

Predicting academic achievement and cognitive ability from child and parent perceptions of
ability

by

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Abstract

Cognitive ability is the best predictor of academic achievement however, a large proportion of the variance with respect to academic achievement remains unexplained. Research has recently focused on motivational variables such as ability perceptions in an effort to better understand the unexplained variance in academic achievement. Past studies have demonstrated the importance of self-perceptions of ability in the prediction of academic achievement above and beyond general cognitive ability in multiple academic domains. Similarly, parents' perceptions of their child's ability have been shown to be a powerful predictor of the academic achievement. No studies, however, have examined both and parent perceptions of ability across a variety of domains yet. Therefore, the present study aimed to address past limitations and thereby systematically examine the extent to which children's self-perceptions of ability and parents' perceptions of their child's ability in the areas of reading, writing, mathematics, overall academic achievement and cognitive ability predicted their objectively measured ability in these areas. A sample of 23 children and their parents completed self and parent perception of ability questionnaires. Results indicated children were only able to accurately predict their own reading ability whereas parents were able to accurately predict their child's ability in the areas of writing, math, overall academic achievement, and general cognitive ability. Future research should consider including teacher perceptions of ability as a separate valuable source of information with respect to a child's academic achievement. In practice, perhaps having parents foster their child's perception of their own ability will enhance the child's self-perception and ultimately allow the child to reach their academic potential.

Preface

This thesis is an original work by Kathleen E. Kennedy. The research project, of which this thesis is a part, received ethics approval from the University of Alberta Research Ethics Board, No. Pro00066496, August 16th, 2016.

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Predicting academic achievement and cognitive ability from child and parent perceptions of ability.

Introduction

Academic achievement is considered to be a critical prerequisite for later academic and vocational success (e.g., Jimerson, Egeland, & Teo, 1999; Karbach et al., 2013; Schmidt & Hunter, 1998; Williamson, Appelbaum, & Epanchin, 1991). As a result, much research has been dedicated to the identification of both cognitive and non-cognitive variables that contribute to academic achievement. One cognitive variable that has been the focus of research with respect to academic achievement is cognitive ability. Cognitive ability typically refers to the overall score as represented by a measure of intellectual functioning. For example, one commonly used measure of cognitive ability used to assess children's intellectual functioning in Canada is the *Wechsler Intelligence Scale for Children – Fifth Edition (WISC-V^{CDN}; Wechsler, 2014)*. Several scores are generated from this measure including a Full-Scale IQ Score (FSIQ) which serves as a measure of the child's overall intellectual functioning or cognitive ability (Wechsler, 2014). For the purpose of the present discussion, cognitive ability represents and refers to an individual's overall intellectual functioning as represented by scores generated from commonly used measures of cognitive ability such as the FSIQ on the *WISC-V^{CDN}*.

With respect to cognitive variables and academic achievement, cognitive ability is the best predictor of academic achievement—accounting for approximately 50-60% of the variability in reading, writing and mathematics achievement (Veas et al., 2015; Deary, Strand, Smith & Fernandes, 2007). It is, therefore, not surprising that cognitive ability is the most studied variable used to predict academic achievement (Colom & Flores-Mendoza 2007; Lu, Weber, Spinath & Shi, 2011; Watkins, Lei & Canivez, 2007). For example, among elementary

school students, the correlation is the strongest ($r = .58$), whereas the observed correlation between cognitive ability and academic success for high school and university students is considerably weaker ($r = .24$, $r = .23$ respectively; Poropat, 2009). Although cognitive ability is an established, powerful predictor of academic achievement, there is still a large proportion of the variance with respect to academic achievement that remains unexplained. Therefore, it is important to consider other variables, aside from cognitive ability, in an effort to best support children in achieving academic success.

Motivation as a Factor in Academic Achievement

One of the non-cognitive variables that has gained a great deal of attention from researchers in explaining academic achievement is motivation. Researchers in the area of motivation are generally interested in investigating how people think and what drives their behavior (Wigfield et al., 2015). Current research focuses on an individual's beliefs, values and goals, which function as the primary influences on motivation (Eccles & Wigfield, 2002; Wigfield et al., 2006). Furthermore, an individual's level of motivation is thought to involve cognitive, conscious, and affective processes, which are at least somewhat under the control of the individual being studied (Wigfield et al., 2015).

Researchers have examined variables pertaining to motivation in an effort to determine how these variables affect achievement in various domains. Much of this research has focused on children in school settings. Children's motivations typically relate to task choice in school or other achievement settings (e.g., extracurricular activities), task persistence, strength of task engagement and task performance (Wigfield et al., 2015). In a recent meta-analysis, which aimed to determine the effect of motivation on student achievement, 205 studies were examined and the

results indicated that motivation had a low level positive effect on student achievement ($r = .27$; Özen, 2017).

Models to understand motivation. There are several models grounded in motivational theory which have been developed to better understand a child's achievement motivation or performance on tasks at which an individual could objectively succeed or fail (Wigfield et al., 2015). For example, expectancy-value theorists have used their models to conceptualize achievement motivation. Expectancy-value theories uphold the notion that behavior is a function of the expectancies one has and the value of the goal that an individual is working towards (Atkinson, 1957). An expectancy-value approach predicts that when there is more than one behavior possible, the selected behavior will be the one with the greatest combination of expected success and value. It is presumed within expectancy-value theories that people are goal-oriented individuals. Therefore, the behaviors they engage in response to their beliefs and values are undertaken to achieve some end (Atkinson, 1957). Expectancy-value theories typically focus on cultural, social or other factors that may influence a child's achievement motivation such as a child's task choice, persistence or performance (Wigfield et al., 2015).

One variable assumed to influence both the expectancy and value components of the model are ability beliefs. This type of belief, also known as competency beliefs, refer to how a child assesses his or her competence. This variable has demonstrated predictive value for academic achievement (see Spinath et al., 2006). Further, differences in child ability beliefs measured in the elementary school years have been found to predict school course, college major and occupational choices made in future years (Eccles, Vida & Barder, 2004; Musu-Gillette et al., 2014; Simpkins, Davis-Kean & Eccles, 2006).

It is further assumed within expectancy-value frameworks, that social cognitive variables such as ability beliefs are, in turn, influenced by variables such as a child's interpretation of a socializer's expectations and beliefs with respect to their task performance (Wigfield et al., 2015). A socializer refers to an individual such as a parent or teacher and it is posited that parents act as expectancy socializers for their child's ability perceptions (Eccles et al., 1983). Research has demonstrated that children's academic-related ability beliefs show increasingly strong associations with parent perceptions of their child's academic ability, measured intelligence and teacher-rated academic achievement (i.e., grades; see Spinath and Spinath, 2005).

Taken together, expectancy-value models provide researchers with a solid conceptual framework for exploring the development of achievement motivation for two reasons. First, these models include several motivation focused constructs which are discussed frequently in the field of educational psychology such as ability beliefs. Second, these models focus on various socializers' (e.g., parents) influence on achievement motivation.

Given the importance of achievement motivation in educational settings it is necessary to explore possible variables in this area, such as ability beliefs, that may contribute to academic achievement. Furthermore, children's ability beliefs or their self-perception of their own ability are important to consider when exploring predictors of achievement as inaccuracy of said perceptions can challenge achievement potential and overall goals in specific academic domains leading to a decline in psychological well-being (Freund & Kasten, 2012).

Self-Perceptions of Cognitive Ability

Self-perceptions of cognitive ability have also been under recent investigation and this area of ability belief is particularly important as self-perceptions in this area inform individual's academic and professional choices in addition to their achievement in this particular domain (von

Stumm, 2013). Additionally, individuals who underestimate their level of cognitive ability fall short of achieving their true potential as they typically tend to avoid tasks that best suit their level of cognitive ability (Dweck & Legett, 1988).

Additionally, parents' ability beliefs of their own children are also important to consider given past research results indicating the association between a child's own ability beliefs and that of their parents (Spinath & Spinath, 2005). Ability beliefs are particularly important because they are *alterable* variables, making it possible to develop interventions that can improve these beliefs to ultimately increase academic achievement. By increasing our understanding of key motivation variables such as ability beliefs that may be accounting for a substantial amount of unexplained variance in academic achievement, we have the potential to uncover a previously untapped resource for increasing academic achievement.

Given that cognitive ability remains relatively stable after the age of 6 (Watkins & Smith, 2013), it is important to focus on *alterable* variables such as those grounded in motivational theory. Increasing our understanding of individual differences in ability beliefs in various cognitive and academic domains has great potential in developing educational interventions that can increase academic achievement relatively easily compared to other instructional and cognitive interventions currently being used in schools. Therefore, ability beliefs, both child and parent, in the context of achievement motivation were explored and discussed in the present study and an expectancy-value framework was used.

Theoretical Framework: Expectancy-Value Theory

Expectancy-value theory: John Atkinson (1964). Achievement motivation theorists typically focus on an individual's achievement task choice, task persistence, and task performance (Eccles et al., 1983). To date, there have been a wide range of constructs posited by

achievement motivation theorists. All of these constructs attempt to explain the mechanism through which motivation influences choice, persistence and performance surrounding a particular task. One long-standing and well-developed perspective involving motivation, as briefly discussed above, is expectancy-value theory. Theorists in this area argue that an individual's choice, persistence, and performance on a task can be explained through the beliefs they hold with respect to how well they will do on said task in addition to the extent to which they value the task (Eccles et al., 1983).

John Atkinson (1964) was the first theorist to develop a formal expectancy-value model in an effort to account for individuals' motivation in situations involving achievement. Through the development of his model, Atkinson aimed to explain various achievement-related behaviors including striving for success, choice of achievement task and persistence on the task. Atkinson (1964) firmly held that these behaviors in particular, resulted from an individuals' achievement motives.

Atkinson's (1964) theory of achievement motivation is explained using a mathematical formula. In its simplest form, the theory states that the tendency to approach an achievement-specific goal (T_s) is a product of the following three factors. The first factor is the need for achievement, which Atkinson (1964) further identifies as the motive for success (M_s). The second factor is the probability or likelihood that one's efforts will be successful in completion of the task (P_s). Finally, the third factor is the incentive value of successfully completing the task (I_s). Overall, these three factors were assumed to be multiplicatively related:

$$T_s = M_s \times P_s \times I_s$$

Atkinson hypothesized that I_s is inversely related to P_s because incentive value of success (i.e., I_s) was presumed to be affective in nature. Atkinson (1964) further reasoned that greater

values of I_s , are experienced following success at a difficult task where the probability of success is lower (i.e., low P_s). Conversely, smaller values of I_s were presumed to be experienced following success at a less difficult task where the probability of success is higher (i.e., high P_s). Therefore, probability and incentive were specified to be negatively related. This presumption and the manner through which the variables are multiplicative in nature introduced numerous motivational consequences. First, motivation was presumed to vary as a function of the probability of success (i.e., P_s) at the task. Second, Atkinson (1957) further hypothesized that the higher the value of M_s or the greater the desire to succeed the greater the draw is to tasks of intermediate difficulty. Moreover, the extent to which an individual placed value in achievement success, the more likely the individual would be to select a task of a particular level of difficulty (e.g., low, intermediate). This theory had many implications for classroom related motivation. Atkinson's empirical work was primarily focused on achievement motivation and therefore this theory was particularly influential in the field of educational psychology with many researchers in this area using it as the foundation for the development of modern expectancy-value theories.

Modern expectancy-value theory. Modern expectancy-value theories differ from that of Atkinson's (1964) model in two ways. First, both expectancy and value have been extended to include a wide range of psychological and social factors. Second, Atkinson (1964) proposed that expectancy and value components are inversely related. However, in modern expectancy-value theories, these components are considered to be positively related. One expectancy-value approach that has been expanded and tested within educational contexts, such as elementary school, is the motivational model of achievement performance and choice by Eccles and her colleagues (Eccles et al., 1983; Wigfield & Eccles, 2000; Eccles, 2005, 2009). This model was initially studied in the domain of mathematics. The model is presented in Figure 1.

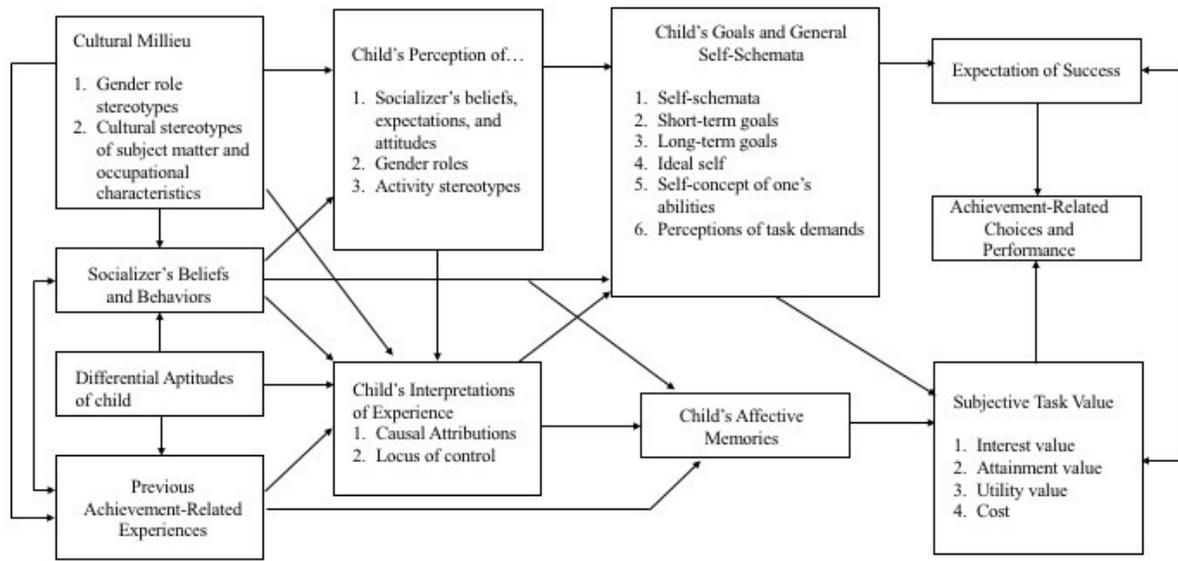


Figure 1. Eccles and colleagues' motivational model of achievement performance and choice (Eccles et al., 1983).

Within this model, achievement-related choices are assumed to be influenced by both positive and negative task characteristics. Furthermore, all task choices are assumed to have associated costs as a result of one choice typically removing opportunities to select other task options. As a result, the relative value of the task and the probability of success of the various available options are crucial components of an individual's choice (Eccles et al., 1983).

In the most recent version of the model (see Figure 1), the authors have postulated that both expectancies and values directly influence performance, persistence and task choice which is characteristic of the majority of expectancy-value models (Eccles et al., 1983). Both expectancies and values are further assumed to be influenced by task-specific beliefs. These beliefs include, but are not limited to, perceptions of competence, perceptions of task difficulty, in addition to goals specific to an individual and self-schema. This model further expands that of

Atkinson's (1964) expectancy-value theory as it includes such social cognitive variables as perceptions of ability. This model also postulates that these social cognitive variables, in turn, are also influenced by external variables including an individual's perceptions of other individual's attitudes and expectations they hold for them, in addition to affective memories, and the individual's beliefs regarding their own previous achievement experiences (Eccles et al., 1983). Finally, it is also postulated by the authors that an individual's beliefs regarding their own previous achievement experiences are additionally influenced by external individual's behavior and beliefs as well as the individual's social environment and unique cultural experiences the individual may or may not have experienced (Eccles et al., 1983).

Expectancy of success. Eccles and colleagues (1983) defined and measured expectancies for success. This construct was defined as an individual's belief with respect to how said individual will perform on an approaching task with the emphasis being placed on the future, either immediate or long-term (Eccles et al., 1983). These beliefs involving expected performance are often regarded as analogous to measures of Bandura's (1977) personal efficacy expectations. However, in contrast to Bandura's assertion that expectancy-value theories focus on expectations of outcome, the focus in this modern expectancy-value model is on personal or efficacy expectations.

Eccles and colleagues (1983) defined self-perceptions of ability as an individuals' own assessment of their ability to perform a task relative to a certain group. For example, if a child is reporting their self-perception of their ability in a particular domain their comparative group may be that of children their own age. Self-perceptions of ability (i.e., ability beliefs) are not formed solely on the basis of the feedback received from past achievement outcomes. Although domain-specific, past research has found no relationship between self-perceptions of ability in domains

that are often positively correlated in terms of achievement outcomes (e.g., Marsh, 1986).

Therefore, these perceptions are not entirely influenced by internalized feedback from achievement outcomes. Instead, self-perceptions of ability are also influenced by other people's attitudes and expectancies for them such as parents or teachers (Eccles et al., 1983). Within the model, Eccles and colleagues refer to those 'other people' as socializers.

Expectancy beliefs differ conceptually from that of ability beliefs such that expectancy beliefs place emphasis on future competence, with ability beliefs placing emphasis on the present or current competence (Eccles et al., 1983). However, although different in terms of how each construct is defined and measured, empirical work has demonstrated that children and adolescents do not distinguish between expectancy beliefs and self-perceptions of ability (Eccles et al., 1983). Despite the fact that these two constructs can be distinguished between on a theoretical level, in real-world or laboratory simulated achievement situations they are considered to be highly related and to date have not been able to be distinguished empirically. Items typically used to assess expectancy beliefs and self-perceptions of ability (i.e., ability beliefs) in the context of assessing these beliefs in children in the domain of mathematics are located in Table 1 (Wigfield & Eccles, 1992).

Table 1.

Items used to assess child's ability beliefs.

Expectancy Belief Items

1. How well do you expect to do in math? (not at all well very well)
2. How good would you be at learning something new in math? (not at all good very good)

Ability Belief Items

1. How good in math are you? (not at all good very good).

2. If you were to list all the students in your class from the worst to the best in math, where would you put yourself? (one of the worst one of the best).
 3. Some kids are better in one subject than in another. For example, you might be better in math than in reading. Compared to most of your other school subjects, how good are you in math? (a lot worse in math than in other subjects a lot better in math than in other subjects).
-

The definitions specific to self-perceptions of ability are often compared to that of related constructs in the literature. For example, in Weiner's (1985) attribution theory, it was proposed that an individual's perception or view of their own ability was a relatively stable characteristic that the individual has little control over. Weiner (1985) argued that important motivational consequences occur as a result of attributions made by an individual with respect to their own ability with positive motivational consequences resulting from attributing success to a particular ability and negative motivational consequences resulting from attributing failure to lack of a particular ability (Weiner, 1985). Similarly, in Covington's 1992 self-worth model, he also focused on individuals' ability beliefs. Covington (1992) argued that in an effort to ultimately preserve self-worth individuals attempt to do so by maintaining a positive sense of ability. Like Weiner, Covington also identified self-perceptions of ability as a relatively stable characteristic. Covington (1992) emphasized the importance of developmental considerations based on past empirical work (e.g., Nicholls, 1990) such that children's understanding of the ability construct or their self-perceived level of their own ability may vary according to developmental stage of the child.

Intrinsic value. With regard to the value portion of the expectancy-value model, intrinsic value is the dimension which represents the value component of the model. Intrinsic value refers

to the extent to which a person engages in a task for reason aside from task completion such as enjoyment (Eccles et al., 1983). Similar to self-perceptions of ability, past research has demonstrated intrinsic value to be domain specific beginning in the early school years (Wigfield et al., 1997). Children as early as first grade have demonstrated the ability to differentiate between their feelings of competence, self-perceptions of ability, as discussed above, and the value they assign to different tasks (Wigfield & Eccles, 2000). Moreover, the Eccles model suggests that self-perceptions of ability are strong predictors of academic achievement. Conversely, intrinsic value does influence academic achievement related choices however, this value may not predict academic achievement if there is no choice to be made (Eccles et al., 1983). Furthermore, the increment in variance with respect to intrinsic value in studies which included both self-perceptions of ability and intrinsic value was rather small (i.e., 3-6%; Spinath et al., 2006) therefore demonstrating that it has far less of an influence on academic achievement. The Eccles-model posits that self-perceptions of ability are the main component that influences future achievement from an expectancy-value perspective and therefore for the purpose of the present study and discussion only self-perceptions of ability from the model were explored.

Socializers. Within this model socializers (i.e., parents) are posited to act as expectancy socializers for their children's self-perceptions of ability. Parents can hold many child-specific and domain-specific beliefs such as the importance of math for their children's future endeavors in addition to how skilled they believe their child is in this particular domain (Wigfield et al., 2015). Thus, this additional source of information with respect to a child's own perception of their ability is important to consider in the context of this model and more importantly with respect to achievement outcomes.

In sum, the Eccles et al., (1983) model as a result of its applicability in academic achievement contexts provides a strong framework to consider when examining motivational variables such as ability and socializer beliefs that may contribute to academic achievement. Therefore, this model and its associated constructs were the main focus for the purpose of the present study and discussion.

Perceptions of Ability

Child Perceptions. One motivational variable that has emerged within the literature are a child's self-perception of his or her ability or their belief in their competence with respect to completing a particular task (e.g., mathematics). Research in this area has demonstrated the importance of self-perceptions of ability in the prediction of school achievement above and beyond cognitive ability in the academic ability areas of English, mathematics, science, German and overall academic achievement (see Greven et al., 2009; Schicke & Fagan, 1994; Spinath et al., 2006; Weber et al., 2013). These results therefore demonstrate the important contribution of this variable to a child's academic success. In a study by Chamorro-Premuzic et al., (2009), a group of adolescents ($M = 14.33$ years) completed a questionnaire with respect to their self-perceptions of cognitive ability (i.e., intelligence). Results indicated that pupils were reasonably accurate at estimating their own cognitive ability test results (Chamorro-Premuzic et al., 2009).

Parent Perceptions. Parents' perceptions of their child's ability has emerged as a separate source of valuable information with respect to predicting a child's academic achievement. The research to date has indicated that parents' beliefs are critical in setting the stage for a child's motivation development by providing various activities or resources at home that may prompt children to pursue various activities over time (Wigfield et al., 2015). Evidence has begun to emerge which shows that assessment of their child's abilities is a consistent and

powerful predictor of the academic achievement of their children (Simpkins et al., 2015, Wigfield et al., 2006). Further, previous research has indicated a strong association between a child's own ability beliefs and that of their parents (Spinath & Spinath, 2005).

With respect to parental estimates of cognitive ability, this has only been researched in an adolescent population. Chamorro-Premuzic et al., (2009) examined the accuracy of parent-estimated cognitive ability in a sample of 187 adolescents ($M = 14.33$ years) and their parents. Results indicated that both parents (e.g., mothers and fathers) significantly over-estimated their child's cognitive ability with the over-estimation more pronounced in fathers than that of mothers (Chamorro-Premuzic et al., 2009).

Limitations of Previous Research

These studies however present several limitations. First, the generalizability of previous findings is limited as a result of not using objective measures of academic achievement. Objective measures of cognitive ability, or adapted measures of standardized tests of cognitive ability were used, however this was not the case for academic achievement. The studies relied on grades as reported by the parents or teachers. The purpose of standardized tests is to assess an individual's knowledge base in a particular academic or cognitive domain (e.g., mathematics and cognitive ability). Within standardized testing, it is assumed that the content and the conditions under which the test is administered will be the same for all test-takers. With this uniformity, a certain level of objectivity is achieved which is not observed for non-standardized tests. Additionally, previous research on standardized tests used widely in Canada, such as the *Wechsler Intelligence Scale for Children – Fifth Edition* and the *Wechsler Individual Achievement Test – Third Edition* (Wechsler, 2014, 2009), have presented with strong validity evidence and psychometric qualities. Finally, these measures are norm-referenced, which allows

for an individuals' knowledge or skills to be compared to a nationally representative sample of same age or grade peers.

A second limitation is that no study to date has systematically examined the extent to which both children and parents' ability perceptions of achievement in the areas of reading, writing, mathematics, overall academic achievement and cognitive ability in a sample of children ages 6-12 in Canada. Past studies have focused primarily on achievement at specific grade levels (e.g., grade 5) as opposed to using a broader age-range. By expanding the age range to include children ages 6-12 it allows for the possibility of observing developmental changes in a child's ability to accurately perceive and predict their own achievement outcomes across this particular age range.

Additionally, in a recent chapter discussing the development of achievement motivation and engagement Wigfield and colleagues (2015) highlighted the need for research into domain specificity of achievement related motivation constructs such as self-perceptions of ability. Studies to date are typically limited to a single area of achievement (e.g., math) More specifically, the authors called for research investigating these motivation constructs across various domains as it has been documented that performing better in one subject area (e.g., math) has consequences for ability beliefs and preferences for other subject areas (e.g., reading) (Marsh et al., 2008). Therefore, more work is needed to systematically look at cross-domain ability beliefs to better understand how these domain-specific beliefs may be impacting achievement outcomes.

Overall, research into motivational variables such as self and parent perceptions of ability in various domains will contribute to the growing body of knowledge with respect to variables that influence academic achievement. Self-perceptions of ability are an important and needed

area of focus within educational psychology as these variables are *alterable* unlike cognitive ability which has demonstrated relative stability after the age of 6 (Watkins & Smith, 2013). The results of this study therefore will contribute to the field by providing valuable information with respect to these *alterable* variables that have the potential to increase a child's academic achievement in a variety of domains.

Present Study

The purpose of the present study was to address past limitations and thereby systematically examine the extent to which children's self-perceptions of their own ability and parents' perceptions of their child's ability in the areas of reading, writing, mathematics, overall academic achievement and cognitive ability predict their objectively measured ability in these areas. Thus, the present study examined the following research questions:

- 1) To what extent do children's self-perceptions of ability in the core curricular areas of reading, writing, and mathematics predict their measured academic achievement in these areas?
- 2) To what extent do parent's perceptions of their child's ability in the core curricular areas of reading writing and mathematics predict their measured academic achievement in these areas?
- 3) To what extent do children's self-perceptions of their overall academic ability predict their measured total academic achievement?
- 4) To what extent do parent's perceptions of their child's academic ability predict their measured total academic achievement?
- 5) To what extent do children's self-perceptions of their cognitive ability predict their measured cognitive ability?

- 6) To what extent do parent's perceptions of their child's cognitive ability predict their child's measured cognitive ability?

Method

Participants

Participants were 23 children aged 6-11 years ($M = 8.70$, $SD = 1.46$). The sample consisted of 11 females and 12 males. Participants were recruited from an Education Clinic at a university in Western Canada. Potential participants had been referred for a psychoeducational assessment to be completed by a student clinician under the supervision of a Registered Psychologist. Parent participants consisted of mothers ($N = 19$), fathers ($N = 2$) and adoptive parents ($N = 2$).

Procedure

The study was reviewed and accepted by the University Research and Ethics Board (ID: Pro00066496). Participants were referred to the Education Clinic at the aforementioned Western Canadian University for a psychoeducational assessment. Each assessment was completed by either a student clinician taking part in a psychoeducational assessment practicum course in partial fulfilment of master's-level degree requirements or a senior associate clinician completing their internship in partial fulfillment of doctoral-level degree requirements. Each student clinician, or senior associate clinician, was closely supervised by a registered psychologist.

The psychoeducational assessment consisted of an intake interview with parents and/or guardians, a 1:1 assessment in which standardized measures (e.g., a test of cognitive ability), were administered and a debrief session in which the results of the assessment were communicated to parents and/or guardians. All clinicians were instructed on the procedures of the study as approved by the ethics committee by the principal investigator.

During the initial intake interview parents were provided with an information letter (see Appendix A) and consent form (see Appendix B) by the clinician conducting the psychoeducational assessment. Once consent was obtained, parents were provided with a questionnaire which measured their perception of their child's ability in the areas of reading, writing, mathematics, overall academic achievement, cognitive ability, and a demographics questionnaire (see Appendix C).

Prior to beginning the psychoeducational assessment, the clinicians obtained assent from each child participant to complete the child self-perception of ability questionnaire. Clinicians completed the questionnaire with each child. All questionnaires, both parent and child, were returned to the principal investigator following the assessment. Once all standardized measures were scored, the principal investigator collected the standard scores necessary for analysis from the tests of cognitive ability and academic achievement.

Measures

There were 15 variables of interest related to the aforementioned research questions. The predictor variables included: children's self-perception of ability in the areas of reading, writing, mathematics, overall academic achievement and cognitive ability, parent's perception of their child's ability in the areas of reading, writing, mathematics, overall academic achievement, and cognitive ability. The dependent variables included: standard scores based on results from standardized assessment measures in the areas of reading, writing, mathematics, overall academic achievement and cognitive ability.

Children's self-perceptions of ability. Children's self-perceptions of ability were assessed by means of a five-item questionnaire (see Appendix D) with each item targeting one of the five main areas of ability performance: reading, writing, mathematics, overall academic

achievement and cognitive ability. For reading, writing and mathematics children were asked to indicate on a 3-point Likert scale, ranging from 1 not good to 3 very good, how good they think they are in a particular area compared to other kids in their class. For example, *“How good do you think you are at reading compared to other kids in your class?”* For academic achievement children were asked to indicate on the same scale, *“How good do you think you are at schoolwork compared to other kids in your class?”* Finally, for cognitive ability, children were asked to indicate on a 3 point Likert scale ranging from 1, not smart to 3, very smart, *“How smart do you think you are compared to other kids in your class?”* The word smart was used as an alternative to cognitive ability in an effort to develop an item that would be developmentally appropriate for children ages 6-12 to complete.

Parent perceptions of their child’s ability. Parent perceptions of their child’s ability were assessed by means of a five-item questionnaire (see Appendix E) with each item targeting one of the five main areas of ability performance: reading, writing, mathematics, overall academic achievement and cognitive ability. For reading writing and mathematics parents were asked to indicate on a 5-point Likert scale, ranging from 1 low to 5 superior, how they would rate their child’s ability in a particular area compared to other children in their child’s grade. For example, *“Compared to other children in their grade, how would you rate your child’s reading ability?”* For academic achievement, parents were asked to indicate on the same scale, *“compared to other children in their grade, how would you rate your child’s overall academic achievement?”* Finally, for cognitive ability, parents were asked to indicate on the same scale *“compared to other children in their grade, how would you rate your child’s cognitive development (intelligence)?”*

Academic achievement. Participants, for the most part were administered the *Wechsler Individual Achievement Test – Third Edition* (WIAT-III^{CDN}; Wechsler, 2009) with the exception of three participants who were administered the *Woodcock-Johnson Tests of Achievement – Fourth Edition* (WJ IV ACH; Schrank, McGrew & Mather, 2014).

WIAT-III^{CDN}. The WIAT-III is an individually administered standardized, norm-referenced test of academic achievement for children and adolescents 4:00 – 19:11 years of age. The WIAT-III consists of several composite scores in the areas of oral language, reading, written expression and mathematics that make up a total achievement score. A child's score is compared to that of same-age peers based on Canadian normative information. For the purpose of the present study the total reading, written expression and mathematics composite standard scores were used in addition to the Total Achievement score. The internal consistency reliability coefficients were calculated with the formula for the reliability of a composite recommended by (Nunnally, 1978). The average calculated coefficients for children ages 6-12 for the total reading, written expression, mathematics and total achievement composites were .98, .94, .95, and .98 respectively.

WJ IV ACH. The WJ-IV Tests of Achievement is an individually administered, norm referenced test that assesses individual abilities in a number of core and applied academic domains. In the present study the composite standard scores of broad reading, broad written language, broad mathematics and broad achievement were used. An individual's score is compared to same-age peers based on American normative information. The median reliability coefficients for the broad reading, broad written language, broad mathematics and broad achievement calculated using Mosier's (1943) formula were .97, .95, .97 and .99 respectively.

Cognitive ability. Participants for the most part were administered the *Wechsler Intelligence Scale for Children – Fifth Edition* (WISC-V^{CDN}; Wechsler, 2014) with the exception of two participants who were administered the *Stanford-Binet Intelligence Scales – Fifth Edition* (SB-5; Roid, 2003).

WISC-V^{CDN}. The WISC-V^{CDN} is an individually administered, norm-referenced test of cognitive ability for children and adolescents ages 6:00-16:11 years of age. The WISC-V^{CDN} consists of five index or composite scores which target verbal comprehension, visual spatial, fluid reasoning, working memory and processing speed abilities. These five index scores contribute to the Full Scale IQ (FSIQ) score which represents an individual's overall cognitive ability. An individual's score is compared to that of same-age peers based on Canadian normative information. The FSIQ standard score was used for the purpose of this study. The internal consistency reliability coefficient was calculated using the Fisher *z* transformation with the average coefficient for children ages 6 through 12 for the FSIQ was .96.

SB-5. The SB-5 is an individually administered, norm-referenced test of cognitive ability for individuals ages 2:0-85:00+ years. The SB-5 provides an overall summary of one's current ability to reason, solve problems, and adapt to the cognitive demands of their environment. An individual's performance on the SB-5 is interpreted in terms of an overall Full Scale IQ score which is then broken down into two main areas: Nonverbal IQ (NVIQ) and Verbal IQ (VIQ). An individual's score is compared to that of a same-age peer based on American normative information. For the purpose of the present study the FSIQ standard score was used. The internal consistency reliability coefficients were calculated using a formula for reliability of a sum of multiple tests recommended by Nunnally (1967 p., 229). The average reliability coefficient for children ages 6-12 for the FSIQ was .97.

Results

Descriptives

The median values for the child and parent perceptions of ability questionnaires in addition to the standard scores for all standardized measures administered during the psychoeducational assessment are presented in Table 2.

Median values for all measures.

	<i>Median</i>
<i>Child Perceptions</i>	
Reading	2.00
Writing	2.00
Mathematics	2.00
Total Achievement	2.00
Cognitive Ability	2.00
<i>Parent Perceptions</i>	
Reading	3.00
Writing	2.00
Mathematics	3.00
Total Achievement	3.00
Cognitive Ability	4.00
<i>Standardized Measures</i>	
Reading*	93.00
Writing*	97.00
Mathematics*	97.00

Total Achievement*	98.00
Cognitive Ability*	103.00

Note. * Standard scores based on $M = 100$, $SD = 15$

Regression Analyses

Children's self-perceptions of ability. Five regression models were constructed to determine the extent to which children's self-perceptions of ability in the areas of reading, writing, mathematics, total academic achievement and cognitive ability predicted their measured ability in these areas (see Table 3).

Table 3.

Children's self-perception of ability models.

	Outcome Variable	β	t	p	R^2
Model 1	Reading	.62	3.60	.00*	.38
Model 2	Writing	-.08	-.37	.72	.01
Model 3	Mathematics	.36	1.75	.10	.13
Model 4	Total Achievement	.41	1.95	.07	.17
Model 5	Cognitive Ability	.36	1.77	.09	.13

Data was screened and assumptions were checked. Results indicated that children's self-perceptions of reading ability significantly predicted reading scores with 38% of the variability in reading scores accounted for by the children's self-perceptions of ability in reading. However, results demonstrated that children's self-perceptions of ability in the areas of writing, mathematics, overall academic achievement and cognitive ability did not significantly predict scores in these four areas

Parent perceptions of their child's ability. Five regression models were constructed to determine the extent to which parent perceptions of their child's ability in the areas of reading, writing, mathematics, total academic achievement and cognitive ability predicted their child's measured ability in these areas (see Table 4). Data was screened and assumptions were checked. Results showed that parent's perceptions of their child's writing ability significantly predicting writing scores with 31% of the variability in writing scores accounted for by the parents' perception of their child's ability in writing. With respect to mathematics, parents' perception of their child's writing ability significantly predicted writing scores with 28% of the variability in writing scores accounted for by parents' perceptions of their child's writing ability.

Table 4.

Parent perceptions of child's ability models.

	Outcome Variable	β	t	p	R^2
Model 1	Reading	.31	.47	.16	.09
Model 2	Writing	.56	.92	.01*	.31
Model 3	Mathematics	.53	.89	.01*	.28
Model 4	Total Achievement	.62	.31	.00*	.38
Model 5	Cognitive Ability	.43	.10	.05*	.18

Similarly, for overall academic achievement, parents' perceptions of their child's ability in this area significantly predicted total achievement scores with 38% of the variability of scores in this area accounted for by the parents' perceptions of their child's ability. Parents' perceptions of their child's cognitive ability significantly predicted scores in this area with 18% of the variability in cognitive ability accounted for by the parents' perceptions of their child's cognitive

ability. Parent perceptions their child's reading ability however, was not found to be a significant predictor of scores in this area.

Discussion

The purpose of the present study was to increase our understanding of key motivational variables that may account for a proportion of the unexplained variance in academic achievement. An expectancy-value theoretical framework was used and child perceptions of ability and parent perceptions of their child's ability in the areas of reading, writing, mathematics, overall academic achievement and cognitive ability were used as the key variables the present study. Moreover, the present study aimed to address past limitations and thereby examine the extent to which children's self-perceptions of their own ability and parents' perceptions of their child's ability in the aforementioned ability areas predicted their measured ability in these areas.

Child self-perceptions of ability. Results indicated that children were only able to accurately predict their own reading ability. These results are inconsistent with past research, given that other studies have demonstrated the importance of self-perceptions when predicting performance in English, math, science, German, as well as overall academic achievement respectively (Greven et al., 2009; Schicke & Fagan, 1994; Spinath et al., 2006; Weber et al., 2013). Children may have been able to accurately predict their own reading given that reading is considered a fundamental skill in Western cultures and parents often begin reading instruction prior to school admission (Eccles et al., 1983). As a result of this, children may be more familiar with their own reading abilities given the early exposure to this domain and are therefore able to more accurately assess their own reading ability.

The capacity to self-perceive one's ability on tasks of different levels of normative difficulty is reported to require the concrete operational capability of coordinating relations (Nicholls, 1978). According to Jean Piaget's theory of cognitive development this capacity develops during the concrete operational stage which takes place from ages 7-11 (Piaget, 1971). Given that the mean age of the sample in the present study was 8 years 7 months, these children have not completed the concrete operational stage and therefore may not have fully developed the capacity to self-perceive their own ability in a variety of areas. In contrast, previous studies with respect to adolescents have demonstrated that this population were reasonably accurate in estimating their own cognitive ability test results (Chamorro-Premuzic et al., 2009). In the context of Piaget's theory, this is to be expected as adolescents have passed through the concrete operational stage of cognitive development and therefore have the operational capacity to coordinate relations.

Parent perceptions of their child's ability. With regard to the parent perceptions of their child's ability results, parents were able to accurately predict their child's writing, math, total achievement and cognitive ability scores. These results are consistent with past research that has demonstrated that parent's assessment of their child's abilities is a consistent and powerful predictor of the academic achievement of their children (Simpkins et al., 2015, Wigfield et al., 2006). However, parents were not able to accurately predict their child's reading ability, which is inconsistent with past research results. This result was surprising given the emphasis placed on reading in school curricula and the required ability to read to be able to complete higher order tasks, such as writing, which is an ability area that parents accurately predicted. Also, it is possible that as a result of many parents beginning reading instruction prior to school admission

coupled with the emphasis placed on reading in school, they rely less on monitoring this ability and therefore are not able to accurately predict their child's reading ability.

Additionally, with respect to cognitive ability, parents in the present study more accurately estimated their child's cognitive ability as in past research both parents (e.g., mothers and fathers) significantly over-estimated their child's cognitive ability with the overestimation more pronounced in fathers than that of mothers (Chamorro-Premuzic et al., 2009). In terms of the more pronounced over-estimation in fathers than mothers it could be explained perhaps in terms of the factors mothers and fathers consider when assessing their child's ability. For example, some studies have shown that a mother's line of thinking with respect to her child's ability is more dependent on gender stereotypes, whereas a father's line of thinking relies more on a child's academic achievement (Frome & Eccles, 1998).

Do Perceptions of Ability Matter?

A child's perception of their own ability is a valuable motivational variable to consider when exploring predictors of academic achievement or cognitive ability, as inaccuracies of children's perceptions can alter achievement potential and overall goals in specific academic and cognitive domains (von Stumm, 2013). For example, individuals who underestimate their achievement potential can fall short of their true potential and furthermore tend to avoid tasks that best suit their achievement and ability levels (Dweck & Legett, 1988). Self-perceptions also inform individual's academic and professional choices in addition to their achievement in a particular domain thus making this source of information particularly valuable in helping a child reach his or her true achievement potential (von Stumm, 2013).

Implications for Practice. Given the results of the present study, parents are able to accurately predict their child's measured ability in a variety of domains. The children, however,

are only able to do so in the area of reading. A child's self-perception of their own ability is an *alterable* motivational variable. For example, according to the Eccles and colleagues (1983) model of achievement related choices, parents hold beliefs and engage in behaviors that have the ability to shape their child's achievement related motivation. Empirically, past studies have demonstrated an association between a child's own ability beliefs and the beliefs their parents hold with respect to their abilities (e.g., Spinath & Spinath, 2005) Therefore, in practice having parents discuss or foster their child's perception of their own ability will enhance the child's self-perceptions of their own ability, or in other words *alter* the perception and ultimately allow the child to achieve their true academic potential.

Directions for Future Research

Teachers as socializers. The Eccles and colleagues (1983) expectancy-value model suggests that, in addition to parents, teachers are also posited to act as expectancy socializers for their student's self-perceptions of ability. Moreover, teachers function as socializers in the context of this model as it is hypothesized that children's self-perceptions of ability are influenced by teacher's attitudes and expectancies for them (Eccles et al., 1983). Past research has included teacher reported academic achievement in the form of grades (e.g., Spinath & Spinath, 2005) however it has not focused on how teachers formally report their own perceptions of their student's reading ability relative to other students in the class. Given that teachers also function as expectancy socializers in the model, future research could explore whether or not teachers' perceptions of their student's ability can accurately predict the child's measured performance to the same extent or perhaps even better as parents in multiple ability domains.

Parent attitudes. Future research should examine the influence of parents' attitudes towards particular domains, and their child's self-perception of and performance in that

particular area. For example, Bleeker and Jacobs (2004) found that mothers with more traditional stereotyped beliefs about math had lower confidence in their daughters' math abilities than mothers with less traditional beliefs. Mothers with a more traditional stereotyped belief about math, for example, may, as socializers, influence the female child's self-perception of ability in this area. This in turn, may negatively impact the child's true academic potential in this particular area. Therefore, future research should consider parents' attitudes towards particular domains when investigating self-perceptions of ability.

Overlap of motivation models. There is much overlap between models within the motivation literature when referencing the construct of self-perceptions of ability. For example, in Weiner's (1985) attribution theory he argues that important motivational consequences occur as a result of attributions made by an individual with respect to their own ability. Future research should examine overlap of these constructs and how they are measured in an effort to better understand children's self-perceptions of ability.

Limitations

The results of this study need to be considered in light of the following four limitations. First, the sample size for the present study was small ($N = 23$). Participants were recruited from an Education Clinic at a Western University after being referred for a psychoeducational assessment. Many of the referrals made to the clinic to see either a student or senior associate clinician were outside of the age-range selected for the purpose of the present study and therefore these clients were not able to participate in the study. Additionally, given that student and senior associate clinicians only see clients for psychoeducational assessment for the most part from September to March (i.e., the school year) this also contributed to the smaller sample size.

A second limitation was that not all participants were administered the same measure of academic achievement or cognitive ability. For the most part participants were administered the *WIAT-III^{CDN}* for academic achievement or the *WISC-V^{CDN}* however two participants were administered the *WJ-IV ACH* for academic achievement and the *SB-5*. The *WIAT-III^{CDN}* and the *WISC-V^{CDN}* rely on Canadian normative information whereas the *WJ-IV ACH* and the *SB-5* rely on U.S normative information. Future research should only administer one measure of academic achievement and cognitive ability to allow for a direct comparison of scores.

A third limitation was that the present study did not account for pre-existing diagnoses, reasons why each student was referred for a psychoeducational assessment, and diagnoses that may or may not have been made on the basis of assessment results. These factors may have influenced the results. The Eccles' et al., (1983) expectancy-value model posits that children's self-perceptions of ability are influenced not only by the beliefs or expectancies of socializers such as parents or teachers but also on the basis of the feedback from past achievement outcomes. If a child was referred for a psychoeducational assessment for concerns with respect to his or her ability in the area of mathematics, past achievement outcomes in this domain may be influencing his or her self-perceptions in this area. Therefore, the child may be forming a more negative self-perception of ability in this particular domain based on receiving negative feedback in this domain leading the child to form the belief that he or she is "not good" or unable to adequately complete mathematics related tasks. Since we did not account for past diagnoses, reason for referral or diagnoses made based on assessment results we cannot be sure the extent to which these variables influenced the child's self-perception of ability in the domains addressed in the present study.

The fourth and final limitation in the present study is that single items were used to represent both child and parent perceptions of ability in the areas of reading, writing, mathematics, overall academic achievement and cognitive ability. For example, with respect to children's self-perceptions of reading, the item "*Compared to other children in their grade, how would you rate your child's reading ability?*" was used. As a result of using single items, it is possible that items did not adequately measure the construct of child self-perceptions of ability in the area of reading. Furthermore, as a result of using single items we were unable to examine the coefficient alpha to determine reliability. Future research should consider adding multiple items that address various component skills of reading (e.g., basic reading, reading comprehension), for example, in an effort to more adequately examine the construct in question and to ultimately calculate coefficient alpha to determine reliability.

Conclusion

This study, subject to the limitations as stated above, concluded that children's self-perceptions of ability in various areas was not a good indicator of their measured performance other than in the area of reading. It is interesting to note that the parents' perception of their child's ability in the broader areas was a much stronger indicator of than that of the children.

This study did not include teacher perceptions of abilities and future research is recommended in such a manner that one may conclude that this is a valuable source of information with respect to alterable motivational variables which influence academic achievement. Any such study should include the perceptions of the child, the parent, and the teacher so that valuable comparisons may be made.

If the goal is to allow each child to achieve their true academic potential, and if alterable motivational variables are to be a factor in this the results of this study would suggest that the

child's perception particularly in the area of reading in the early years is checked as soon as possible. In the clinical and educational areas, early reading intervention is recommended in order to identified inaccuracies in self-perceptions that may be contributing to the child not reaching their true academic potential in the area of reading. The results of the present study also suggest that parents should be encouraged to participate in this process, again at an early age in order to ensure that intervention is made at the appropriate time in order to aid the child in accurately estimating his or her ability in an effort to increase academic achievement in a variety of areas.

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Appendix A

Information Letter

Study Title: Self and parent perceptions of ability in children.

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Background: I, Kathleen Kennedy, am a Master's student in the Department of Educational Psychology. As a part of my degree I am conducting research under the supervision of Dr. Damien Cormier. I am inviting you to participate in my study. Below is a summary of the study. If you agree to participate, please complete and the attached form.

Purpose of Study: Motivation plays a key role in a child's academic success. A child's view of their ability to perform a task is a component of motivation. A child's perspective of their abilities can also predict academic skills. The current study aims to explore this relationship further. Parents' views of their child's abilities and actual performance will also be explored. Academic skills of interest include reading, writing, and mathematics.

Study Procedures: Children will complete a brief five-item questionnaire. Each item will ask them how "good" they are at a task. Parents will complete a similar questionnaire asking them to identify how "good" their children are at a task. We will also obtain scores from measures given by the student clinician in the Education Clinic. These measures include the Wechsler Intelligence Scale for Children – Fifth Edition (WISC-V), The Wechsler Individual Achievement Test – Third Edition (WIAT-III) and/or the Woodcock-Johnson IV Tests of Achievement (WJ-IV).

Benefits: There are no direct benefits for you and your child's participation in this research. However, results will further our understanding of the relationship between motivation and academic skills. This could lead to discovering new ways to increase a child's academic success.

Risks: Although there are no known risks, each questionnaire requires approximately 10 minutes to complete. Your child may find some of the questions challenging and may require the assistance of the student clinician.

Termination and Freedom to Withdraw: You and your child's participation are completely voluntary. You and your child may withdraw from this study at any time, without penalty. If you choose to withdraw you must notify the researcher prior to April 30th, 2017. You and your child are also free to choose not to answer any given question.

Confidentiality and Anonymity: *All information from in this study will be de-identified and kept strictly confidential.* Confidential written records will be stored in a locked cabinet for 5 years after publication of this project. Electronic records will be kept in a password-protected file. These files will be destroyed securely. Group-level results from this project may be used in a written thesis or publication. No individual children will be identified in these documents. Please note that at the end of the study, if interested, parents can obtain a copy of the findings.

If you have any questions please feel free to contact me. If you have further concerns about the study, you may contact the Research Ethics Office, at 492-2615. The Research Ethics office has no direct involvement in the project.

Appendix B

Consent Form

CONSENT FORM*Self and parent perceptions of ability in children.*

- I have read and kept a copy of the letter about the study listed above. I agree to have my child join the study. I am aware of the purpose and methods used in this study. All of my questions have been answered.
- I am aware that my participation in this study is voluntary. I understand that my decision to participate does not affect my relations with the University of Alberta.
- I am aware that my child's participation in this study is voluntary. I understand that my decision regarding my child's participation does not affect my relations with the University of Alberta.
- I understand that my child's assent will be required to participate. I understand that my child's participation will involve the completion of a brief questionnaire. I have been notified that this step will take place under the supervision of the student clinician and will take approximately 10 minutes.
- I am aware that scores from the standardized measures administered by the student clinician in the Education Clinic at the University of Alberta will be obtained for the purpose of this study only.
- I have been notified that there are no known risks related to this study. I have also been informed that there are no costs for participation.
- I have been notified that as participants, my child and I are free to choose not to respond to any given question.
- I understand that I have the chance to withdraw my child's data until April 30th, 2017. I understand that all measures to protect confidentiality will be taken. This includes appropriate data storage.
- I understand that I may have a copy of the results of the study after its completion by indicating below. I understand that the researchers intend to present and publish the findings to inform practice. However, my child's data will be de-identified prior to analysis.
- I am aware the graduate student researcher, Kathleen Kennedy, can be contacted if I have questions about this study. She can be reached by telephone at (902) 225-5195 or by email at kk4@ualberta.ca. Kathleen Kennedy's graduate supervisor is Dr. Damien Cormier and he can be contacted by email at dcormier@ualberta.ca or by phone at (780) 492-8434.
- I understand that the Research Ethics Board at the University of Alberta has reviewed this study. If you have questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

I HAVE READ AND UNDERSTOOD THIS CONSENT FORM AND I AGREE TO PARTICIPATE AND HAVE MY CHILD PARTICIPATE IN THE STUDY. Please sign this copy of the consent form and return to Kathleen Kennedy or the Education Clinic at the University of Alberta.

Child's Name (Participant): _____

Parent or Guardian's Name: _____

Parent or Guardian's Signature: _____

Date: _____

I would like to receive a copy of the completed study ___ (provide email address or full address below)

Appendix C

Demographics Questionnaire

Name of Parent/Guardian: _____

Relationship to Child: _____

Child Name: _____

Child's Gender: _____

Child's Age: _____

Child's Grade: _____

Child's Ethnicity: _____

Parent Education Level (Please check one):

Less than high school

High School Graduate

Some post secondary

College diploma/trade certificate

University Degree

Professional Degree (i.e., Medical School, Law School)

Graduate School

Partner Education Level:

Less than high school

High School Graduate

Some post secondary

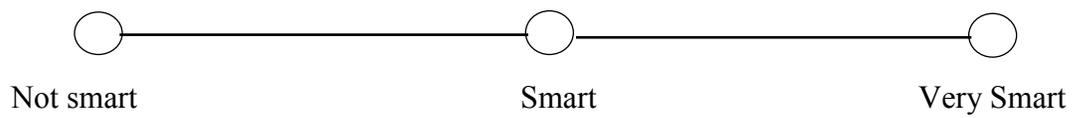
College diploma/trade certificate

University Degree

Professional Degree (i.e., Medical School, Law School)

Graduate School

5) How smart do you think you are compared to other kids in your class?



Appendix E

Parent Ability Questionnaire

Please read the following questions carefully before responding. Place an X in the circle for your response.

- 1) Compared to other children in their grade, how would you rate your child's reading ability?



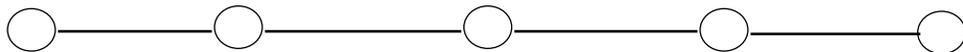
Low Below
Average Average Above
Average Superior

- 2) Compared to other children in their grade, how would you rate your child's mathematics ability?



Low Below
Average Average Above
Average Superior

- 3) Compared to other children in their grade, how would you rate your child's writing ability?



Low Below
Average Average Above
Average Superior

- 4) Compared to other children in their grade, how would you rate your child's overall academic achievement:



Low Below
Average Average Above
Average Superior

- 5) Compared to other children in their grade, how would you rate your child's cognitive development (intelligence)?

