



# Teacher ability evaluation and changes in elementary student profiles of motivation and performance in mathematics<sup>☆</sup>



Rebecca Lazarides<sup>a,\*</sup>, Jaana Viljaranta<sup>b</sup>, Kaisa Aunola<sup>c</sup>, Jari-Erik Nurmi<sup>c</sup>

<sup>a</sup> University of Potsdam, Department of Education, Karl-Liebknecht Straße 24-25, 14476 Potsdam OT Golm, Germany

<sup>b</sup> University of Eastern Finland, School of Educational Sciences and Psychology, PO Box 111, 80101 Joensuu, Finland

<sup>c</sup> University of Jyväskylä, Department of Psychology, P.O. Box 35, FIN-40014, Finland

## ARTICLE INFO

### Keywords:

Interest value  
Self-concept  
Performance  
Latent profile analysis  
Teachers' ability evaluation

## ABSTRACT

The aim of this person-centered study is to identify the profiles of interest value, self-concept, and performance in the domain of mathematics among elementary school students and to examine the stability and changes in these profiles from grade 1 to grade 2. Teacher-reported evaluations of students' mathematical ability and gender were examined as predictors of changes in the student profiles. The sample consisted of 237 students (46.8% girls). The latent profile analysis identified four profiles: 1) low levels of interest value, medium levels of self-concept and performance; 2) low levels of interest value, self-concept and performance; 3) high levels of interest value, self-concept and performance; 4) low levels of self-concept and performance, and medium interest value. Boys and students whose teachers evaluated their abilities as high compared to others were less likely to change from profiles with high levels of interest value or self-concept to profiles with low levels of these factors.

## 1. Introduction

Person-centered research has widely shown that different configurations of student motivation and performance can be identified already in elementary school (Corpus & Wormington, 2014; Schwinger, Steinmayr, & Spinath, 2016). These profiles of cognitive and motivational variables emerge in childhood and provide an important basis for students' academic development (Archambault, Eccles, & Vida, 2010; Jurik, Gröschner, & Seidel, 2014). Although there are some studies focusing on the profiles of children in reading (Viljaranta et al., 2017; Farrington-Flint, 2015) and science (Patrick, Mantzicopoulos, Samarapungavan, & French, 2008), research on student profiles of motivation and performance in mathematics is largely missing. It is, however, highly relevant to examine motivation and performance profiles in mathematics because, particularly in the domain of mathematics, students' motivation declines consistently beginning in elementary school (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). Research is also largely missing that examines whether such developmental trends are reflected in children's subject-specific profiles. It is possible, for example, that despite a declining trend in the mean level of mathematics motivation, not all children face declines in their mathematics motivation; instead, the motivation of some students in

mathematics might even increase.

Starting from these open research questions, we examined elementary student profiles of motivational and cognitive variables within the domain of mathematics. Focusing on one specific subject allows for a more detailed analysis of the configurations of motivational and cognitive variables (e.g. 'high interest, low self-concept in math' instead of 'high math, low reading motivation'). Consequently, it is possible to explore details of mathematics motivational development that would remain unexplored when including several subjects. Knowledge about individual profiles and their development in mathematics allows teachers to plan their instruction in an individualized manner in order to mitigate the motivational decline. Taken together, the novelty of our study is that it is, to our knowledge, the first study that examines student profiles of motivation and performance in mathematics and the stability and changes of these profiles in early elementary school. The domain-specific focus of our study thereby allows to compare the results to other person-oriented studies focusing elementary school children in reading (Viljaranta et al., 2017) and kindergarteners in science (Patrick et al., 2008). Another important contribution of this study to current work is that we investigate whether teacher-reported ability evaluations and student gender are related to changes in elementary school students' profile membership in mathematics. This approach

<sup>☆</sup> Analyses were based on survey data of the Jyväskylä Entrance into Primary School (JEPS) study (Nurmi & Aunola, 1999a–2009) and funded by the Academy of Finland under grant numbers 63099, 778230 and by personal funding from the Academy of Finland to Jaana Viljaranta (grant numbers 265817 and 316852).

\* Corresponding author.

E-mail address: [rebecca.lazarides@uni-potsdam.de](mailto:rebecca.lazarides@uni-potsdam.de) (R. Lazarides).

allows us to better understand the role of socializers and individual characteristics for the emergence of profiles of motivation and performance in mathematics.

### 1.1. Profiles of motivation and performance in elementary school

The expectancy-value theory of Eccles et al. (1983) and posits that the subjective task value and the academic self-concept of individuals directly predict their achievement-related behaviors and performance. Academic self-concept broadly refers to an individual's self-perception of their general ability in a domain (Marsh & Martin, 2011). Subjective task value is the quality of a task that contributes to the increasing likelihood that an individual will select it (Eccles, 2005). Especially the interest value of a task, that is, the enjoyment one gains or expects to gain when doing the task, is highly correlated with academic self-concept (Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005). Academic self-concept in particular is closely related to achievement (Spinath, Spinath, Harlaar, & Plomin, 2006). The strong relationships between interest value, self-concept and achievement are reflected in person-centered research identifying student profiles with high, medium and low levels of interest, self-concept and performance (Patrick et al., 2008; Seidel, 2006). The specific value of person-centered research, however, is to identify profiles with inconsistent levels of motivational and cognitive variables. Seidel (2006), for example, identified a profile of 'uninterested' learners with high cognitive ability and high self-concept of ability but low interest in secondary school physics classrooms. Knowledge of such student profiles informs teachers on how to plan instruction that addresses the needs of different types of learners. Students with low interest find mathematics activities more interesting when tasks attract their attention (Durik & Harackiewicz, 2007). Learners with a low self-concept of their abilities in mathematics are enhanced by tasks emphasizing their utility for students' lives (Hulleman, 2007). Research based on Eccles et al.'s (1983) and Wigfield and Eccles's (2000) expectancy-value theory shows that elementary school students receive different feedback and support from their socializers, which may contribute to the emergence of different profiles in elementary school. Elementary school children distinguish between competence beliefs and task values (see Wigfield, 1994) and have differentiated activity-related competence beliefs and subjective task values (Eccles, Wigfield, Harold, & Blumenfeld, 1993). In this study, therefore, we expected to identify different profiles of self-concept of ability, performance and interest among elementary school students in mathematics. Referring to theoretical assumptions about the strong relationship between self-concept of ability and interest (Eccles & Wigfield, 2002), we expected to find profiles in which the motivational and cognitive variables were on the same level in relation to one another (i.e., high, medium, low levels of self-concept, performance and interest value). Because competence beliefs and task values are not strongly correlated in elementary school (Wigfield et al., 1997), we also expected to find motivational profiles with pronounced differences in interest value and self-concept. Specifically, we expected to find a group of students with high levels of interest and low levels of self-concept and performance as well as a group of students with low levels of interest and low levels of self-concept and performance. These groups were expected to exist due to different socialization experiences. Some students may have parents who are involved in school, but do not feel competent in mathematics – which is associated with low levels of mathematics self-concept, but not with low interest (Häfner et al., 2017), while other children may have parents who are math-motivated, but they might perceive a lack of relevance of the mathematics tasks in class, which has been shown to be associated with a 'uninterested' pattern of motivational and cognitive characteristics (Seidel, 2006).

### 1.2. Change in elementary student profiles

Variable-centered longitudinal research has shown that the average

level of motivation decreases over the elementary school years (Eccles et al., 1993; Jacobs et al., 2002; Spinath & Spinath, 2005b). The knowledge gained through such variable-centered studies is limited to information about the average motivational development of students and cannot provide information about inconsistencies in students' motivation – about the different patterns of motivation that exist among a student population, for example – and about the changes in such patterns. Variable-centered longitudinal research shows that the average level of students' perceived task value and competence beliefs decreases throughout the school years (Gottfried, 1990). However, this average decline of motivation in the student population does not cover the motivational changes of specific subgroups of students. For example, person-centered longitudinal research suggests that while for many students the motivation in school decreases during adolescence, a small percentage of students increased their motivation across the academic year (Bråten & Olaussen, 2005; Hayenga & Corpus, 2010). Consequently, person-centered research extends the knowledge provided by variable-centered motivational research by identifying meaningful subtypes that exist in the student population and by enhancing our understanding of the stability and changes of such subtypes across time. Knowledge about different patterns in the development of students' motivation is important for educational research because it shows that motivation does not develop equally for all students and that we therefore need instructional approaches that match the needs of different types of learners in class when aiming to increase or maintain students' motivation throughout the school years.

On a theoretical level, the different changes in student profiles can be explained by different socialization experiences as well as by individual psychological processes. Depending on their motivational and cognitive characteristics, students are confronted with different ability expectations from their teachers (Jussim & Harber, 2005). Furthermore, learners respond differently to instruction depending on their level of individual interest and on their self-concept of their ability (Durik, Hulleman, & Harackiewicz, 2015). Person-centered research has shown an increasing intraindividual stability of student motivational profiles with consistent levels of motivational and cognitive variables (Hayenga & Corpus, 2010) and a low stability of profiles with inconsistent levels of cognitive and motivational variables (Alexander & Murphy, 1998; Viljaranta et al., 2017). The low stability of profiles with inconsistent profiles may result from differential teacher behaviors. Teacher expectancy research has impressively shown differential treatment by teachers of high- and low-achieving students (Babad, 2009; Brophy & Good, 1970). It is well known, for example, that teachers provide more learning support to low-achievers, but that they provide high-achievers with more positive emotional support. One may assume that such non-verbal teaching behaviors lead to an increase in interest in learning for those students who have low interest but high performance and competence beliefs. In the same vein, one may assume that students with high interest in mathematics but low self-concept and performance may be confronted with their teachers' low ability expectations of their ability and are therefore likely to experience a decline in interest.

Another theoretical explanation of the low stability of profiles with inconsistent patterns of motivational and cognitive variables is the cognitive dissonance that students with those profiles experience. Particularly those students with high levels of interest but low self-concept of ability and performance may become frustrated during learning because they are aware of the dissonance between their cognitions and their actions (Festinger, 1957; Harmon-Jones & Harmon-Jones, 2012). For example, they may enjoy working on mathematics tasks, and at the same time they may have difficulties in solving these tasks. Thus, these students might be likely to change to profiles characterized by overall low levels of motivational and cognitive variables. Accordingly, variable-centered research has suggested that the combination of high task value and low self-concept is detrimental for students' academic development in mathematics (Trautwein et al., 2012).

Download English Version:

<https://daneshyari.com/en/article/11002167>

Download Persian Version:

<https://daneshyari.com/article/11002167>

[Daneshyari.com](https://daneshyari.com)