Profiles of school motivation and emotional well-being among adolescents: Associations with math and reading performance

Pauliina Parhiala\textsuperscript{a,}, Minna Torppa\textsuperscript{b,}, Kati Vasalampi\textsuperscript{a,}, Kenneth Eklund\textsuperscript{a,}, Anna-Maija Poikkeus\textsuperscript{b,}, Tuija Aro\textsuperscript{a}\textsuperscript{*}

\textsuperscript{a}Faculty of Education and Psychology, Department of Teacher Education, University of Jyväskylä, PB 35, 40014, Finland
\textsuperscript{b}Faculty of Education and Psychology, Department of Teacher Education, University of Jyväskylä, PB 35, 40014, Finland

\begin{abstract}
This study examines profiles of school motivation and emotional well-being and their links to academic skills (reading and math) among adolescents (N = 1629) at the end of comprehensive school (age 15–16). Using a person-centered approach (latent profile analysis), five distinct profile groups were identified. Three of the identified groups had a flat profile in motivation and well-being but at different levels. The first group manifested high motivation and well-being (n = 178, 11%); the second group was average in both (n = 1107, 68%); and the third had low motivation and well-being (n = 121, 7%). Two groups had mixed profiles; one group manifested only low motivation (n = 140, 9%) and the other only low well-being (n = 83, 5%). A comparison of the profile groups in terms of academic skills indicated that low school motivation was linked to poor math and reading performance, whereas low emotional well-being was linked to poor math and reading performance only when accompanied by low school motivation. The association between poor math skills and low motivation suggests that, when planning support for students, those with math problems or comorbid math and reading problems are especially at risk for low motivation and need support in both academic skills and motivation.
\end{abstract}

1. Introduction

Many adolescents struggle with the key academic skills of math or reading (Dirks, Spyer, van Lieshoult, & de Sonneville, 2008). Developmental difficulties in cognitive functions typically underlie poor performance in academic learning. However, low school motivation, such as low task-focused behavior (Klauda & Guthrie, 2015) and low emotional well-being, such as low self-esteem (Nathan & Rucklidge, 2011), are also associated with poor academic performance. Previous studies on the links between difficulties with math and reading and school motivation and emotional well-being are limited. Furthermore, those studies typically focus on only a few aspects of those dimensions and on whole-sample averages and correlations, instead of using person-oriented approaches that allow for analysis of heterogeneous profiles in the sample. Profiling studies are pertinent because the links between math and reading difficulties, school motivation, and emotional well-being are likely to vary among individuals (Korhonen, Linnanmäki, & Aunio, 2014; Roeser, Eccles, & Sameroff, 1998). Profiling of several aspects simultaneously provides a more comprehensive understanding of the mechanisms for the accumulation of risks, identifies adolescents at the highest risk, and thus aids in building support systems. The present study includes a broad array of measures, ranging from academic skills (math, reading fluency, and reading comprehension), to school motivation (math motivation, literacy motivation, task-focused behavior, and school enjoyment) and emotional well-being (school burnout, self-esteem, and internalizing and externalizing behavior problems). In addition, it examines a large sample of adolescents at the end of comprehensive school, just before they transition to post-comprehensive secondary education.

1.1. Students’ school motivation and academic performance

Theories of motivation and related empirical research indicate that motivation plays an important role in students’ learning and academic achievement in school (Eccles & Wigfield, 2002; Pintrich, 2003; Wigfield & Cambria, 2010). One approach to studying students’ motivation in a particular learning situation focuses on strategies that students employ; that is, how one interprets the situation based on one’s past experiences (Norem & Cantor, 1986; Nurmi, 1993; Wigfield et al., 2015), and what kind of response style one chooses, such as whether one approaches or avoids the learning task (Dweck, Chiu, & Hong, 1995; Onatsu-Arvilommi & Nurmi, 2000). The evidence indicates that...
task-focused behavior is related to better learning outcomes than task-avoidance (e.g., deep rather than surface processing; Elliot, McGregor, & Gable, 1999). According to the expectancy-value theory (Eccles, 2005; Eccles-Parsons et al., 1983; Wigfield & Cambria, 2010; Wigfield & Eccles, 1992, 2000), an individual's performance, persistence, and task choice in learning situations (i.e., achievement motivation) is influenced by his or her expectations and values. The theory proposes that a student is likely to engage in academic activities if the outcome is something he or she values as interesting (intrinsic enjoyment value), useful (utility value), and important (attainment value), and the effort the activity requires is suitable (relative cost). Motivation has also been associated with emotions (enjoyment) toward studying and school, where one's emotions impact the student's achievement at school via control and value cognitions (Hagenaer & Hascher, 2014; Pekrun, 1992, 2006, 2009). The link between motivation and achievement is assumed to form a reciprocal feedback system in which motivation increases enjoyment and academic achievement in the task domain (Goetz, Frenzel, Hall, & Pekrun, 2008), and high achievement in school, in turn, increases experiences of high task value and school enjoyment via the self-concept of ability (Hagenaer & Hascher, 2014).

Although poor academic skills and math and reading difficulties are acknowledged as constituting risks toward the development of school motivation (Jogi, Kikas, Lerkkanen, & Mägi, 2015; Klauda & Guthrie, 2015; Onatsu-Arvilommi & Nurmi, 2000), studies on school motivation among children and youth with low math or reading performance remain scarce. High motivation for school subjects and task-focused behavior have been suggested to predict achievement more strongly among competent reading children than among struggling readers, even when effort and persistence in a task are controlled for (Klauda & Guthrie, 2015). Poor academic skills have also been shown to affect behavioral strategies in learning situations by decreasing task-focused behavior during the first school years (Onatsu-Arvilommi & Nurmi, 2000). An important limitation of most previous studies is their narrow focus on only one motivational aspect at a time. In the present study, a more comprehensive approach is adopted by examining simultaneously students' behavioral strategies in learning situations (task-focused behavior), the value students attach to different school subjects (task values in math and in literacy), and students' emotions regarding school (school enjoyment).

1.2. Students' emotional well-being and academic performance

In addition to motivation, students' emotional well-being at school is important for their learning and academic achievement (Djambazova-Popordanoska, 2016). Instead of the overall meta-construct of well-being that covers diverse aspects of healthy and successful living (e.g., Renshaw, Long, & Cook, 2015), we focus on students' emotional well-being, conceptualized as an affective subjective experience and encompassing areas such as mood and self-esteem (Schutte, Malouff, Simunek, McKenley, & Hollander, 2002). In the present study, adolescents' emotional well-being at school is conceptualized and assessed using the following four indicators: students self-reported school burnout, self-esteem, and externalizing and internalizing behavior problems.

School burnout is operationalized similarly to the construct of work-related burnout, but it is situated in the context of an individual’s personal feelings about schoolwork. School burnout is seen to comprise the following three components (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009): exhaustion (i.e., strain and fatigue because of schoolwork); cynical attitude toward school (i.e., detached attitude concerning studying); and a sense of inadequacy (i.e., diminished feelings of competence in school and schoolwork). School burnout can also be generalized outside the school context through depression (Salmela-Aro et al., 2009; Salmela-Aro & Upadaya, 2014). Exhaustion and a sense of inadequacy can be manifested by a low positive mood and perception of oneself, whereas a cynical attitude is directed toward school (Bask & Salmela-Aro, 2013). School burnout has been shown to be associated with academic skills (Salmela-Aro, 2009).

Self-esteem refers to an individual's global sense of well-being (Zeleke, 2004) and reflects how much a person likes, accepts, and respects him- or herself overall as a person (Harter, 1990; Rosenberg, 1965). Self-esteem is central to maintaining both overall well-being and life satisfaction (Diener & Diener, 1995; Neto, 1993), and emotional well-being (Schutte et al., 2002). Self-esteem supports academic achievement by fostering belief in oneself as a learner (see Terras, Thompson, & Minnis, 2009), and low self-esteem has been correlated with low academic skills (Nathan & Rucklidge, 2011).

Emotional well-being can also be conceptualized as the absence of externalizing and internalizing behavior problems. The former refers to conduct problems and aggressive and impulsive behavior, and the latter refers to withdrawal, depression, anxiety, and somatic problems (Achenbach & Edelbrock, 1978). According to the literature, both externalizing behavior (Adams, Snowling, Hennessy, & Kind, 1999; Gresham, Lane, MacMillan, & Bocian, 1999; Hinshaw, 1992), and internalizing behavior (Greenham, 1999; Willcutt & Pennington, 2000) are consistenly documented to be correlated with low academic skills. Previous studies have shown that the level of internalizing and externalizing behavior is higher among students with reading or math difficulties in comparison to typical learning peers (e.g., Arnold et al., 2005; Nathan & Rucklidge, 2011; Undheim, Wichstrom, & Sund, 2011). The findings of the complex interrelationships between motivation, well-being, and academic skills provide an impetus for investigating motivation and well-being profiles separately for low math and low reading performance.

1.3. Person-centered studies on the relationships between motivation, well-being, and academic performance

In person-centered approaches, the focus is on individual differences and similarities, or profiles, across critical measures. In these approaches, it is not assumed that the same associations between measures would apply to all individuals (as when using variable-oriented methods). Via identification of similarities across individuals (latent subgroups) in the measures of interest, we can reveal differential associations between measures that would be muddled in approaches relying on across-sample means and correlations.

Only a few studies have applied person-oriented approaches to investigate motivation, well-being, and achievement among adolescents. Roerse et al. (1998) and Roers, Eccles, and Freedman-Doan (1999) studied patterns of adaptation among early adolescents (N = 1041; N = 491) based on school motivation (self-perception of academic competence and academic values) and emotional functioning (depression and anger), and then linked the patterns to academic outcomes. Their analyses identified four subgroups: two groups with either positive or negative school motivation and emotional functioning; and two groups with a mismatch in levels of school motivation and emotional functioning. These findings suggested that some adolescents have low school motivation without emotional distress or academic problems, and another small subgroup may only have problems with emotional functioning. Importantly, the authors found that an association between low school motivation, poor emotional functioning, and low academic achievement was documented only for the multiple risk group and not for all adolescents. The measure of academic achievement used by Roers et al. (1998) was based on parental and self-reports of student academic achievement and grade point average (GPA) and not on tests of specific academic skills, such as reading and math. Furthermore, the authors did not analyze the effects of low academic performance in these subjects in their design.

In a study among high school students, Tuominen-Soini and Salmela-Aro (2014) identified four profiles based on students' schoolwork engagement and burnout: two groups with positive school engagement (one with high levels of burnout) and two groups of less...
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