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Katja Natale

Parents' Causal Attributions Concerning Their Children's Academic Achievement

JYVÄSKYLÄN YLIOPISTO

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Katja Natale

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Editors
Tapani Korhonen
Department of Psychology, University of Jyväskylä
Irene Ylönen, Marja-Leena Tynkkynen
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ABSTRACT

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This thesis investigated how mothers' and fathers' causal attributions concerning their children's academic achievement evolve during their children's transition from kindergarten to the first grades of primary school, and the antecedents and consequences of these causal attributions. Two different data sets were used. The first data set reported here is part of the Jyväskylä Entrance into Primary School study (Nurmi & Aunola, 1999), in which 207 children and their parents were followed up for three years during the children's transition from kindergarten to primary school. Parents completed a questionnaire concerning their causal attributions in the middle of each school year. Information about children's academic performance and self-concept of ability was gathered at the beginning and at the end of each school year. The second data set reported here is part of the Jyväskylä Longitudinal Study of Dyslexia (JLD) (Lyytinen et al., 2004) in which 189 children and their mothers participated. Mothers' were asked for their causal attributions on three occasions during the children's first school year. Children's pre-reading skills were examined prior to school entry. The results showed that mothers and fathers typically attributed their children's academic success to ability and their failure to effort. However, when the children had a risk for learning difficulties (dyslexia), mothers attributed their success decreasingly to ability during the child's first school year. The children's mothers and fathers typically shared their causal attributions, and changes in attributions, when they occurred, were also shared by both parents. The results showed further that the higher the level of performance children showed at school, the more their parents attributed their success to ability and the less to effort. Continuously, the more the parents attributed their children's success to ability, the higher the performance the children showed later on, and the more realistic their self-concept of ability became. Attributing children's success to effort, in turn, led to over-optimism in children's self-concept of ability.

Keywords: Parents' Causal Attributions, Transition to Primary School, Academic Performance, Self-Concept of Math Ability, Risk for Learning Difficulties, Longitudinal Study

Author's address

Katja Natale
Department of Psychology
University of Jyväskylä
P.O. Box 35
FIN-40014 University of Jyväskylä
FINLAND
email: natale@psyka.jyu.fi

Supervisors

Professor Jari-Erik Nurmi
Department of Psychology
University of Jyväskylä, Finland

Docent Kaisa Aunola
Department of Psychology
University of Jyväskylä, Finland

Professor Anna-Maija Poikkeus
Department of Teacher Education
University of Jyväskylä, Finland

Reviewers

Professor Hannu Räty
Department of Psychology
University of Joensuu, Finland

Professor Christina Salmivalli
Department of Psychology
University of Turku, Finland

Opponent

Professor Hannu Räty
Department of Psychology
University of Joensuu, Finland

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CONTENTS

LIST OF PUBLICATIONS

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1 INTRODUCTION

Parental beliefs and cognitions concerning their children's development and academic abilities have received increasing attention in recent years (Jaworski & Hubert, 1994; Miller, 1995). One example of parental beliefs concerns their causal attributions regarding the factors that influence their children's behaviour and outcomes. Such causal attributions are also an important part of parents' social cognitions, because how parents interpret the causes behind their children's outcomes lays the foundation for the ways in which they guide and tutor their children at home. Thus, parents' child-related causal attributions are likely to affect their behaviour towards their children, and, ultimately, the ways in which their children develop (Kinlaw, Kurtz-Costes, & Goldman-Fraser, 2001; Miller, 1995).

Research on parental causal attributions originate in Weiner's (1986) attributional theory of achievement motivation. Applying this theory, a large number of studies in the field have shown that the major causes to which parents typically attribute their children's academic achievement are ability, effort, teaching, and task difficulty (Cashmore & Goodnow, 1986; Dunton, McDevitt, & Hess, 1988; Eccles, Jacobs & Harold, 1990; Georgiou, 1999; Holloway & Hess, 1985; Räty, Vänskä, Kasanen & Kärkkäinen, 2002; Weiner, 1986, 1992; Yee & Eccles, 1988). One major limitation of the previous studies is that parents' causal attributions have seldom been investigated by means of longitudinal data that would provide a basis for investigating prospective relationships between parental attributions and children's behaviors and cognitions. Thus, the present thesis examined the development, antecedents, and consequences of these four parental causal attributions in the school context.

Although a great amount of studies on parental causal attributions in the school context have been conducted in the recent years, most have focused on the associations between parents' causal attributions and children's school performance during later elementary or comprehensive school years (Cashmore & Goodnow, 1986; Dunton et al., 1988; Eccles et al., 1990; Georgiou, 1999; Holloway & Hess, 1985). However, according to the past literature in the field,

parents' conceptions and causal attributions concerning their children begin to develop when the children are relatively young (Jaworski & Hubert, 1994; Miller, 1995). From the day they are born, children are in many ways targets for parents' social-cognitive efforts, and parental beliefs regarding the development of children's cognitive abilities in the early stages of their lives may provide a basis for later parent-child interactions (Jaworski & Hubert, 1994; Miller, 1995). An important time for the development of parents' conceptions concerning their children's cognitive abilities and achievement is the period when their children move from kindergarten to primary school. A major factor influencing the development of parents' conceptions during this period is the kind of feedback they start to receive on their children's progress with reference to age norms.[1] Children's entrance into primary school is the time when parents begin to receive more feedback about their children's abilities and academic performance. For example, parents regularly meet children's teachers and discuss their children's progress and possible difficulties with them. Although grades are not given during the first two years of primary school, teachers give written reports of children's progress in the major subjects. (see also Aunola, Leskinen, Lerkkanen & Nurmi, 2004). In the present thesis the development of and changes in parents' causal attributions were investigated during the children's transition from kindergarten to primary school (Studies I and II), and during the children's first school years (Studies III and IV). In addition, the causal attributions of mothers of children with and without familial risk for learning difficulties (e.g. dyslexia) were investigated (Study IV).

1.1 Causal attributions

When people seek causes or explanations behind their or others actions they often seek answers to "why" questions (Försterling, 2001; Wong & Weiner, 1981). They may ask, for example "Why did I fail in a task?" or "Why does my child succeed in mathematics?". The answers are, normally, in the form of causal explanations, i.e. causal attributions. In everyday situations causal attributions represent people's naïve theories of causality between causes and effects, but the history of causal attribution theories can be traced ultimately to the theories of the nature of causality presented by philosophers such as Hume (1740) and Kant (1781) (see also Försterling, 2001). However, the history of more modern attribution theories goes back to Fritz Heider (1958) who has been

[1] In Finland children attend kindergarten when they are six years old. Kindergarten is not compulsory, but almost all children are enrolled. There is no formal teaching as such in kindergarten, but children are encouraged to play with letters and numbers, and concepts related to reading and mathematics. In kindergarten, parents at least up to now have not been systematically provided with feedback on their children's progress in learning. Children enter primary school during the year of their seventh birthday.

acknowledged as a founder of attribution theory (Weiner, 1992). In his work Heider introduced the dimension of internality-externality to attribution theories. He suggested that the causes of one's outcomes can lie within the person (e.g. internal causes, such as ability) or outside in the environment (e.g. external causes, such as task difficulty). Heider's ideas were continued by Rotter (1966) who labelled the internal-external dimension as *locus of control*. Rotter's work inspired hundreds of studies on this dimension as a personality trait and motivated the classifying of individuals into internals and externals (Weiner, 1992).

Heider's work was followed by Harold H. Kelley (1967) who deepened understanding of how people make attributional observations. According to Kelley (1967) outcomes can be attributed either to the person or to the environment. He also assumed that covariation and consistency between the events in question are the foundations of attribution processes (Försterling, 2001; Weiner, 1992). For example, if person A succeeds in task 1 but fails in tasks 2 and 3, consistency is high between the outcome and the task, and success covaries with the task. On the other hand, if only person 1 succeeds at task 1, and persons 1, 2, and 3 fail, consistency is high between the outcome and the person, and thus, success covaries with person 1. In his later work, Kelley (1972) introduced "causal schemata" which guide attributional processes in single observations when no other observations are possible and information about covariation is lacking. Causal schemata consist of prior observations and experience which guide one's current evaluations. (see also Försterling, 2001; Weiner, 1992).

The study of causal dimensions was continued by Bernard Weiner (Weiner, 1979; 1985; 1986; 1992) who proposed that there were two additional causal dimensions. Already Heider had described how some causes of achievement were more constant whereas others changed from moment to moment (Weiner, 1992). Weiner introduced the dimension *locus of stability*, i.e., whether the causes to which one's actions were attributed were stable (e.g. ability) or unstable (e.g. effort). Later he presented a third causal dimension, *locus of control*, which described whether the causes behind one's actions can be recognized as controllable (e.g. effort) or uncontrollable (e.g. ability).

The most recent research on causal attributions originates with Bernard Weiner's (1985, 1986) attributional theory of achievement motivation. According to this theory causal attributions vary along three bipolar dimensions: locus (internal – external), stability (stable – unstable), and controllability (controllable – uncontrollable) (Weiner, 1986). These causal dimensions influence, for example, people's future achievement expectancies (e.g. hope or hopelessness), as well as their affects (e.g. pride or shame) (Weiner, 1986, 1992). Weiner's theory is summarized in Figure 1.

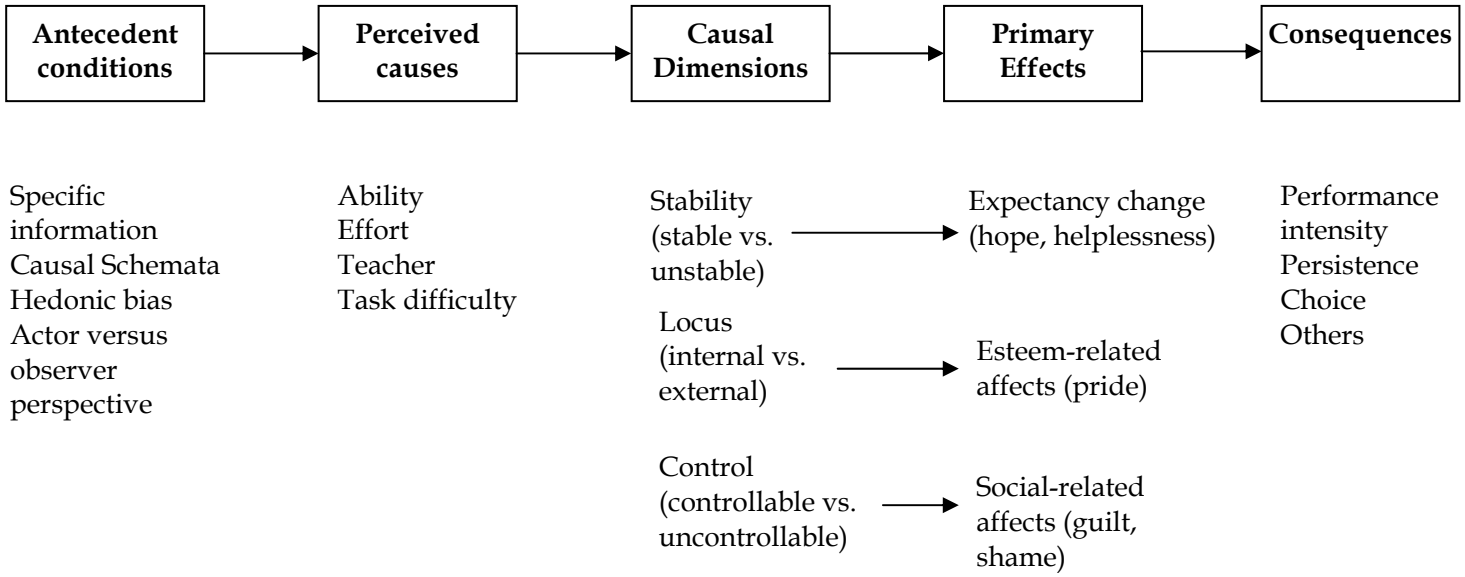

FIGURE 1 Partial representation of Weiner's (1986; 1992) attributional theory of achievement motivation.

1.2 Parents' causal attributions

Parents' causal attributions refer to the ways parents explain, evaluate and predict their children's behaviour or achievement (Miller, 1995). Thus, parents' causal attributions refer rather to their subjective perceptions or beliefs of children's outcomes than to the actual causes of achievement (Försterling, 2001). The causal attributions that parents use have typically been divided into those that refer to a child's ability and effort, and those that refer to task difficulty and teachers' competence (Cashmore & Goodnow, 1986; Cote & Azar, 1997; Georgiou, 1999; Holloway & Hess, 1985; Holloway, Kashiwagi, Hess & Azuma, 1986; Kinlaw et al., 2001; O'Sullivan & Howe, 1996; Räty et al., 2002; Yee & Eccles, 1988). Ability and effort are both internal causal attributions for a child, whereas task difficulty and teachers' competence are external attributions. Ability, however, is a stable characteristic and beyond the control of the child while the amount of effort is an unstable property and controllable by the child. Task difficulty and teachers' competence, in turn, are both stable and uncontrollable properties for a child.

It has been suggested previously that parents typically employ "self-protective bias" (Dix & Grusec, 1985; Himelstein, Graham & Weiner, 1991; Miller, Manhal & Mee, 1991) when they attribute their children's school achievement to a cause: parents tend to give the credit for success to their children, but avoid blaming them for failure. That is, parents would prefer to attribute their children's success to internal causes, such as ability or effort, and failure to external causes, such as task difficulty. A similar pattern has also been described as "developmental optimism" (Coplan, Hastings, Lagacé-Séguin & Moulton, 2002; Goodnow, Knight & Cashmore, 1986). However, some studies have obtained rather different results. For example, Yee and Eccles (1988) found that parents most typically attribute their children's success to internal causes, but their failure to lack of effort. The latter finding emphasizes the child's responsibility to the outcome, and also has consequences for his or her future behavior and achievement.

Previous studies have also documented some gender differences in parents' causal attributions. It has been shown, for example, that mothers typically think that their sons succeed in mathematics because of their ability, but that their daughters' success is due to effort (Dunton et al., 1988; Eccles et al, 1990; Lummis & Stevenson, 1990; Räty et al., 2002; Yee & Eccles, 1988). It has been further assumed that these differences are caused by parents' gender-stereotypes (Bird & Berman, 1984; Dunton et al., 1988; Eccles et al., 1990; Fincham, Beach, Arias & Brody, 1998). There is also evidence suggesting that mothers' thinking, in particular, is dependent on these gender stereotypes, whereas fathers rely more on children's school achievement (Frome & Eccles, 1998). Not all studies, however, have found gender differences. For example, Cashmore and Goodnow (1986) showed that both parents attributed their daughters' and sons' success to ability. Because the previous research on gender

differences has shown conflicting findings, this issue is of interest also in the present thesis.

1.3 Parents' causal attributions and children's performance

Previous research on parental causal attributions in the academic context has concentrated mostly on investigating how children's academic skills, especially their performance in mathematics, influence parental causal attributions concerning their children's academic skills (Dunton et al., 1988; Cashmore & Goodnow, 1986; Eccles et al., 1990; Georgiou, 1999; Holloway & Hess, 1985; Räty et al, 2002; Yee & Eccles, 1988). These studies have shown, first, that when children's performance is at a high level, their parents tend to attribute their success to a stable cause, such as ability, whereas if children's performance is at a low level, parents rather attribute it to an unstable cause, such as effort (Dunton et al., 1988; Holloway & Hess, 1985; Yee & Eccles, 1988). For failure, effort has usually been perceived as the most important cause (Holloway & Hess, 1985; Yee & Eccles, 1988). One limitation of earlier longitudinal studies is, however, that previous levels of parental causal attributions have not been controlled for when predicting subsequent parental attributions by the child's performance.

Only few longitudinal studies have examined the cross-lagged relationships between parental causal attributions and children's performance by controlling for the previous level of the variable before predicting it by another. Consequently, little is known about the direction of influence, i.e., whether it is parents' causal attributions that predict their children's performance (Hess, Holloway, Dickson & Price, 1984) or whether it is rather children's performance that contributes to parental causal attributions (Holloway & Hess, 1985).

Although children's performance has been assumed to influence parents' causal attributions, the latter may also indirectly have an impact on their children's behaviour at school. Parents' causal attributions may, for example, influence their expectations and aspirations concerning their children's performance, as well as the support, advice, and guidance they give to their children (Murphey, 1992). It has been shown, for example, that if adults praise children for intelligence, this increases their performance-orientation, whereas praising them for effort promotes their mastery-orientation strategies (Kamins & Dweck, 1999; Mueller & Dweck, 1998). Such change in children's conceptions may, in turn, have an impact on their subsequent performance.

Using longitudinal data in an academic setting, the present thesis examines the extent to which children's school performance in two central skill areas, that is, performance in mathematics and reading, predicts their parents' causal attributions (Study I and II), the extent to which parental causal attributions predict the child's performance (Study II), and whether these

prospective associations show reciprocal patterns, consisting of both kinds of cross-lagged associations (Study II) (Pomerantz & Eaton, 2001).

Previous research has also shown that parents' perceptions of their children's academic achievement are associated with their children's self-concept of ability even more strongly than the children's grades (Frome & Eccles, 1998; Jacobs, 1991; Parsons, Adler, & Kaczala, 1982; Phillips, 1987). Although a substantial amount of research has been carried out on children's self-concept of ability (Aunola, Leskinen, Onatsu-Arvilommi, & Nurmi, 2002; Bouffard, Marcoux, Vezeau, & Bordeleau, 2003; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Spinath & Spinath, 2005; Stipek & Mac Iver, 1989; Wigfield et al., 1997), little research has focused on the extent to which parental causal attributions and perceptions influence their children's academic self-perceptions (Frome & Eccles, 1998). Consequently, the present thesis investigated to what extent mothers' and fathers' causal attributions concerning their children's academic success and failure would predict accuracy versus positive or negative bias in the children's self-concept of ability in mathematics during the first and the second grade of primary school (Study III).

1.4 Parents' causal attributions and family characteristics

Parents' causal attributions are one aspect of wider range of parenting behaviours and beliefs. However, only few studies have examined how parents' causal attributions are associated with other parenting characteristics. One parent- and family-related characteristic that may play a role in the formation of parents' causal attributions is parents' beliefs and child-rearing attitudes. Such parenting beliefs have typically been described in terms of parenting styles (Baumrind, 1989; Coplan et al., 2002), which refer to a constellation of attitudes that create an emotional climate in which parents' behaviors are expressed (Baumrind, 1989; Darling & Steinberg, 1993). Parenting styles have usually been investigated according to three dimensions: affect refers to emotional support and warmth (Darling & Steinberg, 1993); behavioral control refers to the behaviors with which parents seek to control their children's activities (Barber, 1996); and, psychological control refers to the ways in which parents attempt to control their children's psychological and emotional development (Barber, 1996).

Only a few studies have sought to link parenting styles with parental causal attributions (Coplan et al., 2002). In one recent study, Coplan et al. (2002) found that mothers characterized by authoritarian parenting style (low in warmth but high in behavioral control) (Baumrind, 1989) tended to attribute their child's positive behavior to external causes and negative behavior to internal causes to greater extent than mothers characterized by an authoritative parenting style (high in behavioral control and high in warmth) (Baumrind, 1989) did. However, the focus of the study by Coplan et al. (2002) was on

parental causal attributions concerning children's social behavior rather than their school achievement.

Another parental characteristic that may contribute to parents' causal attributions concerning their children's academic achievement is their level of education. It has been found previously that parents with an academic education attribute their children's success more to ability than parents with a vocational education (Räty, Kasanen, & Kärkkäinen, 2006). However, the associations between parents' educational level and causal attributions seem to vary according to the culture (Stevenson & Lee, 1990). For example, it has been found that highly educated Taiwanese mothers emphasize studying hard and having a good teacher as a cause of their children's success, whereas highly educated American mothers tend to emphasize intelligence and luck as causes of their children's success (Stevenson & Lee, 1990).

In the present thesis, the impact of parenting styles (Study I) and educational level on parents' causal attributions during their children's transition to primary school were studied further (Study I and Study IV). Study I aimed at investigating how parents' educational level, parenting styles, and gender contribute to the level and changes in parents' causal attributions concerning their children's success and failure at school. Also the extent to which these characteristics shared by both parents, and the characteristics of individual mothers and fathers, influence parental causal attributions was examined. Moreover, Study IV aimed at investigating the impact of mothers' educational level on their causal attributions concerning 1st grade children's reading achievement among children with and without a familial risk for dyslexia.

Only a few of the previous studies have simultaneously investigated both mothers' and fathers' causal attributions concerning their children's academic achievement (Cashmore & Goodnow, 1986; Frome & Eccles, 1998; Yee & Eccles, 1988). In most studies on parental causal attributions the interest has been on mothers' causal attributions (Dunton et al., 1988; Holloway & Hess, 1982, 1985; Holloway et al., 1986; Kinlaw et al., 2001). However, it is likely that fathers' evaluations of their children's academic outcomes influence their interactions with their children as much as mothers' evaluations, and thus are important objectives of research. Second, there is little knowledge about how mothers' and fathers' causal attributions differ from each other, and to what extent they are similar. Third, it is possible that mothers and fathers within the same family share their causal attributions and beliefs concerning their children's academic achievement. It is also possible that family characteristics, such as educational level and parenting styles shared by both parents have an impact on their causal attributions. The present thesis investigated both mothers' and fathers' causal attributions, and the extent to which they are shared in the same family.

1.5 Parents' causal attributions and children's risk for learning difficulties

Although some research has been carried out on parents' causal attributions concerning their children's academic performance, only a few studies have examined the factors to which parents of children with learning disabilities attribute their children's successes and failures (Bryan, Pearl, Zimmerman, & Mathews, 1982; Pearl & Bryan, 1982; Tollison, Palmer, & Stowe, 1987). These studies have shown that parents of children diagnosed as having learning difficulties (LD), ADHD, or receiving special education services, differ in their attributions concerning their children's academic or behavioral success compared with parents of children without such difficulties. Mothers of children with LD or ADHD have a higher tendency to attribute their children's success to external causes, such as luck, and their failure to internal causes, such as lack of ability or other child-related characteristics, compared to mothers of children without LD or ADHD (Himelstein et al., 1991; Johnston & Freeman, 1997; Johnston, Reynolds, Freeman, & Geller, 1998; Pearl & Bryan, 1982; Tollison et al., 1987). However, no previous studies have been carried out on how familial risk for learning difficulties, such as dyslexia, is reflected in parents' causal attributions concerning their children's reading achievement. Dyslexia is a specific learning disability characterized by fluent word recognition problems and poor spelling, and which may, for example, cause problems in reading comprehension (Lyon, Shaywitz, & Shaywitz, 2003). At the beginning of primary school, learning to read is a particularly challenging task for children at risk for dyslexia. The present thesis investigated the factors to which mothers of children with and without familial risk for dyslexia attribute their children's success and failure in reading during the first primary school year, and how these causal attributions change over time (Study IV).

1.6 Aims of the empirical studies

The present thesis focuses on investigating how mothers' and fathers' causal attributions concerning their children's academic achievement develop during their children's transition from kindergarten to the first grades of primary school. Additionally, the antecedents of parental causal attributions, as well as their influence on children's academic skills and self-perceptions, were investigated. The first study examines the extent to which parents' educational level, parenting styles, and children's academic skills predict the level of and changes in parents' causal attributions during the children's transition to primary school (Study I). It was also investigated to what extent mothers and fathers share or differ in the levels of and changes in their causal attributions concerning the school achievement of their children. The second and third

studies focus on the reciprocal relationships between parental causal attributions and children's academic skills (Study II), and parental causal attributions and children's self-concept of math ability (Study III). The last study examines the causal attributions of mothers with and without children with a familial risk for dyslexia (Study IV). Also, changes in mothers' causal attributions and the extent to which children's risk for dyslexia, pre-reading skills, and mothers' educational level predict mothers' causal attributions were examined.

2 OVERVIEW OF THE ORIGINAL STUDIES

2.1 Method

2.1.1 Jyväskylä Entrance into Primary School Study

In the present thesis, two different data sets were used. Studies I, II, and II reported here are parts of the Jyväskylä Entrance into Primary School (JEPS) study (Nurmi & Aunola, 1999). In the JEPS study a total of 207 (111 boys, 96 girls) 5- to 6-year-old children (M = 75 month, SD = 3.30 month) and their parents were followed up during the children's transition from kindergarten to primary school. The original sample consisted of all the children from two medium-size districts in Central Finland who were born in 1993 (n=210). Parental permission to gather data from the children was obtained from the parents of 207 children. The families studied were as follows: child/children living with both parents (83.2 % of cases), child/children living with one biological parent plus that parents' new spouse (9.9 % of cases), and child/children living with lone mother (6.8 % of cases). The number of children per family ranged from 1 to 11 (M = 2.80, SD = 1.50).

The parents completed a questionnaire concerning their causal attributions (i.e. ability, effort, teaching, and task difficulty) for their children's general success and failure at school in the middle of their children's kindergarten year (December 1999) (N = 189 mothers and 164 fathers) and during Grades 1 (N = 170 mothers and 147 fathers) and 2 (N = 178 mothers and 160 fathers) (December 2000 and 2001). Parents also answered questions concerning their level of education and their parenting styles (i.e. behavioural control, psychological control, and affect).

Information about the children's performance in reading and mathematics was gathered on six occasions: at the beginning and at the end of their kindergarten year, i.e. in October 1999 (N = 207) and April 2000 (N =199); at the beginning and at the end of their first primary school year, i.e in October 2000 (N = 196) and April 2001 (N = 196); and at the beginning and at the end of their

second primary school year, i.e. in October 2001 (*N* = 197) and March 2002 (*N* = 196). Information about the children's self-concept of ability was gathered on four occasions: at the beginning and end of their first primary school year, that is, in October 2000 and April 2001, and at the beginning and at the end of their second primary school year, that is, in October 2001 and March 2002. The attrition of 11 children was due to the fact that the families of these children moved to other districts and were not able to participate in the study later on.

2.1.2 Jyväskylä Longitudinal Study of Dyslexia

Study IV is a part of the Jyväskylä Longitudinal Study of Dyslexia (JLD) in which 204 Finnish children and their families have been followed from birth to the 3rd grade. The total sample of the JLD study consists of 204 children born in the Central Finland region in 1993 – 1996, half of whom (*N* = 107) had a dyslexic parent who also had a close dyslexic relative and half of whom (*N* = 97) belonged to the matched control group. The analyses conducted for the present thesis involved a total of 189 children (*N* = 85 girls and 89 boys) whose mothers answered questions concerning their causal attributions. Half of the participating children (*N* = 100, 48 girls and 52 boys) had familial risk for dyslexia, and the other half (*N* = 89, 37 girls and 52 boys) belonged to the control group.

In the JLD study, a total of 189 mothers completed a questionnaire measuring their causal attributions concerning their children's success and failure at school in reading-related tasks. Mothers filled in the questionnaires on three occasions during the children's first year of primary school (August, November, and May). Mothers' educational level was classified into seven categories, which were based on a composite score for basic level education and advanced educational training (1 = comprehensive school education without any vocational education; 7 = comprehensive school or upper secondary general school diploma combined with a higher university degree e.g., Master's or a doctoral-level degree).

The tasks measuring children's pre-reading skills, i.e. verbal intelligence (Wechsler Preschool and Primary Scale of Intelligence-R; Wechsler, 1989) and word and nonword reading skills, were administered to the children at 5.0 and 6.5 years of age. Word and nonword reading performance was statistically significantly lower in the at-risk group compared to control group. For verbal intelligence, the mean level was not statistically significantly different between the two groups.

The methods of the four studies are summarized in Table 1.

TABLE 1 Summary of the participants, measurements, and methods used in the original studies (I-IV).

Study	Data	Measurements	Procedure	Analyses
I Parents' causal attributions concerning their children's school achievement: A longitudinal study	- JEPS (207 children, 182 mothers, 164 fathers)	- mothers' and fathers' causal attributions (ability, effort, teaching, task difficulty) - educational level - parenting styles (affection, behavioural control, psychological control) - children's performance in mathematics and reading	- longitudinal (kindergarten and Grades 1-2)	- Multilevel latent growth curve modeling
II Children's school performance and their parents' causal attributions to ability and effort	- JEPS (207 children, 182 mothers, 164 fathers)	- parents' ability and effort attributions concerning their children's academic success and failure - children's performance in mathematics and reading	- cross-lagged longitudinal (kindergarten and Grades 1-2)	- Path-modeling
III Do parents' causal attributions predict accuracy or bias in their children's self-concept of math ability? A longitudinal study	- JEPS (196 children, 182 mothers, 164 fathers)	- children's performance in mathematics - children's self-concept of math ability - mothers' and fathers' causal attributions (ability, effort, teaching, and task difficulty) concerning their children's general success and failure at school	- longitudinal (Grades 1-2)	- ISOA clustering by cases - Multinominal regression analysis - ANCOVA
IV Mothers' causal attributions concerning the reading achievement of their children with and without a familial risk for dyslexia	- JLD (189 children and their mothers)	- mothers' causal attributions (ability, effort, teaching, and task difficulty) concerning their children's general success and failure at school - educational level - children's word and nonword reading - children's verbal intelligence	- longitudinal (Grade 1)	- Latent growth curve modeling

2.2 Study I: Parents' causal attributions concerning their children's school achievement: A longitudinal study

The study investigated the following research questions: (1) To which causes do parents attribute their children's successes and failures during the children's transition from kindergarten to primary school? (2) How do these causal attributions change during the children's transition from kindergarten to primary school? (3) To what extent do mothers' and fathers' causal attributions differ and to what extent are they shared by both parents? (4) How do parents' educational level, and parenting styles contribute to the level and changes in parents' causal attributions concerning their children's success and failure at school? To what extent are these characteristics shared by both parents and to what extent do the characteristics of individual mothers and fathers influence their causal attributions? (5) How do children's mathematics and reading performance, and their gender contribute to the level and changes in parents' causal attributions concerning their children's success and failure at school?

A total of 182 mothers and 167 fathers of 207 children were followed up for three years during the children's transition from kindergarten to primary school. The parents completed a questionnaire concerning their causal attributions (i.e. ability, effort, teaching, and task difficulty) for their children's general success and failure at school in the middle of their children's kindergarten year (December) and during Grades 1 and 2. Parents answered questions concerning their level of education and their parenting styles (i.e. behavioural control, psychological control, and affect) in the middle of their children's kindergarten year (December). The children's performance in mathematics and reading was tested at the beginning of the kindergarten year (October).

The results were analyzed using Multilevel Latent Growth Curve Modeling. The results showed that while the children were in kindergarten both parents typically attributed their success to ability and teaching. When the children moved to primary school, parents increasingly attributed their success to ability, and decreasingly to teaching. Academic failure was typically attributed to lack of effort. Moreover, the results showed that mothers and fathers shared their causal attributions for their children's academic achievement, particularly for ability and effort. Furthermore, changes in causal attributions were shared by both parents.

The results showed further that the higher the level of performance in mathematics and reading the children showed, the more the parents attributed their children's success to ability and the less they attributed it to teaching. In addition, it was found that parents' shared level of education contributed to their causal attributions: the higher the level of education the parents had within the family, the more they attributed their children's success to ability and the less they attributed it to effort. Moreover, the more individual parents showed an authoritative parenting style, that is, a high level of affection and

behavioural control in their parenting, the less they attributed their children's success to teaching. It was also found that mothers who reported a high level of psychological control in their parenting often attributed their children's success to teaching and seldom to ability.

The results suggest that mothers and fathers share similar kinds of causal attributions concerning their children's school achievement. Children's high level of academic performance and parents' high level of education were associated with parents' ability attributions for success. Also parenting styles were associated with the ways parents' interpret the causes of their children's academic successes and failures.

2.3 Study II: Children's school performance and their parents' causal attributions to ability and effort: A longitudinal study.

Three research questions were investigated: (1) Does children's academic performance predict their parents' causal attributions of ability and effort concerning their children's success and failure at school? (2) Do parents' attributions of ability and effort concerning their children's success and failure at school predict their children's subsequent academic performance? (3) Are these relationships different for parents of boys and for parents of girls? In order to examine the research questions, cross-lagged path models were constructed separately for parents' ability and effort attributions concerning their children's success and failure at school, and for children's academic performance.

207 children and their parents were followed up over three years during the children's transition from kindergarten to their Grade 2 of primary school. Parents' causal attributions of ability and effort were assessed with a mailed questionnaire three times: in the middle (December) of the children's kindergarten year, and in the middle of Grades 1 and 2. Information about the children's academic performance (reading and mathematics) was gathered on six occasions: at the beginning and at the end (October and April) of their kindergarten year, Grade 1 and Grade 2.

The results of path-modeling indicated that the higher the academic performance the children showed during each school year, the more their parents attributed their success to ability later on. In addition, the more parents attributed their children's success to ability, the higher the level of academic performance the children showed later on during each school year. For effort attribution it was found that the lower the academic performance the children showed at the beginning of the first grade, the more their parents attributed their success to effort. Furthermore, the more parents attributed their children's success to effort, the poorer the academic performance the children showed at the end of the second grade. The results were found to be similar for boys and girls. No cross-lagged associations between parents' causal attributions and

children's academic performance were found for parents' causal attributions concerning children's failure at school.

The findings suggest that parents' causal attributions originate, at least partly, in their perceptions of their children's actual performance, and form reciprocal patterns with the child's academic performance across the child's first school years.

2.4 Study III: Do parents' causal attributions predict accuracy or bias in their children's self-concept of math ability? A longitudinal study

The study investigated the following research questions: (1) What kinds of "naturally occurring" groups can be identified on the basis of the accuracy of, or bias in, children's self-concept of math ability and their math performance, on entry into primary school? What percentages of children show different patterns of self-concept and math performance? How stable are such groups when children move from Grade 1 to Grade 2? (2) To what do parents of children who show different patterns of accuracy or bias in their self-concept of math ability attribute the causes of their children's academic success and failure? (3) Do parents' causal attributions concerning their children's academic success and failure predict the changes that take place in the children's self-concept of math ability groupings when children move from Grade 1 to Grade 2? (4) Does children's membership in the various groups differing in the accuracy of, or bias in, self-concept of math ability predict their mothers' and fathers' subsequent causal attributions? (5) Are these relationships different for mothers compared to fathers, and for the parents of boys compared to the parents of girls?

196 children and their parents participated in the study during the children's Grade 1 and Grade 2 of primary school. Information about children's self-concept of ability and performance in mathematics was gathered on four occasions: at the beginning and end of Grades 1 and 2. Parents' causal attributions (i.e. ability, effort, teaching, and task difficulty) concerning their children's success and failure at school were assessed with a mailed questionnaire on three occasions: in the middle of children's kindergarten year, in Grade 1, and in Grade 2.

In order to identify homogeneous groups on the basis of the accuracy of, or bias in, self-concept of math ability among primary school children, the I-States as Objects (ISOA) analysis procedure was carried out. Three self-concept of math ability groups were identified: an over-optimistic group, a negative group, and an accurate group. It was found that self-concept of math ability group membership was relatively stable from the beginning of Grade 1 until the end of Grade 2. The results showed further that the more parents attributed their children's success to ability, the more accurate, and thus less over-

optimistic or negative, the children's self-concept of ability became. By contrast, the more the parents attributed their children's success to effort, the less accurate and more optimistic the children's self-concept of ability became.

The results showed further that mothers whose children were in the over-optimistic self-concept of ability group attributed their children's success increasingly to teaching compared with mothers whose children were in the accurate self-concept of ability group. Further, fathers whose daughters were in the accurate self-concept of ability group attributed their failure more to lack of effort compared to fathers whose daughters were in the over-optimistic self-concept of ability group. The results showed further that the associations between children's self-concept of math ability and mothers' and fathers' causal attributions were similar rather than different. Few gender differences were found between the parents of boys and the parents of girls. Overall, the results showed that parents' causal attributions are an important antecedent of the accuracy of their children's self-concept of math ability.

2.5 Study IV: Mothers' Causal Attributions concerning the Reading Achievement of Their Children with and without a Familial Risk for Dyslexia

The study investigated the following research questions: (1) To what factors do mothers of children with and without familial risk for dyslexia attribute their children's successes and failures in early reading performance? (2) Do mothers' causal attributions concerning their children's successes and failures in reading change during the children's first year of primary school and are these changes similar among mothers of children with and without familial risk for dyslexia? (3) Do children's word and nonword reading, verbal intelligence and gender, and mothers' educational level contribute to mothers' causal attributions and changes in them during the children's first year of primary school? Are these associations different for mothers of children with and without familial risk for dyslexia?

In this study, a total of 189 first-grade children and their mothers were followed up during the children's Grade 1. Half of the participating children (N = 100, 48 girls and 52 boys) had familial risk for dyslexia, and the other half (N = 89, 37 girls and 52 boys) belonged to the control group. The mothers completed a questionnaire concerning their causal attributions (i.e. ability, effort, teaching, and task difficulty) for their children's general success and failure at school three times during their children's Grade 1 (August, November and May). Background information about mothers' educational level was gathered prior to the study. Children's pre-reading skills were investigated at the age of 5.0 (verbal intelligence) and 6.5 (word and nonword reading).

The results were analysed using latent growth curve modeling. The results showed that the mothers of children with familial risk for dyslexia attributed

their children's failure more to lack of ability and less to effort compared to the mothers of the control group children. Further, among the mothers of children in the at-risk group their ability attributions for success decreased during the first primary school year, whereas among the control group mothers such attributions increased, even after controlling for the children's level of word and nonword reading. The results showed also that the higher the word and nonword reading skills the children showed, the more their mothers attributed their success in reading to ability, and the less they attributed it to effort. Children's word and nonword reading, however, did not influence the changes in mothers' causal attributions. Further, the higher the mothers' educational level, the more they attributed their children's success to ability and the more they attributed their failure to poor teaching.

The results suggest that familial risk for specific learning difficulties, such as dyslexia, has consequences for mothers' interpretation of the causes of their children's reading achievement. Moreover, children's pre-reading skills, such as verbal intelligence and word and nonword reading influence their mothers' subsequent evaluations of their academic successes and failures.

3 GENERAL DISCUSSION

This thesis focused on mothers' and fathers' causal attributions concerning their children's academic performance during the children's transition to primary school. In Particular, the antecedents of parents' causal attributions, as well as their recursive relationships with children's academic performance and self-concept of ability were examined. Further, the maternal attributions of children with and without familial risk for dyslexia were compared. Overall, the results showed that across the transition from kindergarten to primary school mothers and fathers increasingly attributed their children's academic success to ability. Failure was typically attributed to effort. However, mothers of children with familial risk for dyslexia attributed their success decreasingly to ability and failure more frequently to lack of ability compared with mothers of the control group children. The findings showed further that parental causal attributions and children's academic performance formed reciprocal patterns across the child's first school years. Parents' causal attributions were also closely linked to their own educational level, parenting styles, and to their children's self-concept of ability.

3.1 Parental causal attributions and changes in them

The present thesis investigated four types of parental causal attributions, that is, ability, effort, teaching, and task difficulty, in two kinds of achievement situations, that is, success and failure. Of these four attributions, ability and effort are internal, whereas the quality of teaching and task difficulty are external attributions (Weiner, 1985, 1986). Ability, teaching, and task difficulty are beyond one's own control, whereas effort is seen as a controllable property for a child. Of these four attributions, only effort is generally considered unstable (Weiner, 1985, 1986).

The results showed that when children were still in kindergarten their parents attributed their success typically to good teaching and ability, whereas

after the children's transition to primary school parents increasingly attributed their success to ability (Study I). After the transition to primary school parents' teaching attributions for success started to decrease. The tendency for parents increasingly to see ability as the cause of their children's success as their children grow older may be due to the increasing amount of feedback parents receive about their children's academic performance from the early grades onwards. For example, parents typically follow closely their child's progress in learning to read and acquiring basic math skills. Knowledge about the child's attainment of the basic academic skills may then have the effect of increasing parents' trust in their child's abilities. Another possible explanation for this result is that, when children enter the first grade, parents may also begin to see their offspring as more independent and subsequently less in need of help from their parents and teachers. This may boost parents' tendency to attribute their child's success to ability rather than the importance of teaching.

Study IV showed that the changes in mothers' ability attributions for success during the children's first grade were different when the children belonged to the group at familial risk for dyslexia than when they belonged to the control group. The ability attributions for success increased among the mothers of the control group children while they decreased among the mothers of the at-risk group. Although none of the children had at that point been diagnosed with dyslexia, knowledge of the risk for dyslexia (e.g., having dyslexia in the family) influenced mothers' causal attributions. The results suggested that the development of parental causal attributions may be different among parents whose children have a risk for learning difficulties (LD), and thus it would be important to investigate them in more detail in the future. It is possible, for example, that parental causal attributions that support their children's academic development are different among children with a risk LD than among children without a risk for LD.

In failure situations, the results of the present thesis showed that parents typically attributed their children's failure to effort during the children's transition from kindergarten to primary school (Study I and IV). Parents' tendency to emphasize the role of effort after children's failure may be beneficial for the children's later achievement. By doing so, parents may encourage their children to achieve better at school in the future. Yee and Eccles (1988) suggested that by attributing the child's failure to effort parents may be aiming to improve his or her performance by motivating the child to try harder at school (see also Weiner, 1994b). Effort is something the child can control, and attributing the child's failure to effort allows the child the possibility to improve in the future, in contrast with an attribution to an uncontrollable cause, such as lack of ability or poor teaching.

The present studies confirmed the results of some previous studies (Dunton et al., 1988; Holloway & Hess, 1985; Yee & Eccles, 1988) which have found that, instead of attributing children's success to internal causes and failure to external causes, that is, employing a "self-protective bias" (Dix & Grusec, 1985; Himelstein et al., 1991; Miller et al., 1991) or "developmental

optimism" (Coplan et al., 2002; Goodnow et al, 1986) parents rather attributed both their children's success and failure to *internal causes*, that is, ability and effort. It has been proposed that by attributing success to high ability and failure to low effort, self-perception of one's high ability is preserved (Weiner, 1994a). Similarly, it is possible that parents were also enabled to perceive their children as high in ability when they tended to attribute their children's success to ability and failure to lack of effort. By so doing, parents may also motivate children to perform better and try harder in the future (Weiner, 1994b; Yee & Eccles, 1988).

In general, the results of the present thesis revealed that mothers' and fathers' causal attributions concerning their children's academic outcomes were, quite early on, relatively stable. Mothers and fathers of the same family typically also shared their causal attributions. Once the children had started their first year of primary school relatively few changes occurred in parents' causal attributions. It is important to note here that parents' causal attributions derive from their naïve theories of cause and effect with respect to their children's outcomes (Försterling, 2001). Parents have different schemas by which they interpret their children's achievement; one parent may "know" that her child succeeds at school because of high ability, other parent may "know" that his child fails at school because of low effort. These schemas are not likely to change unless parents' observations of their children's achievement are challenged (Försterling, 2001). However, it is also possible that the child's age influences the stability of parental interpretations and evaluations of their academic outcomes. For example, children's maturational and motivational changes during the later years of primary school and the early stages of adolescence may challenge parents' existing evaluations of their children's academic outcomes, and thus further changes may occur in their causal attributions concerning their children's academic achievement.

3.2 Antecedents of parental causal attributions

One major aim of the present thesis was to investigate the antecedents of parental causal attributions. Previous research on parental causal attributions in the school context has concentrated mostly on investigating how children's academic skills, especially their performance in mathematics, influence their parents' causal attributions concerning their children's academic skills (Dunton et al., 1988; Cashmore & Goodnow, 1986; Eccles et al., 1990; Georgiou, 1999; Holloway & Hess, 1985; Räty et al, 2002; Yee & Eccles, 1988). These studies have shown that when children's performance is high, their parents tend to attribute their success to a stable cause, such as ability, whereas if children's performance is low, parents rather attribute it to an unstable cause, such as effort (Dunton et al., 1988; Holloway & Hess, 1985; Yee & Eccles, 1988). Only few studies have examined the possible role of parent-related characteristics in the formation of

parents' causal attributions (Coplan et al., 2002; Räty et al., 2006). Consequently, the present thesis investigated several child- and parent-related factors as potential predictors of parental causal attributions.

3.2.1 Parent- and family- related antecedents of parental causal attributions

The results showed, first, that the higher the education the parents had, the more they attributed their children's success to ability, and less they attributed it to effort (Study I and IV). Similar results have been found previously (Räty et al., 2006). It is possible that highly educated parents' ability attributions have their origin in the parents' own positive experiences at school and their belief that ability is important. Another possibility is that highly educated parents are more involved with their children's schoolwork, or simply have more knowledge about their children's academic skills and how to support and encourage them, which is later reflected in their attributions as an emphasis on the role of ability (Stevenson & Baker, 1987). More educated parents have also been shown to value ability to a greater extent in their child-rearing practices compared to parents with lower levels of education (Tulviste & Ahtonen, 2007); this may then be reflected in their causal attributions concerning their children.

It has been also suggested that when explaining children's academic achievement parents emphasize the role of ability because they believe that talent is something inherited (Mugny & Carugati, 1989). Parents may think that some children are naturally more gifted in certain tasks than other children and vice versa (Mugny & Carugati, 1989). It has been also found that highly educated parents, in particular, typically think that ability is something inherited (Lareau, 1989). This may also explain why they have more confidence in their children's abilities and stress the role of ability when explaining their children's academic successes.

Also, parenting styles were found to contribute to parental causal attributions (Study I). Here, the results showed that the higher the level of affection and behavioral control an individual parent showed, the less she or he thought her or his child's success was due to teaching. One explanation for these results is that high levels of affection and behavioral control reflect authoritative parenting (Baumrind, 1989), and thus these findings would be consistent with the previous results found in the context of children's social behavior (Coplan et al., 2002) according to which authoritative parents tend to use "developmental optimism" when evaluating the causes of their children's behavior.

The results showed further that mothers who reported a high level of psychological control in their parenting, i.e., sought to control their children through guilt, anxiety, and withdrawal of love (Barber & Harmon, 2002), often attributed their child's success to teaching and seldom to the child's ability (Study I). This result is in accordance with the theory of psychological control (Barber & Harmon, 2002): by not crediting the child's success to his or her talent, but rather attributing it to external causes, the psychologically controlling mother arouses guilt and anxiety in their children. Another

possibility is that a high level of mothers' psychological control reflects an overall authoritarian parenting style. It has been shown previously that authoritarian parents perceive their child's positive behaviors to be due to external rather than internal causes (Coplan et al., 2002).

3.2.2 Familial risk for dyslexia

When studying the impact of familial risk for dyslexia among the mothers of 1st grade children (Study IV), the results showed that, alongside the level of mothers' causal attributions, the risk for dyslexia predicted, changes in them. First, it was found that, when children had familial risk for dyslexia, their mothers' ability attributions concerning the children's success in reading decreased during the first school year. By contrast, mothers of the control group children increasingly attributed their children's success to ability during the same period. Further, mothers of children with familial risk for dyslexia attributed their children's success in reading more to the easiness of the task, and failure more to lack of ability and less to effort, compared to the mothers of the control group children. These results suggested that mothers of children with familial risk for dyslexia are less confident of their children's reading abilities than other mothers, and this is then reflected in their causal attributions concerning their children's successes and failures. Previous studies have shown that mothers of children with LD attribute their success less to ability and failure more to lack of ability compared to mothers of children without LD (Bryan et al., 1982; Pearl & Bryan, 1982; Tollison et al., 1987). The results of the present study add to these findings by showing that even familial risk for specific learning difficulties, such as dyslexia, leads to a similar attributional pattern, which partly increases during the children's first school year. Such an attributional pattern among mothers may not be helpful to their children in school, as the lack of parental ability attributions in response to children's success seems to decrease children's subsequent academic performance (Study II). Consequently, one way to prevent possible future problems among children with familial risk for dyslexia would be to strengthen their parents' belief that their children can still do well in reading despite their familial risk.

It is important to note also that none of the children in the sample had been diagnosed with dyslexia as yet. In other words, the familial risk for dyslexia originated in the parents' reports, and was the mothers' characteristics rather than their children's. Thus, it is possible that the risk groups' mothers' concerns or doubts about their children's progress in reading may partly originate from their own experiences at school, and lead these mothers to attribute their children's success less to internal causes (such as ability) and more to external causes (such as task easiness), and failure to more internal causes (such as ability).

3.2.3 Child-related antecedents of parental causal attributions

The results of the present thesis showed that the higher the performance the children showed at school, the more typically their parents attributed their success to ability and the less typically they attributed it to effort or teaching (Studies I and IV). Similarly, children's high performance also increased parents' subsequent ability attributions, and decreased parents' subsequent effort attributions for success (Study II). These results are in line with previous findings in which it has been shown that, if children do well at school, their parents are likely to attribute their success to an internal and stable attribution, such as ability, whereas when children's performance is average or low, parents tend to attribute their success to effort (Dunton et al., 1988; Holloway & Hess 1985; Yee & Eccles, 1988). However, these findings are in conflict with those of previous studies which have found good performance to be associated with parents' frequent use of effort attributions after the child's success (Georgiou, 1999).

The present results also showed that children's self-concept of math ability predicted their parents' causal attributions. It was found that mothers whose children were in the over-optimistic self-concept of ability group attributed their children's success increasingly to teaching compared to those mothers whose children were in the accurate self-concept of ability group (Study III). It is possible that children's over-optimism decreases parents' trust in their children's skills, and, consequently, increases their external attributions, such as teaching. Further, fathers whose daughters were in the accurate self-concept of ability group attributed their failure more to lack of effort compared to fathers whose daughters were in the over-optimistic self-concept of ability group. The results of the present study add to the previous findings by showing that when children show an accurate self-concept of ability, parents tend to attribute their failure rather to effort, which may also encourage children and motivate to try harder in the future (Yee & Eccles, 1988; Weiner, 1994b).

It has been suggested previously that parents' perceptions are not likely to be affected by their children's self-concepts, especially among adolescents (Yun Dai, 2002). The results of the present thesis, however, showed that children's self-concept of ability predicted changes in their parents' causal attributions. Thus, it is possible that parents' perceptions concerning their children may well be affected by their children's self-concepts, especially when the children are young and about to start their school career. Parents may follow their children's developing skills during the early primary school years more closely than during adolescence and, by doing so, become more aware of their children's academic self-concepts.

Interestingly, most of the associations found between child-related antecedents and parents' causal attributions for failure were particularly profound in the case of children with familial risk for dyslexia (Study IV). The higher the word and nonword reading skills the children showed, the more their mothers attributed their failure to effort and task difficulty and the less they attributed it to poor teaching. These results suggest that mothers of

children with a familial risk for dyslexia are particularly sensitive to feedback concerning their children's reading development. The results of the present thesis suggest that, if at-risk children show a relatively high level of word and nonword reading skills, their mothers begin to attribute their failure to effort. As has been found in previous research (Juvonen & Murdoc, 1993; Weiner, 1994b), attributing failure to effort supports accuracy of self-concept and improvement in future performance. Consequently, mothers of children with a familial risk for dyslexia may be able to contribute their children's positive development by expressing such effort attributions after academic failure.

The lack of associations between parental causal attributions for failure and their possible antecedents investigated in the present study may be due to the observations reported in the literature that failure leads to more causal search than success (Försterling, 2001; Wong & Weiner, 1981). It has been also suggested that parents find it harder to explain their children's failure compared to success (Cote & Azar, 1997), and they describe their children's successes more than their failures (Aunola, Rytkönen, & Nurmi, 2005). Thus, it is possible that parents are more insecure about the causes of their children's failures than the causes of their successes. It is also possible that parents' other general beliefs or values not studied in the present thesis rather contribute to their evaluations of their children's academic failures (Lareau, 1989).

Children's gender was not associated with parental causal attributions in the present thesis. The results of the previous studies have been contradictory in this respect. Some studies have shown gender differences in parental causal attributions (Dunton et al., 1988; Eccles et al, 1990; Räty et al., 2002; Räty & Kasanen, 2006; Yee & Eccles, 1988), whereas other studies have found no such differences (Cashmore and Goodnow, 1986). There may be several reasons for these conflicting findings. First, it is possible that gender differences emerge in parental causal attributions later, when children move to higher grades, as found in the study by Yee and Eccles (1988). Second, the methods that have been used in previous studies to measure parents' causal attributions and their associations with children's gender have varied greatly. Thus, it is possible that the conflicting results of the previous studies are due to the diversity of the research methods used (Bugental, Johnston, New, & Silvester, 1998). It is also possible that gender differences are stronger in parents' domain-specific causal attributions (Räty & Kasanen, 2006; Yee & Eccles, 1988) than in parents' causal attributions concerning children's general school achievement. The third explanation relates to culture. Since parents' causal attributions have been shown to vary according to the culture (Stevenson & Lee, 1990), parents from different cultural backgrounds may place different emphasis on the role of children's gender in achievement.

3.3 Consequences of parental causal attributions: Ability and effort

Research on parental causal attributions has shown that parents tend to attribute their children's academic outcomes particularly to ability and effort (Dunton et al., 1988; Holloway & Hess, 1985; Weiner, 1994a; Yee & Eccles, 1988). Some previous studies suggest that parents' effort attributions are beneficial because they encourage children to invest a high level of effort in a challenging task (Yee & Eccles, 1988; Weiner, 1994b). The results of the present thesis (Study II) emphasize the importance of parents' ability attributions for success as such attributions have a positive effect on children's academic performance.

The results showed further that parents' ability attributions also increased changes in children's self-concept of math ability from an over-optimistic to a more accurate self-concept, whereas parents' effort attributions for success increased the changes from an accurate to a more over-optimistic self-concept (Study III). It would seem, then, that accurate self-concept of ability may improve children's academic performance, whereas optimism is likely to increase children's effort. Further, by attributing children's success to effort mothers and fathers may be trying to encourage their children to perform better in the future, that is, invest a lot of effort when faced by a challenging task. Although such parental causal attributions may be effective in increasing children's effort in difficult situations, they may also encourage the child to form an overly positive self-concept. In the long run, such inaccuracy in children's self-concept may later show as decreased academic performance. It has been also found that increased effort alone does not necessarily promote learning (Ericsson, Krampe, & Tesch-Römer, 1993). Alongside effort a student needs also to have a good cognitive learning strategy (Ericsson et al., 1993). It is possible that emphasizing the role of effort combined with *deliberate practice* would provide optimal support for children's learning and performance (Ericsson et al., 1993).

Another possible explanation for these results is that parents' causal attributions may be reflected in their subsequent expectations and aspirations concerning the child (Bugental & Happaney, 2002; Dix & Grusec, 1985). Such expectations, when communicated to the child, may then be influential in the child's subsequent academic achievement and self-concept (Aunola, Nurmi, Niemi, Lerkkanen & Rasku-Puttonen, 2002). A third possible explanation is that parents' causal attributions may activate certain patterns of affect and emotional responses (Dix & Grusec, 1985; Miller, 1995) which then have consequences for the ways in which parents encourage, support and guide their children. This, in turn, may influence the child's academic performance. Finally, parents who attribute their children's performance to ability may have confidence in their children's talents, and be therefore also more likely to encourage and support their children with their schoolwork (Yun Dai, 2002).

This, in turn, may foster the children's own understanding of their abilities, which is then reflected in a more accurate self-concept of ability.

However, when parents increasingly attribute their children's success to ability not only do they give their children full credit for success and a feeling of being capable, but they also make them responsible for their school achievement. When children are still in the kindergarten or just starting out on their school career, it is reasonable to assume that their successes and failures would greatly depend on their closest significant adults, i.e. parents and teachers. It might be good for the child's developing skills and self-concept to give the child credit for his or hers success (and sense of personal capability), but a strong emphasis on their own responsibility and abilities with respect to their school achievement might not help such children in the long run to develop, for example, appropriate achievement strategies.

According to Dweck and her colleagues, adults' praising children for their intelligence increases their performance-orientation whereas praising children for effort promotes their mastery-orientation strategies (Kamins & Dweck, 1999; Mueller & Dweck, 1998). Such changes in children's conceptions may in turn have an impact on their subsequent performance. Thus, it is possible that praising children for their intelligence increases their performance but does not support them to develop better achievement strategies. However, it has been found that Finnish parents differentiate between "intelligence" or "smartness" and "ability"; they value ability highly, but do not rate smartness as one of the three most important child-rearing goals (Tulviste & Ahtonen, 2007). Consequently, it is possible that ability and intelligence are not conceptually the same in different cultures, and thus may have different meanings in relation to achievement or parenting.

It is also possible that how parents' causal attributions support the academic motivation and skills of their children varies according to the individual characteristics of a child. For example, it has been suggested previously that a child's temperamental characteristics impact the kind of teaching that best suits that individual child (Coplan, Barber, & Lagacé-Séguin, 1999). Likewise, it is possible that for some children it is more beneficial to highlight the role of ability in achieving, whereas for other children high effort might be more important.

It is possible that the present results are connected with cultural differences in parents' causal attributions. Previous studies have shown that parents' causal attributions and beliefs related to their children's academic achievement are influenced by the surrounding culture (Bugental & Happaney, 2002; Crystal & Stevenson, 1991; Holloway, 1988; Lummis & Stevenson, 1990; Stevenson, Chen, & Uttal, 1990; Stevenson & Lee, 1990). For example, mothers whose cultural background is European-American attribute their children's success more to ability than do Asian-American mothers (Kinlaw et al., 2001). A recent study on parental values has shown that ability as a child-rearing goal is generally highly valued among the Finnish parents (Tulviste & Ahtonen, 2007). 59% of Finnish parents in the study of Tulviste and Ahtonen (2007) included

confidence in one's ability (e.g. *believe in his/her abilities*) among their three most important child-rearing goals. Thus, it is possible that Finnish parents' tendency to value highly one's belief in one's abilities leads them to emphasize the role of ability when they evaluate their children's academic achievements, especially in the case of success. However, closer investigating of the associations between parental values and causal attributions concerning children's academic achievement would be needed to resolve these questions.

The results of Studies II and III also add to the findings of previous studies among parents of older children that parents' causal attributions make an important contribution to their children's performance and self-concept already during the transition from kindergarten to primary school.

4 LIMITATIONS

The results of the present thesis have several limitations. First, the present study focused on four types of causal attributions (i.e. ability, effort, teaching, and task difficulty). It has been found previously in using open-ended questions to elicit mothers' causal attributions that mothers spontaneously produce other kinds of causal attributions besides the four examined here (Jaworski & Hubert, 1994). Consequently, some of the findings of the present study should be replicated by using open-ended procedures.

Second, in Studies I-III parents' causal attributions concerned children's general school achievement rather than specific school subjects. Previously parental attributions have often been investigated using domain-specific procedures (Cashmore & Goodnow, 1986; Yee & Eccles, 1988). This difference in the methods used may then also explain some of the differences in the results of this study compared to previous studies. Moreover, parents were asked to rank four causal attributions rather than rate them independently, which may have influenced the results.

Third, other family-related factors, not studied in the present thesis, may also have an impact on parents' causal attributions. For example, other kinds of parental beliefs, such as expectations of children's academic outcomes, may also affect their causal attributions concerning their child's behavior (Miller, 1995). Another factor that might be reflected in parental causal attributions is that of their values. Previously, it has been shown that parents' values and child-rearing goals concerning their children's achievement and abilities vary greatly (Tulviste & Ahtonen, 2007). For example, some parents value ability highly (Tulviste & Ahtonen, 2007). Also, how parents value future education may influence their interpretations of their children's academic achievement as well as their involvement in their children's school work (Lareau, 1989). Consequently, it is possible that parents' general value-based concepts of ability may later show in their causal attributions concerning their children's academic achievement.

Fourth, Studies II and III showed that parental causal attributions predicted their children's academic performance and self-concept of ability.

However, the mechanisms underlying these associations were not examined. Thus, the results did not show through what kind of behavior or what kind of support of children's schoolwork parental causal attributions influenced their children's academic performance and self-concept. Consequently, future research is needed to identify the major mechanisms through which parental causal attributions contribute to children's behavior. One example of such a mechanism is the ways parents are involved in their children's academic activities (Georgiou, 1999).

Finally, the present studies were carried out in one particular country, Finland. Previous studies have shown that parents' causal attributions and beliefs related to their children's academic achievement are influenced by the surrounding culture (Bugental & Happaney, 2002; Crystal & Stevenson, 1991; Holloway, 1988; Lummis & Stevenson, 1990; Stevenson et al, 1990; Stevenson & Lee, 1990). Also the socialization of gender-differences may vary across cultures (Campbell & Beaudry, 1998). It is possible that the lack of gender differences found in the present thesis in parental causal attributions as well as in children's academic performance and self-concept of ability might be partly explained by Finnish culture. Consequently, some of the results might have turned out differently in some other sociocultural contexts.

5 PRACTICAL IMPLICATIONS

The results of the present thesis showed that parents' causal attributions are closely linked to a wider range of familial characteristics, such as parenting styles and educational level. These results suggest, first, that when investigating parental causal attributions their other familial characteristics, such as different parenting beliefs and their own educational level, should be taken into consideration in interpreting the results. For example, it would be important for educators to know that parents from different socioeconomical or educational background evaluate differently and attribute to different causes their children's academic achievement. This might also influence their behaviour and the support they give to their children's school work. For example, parents with a high level of education may be more involved with their children's schoolwork (Stevenson & Baker, 1987) and they may also have better knowledge of their children's skills, which is then also reflected in their causal attributions.

Second, the results of the present thesis may also have consequences for parental education when their children start their school career. The results showed that in particular parents' ability attributions for success increased their children's subsequent performance. These results suggest that parents of primary school children should be advised to communicate to their children the message that they can do well at school because they have the abilities required to succeed. As found here, parents' communication of such optimism to their children is beneficial for the child's academic performance. The results also showed vice versa that children's good performance contributed to parents' attributions of their children's success to ability. Overall, the results revealed that parents' causal attributions of ability, in particular, and their children's academic performance form reciprocal patterns across the child's first school years (e.g. Pomerantz & Eaton, 2001).

Third, it has been found previously that adults' praising children for their intelligence increases their performance-orientation, whereas praising children for effort promotes their mastery-orientation strategies (Kamins & Dweck, 1999; Mueller & Dweck, 1998). Such change in children's conceptions may in turn

have an impact on their subsequent performance. The present results showed that besides effort attributions, parents communicating to children that they have the required skills or talents (e.g. ability) to perform well, may help children to achieve an accurate self-concept of ability. This may, later on, influence children's own evaluations of their achievement as well as their academic performance.

Fourth, the results of the present thesis showed that when children had familial risk for dyslexia, their mothers' ability attributions for the children's success in reading decreased during the first school year, whereas in the control group they increased. These results suggested that mothers of children with a risk for dyslexia not only have less faith in their children's abilities but seem to strengthen their conceptions during the first school year. Such an attributional pattern among mothers may lead to their children experiencing increasing problems at school, as it was also found that lack of parental ability attributions concerning their children's success decreased the children's subsequent academic performance. Consequently, one way to prevent future problems among children with a risk for learning difficulties would be to strengthen their parents' belief that their children can still do well in reading despite their familial risk.

Fifth, the present studies showed the importance of taking account of parents' causal attributions as a family characteristic. The results suggested that mothers and fathers within the same family generally share their evaluations of their children's success. Thus, parental causal attributions may reflect wider family-related beliefs and a family climate that are shared by the whole family rather than being the property of individual parents. Awareness of this may also help educators and parents when reflecting on children's achievement and school career.

6 FUTURE DIRECTIONS

The results of the present thesis showed that parents' ability attributions for success increased their children's subsequent performance and vice versa. More knowledge about these associations would help us to better understand the possible cumulative effects of the interaction between parental causal attributions and children's academic performance. It is also possible that as the children grow older these reciprocal patterns (Pomerantz & Eaton, 2001) turn out to be different, and are replaced by different associations between parental causal attributions and children's academic achievement of self-concept of ability. Knowing this would help educators and parents to prevent negative reciprocal patterns form occurring.

Another important goal for future research would be to investigate different combinations of parents' causal attributions. In the present studies, this was not possible because of the methods used. However, it is possible that parents place equal emphasis on ability and hard work as causes of their children's success rather than on one of them alone. This might subsequently better support children's later performance and the formation of their achievement strategies.

In line with some previous studies (Cote & Azar, 1997; Kinlaw et al., 2001) the present results point to the importance of exploring further the parental behaviours that might mediate the associations between parental causal attributions and children's academic skills, attributions, and self-concept of ability. For example, how parents are involved in their children's schoolwork at home, and how their causal beliefs concerning children's success and failure are communicated to their children would be topics worth of investigating (Bouffard & Hill, 2005). How children interpret these messages from their parents would also merit future study (Bouffard & Hill, 2005).

A fourth possible goal for future research would be to investigate parents' daily evaluations and attributions concerning their children's schoolwork. That would also give us important knowledge about how children's outcomes are seen in their daily interactions at home.

Alongside parents, teachers are also significant adults in kindergarten-aged children's lives. Therefore, it would be useful to know how teachers' causal attributions are associated with children's developing skills, self-concept and future achievement. It has been suggested that at different grade levels teachers emphasize the role of effort and ability differently (Rosenholtz & Simpson, 1984). For example, at the beginning of primary school effort is highlighted more than ability (Rosenholtz & Simpson, 1984). Thus, it is possible that how teachers' emphasize effort and ability at different grade levels not only influences children's self-perceptions of ability but also how parents interpret the causes of their children's academic achievement (Rosenholtz & Simpshon, 1984). Further, it has been suggested that congruency between parents' and teachers' causal attributions concerning children's achievement better support the development of children's academic skills compared to a situation in which the messages a child receives from parents and teachers are conflicting (Peet, Powell, & O'Donnel, 1997). Consequently, it would be important to study further the congruency between parents' and teachers' causal attributions concerning children's academic achievement and how such congruency is reflected in children's subsequent academic achievement and motivation.

One result of the present research was that mothers and fathers within the same family tend to attribute their children's academic achievement the same causes. Moreover, mothers', as well as fathers', causal attributions were highly associated with their children's academic performance and self-concept of ability. These associations were typically similar among mothers and fathers. These results suggest that that parental evaluations of their children's success and failure at beginning of primary school are a characteristic of the family rather than of individual parents, which would be important to take into account in the future studies as well.

7 CONCLUSIONS

Research on parental causal attributions and beliefs concerning their children's development and academic abilities has received increasing attention in recent years (Jaworski & Hubert, 1994; Miller, 1995). Such causal attributions also form an important part of parents' social cognitions, because how parents interpret the causes behind their children's outcomes provides an essential basis for the ways in which they guide and tutor their children at home. The present thesis investigated how mothers' and fathers' causal attributions concerning their children's academic achievement evolve during their children's transition from kindergarten to the first grades of primary school, and the antecedents and consequences of these causal attributions.

The results showed that mothers and fathers typically attributed their children's academic success to ability and their failure to effort. However, when the children had a risk for learning difficulties (dyslexia), mothers attributed their success decreasingly to ability during the children's first school year. The results of the present thesis revealed that mothers and fathers within the same family typically shared their causal attributions concerning their children's academic performance during the transition to primary school. Moreover, parents' causal attributions concerning their children's academic achievement were relatively stable early on; however, when changes occurred in parents' causal attributions, these changes were typically shared by both parents.

The results of the present studies showed further that parents' causal attributions and children's academic performance and self-concept of math ability form reciprocal relations (e.g. Pomerantz & Eaton, 2001) during the children's transition to primary school. The higher the level of performance children showed at school, the more their parents attributed their success to ability and the less to effort. Conversely, the more parents attributed their children's success to ability, the higher the performance the children showed later on, and the more accurate their self-concept of ability became. Attributing children's success to effort, in turn, increased over-optimism in children's self-concept of ability. The results suggest that when the parents of primary school children communicate to their children that they have the abilities required to succeed, such parental optimism is beneficial for their children's later academic development.

TIIVISTELMÄ

Tässä väitöskirjassa tutkittiin vanhempien lastensa koulumenestystä koskevia kausaaliattribuutioita (kyky, yritys, ohjaus ja tehtävän vaikeus). Väitöskirja koostuu neljästä osatutkimuksesta. Väitöskirjassa tarkasteltiin vanhempien tyypillisimpiä kausaaliattribuutioita ja niissä tapahtuvia muutoksia lasten siirtyessä esikoulusta kouluun (Osatutkimus I). Lisäksi tutkittiin myös vanhempien kausaaliattribuutioita ennustavia tekijöitä (Osatutkimus I) ja vanhempien kausaaliattribuuutioiden ja lasten koulutaitojen ja minäkuvan välisiä vastavuoroisia yhteyksiä esikoulusta kouluun siirtymävaiheessa (Osatutkimukset II ja III). Myös äitien, joiden lapsilla oli riski oppimisvaikeuksiin (dysleksia) kausaaliattribuutiota tutkittiin lasten ensimmäisen kouluvuoden aikana (Osatutkimus IV).

Ensimmäisessä osatutkimuksessa tarkasteltiin vanhempien lastensa koulumenestykseen liittämiä kausaaliattribuutioita ja niissä tapahtuvia muutoksia lasten siirtyessä esikoulusta kouluun. Lisäksi tarkasteltiin missä määrin erilaiset vanhempiin liittyvät taustatekijät, kuten koulutustaso ja vanhemmuustyylit, sekä lapsiin liittyvät taustatekijät, kuten luku- ja laskutaito, ennustavat vanhempien kausaaliattribuutioita ja niissä tapahtuvaa muutosta. Kausaaliattribuutioissa tapahtuvia muutoksia ja niitä ennustavien tekijöiden vaikutusta analysoitiin monitaso kasvukäyrä mallinnuksella, jolloin pystyttiin tarkastelemaan myös missä määrin eri attribuutiot ja niitä ennustavat tekijät olivat tyypillisesti vanhempien jakamia ja missä määrin pikemminkin yksilöiden ominaisuuksia. Tulokset osoittivat, että lasten ollessa esikoulussa vanhemmat selittivät heidän onnistumistaan tyypillisesti hyvästä ohjauksesta ja kyvyistä johtuvaksi. Lasten siirtyessä esikoulusta kouluun vanhempien kyky-attribuutiot lisääntyivät, ja ohjaus-attribuutiot vähenivät. Epäonnistuminen selitettiin tyypillisesti yrityksen puutteesta johtuvaksi. Tulokset osoittivat myös, että saman perheen vanhempien attribuutiot ja niissä tapahtuvat muutokset olivat tyypillisesti samanlaisia. Lisäksi tulokset osoittivat että mitä korkeampi koulutus perheen vanhemmilla oli, ja mitä paremmat koulutaidot lapsilla oli, sitä enemmän vanhemmat selittivät lasten onnistumista lasten kyvyistä johtuvaksi. Myös mitä enemmän yksittäiset vanhemmat omasivat auktoritatiivista kasvatustyyliä (paljon rajoja ja lämpöä), sitä vähemmän he selittivät lasten onnistumista hyvästä opetuksesta johtuvaksi. Äidit, joiden kasvatustyylissä korostui psykologinen kontrolli, puolestaan selittivät lasten onnistumista tyypillisesti hyvästä ohjauksesta mutta ei kyvyistä johtuvaksi.

Toisessa osatutkimuksessa tarkasteltiin vanhempien lastensa onnistumiseen ja epäonnistumiseen liittämiä kyky- ja yritys-attribuutioiden ja lasten koulutaitojen välisiä vastavuoroisia yhteyksiä lasten esikoulusta kouluun siirtymävaiheen aikana. Näitä yhteyksiä analysoitiin polkumallien avulla. Tulokset osoittivat, että mitä paremmat koulutaidot lapsilla oli, sitä enemmän vanhemmat selittivät lasten onnistumista kyvyistä ja sitä vähemmän yrityksestä johtuvaksi. Vastavuoroisesti mitä enemmän vanhemmat selittivät lasten onnistu-

mista lasten kyvykkyydellä, sitä paremmat koulutaidot lapsilla oli myöhemmin. Vanhempien lasten onnistumista koskevat yritys-attribuutiot ennakoivat lasten heikompia koulutaitoija peruskoulun toisella luokalla. Lasten koulutaitojen ja vanhempien lasten epäonnistumista koskevien kausaaliattribuutoiden välille ei löytynyt vastaavia yhteyksiä. Tulokset osoittivat, että vanhemmat perustavat lastensa koulumenestystä koskevat attribuutiot ainakin osittain lasten koulutaitoihin, joiden kanssa ne muodostavat myös kumulatiivisia kehiä lasten ensimmäisten kouluvuosien aikana.

Kolmannessa osatutkimuksessa tarkasteltiin millaisia ryhmiä muodostuu lasten matematiikan taitojen ja oppimisminäkuvan realistisuuden pohjalta, ja millaisia muutoksia lasten matematiikkaan liittyvässä oppimisminäkuvassa tapahtuu lasten ensimmäisten kouluvuosien aikana. Lisäksi haluttiin selvittää miten vanhempien kausaaliattribuutiot ennustavat lasten minäkuvassa tapahtuvia muutoksia ja toisaalta miten lasten minäkuva ennustaa vanhempien kausaaliattribuutioita lasten ensimmäisen ja toisen kouluvuoden aikana. Tulokset analysoitiin I-States as Objects (ISOA) –menetelmän ja multinominaalisten regressionalyysien avulla. Analyysien pohjalta löytyi kolme lasten matematiikan oppimisminäkuva-ryhmää: yltiö-optimisten, realistinen, ja yltiö-negatiivinen ryhmä. Tulokset analysoitiin ISOA (I-States as Objects) –menetelmän ja multinominaalisen regressioanalyysin avulla. Tulokset osoittivat, että mitä enemmän vanhemmat selittivät lasten onnistumista kyvykkyydellä, sitä realistisemmaksi lasten minäkuva muuttui ensimmäisten kouluvuosien aikana, ja sitä vähemmän lasten minäkuva oli myöhemmin yltiöoptimistinen. Toisaalta, mitä enemmän vanhemmat selittivät lasten onnistumista ahkerasta yrityksestä johtuvaksi, sitä yltiöoptimistisempi ja sitä vähemmän realistinen lasten oppimisminäkuva oli myöhemmin. Tulokset osoittivat lisäksi että yhteydet vanhempien kausaaliattribuutioiden ja lasten matematiikan oppimisminäkuvan välillä olivat hyvin samanlaisia äideillä ja isillä. Tulosten pohjalta voidaan olettaa, että vanhempien kausaaliattribuutiot, kommunikoituna heidän lapsilleen, ovat yksi tärkeä lasten oppimisminäkuvan realistisuuteen vaikuttava tekijä.

Neljännessä osatutkimuksessa tarkasteltiin miten äidit, joiden lapsilla on familiaalinen riski dysleksiaan attribuoivat lastensa onnistumisen lukemiseen liittyvissä tehtävissä verrattuna äiteihin joiden lapsilla ei ole vastaavaa riskiä lasten ensimmäisen kouluvuoden aikana. Lisäksi tutkittiin miten lasten esilukutaito, sukupuoli, ja äitien koulutustaso ennustavat äitien kausaaliattribuutioita. Tutkimuskysymyksiä analysoitiin latentin kasvukäyrän menetelmällä. Tulokset osoittivat, että riskiryhmän äidit selittivät lastensa onnistumista vähenevässä määrin lasten kyvykkyydellä lasten ensimmäisen kouluvuoden aikana, kun taas verrokkiryhmän äitien kyky-attribuutiot lisääntyivät samana ajanjaksona. Riskiryhmän äidit selittivät myös lastensa epäonnistumista enemmän kykyjen puutteesta ja vähemmän yrityksen puutteesta johtuvaksi kuin verrokkiryhmän äidit. Lisäksi tulokset osoittivat, että mitä parempi esilukutaito lapsilla oli, sitä enemmän äidit selittivät lastensa onnistumista kyvykkyydestä, ja sitä vähemmän ahkerasta yrityksestä johtuvaksi. Mitä korkeampi koulutus äideillä oli, sitä enemmän he myös selittivät lastensa onnistumista kyvykkyydellä ja

epäonnistumista ohjauksen puutteesta johtuvaksi. Tulosten pohjalta voidaan olettaa, että jo riski spesifimpeihin oppimisvaikeuksiin, kuten dysleksiaan, vaikuttaa siihen miten äidit tulkitsevat ja selittävät lastensa koulusuoriutumisen taustalla olevia syitä. Lisäksi myös lasten koulutaitoja ennakoivat taidot, kuten sanojen ja epäsanojen lukeminen ja verbaali älykkyys, ennustava äitien myöhempiä arviointeja lastensa koulusuoriutumisesta.

Kaiken kaikkiaan väitöskirjan tulokset osoittivat, että äitien ja isien lastensa koulusuoriutumista koskevat kausaaliattribuutiot ovat hyvin samanlaisia. Vanhemmat selittävät lastensa onnistumista tyypillisesti kyvykkyydestä ja epäonnistumista yrityksen puutteesta johtuvaksi. Kuitenkin jos lapsella on riski oppimisvaikeuksiin, äidit lasten onnistumista koskevat kyky-attribuutiot vähenevät ensimmäisen kouluvuoden aikana. Vanhempien kausaaliattribuutiot myös muodostavat vastavuoroisia kehiä lasten koulutaitojen ja oppimisminäkuvan kanssa. Myös vanhempien koulutustasolla ja kasvatustyyleillä on vaikutusta siihen miten he myöhemmin selittävät lastensa koulusuoriutumista. Suomalaiset vanhemmat eivät tyypillisesti tee eroa tyttöjen ja poikien suoriutumisen syiden välillä lasten ensimmäisten kouluvuosien aikana.

Tulevaisuuden vanhempien kausaaliattribuutioita koskevissa tutkimuksissa olisi tärkeää ottaa huomioon, että erilaisilla perheelle tyypillisillä ominaisuuksilla, kuten koulutustasolla ja kasvatustyyleillä on vaikutusta siihen miten vanhemmat arvioivat ja selittävät lastensa koulusuoriutumista. Nämä taustatekijät voivat vaikuttaa myös siihen, miten vanhemmat tukevat lapsiaan ja osallistuvat lastensa koulutyöhön. Väitöskirjan tulokset osoittivat myös että koulunsa aloittavien lasten vanhempia voisi neuvoa viestimään lapsilleen, että heillä on kykyjä onnistua haastavissakin koulutehtävissä. Tällainen viesti vanhemmilta lapsille vaikuttaa positiivisesti lasten koulutaitojen kehitykseen ja minäkuvan muuttumiseen realistisemmaksi.

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