

ASSOCIATIONS OF EARLY ADOLESCENTS' READING DIFFICULTIES  
WITH THEIR READING-RELATED TASK VALUES, COMPETENCE BELIEFS  
AND ACHIEVEMENT EMOTIONS

Maria Päivinen  
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Department of Psychology  
University of Jyväskylä  
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UNIVERSITY OF JYVÄSKYLÄ

Department of Psychology

PÄIVINEN MARIA, Associations of Early Adolescents' Reading Difficulties with their Reading-related Task Values, Competence Beliefs and Achievement Emotions

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Supervisors: Noona Kiuru & Kenneth Eklund

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This study was part of the STAIRWAY – From Primary School to Secondary School longitudinal study that started in 2014. The aim was to examine the association between Finnish sixth grade students' reading difficulties with their reading-related (a) task values (interest towards reading and perceived importance of reading), (b) competence beliefs, and c) achievement emotions. In addition, the aim was to examine d) the associations of achievement emotions with reading-related task values and competence beliefs and whether reading difficulties moderate these relations. The sample comprised 128 students that were categorized as having no reading difficulties (No RD, n=66), mild reading difficulties (Mild RD, n=31) or severe reading difficulties (Severe RD, n=31). The reading skills of the students were assessed in classroom settings in autumn 2014 using two Word Reading subtests and a short version of Salzburg sentence reading test. The reading-related task values, competence beliefs and achievement emotions were evaluated in real-time achievement situations in spring 2015, right before performing a reading task. Students' self-ratings of these variables were accessed using an adapted version of the Subject-specific Task Values measure, adapted versions of Eccles and Wigfield (1995) and Spinath and Steinmayer (2008) competence belief scales and the Emotions in Achievement Situations (EAS) scale. The findings indicated differences between the groups in the reading task values and competence beliefs, often so that the Mild RD group differed from the others in their more negative evaluations. In terms of achievement emotions, only hopelessness differed between the groups. The Severe RD group experienced it the most and the No RD group the least. Finally, the results showed that only the association between the perceived importance of reading and the negative achievement emotions was influenced by the reading difficulties of the student. This association was significant only among students with severe reading difficulties. Achievement emotions were linked with interest towards reading and competence beliefs too, but these associations were not different depending on reading difficulties. My findings indicate that reading difficulties are a multilevel phenomenon and their degree of severity should be taken into consideration in the learning context, providing all students as appropriate and supportive an environment as possible.

Keywords: reading difficulties, task values, competence beliefs, achievement emotions, early adolescents

PÄIVINEN MARIA, Varhaisnuorten lukivaikeuksien yhteys lukemisen tehtäväkohtaiseen motivaatioon, pystyvyysuskomuksiin ja tunteisiin

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Ohjaajat: Noona Kiuru & Kenneth Eklund

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Tämä tutkimus oli osa TIKAPUU – alakoulusta yläkouluun pitkittäistutkimusta, joka alkoi syksyllä 2014. Tässä tutkimuksessa haluttiin kartoittaa suomalaisten kuudesluokkalaisten lukivaikeuksien yhteyttä lukemisen (a) tehtäväkohtaiseen motivaatioon (kiinnostus lukemista kohtaan ja lukemisen tärkeys), (b) pystyvyysuskomuksiin ja c) tehtävien herättämiin tunteisiin. Tutkittiin myös sitä, d) ovatko lukemisen tehtäväkohtainen motivaatio ja pystyvyysuskomukset yhteydessä oppilaiden kokemiin tunteisiin. Lisäksi tarkasteltiin lukivaikeuksien vaikutusta oppilaiden kokemien tunteiden, lukemisen tehtäväkohtaisen motivaation ja lukemisen pystyvyysuskomuksien välisiin yhteyksiin. Otos koostui 128 kuudesluokkalaisesta, jotka jaettiin ryhmiin Ei LV (ei lukivaikeuksia, n=66), Lievä LV (lieviä lukivaikeuksia, n=31) ja Vakava LV (vakavia lukivaikeuksia, n=31). Oppilaiden lukutaitoa arvioitiin kahdella sanatason lukutaitoa arvioivalla sanaketjutestillä sekä Salzburgin lauseenlukemistestillä syksyllä 2014. Tehtäväkohtaista motivaatiota, pystyvyysuskomuksia ja tunteita tutkittiin reaaliaikaisissa suoriutumistilanteissa, juuri ennen lukemistehtävän tekemistä keväällä 2015. Oppilaiden vastauksia arvioitiin käyttäen adaptoituja versioita Subject-specific Task Values –mittarista, Ecclesin ja Wigfieldin (1995) ja Spinathin ja Steinmayerin (2008) pystyvyysuskomuksia mittaavista mittareista sekä Emotions in Achievement Situations (EAS)-skaalaa. Tulokset osoittivat, että ryhmät erosivat toisistaan tehtäväkohtaisessa motivaatiossa sekä pystyvyysuskomuksissa, usein siten että Lievä LV –ryhmällä oli muita ryhmiä negatiivisemmat arviot. Tehtäviin liittyvistä tunteista ainoastaan toivottomuuden tunne erosi ryhmien välillä. Vakava LV –ryhmä koki eniten toivottomuutta ja Ei LV –ryhmä vähiten. Lisäksi tulokset osoittivat, että vain lukemisen tärkeyden ja negatiivisten tunteiden välinen yhteys muuntui oppilaan lukivaikeuksien vaikutuksesta. Ainoastaan oppilailla, joilla oli vakavia lukemisen vaikeuksia, lukivaikeudet yhdessä lukemisen tärkeyden kanssa olivat yhteydessä heidän kokemiinsa negatiivisiin tunteisiin. Lukemisen tehtäviin liittyvät tunteet olivat yhteydessä myös lukemisen kiinnostavuuteen ja pystyvyysuskomuksiin, mutta lukivaikeudet eivät muuntaneet näitä yhteyksiä. Tuloksemme osoittavat, että lukivaikeudet ovat moniasteinen ilmiö, ja että niiden vaikeusaste tulisi ottaa huomioon suunniteltaessa oppimisympäristöjä, jotka mahdollisimman hyvin palvelisivat ja tukisivat jokaisen oppilaan tarpeita.

Avainsanat: lukivaikeus, tehtäväkohtainen motivaatio, pystyvyysuskomukset, tunteet, varhaisnuoret

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## **1. INTRODUCTION**

There is a perpetual tendency in today's societies to lay a considerable weight on independency and individual achievements in school and professional life (Pekrun, Goetz, Titz & Perry, 2002). It often seems forgotten, however, that this gradual change in people's values may be unfavorable for those who struggle in academic and especially reading skills' development. Well-developed reading skills are one of the most central basic human abilities and socially greatly valued (Snow, Burns & Griffin, 1998). They form an important base for the student's academic achievement, social and economic development (Perfetti & Curtis, 1986; Snow *et al.*, 1998; van der Leij & van Daal, 1999; Viljaranta, 2010). Reading difficulties, on the other hand, are the most common type of learning difficulties (Kavale & Reese, 1992; Snow *et al.*, 1998). Students dealing with reading difficulties often experience problems in other school subjects, too (Fletcher, Lyon, Fuchs, Barnes & Seppänen, 2009; Koponen, Salmi, Eklund & Aro, 2013; Light and DeFries, 1995; Willcutt & Pennington, 2000), and reading difficulties may have a negative influence on students' subsequent educational and vocational careers (Lyytinen & Erskine, 2006).

To date, the field of research in reading and reading difficulties has focused mainly on cognitive factors, and only recently the importance of the student's developing self-system and self-efficacy beliefs has been announced (Chapman & Tunmer, 2003). However, more research about different reading-related motivational aspects, such as task values, is needed (Baker & Wigfield, 1999; Chapman & Tunmer, 2003; Nurmi & Aunola, 2005) as well as about emotions associated with the reading experiences. Reading-related studies have also been centered mainly on children at the beginning of their academic path (Chapman & Tunmer, 2003). There are only few studies focusing on reading task-related values, competence beliefs, and emotions of adolescents with and without reading difficulties. In this study, I will focus on these factors and their interconnections.

### **1.1. Reading difficulties**

In spite of the incoherence of the definition of reading difficulties, they form an essential area of research because of the significant segment of population they concern (e.g., Lyytinen & Erskine, 2006). Approximately 5-15% of the school-aged children, regardless their ethnic background and mother tongue, have reading-, writing- or mathematics-related specific learning difficulty (American Psychiatric Association, 2013). Most of the children with a learning difficulty, in turn, have reading difficulties (Kavale & Reese, 1992; Snow *et al.*, 1998).

Reading skills and reading difficulties can be defined in many ways on grounds of the underlying reading subskills and the language-specific characteristics. Reading difficulties may be

apparent as decoding or reading comprehension problems, or both these reading subskills (Fletcher *et al.*, 2009; Gough & Tunmer, 1986; Nation & Snowling, 1997; Seymour, Aro & Erskine, 2003). In dyslexia research tradition reading difficulties have been defined as problems in the fluency and/or accuracy of recognizing separate words, and decoding and spelling the text, and problems in reading comprehension are seen as secondary (Lyon, Shaywitz & Shaywitz, 2003). In this study, I follow this line of research. My study grounds on the premise that word decoding skills comprise reading both fluently and accurately (Seymour *et al.*, 2003). In many studies reading *fluency* skills, the automatization and speed of reading, have been named as one of the strongest predictors of reading skills' development (Torppa, Tolvanen, Poikkeus, Eklund, Lerkkanen, Leskinen & Lyytinen, 2007; van der Leij & van Daal, 1999). Reading fluency facilitates the release of resources for more high-level cognitive functions (Fletcher *et al.*, 2009; Logan, 1997; van der Leij & van Daal, 1999), for example text comprehension. Decoding problems are maladaptive in a sense that they are associated with reduced reading activities and, as a result, may reduce the vocabulary and reading comprehension skills of the student (Lyon *et al.*, 2003).

When defining reading difficulties, it must be conceptualized that there are significant language-specific differences in learning to read. When one is learning to read a very transparent language, such as Finnish, reading accuracy generally develops quite effortlessly and quickly (Seymour *et al.*, 2003; Torppa, Eklund, van Bergen & Lyytinen, 2015). This is because the orthographical correspondences (the relation between phonemes and letters) and the consistency (the regularity of how vowels and consonants are united into syllables in a word) of Finnish are very regular in comparison with less transparent languages, such as English (Koponen, Salmi, Eklund & Aro, 2013; Seymour *et al.*, 2003). Therefore, poor reading fluency skills have often been used as criterion for reading difficulties in transparent languages (Lovett, Steinbach & Frijters, 2000; Lyon *et al.*, 2003) especially when considering a language as regular and orthographically consistent as Finnish (Puolakanaho, Ahonen, Aro, Eklund, Leppänen, Poikkeus, Tolvanen, Torppa & Lyytinen, 2007). In this study, reading difficulties were defined according to the development and qualities of a transparent language using reading fluency as a measure for reading difficulties.

Even though reading difficulties have been given much scientific attention, the majority of studies have focused on young children's reading skills' development (Catts, Adolf & Weismer, 2006; Torppa *et al.*, 2015). More studies about the relation of reading difficulties with students' reading motivation, competence beliefs and reading-related emotions are needed.

## **1.2. Task values and competence beliefs in reading and reading difficulties**

There is a long tradition in studying academic motivation and many ways of conceptualizing it. In this study I apply the concept of task value, presented by Eccles, Adler, Futterman, Goff, Kaczala, Meece and Midgley (1983) in their *Expectancy-Value Model of Achievement Motivation*. Inspired by the findings related to decision making (e.g., Weiner, 1985), Eccles and colleagues (1983) formed this model, suggesting that the way one chooses to act in an achievement situation has the strongest link to 1) one's expectations about succeeding in the task and 2) the subjective values of the options seen as available. According to Eccles (2005), these values can be divided into four concepts: utility value, cost value, attainment value and interest value.

*Utility value* conceptualizes the task with a functional perspective; how useful the task is according to the person's future plans (Eccles, 2005). *Cost value* refers to the loss of time that the task possibly generates on the expense of other activities (Eccles, 2005). Fundamental to *attainment value*, for its part, is its relatedness to the self-image and the urge to validate this conceptualization of the core self-image aspects through achievement-related choices (Eccles, 2005). From the attainment value perspective, tasks that provide an opportunity for this, or that are balanced with the individual's long run goals, are more valued than other tasks. Tasks can also be evaluated according to how strong an emphasis they lay on social comparison or personal mastery of the skills (Eccles, 2005). *Interest value*, in turn, presupposes the feeling of anticipated enjoyment or real-time joy, when engaged in a task (Eccles, 2005). Interest has been related to diverse factors, such as genetics (Eccles, 2005), the core parts of the self-concept (Eccles 2005), learning initiated by positive emotional experiences (Eccles, 2005; Krapp, Hidi & Renninger, 1992) and curiosity (Krapp *et al.*, 1992; Renninger, 1992).

There is a notable prior evidence suggesting that children's reading skills and reading motivation are associated (McGeown, Norgate & Warhurst, 2012; for a review, see Morgan & Fuchs, 2007). There are, however, few earlier studies concerning adolescents' reading motivation (Baker & Wigfield, 1999; for a review, see Conradi, Jang & McKenna, 2014; Galloway, Leo, Rogers & Armstrong, 1995; McGeown, Duncan, Griffiths & Stothard, 2015; Watt, 2004). Lepola, Poskiparta, Laakkonen and Niemi (2005) studied the association of developing reading skills with reading task motivation. Reading task motivation is a concept very similar to task values in that it refers to student's internal motivation to search for and investigate learning tasks and the willingness to succeed in them. Lepola and colleagues (2005) found that high reading task motivation at the beginning of the academic career significantly enhanced students' reading skills, whereas reading task motivation was strongly influenced by the students' reading skill level. Of the four task values, interest has been considerably most studied in relation to reading tasks and developing reading skills, and has been associated with for example reading comprehension and

recalling the text (Krapp *et al.*, 1992; Renninger, 1992; Stutz, Schaffner & Schiefele, 2016). Krapp and colleagues (1992) even suggest that the influence of interest on reading comprehension can be maintained over the impact of factors such as the student's knowledge capital and the difficulty level of the text. This might imply that reading-related interest can surmount the inconvenience of reading difficulties on students' motivation and learning, by serving as a protective factor. This assumption is held by studies indicating that the interest may facilitate learning through its qualities of preserving cognitive resources for adaptive purposes and directing the individual towards more selective and spontaneous performance (for a review, see Krapp *et al.*, 1992). Few studies have focused on other task values than interest. Baker and Wigfield (1999) conducted one such study, in which most of their participants were reading poorly in relation to their chronological age. In their cross-sectional study, Baker and Wigfield (1999) used the Motivation for Reading Questionnaire, developed by Wigfield and Guthrie (Wigfield & Guthrie, 1997). It includes three motivational categories; (1) *reading-related competence and efficacy beliefs*, (2) *concepts such as intrinsic/extrinsic motivation, task values and achievement goals* and (3) *social purposes for reading* (Baker & Wigfield, 1999; Wigfield & Guthrie, 1997). In line with earlier researchers, Baker and Wigfield found that English-speaking fifth and sixth graders were motivated towards reading in diverging ways (Baker & Wigfield, 1999; Wigfield & Guthrie, 1997). In comparison with other motivational concepts, the intrinsic and extrinsic motivation (terms that resemble interest and utility task values) most significantly accounted for the students' reading motivation (Baker & Wigfield, 1999). Baker and Wigfield (1999) also found that the fifth and sixth graders differed from each other in terms of social motives and reading for recognition. Younger students accentuated these concepts more than older students (Baker & Wigfield, 1999).

Studies on the role of reading difficulties in reading motivation are scarce but predominantly indicate that students with reading difficulties are less motivated to read when compared with students that have no difficulties. McGeown and colleagues (2012) found that students (from third to eighth grade) with excellent versus poor reading skills differed significantly in their intrinsic reading motivation (e.g., personal interest); the good readers were more highly motivated to read than the poor readers. Sideridis, Mouzaki, Simos and Protopapas (2006), however, did not find significant differences in the good and poor readers' reading motivation (measured with the Motivation for Reading Questionnaire). They found a group of second, third and fourth grade students with reading comprehension difficulties not to be motivated, and a comparable poor reader group to be highly motivated towards reading (Sideridis *et al.*, 2006).

In addition to the task values, *competence beliefs* are central in channeling our decisions about which achievement situations we engage ourselves in and how we act in these

situations (Eccles, 2005; Wigfield & Eccles, 1994). Competence beliefs are usually defined as expectancies about future success in domain specific tasks; how well we think we can accomplish task-related activities and how we evaluate our abilities needed for succeeding in them (Chapman & Tunmer, 2003; Spinath & Steinmayer, 2008; Wigfield & Eccles, 2000; Wigfield & Eccles, 1994). High competence beliefs in a certain area improve the continuation and the reoccurrence of activities related to that domain (Maehr, 1984). Competence beliefs are influenced by such concepts as task values (e.g., Eccles, 2005) and the age of the student (Parsons & Ruble, 1977; Viljaranta, Rääkkönen, Aunola & Nurmi, 2014). More accurately, competence beliefs are increasingly influenced by experiences in the achievement context as the child gets older (Parsons & Ruble, 1977) and they tend to decrease over the elementary school years, becoming more established (Jacobs, Lanza, Osgood, Eccles & Wigfield, 2002; Smith, Smith, Gilmore & Jameson, 2012; for a review, see Wigfield & Eccles, 1994; Wigfield, Eccles, Yoon, Harold, Arbreton, Freedman-Doan & Blumenfeld, 1997). Competence beliefs seem to develop rather quickly after the first experiences in a certain domain (e.g., reading) and they are important in determining the level of personal commitment to the task (e.g., Maehr, 1984).

Competence beliefs have gained much scientific attention, but their relation to reading has been studied mostly from a general (and not domain-specific) point of view to the skills, or during the very first school years (e.g., Quirk, Schwanenflugel & Webb, 2009). Reading-related competence beliefs, however, have been found to decrease during childhood and early adolescence (Jacobs *et al.*, 2002; Smith *et al.*, 2012; Watt, 2004; Wigfield *et al.*, 1997). Some researchers see reading-related competence beliefs as a part of a wider reader self-concept (Chapman & Tunmer, 1997). This reader self-concept has frequently been related to the reading skills' development (Chapman & Tunmer, 1997; Skaalvik & Hagtvet, 1990).

Likewise, previous studies (e.g., Capelatto, Lima, Ciasca and Salgado-Azoni, 2014) in competence beliefs of students with learning difficulties have traditionally been conducted from a rather general and not domain specific perspective (for a review, see Hanich & Jordan, 2004). Few studies have focused on reading-related competence beliefs of students with reading difficulties. In their own empirical study of fourth graders, Hanich and Jordan (2004) found that students with reading difficulties (measured by letter-word identification and reading comprehension) had lower competence beliefs in reading than students with no difficulties. Students with repeated reading task failures have also been assessed not to be competent in reading both from their own and other's perspective, and to have low expectancies considering their success in reading tasks (Butkowsky & Willows, 1980).

Although there are many studies about the task values and competence beliefs, the *Expectancy-Value Model of Achievement Motivation* (Eccles *et al.*, 1983; Wigfield & Eccles, 2000) has not been much applied to reading tasks, and the few related studies have been centered in for example gender differences and age-related changes in the values (Eccles *et al.*, 1983; Viljaranta *et al.*, 2014; Watt, 2004; Wigfield *et al.*, 1997). Only few studies have focused on students with reading difficulties. In addition, the previous studies have generally been inattentive of the severity level and different forms of reading difficulties, and the students with most severe reading problems have not been adequately concerned (McGeown *et al.*, 2012). In addition, there are only few studies in this field that have investigated reading-related motivational concepts in real-time achievement situations. With real-time studies, it is possible to fairly directly assess the participants' thoughts and beliefs. A real-time study is consequently useful in capturing some situational aspects that are not easily accessed by studies with different time perspectives.

### **1.3. Achievement emotions in reading and reading difficulties**

Emotions are carefully structured multidirectional mechanisms, stretching from the brain to other parts of the body (Lewis, Haviland-Jones & Barrett, 2008; Nummenmaa, 2010; Pekrun, 2006). They direct our behavior and motivation to act, as well as the observations and interpretations of the environment and the situations we encounter (Lewis *et al.*, 2008; Nummenmaa, 2010; Pekrun, 2006). Emotions are essentially important for our learning processes and motivation, as well as more generally for our positive self-image, well-being and survival (Lewis *et al.*, 2008; Nummenmaa, 2010). Emotions can be considered as unconscious and automatic mechanisms, but also as conscious processes related to the level on which we are able to regulate, produce and identify our emotions and their causes (Nummenmaa, 2010). In the present study, I will focus on early adolescents' subjective emotional experiences of their achievement emotions.

Achievement emotions are emotions associated with achievement-related activities or their outcome (Pekrun *et al.*, 2002; Pekrun, 2006; Pekrun, 2007). Academic emotions differ from achievement emotions in that they always relate to academic context, whereas achievement emotions can be experienced in other situations, too (Pekrun *et al.*, 2002). Achievement emotions range through the variety of human emotions, and can be categorized according to their object focus either as *activity emotions* that refer to the present actions or as *outcome emotions* that concern the outcome of those actions (Pekrun, Elliot & Maier, 2006; Pekrun, 2007). Activity emotions comprise for example enjoyment of learning, anger and boredom (Pekrun *et al.*, 2006). Outcome emotions, such as anxiety, hope for success, hopelessness, pride and shame, relate to success and failure experiences (Pekrun, 2006; Pekrun *et al.*, 2006). Achievement emotions can also be conceptualized

by their time perspective; as retrospective, concurrent or prospective emotions (Pekrun, 2006; Pekrun *et al.*, 2002). Considering the task been finished already, a student may form *retrospective* causal attributions about the factors having led to success or failure in the task (Weiner, 1985), these attributions inducing achievement emotions (Pekrun *et al.*, 2002). *Concurrent* achievement emotions, in turn, refer to a present task and *prospective* achievement emotions to a future task (Pekrun *et al.*, 2002). The prospective achievement emotions are associated with competence beliefs, previous situation outcome and anticipations of the upcoming task outcome (Pekrun *et al.*, 2002). In addition to their object focus and time perspective, achievement emotions can be classified according to their valence (Pekrun, 2007). By the valence they can be defined as ranging from positive to negative (Pekrun *et al.*, 2006). According to Pekrun and colleagues (2002), the variety of both positive and negative emotions that students experience in the school context is considerable. Students in middle school frequently experience such achievement emotions as enjoyment, boredom, anger, hope, anxiety, hopelessness, pride, relief and shame (Pekrun *et al.*, 2006). Among all emotions, disgust was the only one not mentioned by the students, and anxiety was mentioned most often and in diverging learning situations (Pekrun *et al.*, 2002). Students rarely reported social achievement emotions, such as gratitude and envy (Pekrun *et al.*, 2002).

During the past ten years, emotions in achievement situations have increasingly been in the focus of researchers' interest, studies indicating that emotions are central to students' achievement-related choices and learning (Efklides & Volet, 2005; Linnenbrink, 2006; Pekrun & Linnenbrink-Garcia, 2012). For example, Goetz, Frenzel, Pekrun and Hall (2006) found that emotional experiences show significant specificity to the academic subject. Goetz and colleagues (2006) examined the relation between emotions (enjoyment, anxiety and boredom) and different academic subjects (linguistic tasks and mathematics) and found that enjoyment was significantly more subject-specific compared to anxiety and boredom that, on the contrary, indicated slight domain-generalty. All emotions were more strongly related to the school subject than to students' objectively measured academic performance (Goetz *et al.*, 2006). Studies in reading-related achievement emotions are few, and the connection between reading-related emotions and reading skills has, to some extent, been supported but not sufficiently studied (Jalongo & Hirsh, 2010). For example, Smith and colleagues (2012) conducted a longitudinal study in the enjoyment of reading, assessing students in New Zealand (aged from 8 to 10 years), and found the enjoyment to decrease over the years. Concerning learning difficulties, Yasutake & Bryan (1995) reviewed previous studies in the field resuming that children with learning difficulties are more prone than others to experience negative emotions in diverse situations. Sideridis and colleagues (2006), however, found children with reading comprehension difficulties to demonstrate both negative and positive

emotional responses, indicating that the valence of the achievement emotions did not differentiate them from students without reading difficulties. Jalongo and Hirsh (2010), in turn, suggested that anxiety is associated with difficulties in accomplishing reading tasks.

Despite the growing attention towards emotions in academic achievement situations, the existing studies have mainly focused on for example gender differences and other domains than reading, especially mathematics (e.g., Frenzel, Pekrun & Goetz, 2007). Achievement emotions in reading have been studied only scarcely, and research has frequently been restricted to reading comprehension tasks (Daley, Willett & Fischer, 2014; Lupart, Cannon & Telfer, 2004; Pekrun *et al.*, 2006). Few of the studies in reading-related achievement emotions have been conducted from the perspective of students with learning difficulties (Sideridis *et al.*, 2006).

#### **1.4. The role of task values and competence beliefs in achievement emotions for students with and without reading difficulties**

In the *Control-Value Theory of Achievement Emotions* (Pekrun & Perry, 2014; Pekrun *et al.*, 2006; Pekrun, 2006), Pekrun and colleagues underline 1) the subjective value of the achievement and 2) the experience of control over the task as important factors influencing the achievement emotions. More precisely, high control of the task and positive subjective value towards it have been associated with positive emotions (e.g., enjoyment of learning and pride), and negative subjective value and poor control with negative task outcome –related emotions such as shame and hopelessness (Pekrun *et al.*, 2006). The Control-Value Theory highlights the subject-specificity of these appraisals and emotions (Pekrun & Perry, 2014; Pekrun *et al.*, 2002). The *Attribution Theory* (Weiner 1985), too, relates to the affective, motivational and competence-appraisal aspects of the achievement situation. The Attribution Theory focuses on the causal attributions that people draw from their competence beliefs concerning a task and from their previous success or failure in it (Weiner, 1985). According to Weiner (2005; 1985), these competence evaluations and attributions relate to affective reactions especially if the achievement outcome is negative, unexpected or important for the person – or all of these (Weiner, 2005). As pointed out earlier, previous studies about task values, competence beliefs and emotions in reading have not been very specific in their nature, focusing on school subjects generally, and not taking into account the reading skill variation of the students.

Regarding *task values*, many studies suggest that they are in a positive relation to achievement emotions. More specifically, it seems that the task values are crucial for the development and intensity of achievement emotions in academic context (Pekrun, 2007) and that interest, for example, can be strongly influenced by both positive and negative emotions (Pekrun,

2005). From a general point of view to academic motivation, studies suggest that positive emotions (such as pride, hope and joy of learning) are positively associated with learning motivation, whereas negative emotions (for example boredom, hopelessness and anxiety) have a negative link with it (Fiedler & Beier, 2014; Pekrun *et al.*, 2002). Despite the growing scientific interest in task values and achievement emotions, these studies have focused scarcely on reading. A few related studies, conducted by Ainley and colleagues (2005; 2002) have indicated that being interested in the topic of a reading task is associated with the students' affectivity (measured with a bored-interested scale) during the reading task, and with their persistence to read (Ainley, Corrigan & Richardson, 2005; Ainley, Hidi & Berndorff, 2002). Emotions have notably been found necessary in triggering and sustaining interest in voluntary reading (Ainley *et al.*, 2005). Selkirk, Bouchey & Eccles (2010) studied the task values and achievement expectancies of sixth and seventh graders, and found that students experienced anxiety in reading situations if they valued reading activities high but did not expect to do well in reading tasks.

Previous studies about the relation between reading-related *competence beliefs* and achievement emotions are few, too (e.g., Pekrun *et al.*, 2002; Seifert, 1995; Weiner, 1985; Weiner, 2005). Some of the most supported indication of their association comes from the Attribution Theory (Weiner, 1985). Even though the focus in this theory is mainly on the retrospective point of view to the achievement, it is known that success- and failure-related attributions can influence later achievement-evaluations as well (Weiner, 1985). This is why the Attribution Theory is considered important here. Students with low competence beliefs and weak sense of self-worth have been found to experience positive emotions less often than other students (Seifert, 1995). In addition, studies centering in learning-related maladaptive motivational styles indicate that students with reading difficulties typically experience negative emotions associated with their task-related motivation and competence beliefs (Covington, 1984; Galloway *et al.*, 1995; Galloway, Leo, Rogers & Armstrong, 1996).

There is an urge for more precise research about the relation between task values, competence beliefs and achievement emotions (e.g., Pekrun *et al.*, 2006; Selkirk *et al.*, 2010). Fundamentally, studies about achievement emotions have been rather restricted to achievement outcome –related affective attributions and to the positive-negative affect dichotomy, with the exception of more dedicated studies in anxiety and boredom (Pekrun, Goetz, Daniels, Stupnisky and Perry, 2010; Pekrun, 2005; Pekrun *et al.*, 2006; Selkirk *et al.*, 2010; Weiner, 1985; Zeidner, 1998). In addition, studies linked with the Control-Value Theory are almost non-existent in the achievement emotions of students with reading difficulties.

## **1.5. Aims of the present study**

The aim of this study is to examine the relations of reading difficulties, reading-related task values and competence beliefs, and emotions aroused by the upcoming reading tasks. The first aim is to examine whether students with no, mild and severe reading difficulties differ in their reading-related task values and competence beliefs, assessed before performing a reading task. It is expected that students with reading difficulties report lower task values, especially lower interest, in reading (see also Lepola *et al.*, 2005; McGeown *et al.*, 2012) and lower competence beliefs in reading (see also Butkowsky & Willows, 1980; Hanich & Jordan, 2004).

The second aim is to examine whether students with no, mild and severe reading difficulties differ in their achievement emotions elicited by the upcoming reading tasks. To my knowledge there are no previous studies that have examined real-time reading task -related emotions experienced by students with reading difficulties. In light of previous non-real-time studies, it is hypothesized, however, that students with reading difficulties experience more negative emotions than students without reading difficulties (for a review, see Yasutake & Bryan, 1995).

The third aim is to examine whether the students' reading-related task values and competence beliefs are associated with their achievement emotions aroused by the upcoming reading tasks, and whether these associations are different depending on whether students have or have not reading difficulties. It is expected that students' low reading-related competence beliefs and task values are related to a low occurrence of positive emotions and high occurrence of negative emotions (Pekrun *et al.*, 2006; Seifert, 1995). High task values in reading are expected to relate to frequently occurring positive emotions (Pekrun *et al.*, 2006). It is also hypothesized that the associations of task values and competence beliefs in reading are more strongly linked with negative reading-related achievement emotions among students with reading difficulties, in comparison with students with no reading difficulties (Covington, 1984; Galloway *et al.*, 1995; Galloway *et al.*, 1996).

## **2. METHODS**

### **2.1. Sample**

The present study is a part of STAIRWAY – From Primary to Secondary School – longitudinal study (TIKAPUU – Alakoulusta yläkouluun, Ahonen & Kiuru, 2014), that aims at identifying the multiple individual- and environment-related factors that enhance students' learning and school wellbeing when they are facing the transition from primary school to lower secondary school. Emotions, motivation and social factors are of particular interest in the STAIRWAY study. The funding for the study has been provided by the Academy of Finland. The collection of data started

in autumn 2014, when the participants were at the sixth grade of primary school, and continued across the school transition, to the spring 2016 when the participants were finishing their seventh grade. The total number of participants in the study was approximately 850, from two municipalities in Central Finland. The data have been collected in classroom settings with questionnaires, academic tests and psycho-physiological measures. A written permission was requested from the parents and the teachers to allow the students' participation. The STAIRWAY study has been evaluated and approved by the ethics committee of the University of Jyväskylä.

A subsample (N=190) of the students were selected to individual assessments in grade six spring, including tests on cognitive skills, executive functions, and psycho-physiological measurements, as well as tasks for nonverbal reasoning, reading comprehension, and mathematics adapted to students' individual skill level. The students also answered in questionnaires about emotions, motivation and competence beliefs related to reading and mathematics tasks. On grounds of reading and mathematics skills, three matching groups were formed: students with mathematics difficulties (N=62), students with reading difficulties (N=62) and students with difficulties in neither mathematics nor reading (N=66). Of these groups, my study focused on students with difficulties in reading and students with no difficulties.

As a result, the present study focused on a sample comprising 128 sixth grade students who participated in individual assessments in the STAIRWAY study. Out of these students 53 (41.4%) were girls and 75 (58.6%) were boys. On a sample level (N=128), there were no significant gender-related differences in the age, parents' education, living conditions or reading difficulties between the participants. At the beginning of the study in autumn 2014, the students were aged 11 to 13 years (M = 12.3 years, SD = 4.3 months). Two students did not answer to the question about their age. All students had Finnish as their mother tongue and two of them had a second mother tongue as well; one Hungarian and the other English. In terms of the students' mother tongue, the current sample can be viewed as relatively representative to the Finnish population (Official Statistics of Finland, 2016). Approximately 74.2% of the students were living with both their mother and father, 9.4% with only their mother and 10.9% alternatively with both their parents. In addition, 3.1% of the students were living with their mother and stepfather, 0.8% with their father and stepmother and 1.6% in foster care, in approved home or with someone else. Concerning the education of the students' parents, 28.2% of the mothers and 21.9% of the fathers had a master's degree or higher education, 17.2% of the mothers and 14.1% of the fathers had a vocational college degree, 35.9% of the mothers and 41.4% of the fathers had a vocational school degree and 3.1% of the mothers and 7.8% of the fathers had no completed studies beyond comprehensive. 16 mothers and 18 fathers did not answer to the question about their education. According to the students'

living conditions and their parents' education, my sample can be concluded representative to the Finnish population in general (Official Statistics of Finland, 2014; Official Statistics of Finland, 2015). The sample of this study was selected on the basis of the students' reading skills in a way that three comparable groups could be formed: No reading difficulty (No RD, N=66), Severe reading difficulty (Severe RD, N=31) and Mild reading difficulty (Mild RD, N=31). Accordingly, 66 of the students (51.6% of the sample) had no reading difficulties. 31 students (24.2%) were labeled as having severe reading difficulties and were selected from the weakest 8<sup>th</sup> percentiles of the age group. 31 students (24.2%) were labeled as having mild reading difficulties and were selected from the students whose reading performance scored between the lowest 8<sup>th</sup> and the 16<sup>th</sup> percentiles according to the age group. The standardized mean of three reading tasks (Wordchain, Searching spelling errors and Sentence reading) composed the criterion score for these cut-off values. These reading tasks will be more thoroughly presented in the following chapter. The cut-off values for reading skills were -1.283097 for the 8<sup>th</sup> percentile and -0.939098 for the 16<sup>th</sup> percentile. The students were selected into the groups in a hierarchical order, starting from the 8<sup>th</sup> lowest percentile, and excluding the students who did not speak Finnish as their mother tongue and those who scored weaker than three SD below the age level mean in Standard Raven progressive matrices. Statistical analyses revealed that there were no significant differences in the gender, general abilities, the fathers' education and living conditions of the students in the three groups.

## **2.2. Measures and procedure**

The students' reading skills were assessed during the autumn of 2014, at the beginning of their sixth grade. The information about reading task values, reading competence beliefs and reading task - related achievement emotions in real-time achievement situations was collected in spring 2015, during individual measurements. The data about task values, competence beliefs and achievement emotions were collected with a computerized questionnaire that the students completed in the presence of a trained research assistant. Students filled in the questionnaire before performing at a reading task, without beforehand knowledge about its difficulty level.

### **Reading skills**

Reading skills were measured with three tests: a Word Reading subtest (Holopainen, Kairaluoma, Nevala, Ahonen & Aro, 2004), containing two different tasks, and a Salzburg test measuring sentence level reading fluency (Landerl, Wimmer & Moser, 1997, translated into Finnish by Sini Huemer; Pichler & Wimmer, 2006).

The Word Reading test is part of Finnish dyslexia screening tests for youth and adults (Holopainen *et al.*, 2004). In the first Word Reading task, *Spelling errors*, the student had to find a spelling error in 100 words, by marking the error with a vertical line. The words were written in their basic form; for example “käsitämätön” (incomprehensible), “kuulantyöntö” (shot put), and there was one error in each word. Three different error types were used: a missing letter, an additional letter and an incorrect letter. The students had 3.5 minutes time to mark as many errors as they could. According to the test manual, the test-retest data has been collected twice in two Finnish cities and the correlations between the two consecutive assessments have been found satisfactory (.83 and .85). In the second Word Reading task, *Word identification* (Holopainen *et al.*, 2004), the students were instructed to divide word chains, composed of four words each, into separate words by marking vertical lines between the word boundaries. The words were again in their basic form and the word chains were written together with no spaces between, for example “vasikkailmeisestiilmoittaaunti” (calfapparentlytoinformhour). There were 25 word chains altogether and 100 separate words consequently. The students had 1.5 minutes time to separate as many word chains as they could. On grounds of the test manual, the test-retest correlation measured in two Finnish cities has been approved as satisfactory (.70 and .84). Both Word Reading tasks were evaluated according to the total quantity of the correctly marked vertical lines, subtracted by the number of misplaced lines.

In the short version of *Salzburg reading fluency test* (Landerl *et al.*, 1997) the students were informed to silently read and evaluate 36 sentences (36 most difficult sentences were selected out of the 69 original sentences) according to the truthfulness of their content, by marking each sentence by circling either an O (oikein = correct) or a V (väärin = not correct) followed by the sentence. The task was evaluated according to the number of correct answers. The Salzburg test is constructed in a way that the sentences are easy to understand, in order to focus on assessing the reading fluency skills of the student. The time limit of completing the task is 3.5 minutes in the original test. However, we used an adapted version of the test limiting it to only the most difficult sentences and employing a slightly shorter time limit of 1.5 minutes. Two kinds of versions of the test were distributed to the students so that the possibility of copying the correct answers from a classmate would be reduced to a minimum. According to the test manual, the reliability of the original Salzburg reading fluency test has been found satisfactory; .95 for the second grade students and .87 for the eighth grade students (Pichler & Wimmer, 2006).

### **Task values in reading**

Task values in reading were measured with a questionnaire that the students completed before performing a reading task. In this study, the reading task values were determined as interest and attainment (perceived importance) value. In order to measure these values, an adapted version of the Eccles and colleagues' (1983) Subject-specific Task Values measure was used. In this study, the interest towards reading was assessed with two questions: (2) *How much do you like reading and writing?* (4) *How much do you like doing reading and writing tasks?* The perceived importance of reading, in turn, was measured with the following questions: (1) *How important is it for you to succeed in reading and writing tasks?* (3) *How important do you think it is to succeed in reading and writing tasks?* The students answered to the questions by choosing an alternative that best complied with their opinion. The five possible alternatives ranged from 1= not important at all/very little to 5 = very important/very much. Cronbach's Alphas for the attainment value (.89) subscales and interest value subscales (.85) were calculated and found satisfactory, indicating high reliability of these variables.

### **Competence beliefs in reading**

Competence beliefs in reading were assessed in the questionnaire according to adapted versions of Eccles and Wigfield (1995) and Spinath and Steinmayer (2008) measures. In this study, the competence beliefs were measured with three questions: (1) *How difficult do you think the task will be?* (3) *How well do you think you will succeed in the task?* (5) *How well do you think you will do compared to your peers?* The students answered to the questions by choosing an alternative that best corresponded with their thoughts, choosing from five alternatives that ranged from 1 = very easy/very poorly/very little to 5 = very difficult/very well/very much. The first item was statistically reversed and the scale modified so that the values would better correspond to their positive versus negative valence, the scale consequently ranging from 2 (very difficult/very poorly/very little) to 10 (very easy/very well/very much). The Cronbach's Alpha value for the reading competence belief subscales was calculated and found satisfactory (.65). This section of the questionnaire also included two questions assessing the effort that the student was going to exert in the following task. These questions were left out from my analysis because they did not directly measure the students' thoughts about their reading competence beliefs.

### **Achievement emotions towards reading**

Students' achievement emotions towards the forthcoming reading tasks were assessed with The *Emotions in Achievement Situations* (EAS) scale (Kiuru, Eklund, Hirvonen, Kaartinen, Mikkonen & Ahonen, 2014), an adapted version of the Achievement Emotion scale (AEQ; Pekrun, Goetz,

Frenzel, Barchfeld & Perry, 2011) and the Positive and Negative Affect scale (PANAS; Watson, Clark & Tellegen, 1988). This adapted version was developed for the means of the STAIRWAY study. There were seven claims: (1) *I'm looking forward to the task with curiosity.* (2) *I feel hopeful about doing well.* (3) *I feel angry / irritated.* (4) *I feel enthusiastic.* (5) *I feel nervous / restless.* (6) *I'm afraid that I won't know how to do the task.* (7) *I feel hopeless.* Students were instructed to evaluate the claims by choosing the alternative that they most agreed with according to their current affective state, on a scale from 1 = least agree with to 5 = most agree with. I also composed the mean score across the three items measuring positive emotions ((1) joy, (2) hopefulness and (4) enthusiasm) and the mean score across the four items measuring negative emotions ((3) anger / irritation, (5) nervousness / restlessness, (6) fear of failing and (7) hopelessness). The values of Cronbach's Alpha were satisfactory for both negative (.84) and positive emotions (.80).

### **2.3. Statistical analyses**

In this study, the aim was to examine the interrelations of reading-related task values (interest and perceived importance), competence beliefs and achievement emotions of students with and without reading difficulties. The statistical analyses were carried out with the IBM SPSS Statistics 22 program. Statistical analyses were carried out along the following steps. *First*, the descriptive analyses were conducted. *Second*, the missing values were looked for and found not to exist. *Third*, the normality of the distribution of the data was analyzed with means of tests for skewness and kurtosis, by generating graphic presentations of the normality curve and with the test of Kolmogorov-Smirnoff. These descriptives indicated that all but the negative achievement emotions (the separate emotions as well as the mean score of all negative emotions) filled in the criteria for the normality distribution. This is why modifications were conducted upon these variables. As a result, the reciprocals (1/Y) of the variables' original values were found to most robustly reduce the skewness of the normality distribution. These new negative achievement emotion variables were used in the following parametric analyses. However, as the distributions of these new variables still remained significantly negatively skewed after the modifications, I conducted the non-parametric tests of Kruskal-Wallis and Mann-Whitney for these items in addition to the parametric analyses.

The main analyses were carried out by means of analysis of variance (ANOVA) and the general linear model. The t-test of independent samples was used in case I did not find significant group-level differences between the groups No RD, Severe RD and Mild RD. In the t-tests I compared the groups of 1) students with no reading difficulties (No RD) and 2) students with reading difficulties (RD; mild or severe). *Firstly*, to examine the relation of reading difficulties with reading task values (interest and perceived importance) and reading competence beliefs, I used the

ANOVA. *Secondly*, to test the association between reading difficulties and achievement emotions experienced before the reading tasks, I again employed the ANOVA. In addition, to confirm the findings of these tests, the analyses were also conducted with the non-parametric Kruskal-Wallis test for the negative achievement emotions because they were not normally distributed. Kruskal-Wallis test gave support for the parametric test results. *Thirdly*, in order to examine the association between 1) reading task values and reading-related achievement emotions, and between 2) reading competence beliefs and reading-related achievement emotions, and to see whether reading difficulties influenced the relationship between these factors, the general linear model was employed. The continuous factors; reading task values, reading competence beliefs and reading-related achievement emotions, were included into the model as covariates, and the categorical reading difficulties (No RD, Mild RD and Severe RD) as factors. I was consequently able to investigate the interaction terms of the continuous covariates (tasks values, competence beliefs and achievement emotions) and the categorical factors (No RD, Mild RD and Severe RD) and to see whether the reading task values and competence beliefs were generating their potential association with achievement emotions together with reading difficulties, or separately from them. The ANOVA was employed to see whether the task values, competence beliefs and reading difficulties were significantly linked with achievement emotions, separately from reading difficulties. The Kruskal-Wallis test was conducted to verify the findings of the ANOVA, and to overcome the problematics caused by the inequality of the variances and the skewness of the distribution of the negative achievement emotions. The results of Kruskal-Wallis test supported the results of the ANOVA.

### **3. RESULTS**

The primary interest in this study was to compare students with no, mild and severe reading difficulties (No RD, Mild RD and Severe RD). Due to the relatively small size of the Mild RD and Severe RD groups, the group-level comparisons were conducted for the groups No RD and RD in case the comparisons between groups No RD, Mild RD and Severe RD showed no significant differences. This was done in order to verify that the possible non-significant results were not caused by the small size of the Mild RD and Severe RD groups.

#### **Reading-related Task Values and Reading Difficulties**

*First*, I wanted to see whether the students with and without reading difficulties differed from each other in regards to reading task values (interest and perceived importance). Statistically significant differences were not found in the interest value between groups No RD, Mild RD and Severe RD

(see Table 1). When comparing No RD and RD groups, I found marginally significant difference in the interest value. Students with no reading difficulties ( $M = 6.33$ ,  $SD = 1.60$ ) valued reading as slightly more interesting than students with difficulties ( $M = 5.82$ ,  $SD = 1.65$ ,  $t(126) = 1.77$ ,  $p = .078$ ). The ANOVA results further indicated that No RD, Mild RD and Severe RD groups significantly differed in terms of the importance value ( $F(2, 125) = 3.78$ ,  $p = .026$ , partial  $\eta^2 = .06$ ). More precisely, the pair-wise comparisons of Tukey HSD indicated that students with mild reading difficulties evaluated reading as significantly less important than students without difficulties ( $p = .045$ , Table 1).

### Competence Beliefs in Reading and Reading Difficulties

*Second*, I studied the association between reading difficulties and competence beliefs in reading. The ANOVA showed marginally significant differences between No RD, Mild RD and Severe RD groups in relation to competence beliefs in reading ( $F(2, 125) = 2.59$ ,  $p = .079$ , partial  $\eta^2 = .04$ ). According to the Tukey HSD test, students with mild and severe reading difficulties differed marginally significantly from one another ( $p = .070$ , Table 1), indicating that students with mild reading difficulties had lower competence beliefs than students with severe difficulties.

*Table 1. Distribution of interest towards reading, the perceived importance of reading and reading-related competence beliefs among students with no, mild and severe reading difficulties*

	<b>(1) No RD, n=66</b>		<b>(2) Mild RD, n=31</b>		<b>(3) Severe RD, n=31</b>		<b>Total, N=128</b>		<b>Pair-wise comparison s<sup>a</sup></b>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
Interest	6.33	1.60	5.65	1.62	6.00	1.69	6.09	1.64	
Importance	7.55	1.22	6.77	1.75	6.90	1.64	7.20	1.50	(1) > (2)*
Competence beliefs	9.42	1.60	9.13	1.36	9.97	1.33	9.48	1.50	(3) > (2) <sup>+</sup>

*Descriptive statistics from the Univariate Analysis of Variance. a = Tukey HSD multiple comparisons where values are based on observed means. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , + = marginally significant value*

### Achievement Emotions in Reading and Reading Difficulties

*Third*, I looked at the relation of reading difficulties to the achievement emotions that the upcoming reading task evoked in students. The No RD, Mild RD and Severe RD groups did not differ significantly in their experience of the positive emotions as a sum factor. Likewise, the differences did not reach the significance level when studying the separate emotion variables; joy, hopefulness and enthusiasm. The t-test showed a similar pattern of results for the No RD and RD groups (see Table 2).

The ANOVA results further indicated that the distribution of the negative achievement emotions as a sum factor did not differ significantly between the groups No RD, Mild RD and Severe RD. However, when testing the negative emotion factors separately, the results were more diverging. None of the negative achievement emotions, except for hopelessness, differed between the groups No RD, Mild RD and Severe RD. Because of the inequality of the variances (Levene's value < .001), I also conducted the Kruskal-Wallis test for the hopelessness factor. The Kruskal-Wallis test revealed significant differences in the hopelessness experienced by the No RD, Mild RD and Severe RD groups ( $X^2(1, 128) = 6.07, p = .048$ ). The Mean Ranks were 58.53 (No RD), 69.89 (Mild RD) and 71.82 (Severe RD). The Tukey HSD comparisons revealed a marginally significant difference ( $p = .076$ ) between No RD and Severe RD groups, indicating that the students with severe difficulties experienced most hopelessness, and the students with no difficulties the least. Also the t-test results indicated that the No RD and RD groups differed significantly in the experience of hopelessness (see Table 2).

Table 2. Comparisons of achievement emotions towards reading between students with and without reading difficulties (N=128)

	No RD, n = 66		RD, n = 62		t	Mean difference	Cohen's d	95% CI (Upper, lower)
	Mean	SD	Mean	SD				
Positive emotions	10.55	2.46	10.26	2.74	.63	.29	.01	-.62, 1.20
Joy/curiosity	3.70	.89	3.68	1.04	.11	.02	.00	-.32, .36
Hopefulness	3.61	.94	3.47	.95	.83	.14	.01	-.20, .47
Enthusiasm	3.24	1.12	3.11	1.19	.63	.13	.01	-.28, .53
Negative emotions	.20	.06	.19	.06	.71	.01	.33	-.01, .03
Anger/irritation	.91	.21	.92	.22	.07	-.003	.00	-.08, .07
Nervousness/restlessness	.87	.24	.86	.26	.25	.01	.00	-.08, .10
Fear of failing	.71	.31	.71	.29	-.11	-.006	.00	-.11, .10
Hopelessness	.90	.22	.79	.29	<b>2.46*</b>	.11	.04	.02, .21

T-test comparisons,  $df = 126$ , \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ . Sum factor Positive emotions constructed with Joy/curiosity, Hopefulness and Enthusiasm. Sum factor Negative emotions constructed with Anger/irritation, Nervousness/restlessness, Fear of failing and Hopelessness

### Task values, competence beliefs, achievement emotions, and reading difficulties

*Fourth*, I examined whether the interest towards reading, the perceived importance of reading activities and the competence beliefs in reading were associated with reading-related achievement emotions. I also wanted to find out had this association been influenced by the student's reading difficulties. The analyses were carried out by means of general linear model. Concerning the achievement emotions, only the sum factors of positive versus negative emotions were used in order to simplify the analyses. In the analyses, I used the reciprocals of the original negative emotion variables in order to adjust their normality distribution.

The results showed that the interaction term of the *interest towards reading* and reading difficulties was related neither to the positive nor negative achievement emotions. Consequently, I examined the univariate link between the interest towards reading and the reading-related emotions, separately from reading difficulties. The results indicated that the interest towards reading was significantly related to positive achievement emotions ( $F(8, 119) = 8.58$ ,  $b = 1.11$ ,  $s.e. = .30$ ,  $p < .001$ ,  $\text{partial } \eta^2 = .37$ ). The more the student was interested in reading, the more positive achievement emotions the student reported. The analyses also indicated that the interest towards reading and the negative reading-related emotions were marginally significantly associated ( $F(8, 119) = 1.80$ ,  $b = .01$ ,  $s.e. = .01$ ,  $p = .083$ ,  $\text{partial } \eta^2 = .11$ ). Having used the reciprocals of the original negative emotions, these results indicate that the higher the interest towards reading, the fewer negative reading-related emotions the student experienced. As reported earlier, the associations of reading difficulties with negative and positive reading-related achievement emotions as sum factors were not statistically significant.

The general linear model also indicated that the *perceived importance of reading* and reading difficulties as an interaction term were not associated with positive achievement emotions towards reading. The analyses showed, however, that the perceived importance of reading was significantly associated with positive achievement emotions ( $F(8, 119) = 4.95$ ,  $b = 1.09$ ,  $s.e. = .41$ ,  $p < .001$ ,  $\text{partial } \eta^2 = .25$ ). The more important the student considered reading activities, the more positive reading-related achievement emotions he/she experienced. The interaction term of the perceived importance of reading and reading difficulties was, in turn, marginally significantly associated with negative reading-related emotions (see Table 3), indicating that reading difficulties together with the perceived importance of reading were associated with the students' negative emotions towards reading. More precisely, the lower the perceived importance of reading was, the more the student experienced negative achievement emotions. The follow-up analyses indicated that the perceived importance of reading was significantly related to negative emotions towards reading among students with Severe RD ( $b = .02$ ,  $s.e. = .01$ ,  $p < .01$ ). In turn, no association between the perceived importance of reading and negative emotions was found for students with No RD ( $b =$

.003, s.e. = .01,  $p = .60$ ) and Mild RD ( $b = -.003$ , s.e. = .01,  $p = .62$ ). The association between the perceived importance of reading and negative reading-related emotions was stronger among students with severe reading difficulties, in comparison with other students.

Table 3. The relation between the perceived importance of reading and the negative reading-related achievement emotions, and the moderating effect of reading difficulties to this relation ( $n=128$ )

Negative achievement emotions	df	F-value	Partial Eta Squared
Reading difficulties	2	2.63	.04
Importance	1	2.66	.02
Interaction term	2	<b>2.96<sup>+</sup></b>	.05
Error	122		
Corrected Total	127		

General linear model: Tests of Between-Subjects Effects; the reciprocals of the original variables used as the negative achievement emotions, \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , + = marginally significant

The general linear model results concerning the association between reading-related *competence beliefs* and achievement emotions indicated that reading-related competence beliefs and reading difficulties were together not linked with either the positive or the negative emotions. The analyses indicated, however, a significant association between the competence beliefs in reading and the positive reading-related achievement emotions ( $F(10, 117) = 4.50$ ,  $b = .65$ , s.e. = .50,  $p < .001$ , partial  $\eta^2 = .28$ ). More specifically, the higher the competence beliefs in reading were, the more positive reading-related emotions were experienced, and the weaker were the competence beliefs, the less positive achievement emotions were indicated by the students. Considering negative achievement emotions, the results indicated that also the link between the competence beliefs in reading and the negative reading-related emotions was statistically significant ( $F(10, 117) = 3.05$ ,  $b = .03$ , s.e. = .01,  $p = .002$ , partial  $\eta^2 = .21$ ). Considering that I used the reciprocals of the original negative achievement emotion variables in the analyses, these results indicate that the higher the students' competence beliefs in reading were, the less negative reading-related achievement emotions were reported. As I found earlier in this chapter, reading difficulties were not significantly linked with reading-related achievement emotions as sum factors.

#### 4. DISCUSSION

The current study investigated the relation of sixth grade students' reading difficulties with reading-related task values and competence beliefs, and the emotions that the upcoming reading task evoked in the students. I also wanted to find out whether these emotions were associated with the

motivation to read and the students' beliefs related to their reading skills, and to see whether reading skills moderated this association. The relatedness of these elements has previously not been as systematically studied as the present study attempted to do. Most previous studies concerning these factors have also focused on students with and without reading difficulties, not dividing them more accurately according to their reading skill level. Interestingly, some of my main findings were related to the differences between students with severe and students with mild reading difficulties. These two groups differed in their beliefs concerning their reading abilities. Another key result was that hopelessness was the only achievement emotion to distinguish students from one another. More precisely, the students with severe reading difficulties experienced hopelessness in reading the most and students without difficulties the least. My findings also indicated that reading skills did not intervene any other but the association between the perceived importance of reading activities and the negative achievement emotions. This association was strongest among students with severe reading difficulties, and not significant among other students. I will now discuss these findings in more detail and consider future research in this field.

### **Interest towards and perceived importance of reading activities**

The first goal was to compare students with no, mild and severe reading difficulties in terms of reading-related task values and competence beliefs. First, the results concerning interest towards reading and the perceived importance of reading were consistent with my hypothesis (see also Lepola *et al.*, 2005; McGeown *et al.*, 2012). Students with no reading difficulties valued reading as marginally significantly more interesting than students with reading difficulties of any severity level. Students with mild and severe reading difficulties did not differ from each other in relation to interest towards reading. Students with mild reading difficulties, in turn, valued reading as significantly less important than students without difficulties. It is interesting that students with severe reading difficulties did not differ in their importance evaluations from students with no difficulties. Maybe students with severe reading difficulties are more conscious of their reading problems because these difficulties probably more distinctively influence their school achievement and other fields of life. Students with severe reading difficulties may accordingly view reading skills and tasks associated with them as more important in terms of their self-concept. This result calls for further investigation in the motivational differences in a wider range of reading skills

### **Competence beliefs in reading**

Students with no reading difficulties did not differ from students with either mild or severe difficulties in their competence beliefs in reading. These results for competence beliefs were not in

line with my hypothesis but rather contradictory to it (see also Butkowsky & Willows, 1980; Hanich & Jordan, 2004). However, students with mild reading difficulties had marginally lower competence beliefs than students with severe problems in reading. This difference might be explained by the characteristics of self-worth motivation, a motivational style that has been linked to students with reading difficulties (Galloway *et al.*, 1995; 1996). It is typical for self-worth motivated students to possess unrealistic academic competence beliefs in order to maintain their sense of self-worthiness (Galloway *et al.*, 1995; 1996), as a coping mechanism against a negative self-image. Klassen (2002) reviewed 22 studies in self-efficacy beliefs of learning disabled students, summarizing that students with learning difficulties seem to have the tendency of optimistically overestimating their skills. This tendency seems especially typical for students with reading difficulties, and in reading situations (for a review, see Klassen, 2002). Maybe students with most severe reading difficulties are more prone than others to express themselves through self-worth motivation and unrealistic competence beliefs, as these students can be assumed to face many reading test-situations in which they are not able to perform successfully. For students with milder reading difficulties these situations may not occur as frequently. On grounds of the *Attribution Theory* (Weiner, 1985), previous experiences in achievement context are seen as important in guiding our attention to and our attributions of success and failure. Mild reading difficulties may not be as easily detected as more severe problems, enabling students to cope with them relatively better, not having to construct an unrealistic self-image or self-detrimental attributions, but to accept their skills as they are. Students with severe reading difficulties, in turn, may be more aware of their difficulties and, as a consequence, more easily develop an unrealistic reader self-image as a way of coping. According to Marsh (1987; 1990), a positive self-concept is crucial for learning difficulty management.

A second explanation for the differing competence beliefs of students with reading difficulties could be that students with severe reading difficulties, or deep learning difficulties more generally, are not as competent as other students in evaluating their skills. The relatively high competence beliefs of students with severe problems in reading could be interpreted by their possible accumulation of more general cognitive deficits. Stanovich (1986) resumes the research in this field noting that although much still remains unknown, there is a notable amount of evidence supporting the association between reading skills and other cognitive abilities. Maybe the underdevelopment of reading skills is a sign of more general decline in cognitive skills, reflecting on the functioning of the self-system and self-related beliefs too. In this study, students with no reading difficulties did, however, not differ from the students with mild or severe difficulties in their reading-related competence beliefs. Klassen (2010) also found no association between the self-

regulatory efficiency beliefs and reading skills, when comparing students with and without learning difficulties. As students' *beliefs* about their capacities of administering school tasks seem to be almost as equally important for their academic performance as their actual abilities are (Klassen, 2010), students with learning difficulties of any severity type could be assumed to considerably profit from remedial instruction that aims at building and supporting their academic self-concept and self-efficacy beliefs. On grounds of my results, especially students with mild difficulties could greatly profit from this kind of guidance.

### **Reading-related achievement emotions**

The second research question focused on comparing students with no, mild and severe reading difficulties in relation to the achievement emotions associated with the forthcoming reading task. Due to the very limited previous research in this topic, and especially the lack of real-time assessments, it was only hypothesized that students with reading difficulties are more likely than other students to experience negative reading-related achievement emotions (Yasutake & Bryan, 1995). When examining negative versus positive emotions as sum scores I, however, did not find group-level differences. Among the seven achievement emotions I found hopelessness to be the only emotion to show a group-level difference. Students with severe reading difficulties experienced marginally significantly more hopelessness than students with no difficulties. This result could be explained by the fact that self-worth-motivated students often experience negative emotions in achievement situations that appear too demanding in terms of their skills (Galloway *et al.*, 1995; 1996). Self-worth motivation in turn is a typical motivational pattern among students with reading difficulties (Galloway *et al.*, 1995; 1996). Pekrun and colleagues (2006) also found that negative task values and low sense of control over the academic performance both commonly occur among students with reading difficulties, and are linked with students' experiences of hopelessness in achievement situations. My results are in line with these findings.

### **Associations of task values with achievement emotions for students with and without reading difficulties**

The third aim was to study whether the reading-related task values and competence beliefs were associated with the achievement emotions in reading situations, and see whether these associations were different depending on students' reading difficulties. Based on previous studies (Covington, 1984; Galloway *et al.*, 1995; Galloway *et al.*, 1996; Pekrun *et al.*, 2006; Seifert, 1995), I hypothesized task values and competence beliefs to be related to the achievement emotions, and that these relations would show group-specific differences associated with the reading skill level.

My results were partly in line with these expectations. *Perceiving reading as important* was significantly linked with experiencing positive emotions, regardless the student's reading skill level. Considering negative emotions towards reading, reading difficulties and the perceived importance of reading were, in line with my hypothesis, together associated with them. In previous studies (Pekrun *et al.*, 2006; Seifert, 1995), students' motivational approaches towards academic tasks have been associated with negative achievement emotions and rarely occurring positive emotions, and with learning difficulties. In this study, the perceived importance of reading was marginally significantly associated with negative reading-related emotions if student possessed any kind of reading skills, but the association became significant in case the student had severe reading difficulties. In other words, reading skills and the evaluation of reading activities as important or not were linked to students' negative affectivity. This is not surprising, considering how openly and vigorously reading skills are appreciated as one of the most important human skills in the school and society. The attainment value has, indeed, been related to the most core parts of the self (Eccles, 2005). In light of these findings, it appears quite natural that negative emotions are strongly associated with severe difficulties in reading and with the importance-evaluations of reading activities. Nevertheless, it is surprising that students with mild reading difficulties were not similarly associated with this finding. This observation might be explained by earlier studies suggesting that the reader self-image and reading skills develop in relation to one another (Chapman & Tunmer, 2003; Nicholls & Miller, 1984). Maybe mild reading difficulties are not considerable enough to construct a stable part of the self, and consequently do not strongly associate with negative affectivity and importance-evaluations towards reading.

Considering the *interest towards reading*, I did not find differences between reading difficulty groups in relation to achievement emotions as I did when examining the perceived importance of reading. In this study, a strong interest in reading was marginally significantly linked to experiencing few negative reading-related achievement emotions, and to a significant volume of positive emotions, but reading skills did not influence this association. This interesting difference between the two task values might be explained by the different nature of interest in comparison with the perceived importance. Even though interest, too, has been associated with the most central parts of self-concept, it also relates to for example experiences of curiosity and enjoyment of learning (e.g., Eccles, 2005). Maybe the interest towards reading is not so closely tied to the reader's skills but rather to seeking for new information and new experiences that are based on something more abstract than our academic achievements. On the whole, it must be remembered that research in the interrelations of these concepts is very scarce, and most studies in reading difficulties have focused on negative achievement emotions only, excluding the positive emotions

from the analyses. More studies are needed in order to understand the connections between reading motivation, reading difficulties and affectivity related to reading. When not including the reading difficulty level in the analyses, the link between positive achievement emotions and reading task values was, on the other hand, expected. In previous studies also, interest especially has been linked with positive affectivity (Eccles, 2005; Krapp *et al.*, 1992; Renninger, 1992).

### **Associations of competence beliefs with achievement emotions for students with and without reading difficulties**

In terms of competence beliefs in reading, my results were partially in line with the hypothesis. I found that the higher the student's competence beliefs in reading were, the more they experienced positive reading-related emotions and, conversely, the lower were the competence beliefs concerning reading skills, the lower was the level of experienced positive emotions. These associations reached the significance level and were in line with my hypothesis (Covington, 1984; Galloway *et al.*, 1995; Galloway *et al.*, 1996; Pekrun *et al.*, 2006; Seifert, 1995). According to the *Control-Value Theory of Achievement Emotions* (Pekrun & Perry, 2014; Pekrun *et al.*, 2006; Pekrun, 2006), the subjective competence evaluations have an important role in the emotional experiences associated with the achievement. My results indicated, in turn, that reading difficulties did not influence this association, which was an unexpected finding. It must be remembered, however, that previous studies in this field are very few. Maybe the students' subjective experience of managing the task was strong enough to influence the task-triggered positive emotions, regardless of their actual reading skill level. This result might also be explained by factors exterior to the reading task itself, by for example a supportive environment that serves as a protective factor against the possible emotional inconvenience caused by lower reading skills. Maybe students with reading difficulties have received social support and adaptive feedback that has helped them to maintain as positive emotional approach as other students towards challenging school tasks. Another explanation for this finding might be that according to the self-worth motivation researchers, students with reading difficulties tend to develop unrealistic competence beliefs because they want to protect their self-esteem (Galloway *et al.*, 1995; 1996).

Likewise, reading skills did not influence the relation between students' beliefs about their reading skills and the negative emotions towards reading. Competence beliefs and negative emotions were, however, significantly linked to one another when excluding reading difficulties from the analyses. The higher were the competence beliefs in reading, the less the student experienced negative achievement emotions. Previous studies (Covington, 1984; Galloway *et al.*, 1995; Galloway *et al.*, 1996) have indicated that students with reading difficulties often actualize

maladaptive motivational styles that comprise doubts about abilities and low self-efficacy beliefs. These behavior patterns, in turn, have been linked with negative emotions (Covington, 1984; Galloway *et al.*, 1995; Galloway *et al.*, 1996). It must be noted, however, that in previous studies, the researchers have often focused on specific negative emotions (e.g., anxiety) and not on negative emotions as a sum. In this study, I found a link between hopelessness and reading difficulties, but negative emotions as a sum factor were not related to reading skills. It can be, consequently, that having studied negative emotions separately, and not as a sum variable, my results would have indicated differences between the reading difficulty groups. This is an interesting area for future researchers to focus on.

In addition to this, there are some other limitations to this study. *First*, my sample was rather restricted (N=128), which may have reflected on some of the results. Especially the Severe RD (n=31) and Mild RD (n=31) groups were relatively small compared to the group No RD (n=66). *Second*, many of the findings in this study were marginal and the effect sizes were relatively small. *Third*, my approach was cross-sectional and this study did not assess the students' reading skills and other variables longitudinally. I was accordingly not able to study the changes in the relations of the variables over time. I also focused on the responses that the students provided before starting the reading task, and excluded the information gathered during and after the reading task. *Fourth*, I did not study the relatedness of gender differences to the variables. Studies focusing on gender differences have very consistently indicated that the prevalence of reading difficulties among boys is higher than among girls. The sample of this study was selected in a way that there were no gender differences in the reading skill groups, in order to exclude the gender variable from the statistical analyses. Hopefully, future studies will focus on some of these perspectives, providing more information about the nature of reading difficulties and related elements during adolescence.

With this study, I wanted to deepen the understanding about the adolescents' reading difficulties and the motivational and emotional characteristics associated with them. The research tradition in reading difficulties is multifaceted and has a long history, but studies focusing on motivational and especially emotional perspective of the phenomenon are strikingly limited. In addition, most of the studies have focused on one variable only, and the associations of the different aspects of motivation, competence beliefs and affectivity have not been sufficiently examined. In this study, I was able to focus on how these variables are connected to one another, and to shed light on the importance of not conceptualizing all students with reading difficulties as the same, but as individuals with different kinds of motives and beliefs, and diverging reading skills. By defining reading difficulties as mild or severe, I was able to examine whether the level of severity was associated with the motivational and emotional experiences of the student. The characteristics of

reading difficulties and related academic challenges have only been in the focus of a very limited amount of studies. Considering the diversity of reading difficulties and their continuous development throughout the lifespan, as well as the challenges characteristic to the academic life in adolescence, more dedicated studies to the characteristics of adolescents' reading difficulties are needed.

## REFERENCES

- Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest, learning, and the psychological processes that mediate their relationship. *Journal of Educational Psychology*, 94(3), 545-561.
- Ainley, M., Corrigan, M. & Richardson, N. (2005). Students, tasks and emotions: Identifying the contribution of emotions to students' reading of popular culture and popular science texts. *Learning and Instruction*, 15(5), 433-447.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders : DSM-V* (5th ed.). Washington, D.C.: American Psychiatric Association.
- Baker, L. & Wigfield, A. (1999). Dimensions of children's motivation for reading and their relations to reading activity and reading achievement. *Reading Research Quarterly*, 34(4), 452-477.
- Butkowsky, I. S., & Willows, D. M. (1980). Cognitive-motivational characteristics of children varying in reading ability: Evidence for learned helplessness in poor readers. *Journal of Educational Psychology*, 72(3), 408-422.
- Capelatto, I., Lima, R., Ciasca, S. & Salgado-Azoni, C. (2014). Cognitive Functions, Self-Esteem and Self-Concept of Children with Attention Deficit and Hyperactivity Disorder. *Psicologia, Reflexão e Crítica*, 27(2), pp. 331-340.
- Catts, H. W., Adlof, S. & Weismer, S. (2006). Language deficits in poor comprehenders: A case for the simple view of reading. *Journal of Speech, Language, and Hearing Research : JSLHR*, 49(2), 278-293.
- Chapman, J. W., & Tunmer, W. E. (1997). A longitudinal study of beginning reading achievement and reading self-concept. *British Journal of Educational Psychology*, 67, 279-291.
- Chapman, J. W., & Tunmer, W. E. (2003). Reading difficulties, reading-related self-perceptions, and strategies for overcoming negative self-beliefs. *Reading & Writing Quarterly*, 19(1), 5-24.
- Conradi, K., Jang, B., & McKenna, M. (2014). Motivation terminology in reading research: A conceptual review. *Educational Psychology Review*, 26(1), 127-164.
- Coolican, H. (2014). *Research methods and statistics in psychology* (6th ed.). London; New York: Psychology Press.
- Covington, M. V. (1984). The Self-Worth Theory of Achievement Motivation: Findings and Implications. *The Elementary School Journal*, 85(1), 5-20.

- Daley, S., Fischer, K. & Willett, J. (2014). Emotional responses during reading: Physiological responses predict real-time reading comprehension. *Journal of Educational Psychology*, 106(1), 132-143.
- Eccles, J. S. & Wigfield, A. (1995). In the mind of the actor: The structure of adolescents' achievement task values and expectancy-related beliefs. *Personality and Social Psychology Bulletin*, 21(3), 215-225.
- Eccles, J. S. (2005). Subjective task value and the Eccles et al. model of achievement-related Choices, in Elliott, A. J. & Dweck, C. S. (2005) *Handbook of competence and motivation* (pp. 105-121). The Guilford Press.
- Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., et al. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (ed.), *Achievement and achievement motives* (pp. 75–146). San Francisco: Freeman.
- Efklides, A. & Volet, S. (2005). Emotional experiences during learning: Multiple, situated and dynamic. *Learning and Instruction*, 15(5), 377-380.
- Fiedler, K., & Beier, S. (2014). Affect and cognitive processes in educational contexts. In Pekrun, R. & Linnenbrink-Garcia, L. (eds.) *International handbook of emotions in education* (pp. 36-55). New York: Taylor and Francis.
- Fletcher, J. M., Lyon, G. R., Fuchs, L. S., Barnes, M. A., & Seppänen, H. (2009). *Oppimisvaikeudet : Tunnistamisesta interventioon*. Kuopio: Unipress.
- Frenzel, A. C., Pekrun, R. & Goetz, T. (2007). Perceived Learning Environment and Students' Emotional Experiences: A Multilevel Analysis of Mathematics Classrooms. *Learning and Instruction*, 17(5), 478-493.
- Galloway, D., Leo, E. L., Rogers, C., & Armstrong, D. (1995). Motivational styles in English and mathematics among children identified as having special educational needs. *Journal of Educational Psychology*, 65, 477-487.
- Galloway, D., Leo, E. L., Rogers, C., & Armstrong, D. (1996). Maladaptive motivational style: The role of domain specific task demand in English and mathematics. *British Journal of Educational Psychology*, 66, 197-207.
- Goetz, T., Frenzel, A. C., Pekrun, R., & Hall, N. C. (2006). The domain specificity of academic emotional experiences. *The Journal of Experimental Education*, 75, 5-29.
- Gough, P. B. & Tunmer, W. E. (1986). Decoding, Reading, and Reading Disability. *Remedial and Special Education*, 7(1), 6-10.
- Hanich, L., & Jordan, N. (2004). Achievement-related beliefs of third-grade children with mathematics and reading difficulties. *The Journal of Educational Research*, 97(5), 227-234.
- Holopainen, L., Kairaluoma, L., Nevala, J., Ahonen, T. & Aro, M. (2004). *Lukivaikeuksien seurantamenetelmä nuorille ja aikuisille*. Jyväskylä: Niilo Mäki -instituutti.

- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S. & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development*, 73(2), 509-527.
- Jalongo, M. & Hirsh, R. A. (2010). Understanding reading anxiety: New insights from neuroscience. *Early Childhood Education Journal*, 37(6), 431-435.
- Kavale, K. A. & Reese, J. H. (1992). The character of learning disabilities: An Iowa profile. *Learning Disability Quarterly*, 15(2), 74-94.
- Kiuru, N., Eklund, K., Hirvonen, R., Kaartinen, J., Mikkonen, J., & Ahonen, T. (2014). *Emotions in achievement situations (EAS) scale*. Department of Psychology, University of Jyväskylä.,
- Klassen, R. M. (2010). Confidence to manage learning: The self-efficacy for self-regulated learning of early adolescents with learning disabilities. *Learning Disability Quarterly*, 33(1), 19-30.
- Klassen, R. M. (2002). The Optimistic Self-Efficacy Beliefs of Students with Learning Disabilities. *Exceptionality Education Canada*, (2008), 18(1), 93-112.
- Koponen, T., Salmi, P., Eklund, K. & Aro, T. (2013). Counting and RAN: Predictors of arithmetic calculation and reading fluency. *Journal of Educational Psychology*, 105(1), 162-175.
- Krapp, A., Hidi, S., & Renninger, K. A. (1992). Interest, learning and development. In Renninger, K. A., Hidi, S. & Krapp, A. (eds.) *The role of interest in learning development*, Lawrence Erlbaum Associates, Inc., Hillsdale, New Jersey.
- Landerl, K., Wimmer, H., & Moser, E. (1997). *Salzburger Lese- und rechtschreibtest* [Salzburg reading and spelling test]. Bern: Huber.
- Lepola, J., Poskiparta, E., Laakkonen, E., & Niemi, P. (2005). Development of and relationship between phonological and motivational processes and naming speed in predicting word recognition in grade 1. *Scientific Studies of Reading*, 9, 367-399.
- Lewis, M., Haviland-Jones, J. M., & Barrett, L. F. (2008). *Handbook of emotions* (3rd ed.). New York: Guilford Press.
- Light, J. G. & De Fries, J. C. (1995). Comorbidity of reading and mathematics disabilities: Genetic and environmental etiologies. *Journal of Learning Disabilities*, 28(2), 96-106.
- Linnenbrink, A. E. (2006). Emotion research in education: Theoretical and methodological perspectives on the integration of affect, motivation and cognition. *Educational Psychology Review*, 18(307), 307-314.
- Logan, G. D. (1997). Automaticity and reading: Perspectives from the instance theory of automatization. *Reading and Writing Quarterly: Overcoming Learning Difficulties*, 13(2), 123-146.
- Lovett, M. W., Steinbach, K. A. & Frijters, J. C. (2000). Remediating the core deficits of developmental reading disability: A double-deficit perspective. (statistical data included). *Journal of Learning Disabilities*, 33(4), 334-358.

- Lupart, J. L., Cannon, E. & Telfer, J. O. (2004). Gender differences in adolescent academic achievement, interests, values and life-role expectations. *High Ability Studies*, 15(1), 25-42.
- Lyon, G. R., Shaywitz, S. E. & Shaywitz, B. A. (2003). Defining dyslexia, comorbidity, teachers' knowledge of language and reading A definition of dyslexia. *Annals of Dyslexia*, 53, 1-14.
- Lyytinen, H., & Erskine, J. (2006). Early identification and prevention of reading problems. *Encyclopedia on Early Childhood Development*, Center of Excellence of Early Childhood Development.
- Maehr, M. L. (1984). Meaning and motivation: Toward a theory of personal investment. In Russell, A. & Ames, C. (eds.), *Research of Motivation in Education (vol. 1): Student Motivation* (pp. 115-144), Orlando, Academic Press Inc.
- Marsh, H. W. (1987). The big-fish-little-pond effect on academic self-concept. *Journal of Educational Psychology*, 79, 280-295.
- Marsh, H. W. (1990). Causal ordering of academic self-concept and academic achievement: A multiwave, longitudinal panel analysis. *Journal of Educational Psychology*, 82(4), 646-656.
- McGeown, S., Duncan, L., Griffiths, Y., & Stothard, S. (2015). Exploring the relationship between adolescent's reading skills, reading motivation and reading habits. *Reading and Writing*, 28(4), 545-569.
- McGeown, S., Norgate, R., & Warhurst, A. (2012). Exploring intrinsic and extrinsic reading motivation among very good and very poor readers. *Educational Research*, 54(3), 309-322.
- Metsämuuronen, J. (2003). *Tutkimuksen tekemisen perusteet ihmistieteissä* (2. uud. p. ed.). Helsinki: International Methelp.
- Morgan, P. L. & Fuchs, D. (2007). Is there a bidirectional relationship between children's reading skills and reading motivation? *Exceptional Children*, 73(2), 165-184.
- Nation, K. & Snowling, M. (1997). Assessing reading difficulties: The validity and utility of current measures of reading skill. *The British Journal of Educational Psychology*, 67(3), 359-370.
- Nicholls, J. G., & Miller, A. T. (1984). Development and its discontents: The differentiation of the concept of ability. In J. G. Nicholls (ed.), *Advances in motivation and achievement* (vol. 3, pp. 185-218), Greenwich, CT: JAI press.
- Nummenmaa, L. (2010). *Tunteiden psykologia*. Helsinki: Tammi.
- Nurmi, J., & Aunola, K. (2005) Task-motivation during the first school years: A person-oriented approach to longitudinal data. *Learning and Instruction*, 15(2), 103-122.
- Official Statistics of Finland (OSF): Population structure [e-publication].  
ISSN=1797-5395. 2015. Helsinki: Statistics Finland [referred: 18.8.2016].  
Access method: [http://www.stat.fi/til/vaerak/2015/vaerak\\_2015\\_2016-04-01\\_tie\\_001\\_en.html](http://www.stat.fi/til/vaerak/2015/vaerak_2015_2016-04-01_tie_001_en.html)

- Official Statistics of Finland (OSF): Educational structure of population [e-publication].  
ISSN=2242-2919. Helsinki: Statistics Finland [referred: 18.8.2016].  
Access method: [http://www.stat.fi/til/vkour/index\\_en.html](http://www.stat.fi/til/vkour/index_en.html)
- Official Statistics of Finland (OSF): Families [e-publication].  
ISSN=1798-3231. Annual Review 2014, 1. Average number of family members is 2.8 persons  
. Helsinki: Statistics Finland [referred: 18.8.2016].  
Access method: [http://www.stat.fi/til/perh/2014/02/perh\\_2014\\_02\\_2015-11-27\\_kat\\_001\\_en.html](http://www.stat.fi/til/perh/2014/02/perh_2014_02_2015-11-27_kat_001_en.html)
- Parsons, J. E., & Ruble, D. N. (1977). The development of achievement-related expectancies. *Child Development*, 48, 1075-1079.
- Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review*, 18, 315-341.
- Pekrun, R. (2007). The control-value theory of achievement emotions: An integrative approach to emotions in education. In Schultz, P. A. *et al.*, *Emotion in Education* (pp. 9-32), San Diego, Elsevier Inc.
- Pekrun, R., Elliot, A. J., & Maier, M. A. (2006). Achievement goals and discrete achievement emotions: A theoretical model and prospective test. *Journal of Educational Psychology*, 98(3), 583-597.
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of quantitative and qualitative research. *Educational Psychologist*, 37, 91-106.
- Pekrun, R., & Linnenbrink-Garcia, L. (2012). Academic emotions and student engagement. In Christenson, S. L., Reschly, A. L., & Wylie, C. (eds.) *Handbook of Research on Student Engagement* (2012). Boston, MA: Springer US.
- Pekrun, R., & Perry, R. P. (2014). Control-value theory of achievement emotions. In Pekrun, R. & Linnenbrink-Garcia, L. (eds.) *International Handbook of Emotions in Education* (pp. 120-141), New York: Taylor & Francis.
- Pekrun, R. (2005). Progress and open problems in educational emotion research. *Learning and Instruction*, 15(5), 497-506.
- Pekrun, R., Goetz, T., Daniels, L. M., Stupnisky, R. H. & Perry, R. P. (2010). Boredom in achievement settings: Exploring control-value antecedents and performance outcomes of a neglected emotion. *Journal of Educational Psychology*, 102(3), 531-549.
- Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P. & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The achievement emotions questionnaire (AEQ). *Contemporary Educational Psychology*, 36(1), 36-48.
- Perfetti, C. A., & Curtis, M. E. (1986). Reading. In R. F. Dillon & R. J. Sternberg (eds.), *Cognition and Instruction* (pp. 13-57). Orlando, FL: Academic Press.

- Pichler, C., & Wimmer, L. (2006). Das salzburger Lesescreening 2-9. Handreichung für Lehrerinnen und Lehrer. Based on Mayringer, H., & Wimmer, H. (2003). *Salzburger Lesescreening für die Klassenstufen 1-4* and Auer, M., Gruber, G., Mayringer, H., & Wimmer, H. (2005). *Salzburger Lesescreening für die Klassenstufen 5-8*.
- Puolakanaho, A., Ahonen, T., Aro, M., Eklund, K., Leppänen, P. H. T., Poikkeus, A., Tolvanen, A., Torppa, M. & Lyytinen, H. (2007). Very early phonological and language skills: Estimating individual risk of reading disability. *Journal of Child Psychology and Psychiatry*, 48(9), 923-931.
- Quirk, M., Schwanenflugel, P. J. & Webb, M. Y. (2009). A short-term longitudinal study of the relationship between motivation to read and reading fluency skill in second grade. *Journal of Literacy Research*, 41(2), 196-227.
- Renninger, K. A. (1992). Individual interest and development: Implications for theory and practice. In Renninger, K. A., Hidi, S. & Krapp, A. (eds.) *The role of interest in learning development*, Lawrence Erlbaum Associates, Inc., Hillsdale, New Jersey.
- Seifert, T. L. (1995). Characteristics of ego- and task-oriented students: A comparison of two methodologies. *The British Journal of Educational Psychology*, 65(1), 125-138.
- Selkirk, L. C., Bouchey, H. A. & Eccles, J. S. (2010). Interactions among domain-specific expectancies, values, and gender: Predictors of test anxiety during early adolescence. *Journal of Early Adolescence*, 31(3), 361-389.
- Seymour, P., Aro, M. & Erskine, J. M. (2003). Foundation literacy acquisition in European orthographies. *British Journal of Psychology*, 94, 143-175.
- Sideridis, G. D., Mouzaki, A., Simos, P., & Protopapas, A. (2006). Classification of students with reading comprehension difficulties: The roles of motivation, affect, and psychopathology. *Learning Disability Quarterly*, 29(3), 159-180.
- Skaalvik, E. M., & Hagtvet, K. A. (1990). Academic achievement and self-concept: An analysis of causal predominance in a developmental perspective. *Journal of Personality and Social Psychology*, 58, 292-307.
- Smith, J. K., Smith, L. F., Gilmore, A. & Jameson, M. (2012). Students' self-perception of reading ability, enjoyment of reading and reading achievement. *Learning and Individual Differences*, 22(2), 202-206.
- Snow, C. E., Burns, S & Griffin, P. (1998). *Preventing reading difficulties in young children*. National Research Council. National Academy Press, Washington, DC.
- Spinath, B., & Steinmayer, R. (2008). Longitudinal analysis of intrinsic motivation and competence beliefs: Is there a relation over time? *Child Development*, 79(5), 1555-1569.
- Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21(4), 360-407.

- Stutz, F., Schaffner, E., & Schiefele, U. (2016). Relations among reading motivation, reading amount, and reading comprehension in the early elementary grades. *Learning and Individual Differences*, 45, 101-113.
- Torppa, M., Eklund, K., van Bergen, E., & Lyytinen, H. (2015). Late-emerging and resolving dyslexia: A follow-up study from age 3 to 14. *Journal of Abnormal Child Psychology*, 43(7), 1389-1401.
- Torppa, M., Tolvanen, A., Poikkeus, A. M., Eklund, K., Lerkkanen, M. K., Leskinen, E. & Lyytinen, H. (2007). Reading development subtypes and their early characteristics. *Annals of Dyslexia*, 57(1), 3-32.
- van der Leij, A. & van Daal, V. H. (1999). Automatization aspects of dyslexia: Speed limitations in word identification, sensitivity to increasing task demands, and orthographic compensation. *Journal of Learning Disabilities*, 32(5), 417-428.
- Viljaranta, J. (2010). *The development and role of task motivation and task values during different phases of the school career*. Jyväskylä Studies in Education, Psychology and Social Research.
- Viljaranta, J., Räikkönen, E., Aunola, K., & Nurmi, J-E. (2014). The role of Academic Performance, self-concept of ability and gender in adolescents' educational plans in Finland. In *The power of education research for innovation in practice and policy : The 2014 annual meeting of the American educational research association*. American Educational Research Association (AERA).
- Watson D, Clark L. A., & Tellegen A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.
- Watt, H. M. G. (2004). Development of adolescents' self-perceptions, values, and task perceptions according to gender and domain in 7th- through 11th-grade Australian students. *Child Development*, 75, 1556-1574.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92(4), 548-573.
- Weiner, B. (2005). Motivation from an attribution perspective and the social psychology of perceived competence. In Elliott, A. J. & Dweck, C. S., *Handbook of competence and motivation* (2005, pp. 73-84), The Guilford Press.
- Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25, 68-81.
- Wigfield, A. & Eccles, J. S. (1994). Children's competence beliefs, achievement values, and general self-esteem: Change across elementary and middle school. *Journal of Early Adolescence*, 14(2), 107-138.
- Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arbreton, A. J. A., Freedman-Doan, C. & Blumenfeld, P. C. (1997). Change in children's competence beliefs and subjective task values

across the elementary school years: A 3-year study. *Journal of Educational Psychology*, 89(3), 451-469.

Wigfield, A. & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, 89(3), 420-432.

Willcutt, E. G. & Pennington, B. F. (2000). Comorbidity of reading disability and attention-Deficit/Hyperactivity disorder: Differences by gender and subtype. *Journal of Learning Disabilities*, 33(2), 179-191.

Yasutake, D., & Bryan, T. (1995). The influence of affect on the achievement and behavior of students with learning disabilities. *Journal of Learning Disabilities*, 28(6), 329-334.

Zeidner, M. (1998). *Test anxiety : The state of the art*. New York: Plenum Press.