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Early Temperament and Age at School Entry Predict Task Avoidance in Elementary School

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Abstract

This study examined the role of temperament, prereading skills, and age at school entry in the development of Finnish children's task avoidance. Teachers rated the task-avoidant behavior of 198 participants in kindergarten and twice in Grades 2 and 3. Parents rated the children's temperament at age 3 and children's prereading skills were measured at age 5. The results showed that, on average, the level of children's task avoidance remained the same from kindergarten to Grade 2 Fall, but decreased from Grade 2 Fall to Grade 3 Spring. A low task avoidance level was predicted by good prereading skills, high effortful control, and high negative affectivity. Low surgency predicted a decrease in task avoidance from kindergarten to Grade 2 Fall, whereas high negative affectivity predicted a decrease from Grade 2 Fall to Grade 3 Spring. Finally, task avoidance of the oldest children in the classrooms decreased more from kindergarten to Grade 2 Fall, whereas younger children's task avoidance decreased particularly from Grade 2 Fall onward.

Keywords: elementary school, prereading skills, school entry, task avoidance, temperament

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1. Introduction

Students' achievement behaviors in learning situations influence their academic performance and skill development (e.g., Aunola, Nurmi, Niemi, Lerkkanen, & Rasku-Puttonen, 2002; Fyrstén, Nurmi, & Lyytinen, 2006). One form of maladaptive achievement behavior is *task avoidance* evidenced in a low level of effort in learning tasks and/or task-irrelevant activities, such as fooling around in the classroom and disturbing other students (Onatsu-Arvilommi & Nurmi, 2000). Task avoidance has been found to have detrimental effects on the development of both reading and math skills (e.g., Aunola et al., 2002; Eklund, Torppa, & Lyytinen, 2013; Hirvonen, Tolvanen, Aunola, & Nurmi, 2012). Because of the dysfunctional role that task avoidance plays in learning situations, it is important to understand the origins of this type of behavior. In the present study we examined Finnish children's temperament, prereading skills, and age at school entry as predictors of children's task avoidance in kindergarten and the early grades of elementary school.

The beginning of formal schooling is a critical time for the formation of children's academic self-perceptions and school motivation (Aunola, Nurmi, Lerkkanen, & Rasku-Puttonen, 2003; Heckhausen & Heckhausen, 2008), because it is at school that children receive, for the first time, systematic feedback of their progress and begin to compare their achievement with that of others. The foundation for achievement-related behaviors is laid in children's early experiences and related feedback: previous levels of children's task-focused or task-avoidant behaviors from kindergarten age onward have been found to contribute to their behavior in subsequent situations (e.g., Aunola et al., 2003; Onatsu-Arvilommi & Nurmi, 2000). Previous studies have not, however, considered whether there are different phases in the development of children's behavioral patterns. For example, school entry and other school transitions may lead to temporary increases in task avoidance, because children

need to face a new learning environment and more challenging learning tasks. In contrast, task avoidance may decrease later on once the children have familiarized themselves with the new learning environment. The development of achievement-related behaviors may also follow different paths for different groups of children depending on what kind of learning experiences and possible difficulties they meet in their learning (see Poskiparta, Niemi, Lepola, Ahtola, & Laine, 2003).

The adoption of adaptive and maladaptive patterns of behavior (such as task avoidance) in learning situations can be explained from a motivational perspective. This perspective suggests that students' perceptions of their own ability affect their expectations in a particular task and further influence their motivation and effort expenditure in the task (e.g., Bandura, 1993; Wigfield & Eccles, 2000). Studies have shown that children's good performance in reading or math at school age or already in preliteracy tasks in kindergarten can support their task-focused behaviors in school, whereas difficulties in learning or weaker preskills can later lead to increased levels of task-avoidant behaviors (e.g., Fyrstén et al., 2006; Hirvonen et al., 2012; Onatsu-Arvilommi & Nurmi, 2000). After repeated negative learning experiences, engaging in task-avoidant activities can be seen as a self-handicapping strategy in order to create an excuse for another failure the child is fearing to face (Jones & Berglas, 1978), or as a way to decrease anxiety in a learning situation (Miller, 1987).

During the past decades, there has been a growing interest in the role of temperament and personality in students' achievement-related motivation and behaviors (e.g., Bjørnebekk & Diseth, 2010; Elliot & Thrash, 2002; Rothbart & Hwang, 2005). The balance between approach versus avoidance motives, on one hand, and between reactivity versus self-regulation, on the other hand, is in the focus of both theories of motivational systems and theories of temperament and personality (see Ahadi & Rothbart, 1994; Derryberry & Rothbart, 1997; Elliot & Thrash, 2002, 2010). Both research traditions have also used

concepts such as task orientation, task-related behavior, on-task behavior, and persistence. Elliot and Thrash (2002, 2010) have argued that the neurobiological, affective, and motivational aspects of personality converge into the construct of approach/avoidance temperament. Approach temperament (containing extraversion, positive emotionality, and behavioral activation system) is defined as a neurobiological sensitivity toward positive or desirable stimuli, directing individuals' attentional, affective, and behavioral responses toward such stimuli. By contrast, avoidance temperament (consisting of neuroticism, negative emotionality, and behavioral inhibition system) is defined as an analogous sensitivity toward negative or undesirable stimuli, resulting in individuals' attentional, affective, and behavioral responses away from such stimuli. It has been further suggested that individuals' achievement motivation, for example the pursuit of approach and avoidance goals, is directed by these neurobiological sensitivities toward either positive and desirable or negative and undesirable stimuli, respectively (Elliot & Thrash, 2002, 2010; see also Bjørnebekk & Diseth, 2010). Avoidance orientation in learning situations would thus be instigated by a motive to avoid negative outcomes, such as looking incompetent to others or failing to understand the course materials.

The present study applies the theoretical framework of Rothbart and colleagues (Derryberry & Rothbart, 1997; Rothbart, Ahadi, Hershey, & Fisher, 2001), which defines temperament as individual differences in emotional and behavioral reactivity as well as differences in the self-regulation of this reactivity (Henderson & Wachs, 2007; Rothbart, Ahadi, & Evans, 2000). These differences are constitutional, genetically influenced and visible soon after birth, but temperament also develops over time as a result of maturation and socialization processes and individuals' experiences in different environments (Henderson & Wachs, 2007; Rothbart et al., 2001). Rothbart and her colleagues (Derryberry & Rothbart, 1997; Rothbart et al., 2001) have identified three dimensions of temperament: effortful

control, negative affectivity, and surgency/extraversion. The self-regulative aspect of temperament, *effortful control*, refers to the ability to willfully suppress a dominant response in order to perform a subdominant response (Posner & Rothbart, 2000). Individuals with high effortful control have a high ability to direct, shift, and maintain attention and to control or inhibit one's impulses (e.g., Henderson & Wachs, 2007; Rothbart et al., 2001). At kindergarten and elementary school age, high effortful control has been found to be positively related to, for example, students' academic self-efficacy (Liew, McTigue, Barrois, & Hughes, 2008), academic competence (Valiente, Lemery-Chalfant, & Swanson, 2010; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008; Zhou, Main, & Wang, 2010), school liking (Valiente, Swanson, & Lemery-Chalfant, 2012), and classroom participation (Valiente et al., 2008; 2012). *Negative affectivity* as a temperamental facet refers to individual differences in the threshold, intensity, and recovery of negative emotions such as anger, frustration, fear, discomfort, and sadness (Rothbart et al., 2000; Rothbart et al., 2001). Individuals high in negative affectivity are sensitive to negative cues in the environment and prone to express and dwell on intense negative feelings, for example if their needs, hopes, or expectations are not met. Among kindergarten and elementary school students, these characteristics have been found to be associated with negative outcomes, such as low classroom participation and school performance, and high externalizing and internalizing problem behavior (e.g., Eisenberg et al., 2009; Valiente et al., 2010, 2012; Zhou et al., 2010). Finally, *surgency/extraversion* is characterized by impulsivity, a high activity level, high-intensity pleasure, and a lack of shyness (Rothbart et al., 2000; Rothbart et al., 2001). Individuals high in extraversion are active and rapid in their responses, seek intense stimuli, do not mind taking risks, and are comfortable with new people and new situations. High impulsivity has been found to relate to children's externalizing problems (Eisenberg et al., 2009) and low classroom participation and school liking (Valiente et al., 2012), whereas behavioral

inhibition (or shyness) contributes negatively to academic achievement (Valiente et al., 2010) and school engagement (Hughes & Coplan, 2010). Temperamental characteristics may also work in interaction. For example, effortful control has been suggested to play a moderating role in the relationship between negative affect and socio-emotional or cognitive functioning: Children's high negative affectivity has been shown to be related to high externalizing problems (Moran, Lengua, & Zalewski, 2013) and attentional bias toward threat (Lonigan & Vasey, 2009), but only when accompanied by low effortful control. On the other hand, a study of Valiente and colleagues' (2010) suggested that at low levels of negative affect, children with high effortful control performed academically better than children with low effortful control, whereas at high levels of negative affect, all children showed similar academic achievement regardless of their effortful control.

Although the role of temperament in the school context has been previously studied from several aspects and found to play a significant role, for example, in students' academic achievement (e.g., Valiente et al., 2010; Zhou et al., 2010), and internalizing and externalizing problem behavior in school (e.g., Eisenberg et al., 2009; Zhou et al., 2010), there are a limited number of studies on the predictive links of temperament to the development of achievement behaviors, such as task-avoidant behavior, during the early school years. Cross-sectional studies have reported positive associations between classroom participation and effortful control (Valiente et al., 2008, 2012), and negative associations between classroom engagement and impulsivity, anger, and shyness (Hughes & Coplan, 2010; Valiente et al., 2012). Temperament explains students' classroom behaviors because individual differences in temperament affect the way students perceive and react to learning situations and learning tasks, the things they orient their attention to, and their ability to plan, initiate, and perform actions that are relevant for task completion (cf. Rothbart & Hwang, 2005). However, previous studies have not considered whether temperament also contributes

to changes in students' achievement behaviors across time as a result of increasing number of learning experiences the students have gained in different situations, and because of individual differences in how the students respond and adapt to changes in their learning environment, for example during school transitions. As an exception, the recent study of Hirvonen and colleagues (2013) examined the contribution of teacher-rated temperament to changes in children's teacher-rated achievement behaviors during Grade 1 of elementary school. The findings showed that distractibility was related to a high level of task avoidance and an increase of task avoidance during the first grade, whereas behavioral inhibition was associated with high anxiety and helpless behavior but not with changes in them. Helpless behavior was characterized as a passive form of avoidance (i.e., giving up and withdrawing), whereas task avoidance can be described as an attempt to avoid tasks by actively engaging in task-irrelevant activities.

In addition to being influenced by their previous learning experiences and temperamental characteristics, children's behavior in learning situations can be affected by various cognitive factors. One of such factors is child's cognitive readiness in relation to language learning and reading acquisition. For example, familial risk of dyslexia and low early cognitive skills increase the probability of reading difficulties (Eklund et al., 2013; Puolakanaho et al., 2007). However, task-focused behavior in learning situations can act as a protective factor against the harmful effects of cognitive risks (Eklund et al., 2013). In the present study, we examine the extent to which familial risk of dyslexia and prereading skills contribute to children's task-avoidant behavior.

Another potentially important factor for the questions we focus on in the present study is the chronological age of children. In classrooms, age differences between children can be almost a year depending on which month they are born in. This age difference can cause considerable differences between children in their school readiness, that is, in their

cognitive, emotional, and social skills (Blair, 2002; Datar & Gottfried, 2013; Macdonald, Beauchamp, Crigan, & Anderson, 2014). Children at this age develop fast, for example in respect to their academic skills, social skills, and physiological abilities to sit still and to stay attentive for the whole school day. It is justified to assume that age differences at the time of school entry are likely be reflected in children's level of maturity and their ability to regulate their behavior in the classroom (Datar & Gottfried, 2013; Macdonald et al., 2014; Mühlenweg, Blomeyer, Stichnoth, & Laucht, 2012), such as their task-avoidant behavior. In Finland, children enter first grade of elementary school in August of the year they turn seven. In the present study, this is referred to as the time of school entry.

1.1. The Present Study

In the present study we examined children's task avoidance from kindergarten through Grade 3 of elementary school in order to understand how task-avoidant behavior changes during the first critical years of children's school careers. There have been longitudinal inspections in previous studies as well, but usually they have not considered whether the nature of development of children's task-avoidant behavior is different at different stages of children's school careers. As learning contexts, kindergarten and elementary school differ from each other and set different demands for children and their behavior. Children may react in various ways when moving from a less structured and less academically oriented kindergarten environment to a more formal school environment. In Finland, kindergarten education is less focused on academic skills such as learning to read, than for example on supporting the development of social skills (National Board of Education, 2010). The change in the emphasis from non-academic skills to academic skills may affect children's achievement behaviors when they move from kindergarten to elementary school. In another Finnish study, it was found that differences between poor readers and good readers in their motivational orientations were not yet apparent in

kindergarten, but in Grades 1 and 2 when the prospective poor readers started to face difficulties in learning to read and write, they showed less task orientation, and more social dependence and ego-defensiveness than the prospective good decoders and good readers (Poskiparta et al., 2003). Consequently, we considered it important to study the development of task avoidance in a piecewise manner, separating the transition from kindergarten to elementary school from the development of later school years. Furthermore, we examined individual factors in early childhood that would explain the level and changes of children's task avoidance in later learning situations. Previous studies have mostly concentrated on simultaneous or closely preceding antecedents of task avoidance, such as children's skill development or parents' beliefs about their offspring's competence at school (e.g., Aunola et al., 2003; Aunola et al., 2002; Mägi, Lerkkanen, Poikkeus, Rasku-Puttonen, & Nurmi, 2011; Onatsu-Arviolommi & Nurmi, 2000). Instead, in this study we used parental ratings of children's temperament at the age of 3, distinctly before school entry (age 7 in Finland). An early assessment of temperament was considered essential for the rating to better reflect children's dispositional traits instead of learned affective and behavioral responses, shaped by children's school-related experiences. Regarding the contribution of skill development and cognitive skills, we used measures of prereading skills at the age of 5. The significance of age differences was taken into account by including children's age at school entry as one of the predictors of their task avoidance.

The following research questions were examined: How does children's task-avoidant behavior change (a) from kindergarten to the beginning of Grade 2, and (b) from the beginning of Grade 2 to the end of Grade 3? To what extent do children's temperament, prereading skills, and age at school entry predict the changes in children's task avoidance?

Some previous findings have suggested that the level of children's task-avoidant behaviors increases during kindergarten and the first grades of elementary school (see

Hirvonen et al., 2012; Hirvonen et al., 2013), but these studies have not examined the different stages of development separately. Thus, although there were no studies to build hypotheses on, we assumed that children's task-avoidant behavior would first increase by the beginning of the second year in elementary school (after the transition from kindergarten to formal schooling), but would then decrease or stay at the same level in later school grades when children adjust to the demands of school. Furthermore, because regulative aspects of temperament have been found to contribute to low task avoidance (Hirvonen et al., 2013) and high classroom participation and school liking (Valiente et al., 2008; Valiente et al., 2012), we expected effortful control to be negatively associated with task avoidance. A positive association was expected between negative affectivity and task avoidance, because high negative emotionality has been found to be related to negative outcomes, such as high problem behavior and low school liking (e.g., Eisenberg et al., 2009; Valiente et al., 2012; Zhou et al., 2010). Similarly, because characteristics such as impulsivity have been found to relate to externalizing problems and low classroom participation and school liking (e.g., Eisenberg et al., 2009; Valiente et al., 2012), we expected surgency/extraversion to be positively related to task-avoidant behavior. Children's prereading skills were expected to be negatively related to their task-avoidant behavior in kindergarten and school (see Fyrstén et al., 2006; Onatsu-Arvilommi & Nurmi, 2000). Based on the findings on the effect of age on children's self-regulation ability (see Datar & Gottfried, 2013; Macdonald et al., 2014; Mühlenweg et al., 2012), we expected that children's age at school entry (and consequently, at the time of the assessments) would contribute to the level of and changes in their task avoidance, with children born in the beginning of the year being ahead of the younger children in self-regulation and thus showing less task-avoidant behavior in kindergarten and early school years. Finally, familial risk of dyslexia and parents' level of education were included in the analyses as control variables, because it was assumed they could be related to

parents' ratings of children's temperament or to children's prereading skills and task avoidance (see Eklund et al., 2013). The link from familial risk of dyslexia and parental education to task avoidance can be direct or mediated via children's prereading skills.

2. Method

2.1. The Finnish School System

Before they begin their compulsory education, Finnish children have the possibility to attend kindergarten for one year. At the time of the present study, participating in kindergarten education was voluntary, but nationally the participation rate was high (89.9% in 2000; Statistics Finland, 2008). Kindergarten education is free of charge, and it is usually organized in local day care centers or elementary schools. In kindergarten, there is no formal teaching of literacy and numeracy, but children are introduced to letters, words, numbers, mathematical concepts and shapes through play, nursery rhymes, stories, and games. In the year of their seventh birthday, Finnish children start their compulsory education. This includes nine grades of comprehensive schooling, divided into six grades of elementary school and three grades of lower secondary school. Like the kindergarten education, the comprehensive school education is free of charge to all children. The learning objectives and core contents of each subject on each grade level are regulated by the national core curriculum for comprehensive education, determined by the National Board of Education (2004). In the early grades, the task of instruction is not only to meet the objectives of each subject, but also to invoke students' interest in learning, support learning in interaction with other students, develop students' learning strategies, and help students to take responsibility for their learning. Learning environment should promote students' active, self-directed, and creative learning, provide opportunities for students to set their own goals for their learning, and enable interaction among students and between students and teachers (National Board of Education, 2004).

2.2. Participants

All children ($n = 198$; 93 girls, 105 boys) were participants of the XXX study (authors removed for reviewing purposes), originally selected into one of two samples: with or without family risk for dyslexia. Children at risk ($n = 106$) had a parent and one or more other close family members with dyslexia. The parents' dyslexia status was confirmed through an extensive test battery (see Leinonen et al., 2001). The parents of the control group children ($n = 92$) had no difficulties in reading and writing tasks nor did they report difficulties in close family members. The groups were matched in parental education. All the children spoke Finnish as their native language and had no mental, physical, or sensory impairments. The number of participating children in each classroom ranged from 1 to 4; however, nearly 90% of the participants were the only child in her/his classroom taking part.

2.3. Measures and Procedure

2.3.1. Procedure

At the time of the children's third birthday, parents were asked to rate their children's temperament. At ages 5 and 5.5, the children were tested for their prereading skills by trained testers. Moreover, children's task-avoidant behavior was rated at five time points. Near the children's ($n = 188$) sixth birthday, the ratings were done by the children's kindergarten teachers. The classroom teachers rated the children's task-avoidant behavior in the fall ($n = 184$) and spring ($n = 162$) semesters of Grade 2, and in the fall ($n = 144$) and spring ($n = 162$) semesters of Grade 3 in elementary school. Grade 1 ratings were obtained for only 118 children (59.6%), and thus, this measurement point had to be excluded. Teacher ratings were obtained at all five time points for 103 children (52.0%), at four time points for 59 children (29.8%), at three time points for 23 children (11.6%), at two time points for 7 children (3.5%), and at only one time point for six children (3.0%). When comparing the children for whom teacher ratings were available from all five time points with children for

whom one or more teacher ratings were missing, the results showed that the children with missing data did not differ from the children with complete data in any of the variables (teacher-rated task avoidance, parent-rated temperament, prereading skills, age at school entry, risk versus control group status, gender, or parents' education). A non-significant Little's MCAR test ($\chi^2(470) = 472.69, p = .46$) indicated that data could be considered missing completely at random. All 198 participants were included in the statistical analyses using maximum likelihood estimation assuming missingness at random.

2.3.2. Task-avoidant behavior

The children's task-avoidant behavior was rated by their kindergarten and classroom teachers using the Behavioral Strategy Rating Scale (BSRS; Onatsu & Nurmi, 1995; for validation information see also Zhang, Nurmi, Kiuru, Lerkkanen, & Aunola, 2011). Based on their impression of how each child typically behaves when working on tasks, the teachers were asked to respond to five statements concerning the child's task avoidance (*When facing difficulties, does the student have a tendency to find something else to do instead of focusing on the task at hand? Does the student give up easily? Does the student actively attempt to solve even difficult situations and tasks [reverse coded]? If the activity or task is not going well, does the student lose his/her focus? Does the student demonstrate initiative and persistence in his/her activities and tasks? [reverse coded]*). The statements were assessed on a 5-point Likert scale (1 = *not at all*; 5 = *to a great extent*). A composite score was created at each time point by computing a mean of the five items. Cronbach's alpha reliability coefficients for the teacher-rated task avoidance at the five time points were .89, .91, .92, .92, and .93, respectively.

2.3.3. Temperament

Children's temperament at the age of 3 was rated by their parents using a Finnish version of the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001). The CBQ

consists of 195 items to which the parents are asked to respond on a 7-point scale (1 = *extremely untrue of your child*; 7 = *extremely true of your child*). The items cover 15 temperamental dimensions: activity level, anger/frustration, attentional focusing, discomfort, falling reactivity/soothability, fear, high intensity pleasure, impulsivity, inhibitory control, low intensity pleasure, perceptual sensitivity, positive anticipation, sadness, shyness, and smiling/laughter.

The 15 subscales of the CBQ have been shown to form three broader temperamental factors (e.g., Ahadi, Rothbart, & Ye, 1993; Rothbart et al., 2001). To examine the factor structure of the CBQ among 3-year-old Finnish children, exploratory factor analyses with the CBQ scale scores were conducted using IBM SPSS Statistics 20. The analyses were conducted using principal axis factoring with direct oblimin rotation. The extraction of the factors was based on eigenvalues greater than one. Three scales (smiling/laughter, positive anticipation, and shyness) were excluded from the final solution because they loaded on more than one factor (loadings above .30). Also in previous studies, these three scales have been found to have relatively high cross-loadings on several factors or to load differently in samples with different backgrounds (see Ahadi et al., 1993; Rothbart et al., 2001). The final solution with the remaining 12 scales consisted of three factors accounting for 53.2% of the total variance. The first factor, surgency/extraversion, comprised of impulsivity, high intensity pleasure, and activity level. The second factor, negative affectivity, consisted of anger/frustration, sadness, discomfort, falling reactivity/soothability (loading negatively), and fear. The third factor, effortful control, included low intensity pleasure, inhibitory control, attentional focusing, and perceptual sensitivity. Inhibitory control loaded relatively highly (-.32) also on surgency/extraversion, but its highest loading (.63) was still clearly on effortful control. Apart from the three excluded scales, the final solution resembled the factor structure found in previous studies for this age group in other cultural

contexts (Rothbart et al., 2001). Consequently, based on this factor solution, three composite scores for children's temperament were calculated. In the whole sample, the Cronbach's alpha reliability coefficients for surgency/extraversion, negative affectivity, and effortful control were .86, .79, and .73, respectively.

2.3.4. Prereading skills

Children's prereading skills were assessed before school entry. Skills in letter knowledge were assessed at the age of 5 years and phonological awareness and rapid naming (RAN) at 5.5 years. All assessments were conducted in laboratory settings by trained testers.

2.3.4.1. Letter knowledge

Children were asked to name 23 capital letters presented one at a time. Testing always began by presenting the first letter of the child's first name. Subsequent letters were presented in the order in which letters are typically taught in Finnish schools. The child received one point for each correct response (use of a phoneme or a letter name were both coded as correct responses), and thus the maximum score for the task was 23. A standardized score was used as the letter knowledge measure.

2.3.4.2. Phonological awareness

Four measures of phonological awareness were assessed (see Puolakanaho, Poikkeus, Ahonen, Tolvanen, & Lyytinen, 2003): (1) *Segment identification*. On a computer screen, the child viewed three pictures of objects with simultaneous pronunciation of the object's name. The child identified the picture containing a specified subword level segment. The size of the segment to be identified varied from one to four phonemes (1–2 syllables). Segments came from the beginning, middle, or end of the word. There were 20 items. (2) *Blending*. The task was to blend segments into a word (e.g., per-ho-nen [butterfly]). The segments consisted of words, syllables, or phonemes. The segments were separated by 750 ms and were presented via headphones. One item consisted of a compound word, eight items

required synthesis of syllables, and three items required the synthesis of syllables and phonemes. There were 16 items, and one point was awarded for each correct answer. (3) *Initial phoneme identification*. The child was shown four pictures of objects. Simultaneously, the object names were presented. Subsequently, a phoneme was given, and the task was to select the picture of the object that starts with the phoneme. For example: "Which word begins with /m/?". There were nine items, and one point was awarded for each correct answer. (4) *Initial phoneme production*. The tester showed a picture to the child and asked what the child saw in the picture. Next, the child listened to the tester pronouncing the word and articulated the initial sound. The number of correct initial sounds or letter answers out of eight items formed the score. The mean of the standardized scores from these four tasks formed the composite score for phonological awareness. Cronbach's alpha for the composite score was .76.

2.3.4.3. Rapid automatized naming

Rapid serial naming of objects and colors (Denckla & Rudel, 1976) was administered in short form (in a 5 x 6 random matrix). Children named the objects/colors as quickly as possible without making errors, beginning with the top row and continuing to the bottom. Total matrix completion times in seconds were recorded for both matrices, and the mean of the standardized scores was used as the measure of rapid automatized naming.

2.3.5. Age at school entry

The children's age at the time they entered Grade 1 of elementary school was coded in months. Typically Finnish children begin Grade 1 in August in the year of their seventh birthday. However, one participant began school the year of his or her sixth birthday, whereas two participants entered Grade 1 the year of their eighth birthday.

2.3.6. Parental education

Parental education (reported at the entry stage of the project) was classified using a 7-point scale. This scale was constructed by combining the information that the parents had given concerning their general education and their upper secondary vocational education and tertiary education. These two scales were combined into one 7-point scale in the following way: 1 (*comprehensive school education without any vocational education*), 2 (*comprehensive school education combined with short-term vocational courses*), 3 (*comprehensive school education combined with a vocational school degree*), 4 (*comprehensive school education combined with a vocational college degree*), 5 (*comprehensive school education combined with a lower university degree [Bachelor's] or a degree from a polytechnic*), 6 (*upper secondary general school diploma combined with a lower university degree [bachelor's] or a degree from a polytechnic*), and 7 (*comprehensive school or upper secondary general school diploma combined with a higher university degree [master's or a doctorate-level degree]*). Finally, a composite score for parental education was created as a mean of the mother's education and father's education.

2.4. Statistical Analyses

The analyses were run in two stages. First, in order to examine the changes in children's task-avoidant behavior across time, a piecewise growth curve model was created. The changes in task avoidance were estimated separately from kindergarten to the fall of Grade 2, and from the fall of Grade 2 to the spring of Grade 3. Consequently, the growth curve model included three components: (a) an intercept factor (Level) to estimate the initial level of task avoidance, and two slope factors to estimate the changes in task avoidance across time, that is, (b) linear growth from kindergarten to the fall of Grade 2 (Growth 1) and (c) linear growth from the fall of Grade 2 to the spring of Grade 3 (Growth 2). The loadings of the teacher-rated task avoidance at the five time points were each set to 1 on the intercept factor. For the first slope component (Growth 1), the loadings of the task avoidance variables

were set to 0, 1, 1, 1, and 1, respectively. The first slope component thus estimates the change from kindergarten to the fall of Grade 2. For the second slope component (Growth 2), the loadings were set to 0, 0, 1, 2, and 3, respectively. The second slope component thus describes the linear change from the fall of Grade 2 onward. The residual variances of the task avoidance variables were constrained equal across time. Second, the antecedents for the level and changes of children's task avoidance were examined by including children's temperament, prereading skills, age at school entry, dyslexia risk versus control group status, and parents' education as covariates in the piecewise growth curve model. Interaction effects of the temperamental characteristics were included in the model in a separate analysis. The models were tested for gender differences using a multisample procedure.

The analyses were performed with the Mplus 6.12 statistical package (Muthén & Muthén, 1998–2011). The models were estimated with maximum likelihood estimation with robust standard errors (MLR).

3. Results

3.1. Descriptive statistics

The means, standard deviations, and correlations between the study variables are presented in Table 1. Significant gender differences were found in effortful control and teacher-rated task avoidance: girls were rated higher than boys in effortful control ($t(192) = 3.13, p < .01$; Cohen's $d = .45$), and lower in task avoidance in kindergarten ($t(186) = -2.52, p < .05$; Cohen's $d = .37$), Grade 2 fall ($t(182) = -1.98, p < .05$; Cohen's $d = .29$), Grade 2 spring ($t(160) = -2.07, p < .05$; Cohen's $d = .33$) and Grade 3 spring ($t(150) = -3.25, p < .01$; Cohen's $d = .51$). The gender difference in task avoidance at Grade 3 fall did not reach .05 level of significance ($t(142) = -1.81, p = .07$; Cohen's $d = .30$). Family risk for dyslexia was linked to prereading skills: significant differences in favor of the control group were found in letter knowledge ($t(195) = -2.81, p < .01$; Cohen's $d = .40$), phonological awareness ($t(190) =$

-3.95, $p < .001$; Cohen's $d = .57$) and RAN ($t(158) = -3.62$, $p < .001$; Cohen's $d = .58$). The family risk and control groups did not differ in any of the other variables.

--- TABLE 1 AROUND HERE ---

3.2. Two-piece growth curve model

A piecewise growth curve model was created to examine the development of children's task-avoidant behavior in elementary school. The final model is presented in Figure 1. The model fit the data well ($\chi^2(10) = 9.21$, $p = .51$; CFI = 1.000; TLI = 1.002; RMSEA = .000; SRMR = .036). The results showed that the mean of Growth 1 was not statistically significant, suggesting that there was no linear change in children's task avoidance mean level from kindergarten to the fall of Grade 2. The mean of Growth 2, in turn, was negative and statistically significant, indicating that on average, children's task-avoidant behavior decreased from the fall of Grade 2 to the spring of Grade 3. The variances of all model components were statistically significant, indicating that there were inter-individual differences in the level and change of children's task avoidance across time. Furthermore, the covariance between the latent Level and Growth 1 factors was negative and statistically significant, suggesting that the lower the children's task avoidance was in kindergarten, the less it decreased from kindergarten to the fall of Grade 2, and similarly, the higher the level of task avoidance in kindergarten, the bigger the decrease from kindergarten to Grade 2. The covariance between Level and Growth 2 was not significant. Finally, the covariance between the two slope components, Growth 1 and Growth 2, was negative and statistically significant: The more children's task avoidance decreased from kindergarten to the fall of Grade 2, the less it decreased from the fall of Grade 2 to the spring of Grade 3.

The growth curve model was tested for gender differences using a multisample procedure. A model in which the means and variances of the growth components as well as covariances between the growth components were restricted to be equal across gender was

compared to a model where these parameters were not restricted. The chi-square likelihood ratio test between the models suggested that there were no gender differences ($\Delta\chi^2 = 15.02$, $\Delta df = 9$, $p = .09$) in the overall model. The model fitted well for both genders.

--- FIGURE 1 AROUND HERE ---

3.3. Growth curve model with covariates

Next, antecedents of task-avoidant behavior were examined by including children's temperamental characteristics, prereading skills, age at school entry, parents' education, and risk versus control group status as predictors of the growth components in the above-described model. Children's prereading skills were included as a latent factor with RAN, letter knowledge and phonological awareness as indicators. Temperament, parents' education, and group status were allowed to predict children's skill level at age 5. Covariances between all parent-rated variables (parents' education and children's temperamental characteristics) were estimated. The fit of the model was acceptable ($\chi^2(55) = 77.40$, $p = .02$; CFI = .97; TLI = .95; RMSEA = .05; SRMR = .05). However, inspection of the model fit indices suggested that the model would improve if the residuals of phonological awareness and RAN were allowed to covary. After this addition, the model fit the data well ($\chi^2(54) = 69.95$, $p = .07$; CFI = .98; TLI = .97; RMSEA = .04; SRMR = .05). The final model is presented in Figure 2.

--- FIGURE 2 AROUND HERE ---

The results showed, first, that children's negative affectivity, effortful control, and prereading skill level were negatively associated with the initial level of their task-avoidant behavior: The more negative affectivity and effortful control the children were rated to show at age 3 and the better the children performed in prereading tests at age 5, the less task avoidance they later showed in kindergarten. Second, the change in children's task-avoidant behavior from kindergarten to the fall of Grade 2 (Growth 1) was positively predicted by

their surgency/extraversion and negatively by their age: The lower the children were rated in surgency/extraversion at age 3, the more their task avoidance decreased from kindergarten to the fall of Grade 2. Similarly, the older the children were at school entry, the larger was the decrease in their task avoidance between the first two time points. Third, the change in task avoidance from Time 2 onward (Growth 2) was negatively predicted by children's negative affectivity and positively by their age: The more negative affectivity the children were rated to have at age 3, the more their task avoidance decreased from the fall of Grade 2 to the spring of Grade 3. Similarly, the younger the children were at school entry, the larger was the decrease in their task avoidance from Grade 2 onward.

Additionally, the interaction effects of temperamental characteristics were examined by adding negative affectivity x effortful control, negative affectivity x surgency/extraversion, and effortful control x surgency/extraversion interactions as predictors of the growth components. The fit of the model after these additions was satisfactory ($\chi^2(78) = 112.58, p = .01; CFI = .95; TLI = .93; RMSEA = .05; SRMR = .05$). The results showed that negative affectivity and effortful control had a small interaction effect on Growth 1 (standardized $\beta = -.17, p = .048$): negative affectivity was positively related to an increase in task avoidance from kindergarten to the beginning of Grade 2 for children low in effortful control, but not for children high in effortful control. No other interaction effects were found.

Finally, the model illustrated in Figure 2 was tested for gender differences. A model in which all correlation coefficients between the predictors and all regression coefficients between the predictors and the growth components were restricted to be equal across gender was compared to a model where these parameters were not restricted. The chi-square likelihood ratio test between the models suggested that there were no gender differences ($\Delta\chi^2 = 43.65, \Delta df = 32, p = .08$).

4. Discussion

This study had two aims. The first aim was to examine how children's task-avoidant behavior changed from kindergarten to Grade 2 and from Grade 2 to Grade 3. The second aim was to examine the antecedents (temperament, prereading skills, and age at school entry) of this behavior. The results showed that, on average, children's task-avoidant behavior remained at the same level from kindergarten to the beginning of Grade 2, but decreased thereafter. Moreover, the results showed that high levels of prereading skills, negative affectivity and effortful control predicted a lower level of task avoidance, whereas low surgency/extraversion and high negative affectivity contributed to decreases in task-avoidant behavior. Finally, older age at the time of school entry predicted a decrease in children's task avoidance from kindergarten to the fall of Grade 2, but a decrease from the fall of Grade 2 to the spring of Grade 3 was related to being younger at school entry.

The first aim of the present study was to examine the developmental changes in children's task avoidance during kindergarten and first school years. The findings showed that, in the group mean level, children's task avoidance did not significantly change from kindergarten to the beginning of Grade 2, but it decreased from Grade 2 to the end of Grade 3. The insignificant mean change between the first time points was contrary to our expectations, because we had expected children's task-avoidant behavior to slightly increase at the beginning of elementary school as a reaction to the transition from kindergarten to a more challenging and learning-oriented school environment. It is possible that the span between the time points was too long for capturing the changes in children's behavior if they took place immediately after the transition (during Grade 1) and leveled off by the beginning of Grade 2. Moreover, the decrease in task avoidance from Grade 2 onward was in contrast to some previous studies that have suggested a slight increase in children's teacher- and observer-rated task-avoidance in the early grades of elementary school (Hirvonen et al., 2012; Hirvonen et al., 2013), possibly as a reaction to children's decreasing interest in school (see

Yeung, Lau, & Nie, 2011). The decrease in the teacher evaluations of children's task avoidance after Grade 2 was a positive finding and could be explained by the fact that, in general, children need some time to learn the code of classroom behavior, but in the course of time the majority of them do learn to behave in ways that are valued as adaptive and appropriate behavior in the classroom (see Blair, 2002; Datar & Gottfried, 2013).

Another key focus of the study was to examine the extent to which children's temperamental characteristics measured at age 3 predict the development of their task-avoidant behavior as they are moving from kindergarten to elementary school. An early assessment of temperament was used to ensure that the ratings would better reflect children's dispositional traits instead of learned affective and behavioral responses, influenced by their experiences at school. The results showed, first, that a high level of effortful control at age 3 predicted a low level of task avoidance in kindergarten and early school years. Children who at age 3 already showed more ability to shift and maintain attention and to control their impulses were more likely to benefit from this ability in later learning situations by being able to focus on and to persist with the academic tasks. Children with poorer self-regulatory skills at age 3, in contrast, engaged with more task-avoidant behavior in learning situations later on. These results are in accordance with previous findings showing that high effortful control is related, for example, to students' classroom participation (Valiente et al., 2008, 2012).

Second, the results showed that children's surgency/extraversion predicted the change in their task avoidance from kindergarten to the beginning of Grade 2: The lower the children were rated in surgency/extraversion at age 3, the more their task-avoidant behavior decreased from kindergarten to the second grade. In contrast, the higher the children were in surgency/extraversion, the more their task avoidance increased from kindergarten to Grade 2. One possible explanation for this relation is that children high in surgency/extraversion may

be able to keep their focus on tasks in kindergarten where the activities are more informal, the tasks are easier, and the learning situations are shorter, but they run into problems when they enter school. In Finnish kindergarten, there is an emphasis on the development of children's social skills more than on formal instruction of academic skills (National Board of Education, 2010). Activity and impulsivity may not be as problematic in kindergarten, because kindergarten curriculum includes more playful elements and children are allowed more freedom to bustle, but impulsive students may have difficulties adjusting to a school classroom, where the children are expected to be able to stay attentive and focused longer time periods than in kindergarten, and not to act on immediate impulses (cf. Blair & Diamond, 2008; Valiente et al., 2012).

Third, children's negative affectivity was found to predict both the level of children's task-avoidant behavior and the change in it during Grades 2 and 3. We had expected that a disposition to express intense, negative emotions (such as anger, frustration, sadness, and fear) when encountered with disappointments and anticipated distress, would show as intense responses in challenging learning situations, thus interfering with children's cognitive functions and leading to task-avoidant behavior (see Zhou et al., 2010). However, contrary to this expectation and somewhat surprisingly, the associations were negative, suggesting that the more openly and intensely the children had showed their negative affects as 3-year-olds, the less they showed task avoidance at school age, and the more their task avoidance decreased during Grade 2 and Grade 3 of elementary school. One possible explanation for this result is that children with high negative affectivity as 3-year-olds had received guidance and control from their parents as a reaction to their intense emotional expressions (see Blair, 2002; Laukkanen, Ojansuu, Tolvanen, Alatupa, & Aunola, 2014), and had consequently learned to regulate their own responses by school age. Thus, in learning situations the children were perhaps better able to suppress their emotional responses and

direct their attention to the tasks. Findings among preschoolers suggest that young children who are low in negative emotionality and high in effortful control, are able to follow display rules and to mask socially inappropriate expressions of anger and disappointment (Liew, Eisenberg, & Reiser, 2004). This ability is also related to being perceived as socially competent by others. To further support this, we found a small interaction effect between negative affectivity and effortful control showing that task avoidance increased most for children who were high in negative affectivity and low in effortful control. There are also previous findings showing that high negative affectivity has negative outcomes only when co-occurring with low effortful control (Lonigan & Vasey, 2009; Moran et al., 2013).

Alternatively, it could be that affectivity is a sign of strong emotional commitment to things the child finds interesting and important. Thus, children scoring high in affectivity may be more prone to get emotionally involved in learning and may not detach themselves from learning tasks easily if they are interested in them. It is also possible that children high in negative affectivity are particularly worried about their performance and the outcomes of their behavior, and thus, are committed to keeping their focus on task and doing what is expected from them (see Berhenke, Miller, Brown, Seifer, & Dickstein, 2011). It has been proposed that a fearful temperament in early childhood contributes to guilt proneness, which in turn is related to conscientiousness and to a tendency to obey rules (Kochanska, 1993; Kochanska, Gross, Lin, & Nichols, 2002; Rothbart et al., 2000).

Besides by their temperamental characteristics, children's task avoidance was found to be predicted by their prereading skills at age 5. The results showed that the lower the prereading skill level of the children was, the more task avoidance they showed in kindergarten and early school years. In previous studies it has been found that school-aged children's good performance in reading or math can support their self-concept as learners and, consequently, their task-focused behaviors, whereas difficulties in learning can later lead

to increased levels of task-avoidant behaviors (e.g., Fyrstén et al., 2006; Onatsu-Arviolommi & Nurmi, 2000). It has also been suggested that low motivation and increased task avoidance is specifically common for children with difficulties in learning (such as reading difficulties), because of the increasing demands that they need to face in the classroom as they grow older (e.g., Lepola, Salonen, & Vauras, 2000; Morgan, Fuchs, Compton, Cordray, & Fuchs, 2008). Because in the present study children's prereading skills were tested already at age 5 (two years before the beginning of formal reading instruction), the findings suggest that already at this age the children had built preliminary self-perceptions of their abilities that were further influencing their willingness to invest effort in or to avoid tasks in later learning situations. Alternatively, it is possible that both children's performance in the prereading tests and their behavior in learning situations at school age can be explained by a third factor, such as their cognitive capacity or attention regulation skills. A familial risk for dyslexia was not directly linked to the level of children's task avoidance, although an indirect link was found via prereading skills. It is not surprising that being at risk for learning difficulties by itself does not lead to maladaptive achievement behaviors, but it is the actual problems in learning that may have consequences on students' motivation and behavior.

Moreover, the findings of the present study showed that children's age at school entry was related to the changes in their task avoidance. From kindergarten to the fall semester of Grade 2, the decrease in task avoidance was steeper the older the child was. Older children were, by the beginning of Grade 2, already better able to cope with the situational demands, whereas their younger classmates had not yet adjusted to the school environment and were thus showing as much task avoidance as they had shown in kindergarten. This effect of maturation was further supported by the finding that children's age at school entry was also related to the change in their task avoidance from the fall of Grade 2 to the spring of Grade 3: The decrease was now greater for the youngest children and smaller for the older

children. After they had some more time to mature, the younger children were catching up to their older classmates at a lower level of task avoidance. At school entry, even a few months' difference in age can thus make a statistically significant contribution to children's ability to regulate their behavior and to stay on task. School cutoff studies have indicated that children who have started school earlier are showing better academic skills and executive functioning compared to same-age children who have started school one year later (e.g., McCrea, Mueller, & Parrila, 1999; Morrison, Alberts, & Griffith, 1997), but it has also been suggested that the development of behavioral regulation skills are more closely associated with chronological age than with the amount of schooling (see Skibbe, Connor, Morrison, & Jewkes, 2011).

From a practical point of view, the findings of this study showed that it is possible to predict children's task-avoidant behaviors at school age with early predictors such as temperament at age 3 and prereading skills at age 5. These factors should be considered when promoting children's adaptive behavior in the classroom and in identifying children who are at risk of developing maladaptive behavioral patterns. On the one hand, task avoidance (or lack thereof) seems to relate to an age-related maturation process. The youngest children showed more task avoidance at school entry, but their avoidance later decreased to the same level as that of their older classmates. The ability to stay on task develops over time and may require a certain level of cognitive and neurobiological maturation, as well as a sufficient amount of opportunities to practice self-control and task mastery. Therefore, the same level of self-control cannot be expected from a 6-year-old as from a 9-year-old, and younger children may need help from adults for several years in adapting their behavior to learning situations, controlling their maladaptive behaviors, and maintaining their adaptive way of behaving (see Blair, 2002). The findings of the study also suggest that differences in children's task avoidance can partly be explained by their temperamental characteristics. For

some children it may be naturally easier to stay focused on tasks, whereas for others staying on task requires more conscious control and more effort to adopt adaptive patterns of behavior. Already in kindergarten before school entry, children can be guided in how to modulate and regulate their attention, behavior, and affective responses (see Blair & Diamond, 2008). Again, individually planned support from adults can help the children to find the working methods that work best for them, taking into account their individual characteristics and the special needs they may have in their skill development, such as dyslexia or other learning difficulties.

This study has some limitations that should be taken into account when interpreting the results and planning future studies. First, the time span between the measurement points may have been too long for studying subtle changes in children's task avoidance, especially immediately after the transition from kindergarten to Grade 1 of elementary school. Second, the time span between the first two time points varied between the participants, because the first measurement was conducted near the sixth birthday of each participant, whereas the second measurement took place concurrently for all participants. Third, for most children their teacher changed from kindergarten to Grade 1, and again from Grade 2 to Grade 3, which may have partly influenced the changes in children's reported task avoidance. Multiple informants, such as observations and self-reports, should be used in future to ensure that changes in task-avoidant behavior do not merely reflect changes of the observers. Fourth, we used latent growth curve analysis that describes the development of children's task-avoidant behavior at a group level. In future research, a person-oriented approach might complement our findings and bring more insight into what kind of developmental trajectories could be identified in children's task-avoidant behavior, and what are the factors that predict such trajectories (see Mägi et al., 2013). It should also be noted that the amount of explained variance in children's task avoidance was rather small. This may

be partially due to the above-mentioned limitations with the measurements, but it also suggests that task-avoidant behavior is largely influenced by other experiences during the children's development, such as their relations with parents and teachers.

In conclusion, the findings of this study suggest that the development of children's teacher-rated task-avoidant behavior in kindergarten and during the early grades of elementary school are partly explained by their temperamental characteristics, prereading skills, and age at school entry. A high level of task avoidance was predicted by low prereading skills, low effortful control, and low negative affectivity, whereas decreases in task avoidance were partly explained by high negative affectivity and low surgency/extraversion. Finally, task avoidance of the oldest children in the classrooms decreased more from kindergarten to the beginning of second grade, whereas younger children's task avoidance decreased from Grade 2 Fall onward.

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Table 1.

Intercorrelations, Means, and Standard Deviations of the Study Variables

Variables	Task avoidance				Temperament			Pre-reading skills			Background			
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Task avoidance														
1. Kindergarten														
2. Grade 2 fall	.46***													
3. Grade 2 spring	.59***	.75***												
4. Grade 3 fall	.58***	.68***	.77***											
5. Grade 3 spring	.52***	.61***	.70***	.81***										
Temperament														
6. S/E	.08	.19*	.15	.16	.21**									
7. NA	-.14	-.04	-.11	-.24**	-.18*	-.10								
8. EC	-.18*	-.21**	-.09	-.12	-.26**	-.37***	-.05							
Pre-reading skills														
9. LK	-.13	-.21**	-.19*	-.17*	-.22**	-.13	-.01	.09						
10. PA	-.18*	-.16*	-.20*	-.09	-.14	-.16*	.05	.13	.60***					
11. RAN	-.20**	-.21**	-.28***	-.26**	-.28***	-.07	-.12	.09	.37***	.23**				
Background														
12. Age	-.10	-.24**	-.20*	-.10	-.09	.08	-.06	.05	.03	-.03	.09			
13. Risk	-.08	.00	-.11	-.04	-.02	.10	-.11	-.10	.20**	.27***	.24**	.10		
14. Education	-.14	-.01	-.14	-.15	-.13	-.07	-.07	.13	.22**	.16*	-.01	.04	.11	
Descriptives														
<i>Min</i>	1.00	1.00	1.00	1.00	1.00	3.03	2.18	3.15	-1.55	-3.71	-7.81	79	1	1.00
<i>Max</i>	4.80	5.00	4.60	5.00	4.80	6.44	5.51	6.31	1.50	2.12	2.05	99	2	7.00

<i>M</i>	2.23	2.20	2.18	2.15	2.02	5.14	3.92	5.05	-0.22	-0.26	-0.37	85.66	4.02
<i>SD</i>	0.97	1.03	1.02	0.96	0.96	0.75	0.65	0.56	1.03	0.91	1.44	3.46	1.09

Note. *N* = 198. S/E = surgency/extraversion; NA = negative affectivity; EC = effortful control; LK = letter knowledge; PA = phonological awareness; RAN = rapid automatized naming; Age = child's age (in months) at school entry; Risk = family risk vs. control group status; Education = parental education.

p* < .05. *p* < .01. ****p* < .001.

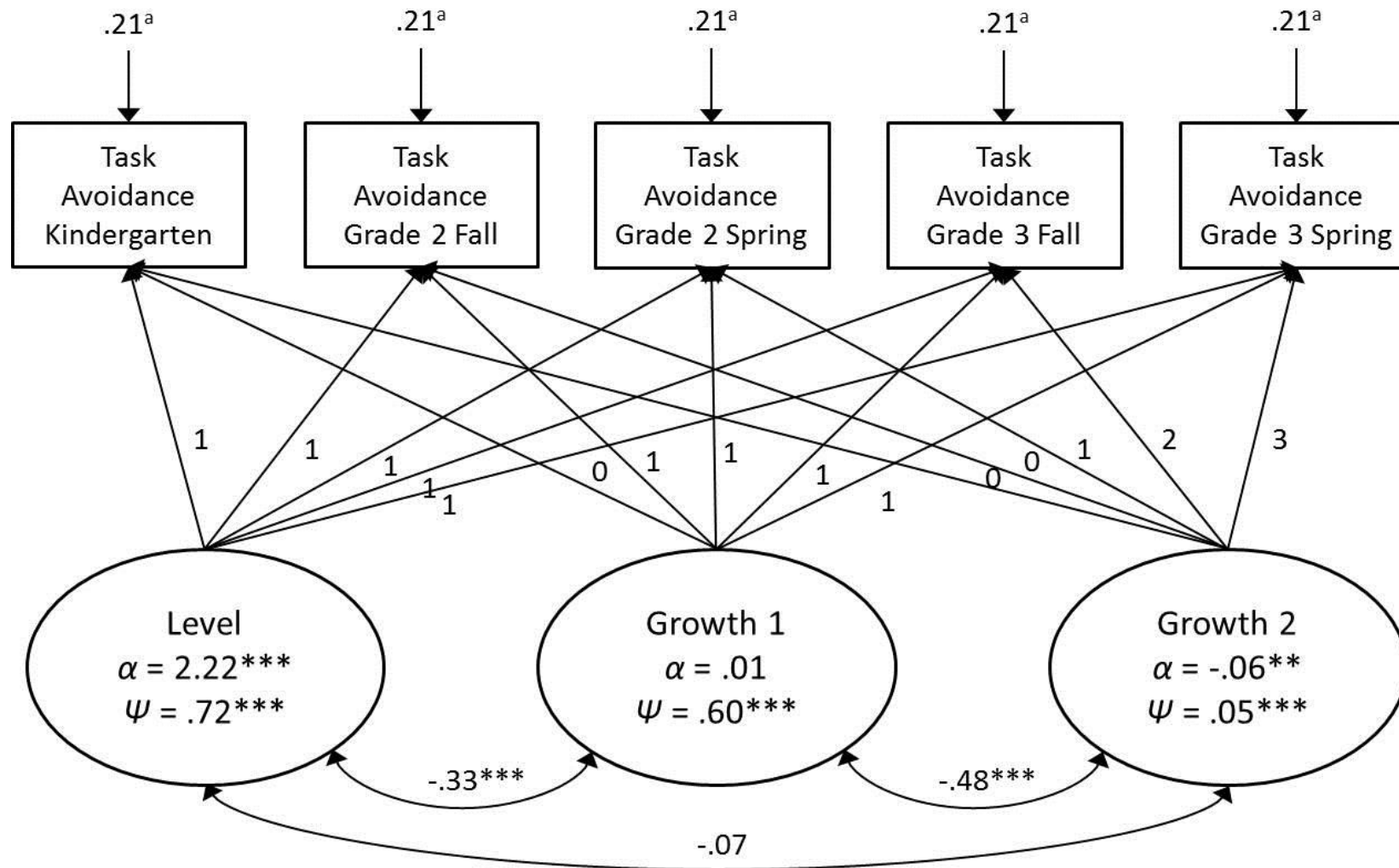


Figure 1. A piecewise growth curve model for teacher-rated task avoidance. ^a = constrained equal. $^{**}p < .01$. $^{***}p < .001$.

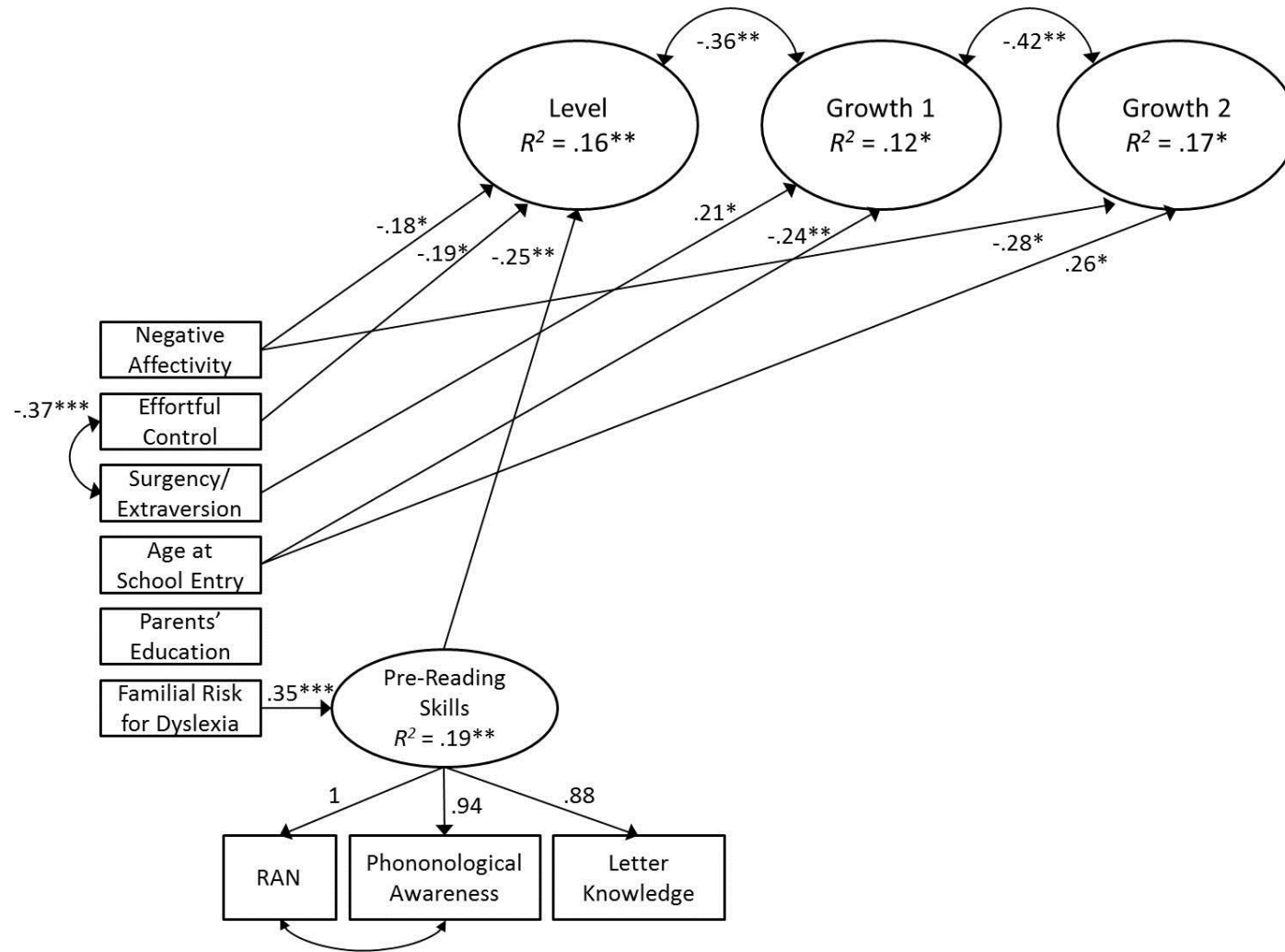


Figure 2. Predictors for the development of task avoidance. Only statistically significant paths are presented (standardized estimates). $*p < .05$.

$**p < .01$. $***p < .001$.

Research highlights

The development of children's task avoidance was examined from kindergarten to Grade 3.

On average, task avoidance first remained stable and then decreased in Grades 2 and 3.

Parent-rated temperament at age 3 predicted the level and changes of task avoidance.

High prereading skills at age 5 predicted a low level of task avoidance.

Younger children's task avoidance decreased later than that of children born earlier.