	0.01	-0.19	.77
S_Interpersonal	20.66	2.49	-0.65	0.74	.65
S_Stress Management	16.56	3.74	-0.21	-0.32	.78
S_Adaptability	17.64	3.39	-0.28	0.23	.81
			Males, Age 13-15; N=160		
P_Intrapersonal	15.89	3.31	0.02	0.35	.84
P_Interpersonal	19.67	2.46	-0.53	-0.17	.73
P_Stress Management	18.54	3.61	-0.70	0.22	.84
P_Adaptability	18.30	3.74	-0.35	-0.27	.90
S_Intrapersonal	14.04	3.42	-0.11	0.01	.76
S_Interpersonal	18.68	3.06	-0.37	0.01	.77
S_Stress Management	16.42	3.90	-0.20	-0.55	.81
S_Adaptability	17.73	3.48	-0.05	-0.11	.86
			Females, Age 13-15; N=209		
P_Intrapersonal	16.12	3.74	-0.16	0.11	.87
P_Interpersonal	20.64	2.70	-0.72	0.19	.80
P_Stress Management	18.10	4.13	-0.77	0.19	.86
P_Adaptability	18.23	3.61	-0.62	0.76	.90
S_Intrapersonal	15.22	3.92	0.01	-0.09	.85
S_Interpersonal	20.56	2.41	-0.34	-0.56	.67
S_Stress Management	16.63	3.92	-0.30	-0.37	.83
S_Adaptability	16.92	3.37	0.20	-0.22	.86

			Males, Age 16-18; N=153		
P_Intrapersonal	15.07	3.56	-0.42	-0.07	.82
P_Interpersonal	19.26	2.63	-0.51	-0.09	.73
P_Stress Management	18.54	4.18	-0.68	-0.22	.87
P_Adaptability	18.07	3.98	-0.28	-0.70	.91
S_Intrapersonal	14.45	3.68	-0.003	0.01	.81
S_Interpersonal	19.06	2.60	-0.46	0.22	.67
S_Stress Management	17.20	3.82	-0.24	-0.56	.81
S_Adaptability	17.56	3.55	-0.13	-0.25	.88
			Females, Age 16-18; N=228		
P_Intrapersonal	16.56	3.84	-0.39	0.27	.87
P_Interpersonal	20.36	2.68	-0.92	0.76	.76
P_Stress Management	17.42	4.23	-0.57	-0.08	.85
P_Adaptability	18.81	3.24	-0.20	-0.52	.86
S_Intrapersonal	15.59	4.18	-0.25	-0.44	.87
S_Interpersonal	20.66	2.32	-0.56	-0.11	.69
S_Stress Management	16.35	3.98	-0.34	0.05	.84
S_Adaptability	16.97	3.28	-0.50	1.12	.86

Note. P_= Parent-report variables; S_= Self-concept variables.

Table 2

ANOVA Results

Effect	Intrapersonal		Interpersonal		Stress Management		Adaptability	
	F	Part. Eta^2	*F*	Part. Eta^2	*F*	Part. Eta^2	*F*	Part. Eta^2
Parent-rated:								
Age (*df* = 2, 1063)	3.17*	.01	5.17**	.01	8.13**	.02	3.38*	.01
Gender (*df* = 1, 1063)	10.42**	.01	35.08**	.03	2.83	--	3.67	--
Age x Gender (*df* = 2, 1063)	3.13*	.01	0.38	--	2.61	--	1.34	--
Self-concept:								
Age (*df* = 2, 1063)	1.02	--	2.79	--	1.69	--	0.30	--
Gender (*df* = 1, 1063)	23.11**	.02	86.31**	.08	0	--	2.64	--
Age x Gender (*df* = 2, 1063)	0.01	--	1.76	--	3.47*	.01	2.56	--

Note. Effect sizes (partial eta-squared) for non-significant effects are omitted from this table (all were <.01).

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

Table 3
Model Fit Indices for the Measurement and Structural Equation Models

Sample	*df*	Chi-square	CFI	RMSEA (90% CI)	SRMR
Males, Age 9-12	224	311.62**	.947	.054 (.038 - .067)	.059
Females, Age 9-12	224	344.93**	.937	.054 (.043 - .065)	.059
Males, Age 13-15	224	283.56**	.968	.041 (.024 - .055)	.059
Females, Age 13-15	224	344.89**	.953	.051 (.040 - .061)	.053
Males, Age 16-18	224	290.14**	.964	.044 (.028 - .058)	.062
Females, Age 16-18	224	309.36**	.969	.041 (.029 - .052)	.051

Note. *df* = degrees of freedom; CFI = comparative fit index; RMSEA = root mean-square error of approximation; 90% CI = 90% confidence interval; SRMR = standardized root mean-square residual.

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

Table 4

Standardized Factor Loadings and Inter-Factor Correlations from the Measurement Models

	Age 9-12		Age 13-15		Age 16-18	
	Males	Females	Males	Females	Males	Females
	Standardized Factor Loadings					
Parent-report						
Intra1	.89	.94	.94	.88	.96	.94
Intra2	.95	.89	.91	.92	.90	.91
Intra3	.61	.53	.38	.63	.29	.55
Inter1	.67	.73	.65	.82	.69	.73
Inter2	.74	.77	.81	.75	.84	.80
Inter3	.71	.70	.60	.76	.62	.73
Stress1	.87	.86	.85	.82	.79	.85
Stress2	.88	.81	.82	.84	.84	.86
Stress3	.77	.72	.77	.83	.86	.79
Adapt1	.88	.90	.87	.86	.91	.83
Adapt2	.91	.87	.89	.89	.88	.85
Adapt3	.82	.85	.91	.89	.91	.86
Self-concept						
Intra1	.76	.76	.87	.90	.87	.87
Intra2	1.00 [a]	.93	.88	.92	.94	.96
Intra3	.41	.40	.30	.45	.35	.62
Inter1	.76	.58	.66	.67	.66	.67
Inter2	.67	.70	.80	.59	.51	.64
Inter3	.80	.72	.84	.76	.73	.68
Stress1	.78	.78	.75	.85	.69	.78
Stress2	.75	.69	.78	.81	.76	.84
Stress3	.85	.79	.84	.75	.83	.81
Adapt1	.93	.67	.80	.83	.90	.88
Adapt2	.78	.85	.82	.87	.79	.83
Adapt3	.82	.76	.86	.82	.83	.78

			Inter-Factor Correlations			
Parent-report						
Intra*Inter	.30**	.25**	.35**	.39**	.57**	.25**
Intra*Stress	.01	.10	.07	.16*	.21*	.24**
Intra*Adapt	.20*	.39**	.30**	.39**	.37**	.28**
Inter*Stress	.01	.22**	.42**	.29**	.32**	.39**
Inter*Adapt	.31**	.34**	.30**	.36**	.46**	.26**
Stress*Adapt	.15	.21**	.02	.10	.32**	.15*
Self-concept						
Intra*Inter	.35**	.16	.45**	.24**	.50**	.16*
Intra*Stress	.28**	.40**	.12	.11	.04	.04
Intra*Adapt	.35**	.36**	.18*	.22**	.26**	.33**
Inter*Stress	.19	.17	.22*	.18*	.17	.21**
Inter*Adapt	.48**	.41**	.44**	.27**	.35**	.25**
Stress*Adapt	.13	.10	.10	.10	.09	.11
Parent-Self						
Intra	.22**	.24**	.42**	.40**	.38**	.32**
Inter	.45**	.34**	.41**	.38**	.47**	.42**
Stress	.42**	.56**	.53**	.53**	.53**	.59**
Adapt	.44**	.40**	.42**	.50**	.59**	.52**

Note. Intra1-Intra3 = item parcel indicators for the Intrapersonal factor (Intra); Inter1-Inter3 = item parcel indicators for the Interpersonal factor (Inter); Stress1-Stress3 = item parcel indicators for the Stress Management factor (Stress); Adapt1-Adapt3 = item parcel indicators for the Adaptability factor (Adapt).

[a] This indicator variable was associated with negative error variance, which was constrained at zero.

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

Table 5

Standardized Path Coefficients from Structural Equation Models Testing the Dimensional Comparison Theory of EI Self-Concepts

Predictor	EI Self-Concept			
	Intrapersonal	Interpersonal	Stress Management	Adaptability
		Males, Age 9-12		
Parent: Intrapersonal	.22*	.24**	.01	.12
Parent: Interpersonal	-.01	.40**	.12	-.14
Parent: Stress Management	.10	.21*	.43**	.14
Parent: Adaptability	.02	-.06	-.05	.44**
		Females, Age 9-12		
Parent: Intrapersonal	.26**	.22*	.11	.08
Parent: Interpersonal	.13	.38**	-.03	-.06
Parent: Stress Management	.06	-.02	.58**	-.14
Parent: Adaptability	-.15	-.26**	-.12	.42**
		Males, Age 13-15		
Parent: Intrapersonal	.46**	.20*	.09	.07
Parent: Interpersonal	-.07	.38**	.13	-.19
Parent: Stress Management	.22*	.00	.47**	.10
Parent: Adaptability	-.12	-.14	.09	.45**
		Females, Age 13-15		
Parent: Intrapersonal	.41**	.03	.04	.02
Parent: Interpersonal	.03	.33**	.02	.12
Parent: Stress Management	.05	.12	.52**	.07
Parent: Adaptability	-.08	-.01	-.04	.46**

		Males, Age 16-18		
Parent: Intrapersonal	.38**	.09	.05	.12
Parent: Interpersonal	.04	.39**	-.12	-.16
Parent: Stress Management	-.06	-.06	.53**	-.08
Parent: Adaptability	-.05	.09	.08	.65**
		Females, Age 16-18		
Parent: Intrapersonal	.34**	-.03	.03	.04
Parent: Interpersonal	-.08	.36**	.09	-.14
Parent: Stress Management	.13	.17	.54**	.11
Parent: Adaptability	-.08	.00	.06	.53**

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

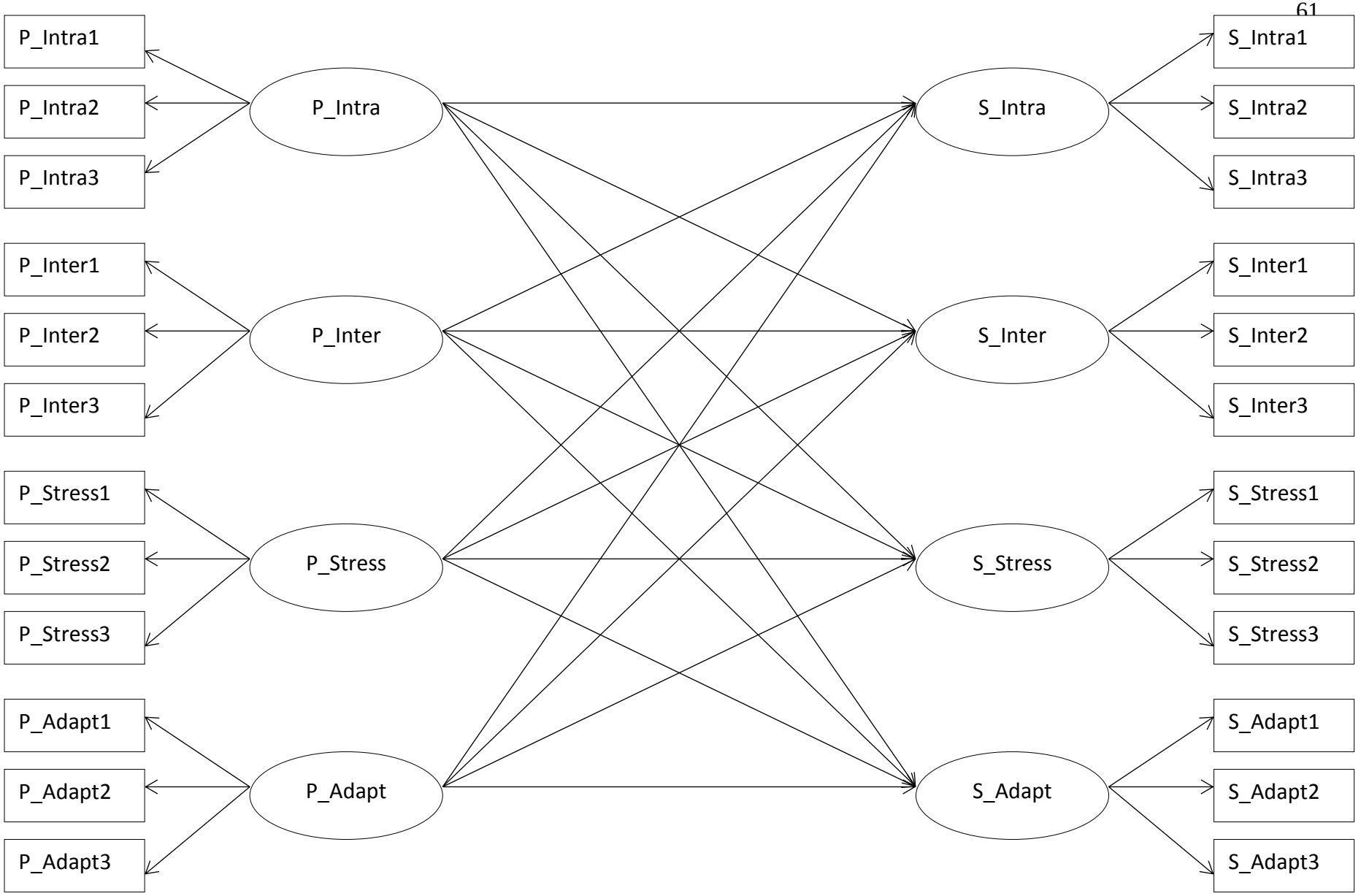
P_Intra1
P_Intra2
P_Intra3
P_Intra
P_Inter1
P_Inter2
P_Inter3
P_Inter
P_Stress1
P_Stress2
P_Stress3
P_Stress
P_Adapt1
P_Adapt2
P_Adapt3
P_Adapt
S_Intra
S_Inter
S_Stress
S_Adapt
S_Intra1
S_Intra2
S_Intra3
S_Inter1
S_Inter2
S_Inter3
S_Stress1
S_Stress2
S_Stress3
S_Adapt1
S_Adapt2
S_Adapt3

Figure 1

General structural equation model testing the Dimensional Comparison Theory as applied to EI self-concepts. Standardized solution for the measurement model can be found in Table 4. Standardized parameter estimates for the structural paths can be found in Table 5. The model includes correlated exogenous latent variables and correlated endogenous disturbance terms (not displayed in this figure). P_= Parent-report variables; S_= Self-concept variables.

APPENDIX

Abbreviated EQ-i:YV Scale Items

Interpersonal Items

1. Care what happens to others
2. Respect others
3. Like doing things for others
4. Feel good about self
5. Good at understanding how others feel
6. Sensitive to others' feelings

Intrapersonal Items

1. Easy to tell others how I feel
2. Can talk easily about feelings
3. Hard to talk about deep feelings
4. Can easily describe feelings
5. Easy to tell others what I feel
6. Trouble expressing feelings to others

Stress Management

1. Get too upset
2. Fight with people
3. Have temper
4. Hard to control anger
5. Get upset easily
6. Act impulsively when angry

Adaptability

1. Can understand hard questions
2. Can find good solutions to difficult questions
3. Take different approaches in problem solving
4. Consider all possibilities in solving problems
5. Think of many different solutions to hard questions
6. Good at solving problems

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Wilson, C. A. & **Spencer, C. J.** (2016). Review of the book *Well Aware: Developing resilient, active and flourishing students*, by P. Carney. *Canadian Journal of School Psychology, 31*, 66-70. DOI: 10.1177/0829573515600512

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