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Reciprocal effects between self-concept of ability and performance: A longitudinal study of children with learning disabilities in inclusive versus exclusive elementary education☆

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ABSTRACT

Ample empirical research from regular school settings documents reciprocal effects between academic performance and academic self-concept of ability (ASC), supporting what is known as a reciprocal effects model (REM). The present article investigates a REM in the domain of reading performance in a sample of elementary students with special educational needs in learning (SEN-L) who received special educational support in exclusive versus inclusive settings ($N = 446$). In exclusive settings, SEN-L students attend special schools and are completely separated from regular students. By contrast, SEN-L students in inclusive settings attend regular schools and are educated in classes with regular students. In both settings, SEN-L students are not graded and taught based on individual learning goals, which may affect reciprocal effects between ASC and reading performance. In addition, given that special education for SEN-L students relies heavily on individual reference standards to evaluate performance, we tested individual performance growth of SEN-L students as a predictor of ASC. Analyses of a longitudinal dataset across 3rd and 4th grade revealed some cross-lagged effects and an effect of performance growth on ASC in exclusive settings in particular. The discussion focuses on the role of individualized instruction, grades, peer groups, and individual versus social reference standards for reciprocal effects between ASC and performance as well as practical implications.

1. Introduction

In educational psychology, students' academic self-concept (i.e., subjective perceptions) of ability is among the most researched theoretical constructs (cf. Marsh, 2007). Due to the undeniable importance of academic self-concept of ability as a key predictor of academic performance (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2007), a bulk of literature addresses self-concept development in general and the role of academic performance for self-concept development in particular. The present study aims at contributing to this literature by providing empirical analyses of self-concept development in a hitherto neglected group of students, that is, students with special educational needs.

Three models of self-concept development stand out due to their extensive coverage by empirical studies. First, postulating social comparison processes with a generalized other, the big-fish-little-pond

effect predicts a negative effect of peer-group performance—i.e., the school or class average achievement—on his or her self-concept of ability (Marsh, 1987; Marsh & Hau, 2003). Second, the internal/external-frame-of-reference model predicts that domain-specific achievement positively affects within domain self-concept but negatively affects cross-domain self-concepts (Marsh, 1986; Möller, Pohlmann, Köller, & Marsh, 2009). Third, the reciprocal effects model of causal ordering (REM) predicts that performance affects subsequent self-concept and vice versa within domains over time (cf., Marsh & Martin, 2011).

Support for the REM of academic self-concept and performance comes from research on various cultures, age groups and educational systems (Marsh & Martin, 2011; Valentine, DuBois, & Cooper, 2004). Although the REM focuses on intra-individual processes, self-concept theory suggests that performance needs be evaluated against a social, temporal, or criterial standard to become informative (Marsh, 1986,

1987). Hence, contextual factors relevant for comparison processes such as available comparison targets within classrooms may affect intra-individual reciprocal effects between self-concept and performance.

This assumption has led us to investigate the REM within a specific student population whose schooling systematically differs from their peers, and which has rarely been studied: students with special educational needs in learning (SEN-L). Because academic performance of SEN-L students is substantially lower than the performance of their non-SEN-L peers (Fuchs, Fuchs, Mathes, Lipsey, & Roberts, 2001; Kocaj, Kuhl, Kroth, Pant, & Stanat, 2014), special educational support is provided for these students in various forms. In Germany, SEN-L students can attend exclusive special or inclusive regular schools. The exclusive setting means they attend schools in which teachers have specialized skills to support students' special educational needs and the whole student population consists of students with SEN-L. In inclusive settings, by contrast, SEN-L students are members of a regular classroom at a regular school and receive part time special educational support through special education teachers mostly during regular classes or in small group settings; although the exact format differs between federal states or even schools (cf., Werning & Lütje-Klose, 2016). Unlike regular students, SEN-L students in elementary schools participating in this study—in exclusive and inclusive settings alike—do not receive formal grades but individualized reports on their development and are taught according to individual learning goals.

Using the case of Germany, the present study addresses three research questions. Our first question is whether empirical support for a REM may be found among SEN-L students. Second, given the distinction between inclusive and exclusive settings, Germany's school system provides a suitable setting to examine the role of educational setting for processes underlying a REM. Hence, our second question is whether an inclusive versus exclusive setting moderates reciprocal effects between self-concept and performance. Finally, because of their individualized learning goals, SEN-L students may draw on an individual frame-of-reference (i.e., their own performance growth) to evaluate their performances (Lüdtke, Köller, Marsh, & Trautwein, 2005). Therefore, our third question is whether performance growth over time differentially predicts self-concept of SEN-L students. Naturally, the former two questions lead to the idea that educational setting might also moderate the predictive validity of performance growth.

1.1. The reciprocal effects model in regular classrooms

Ample research documents the close relation between academic self-concept of ability (SCA) and academic performance (for elementary education e.g., Guay, Marsh, & Boivin, 2003; Helmke & van Aken, 1995; Weidinger, Spinath, & Steinmayr, 2015; for secondary education e.g., Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005; Marsh & O'Mara, 2008; Retelsdorf, Köller, & Möller, 2014; for overviews see Marsh & Martin, 2011; Valentine et al., 2004). A meta-analysis by Valentine et al. (2004) reveals that REMs find strong support when the respective academic self-concept and academic performance refer to the same skills (i.e., a particular school subject), the performance measure has some relevance for the students (i.e., grades that determine educational progress), and students are informed about their performance (i.e., grades or feedback communicated by teachers).

The self-concept-performance REM is a product of two models initially developed and tested separately. On the one hand, the self-enhancement model posits that positive self-concepts promote students' motivation to engage in effortful behavior and experience themselves as self-efficacious, which, in turn, leads to higher academic performance (Green et al., 2012; Marsh, Byrne, & Yeung, 1999). On the other hand, the skill-development model posits that academic performance informs students' self-concepts (Chapman & Tunmer, 1997; Liem, McInerney, & Yeung, 2015; Poloczek, Karst, Praetorius, & Lipowsky, 2011; Retelsdorf et al., 2014; Skaalvik & Valås, 1999; Weidinger et al., 2015). The self-

enhancement model primarily relies on intrapersonal processes, whereas the skill-development model takes contextual characteristics of students' school experiences into account (Valentine et al., 2004).

When students in elementary school start to take standardized tests as a class, receive grades on the same scale, and have a peer-group with roughly the same level of ability to use as a social frame of reference (e.g., same-aged peers with a similar educational biography) they can easily compare their own performance to the performance of other students. Such social comparisons are an important source of information to develop their self-concepts (Marsh, 2007) and, therefore, domain-specific performance and self-concepts of ability become more closely related starting in primary school (cf., Dweck, 2002; Wigfield et al., 2007; see Rosenholtz & Simpson, 1984, for a detailed account of how classroom organization affects the formation of ability conceptions).

Beyond social comparisons, students' self-concepts may be based on temporal or intra-individual comparison processes (i.e., comparing one's current performance to one's previous performance), criterion comparison processes (i.e., comparing one's performance to a given standard of excellence), or by drawing inferences from feedback given by significant others (Möller & Trautwein, 2015). Supporting the relevance of such alternative frames of reference, parents' evaluations affect elementary students' SCAs beyond grades (Entwisle, Alexander, Pallas, & Cadigan, 1987; Gniewosz, 2010). Regarding intra-individual reference standards, Lüdtke et al.'s (2005) analyses of a large cross-sectional dataset show that an individualized teacher frame-of-reference—that is, teachers evaluating students' performance based on the student's performance growth rather than social comparisons—promotes a close association of a student's self-concept and performance within a specific domain.

Overall, various processes underlying the skill-development model and the self-enhancement model are spelled out in the literature. At face value these two models specify that there are reciprocal causal effects between self-concept and performance over time. Factors affecting the skill-development model in particular draw on contextual features of students' schooling. Given distinctive features of SEN-L students' school and educational contexts in Germany, our next step is to review and evaluate to what extent a REM may be conferrable to inclusive and exclusive settings.

1.2. Characteristics of SEN-L students and provision of special education support

Students with SEN-L represent the majority of students with special educational needs in Germany (Bildungsberichterstattung, Autorengruppe, 2014). However, SEN-L is not uniformly defined in Germany (Moser, 2012; see Fuchs et al., 2001, for a similar discussion in the US) and hardly comparable to the US-American definition (Löser & Werning, 2011). International consensus is that the term SEN-L typically refers to students whose academic performance—particularly in basic skills such as reading, writing and arithmetic—is one to two years behind those of their same-aged peers (Löser & Werning, 2011; Werning & Lütje-Klose, 2016). Although some authors consider SEN-L to be a mild intellectual disability, a below average cognitive ability is no constitutive element of diagnosing SEN-L. Other individual and contextual risk factors leading to low academic performance are taken into account when diagnosing SEN-L (Werning & Lütje-Klose, 2016). Isolated specific learning difficulties such as dyslexia or dyscalculia are not recognized as SEN-L per se, but often accompany it.

The German school system provides two prototypical forms of special educational support. Exclusive education via special schools for SEN-L students only is available from first grade until the end of compulsory education. The basic idea of this type of school is that "students with similar special needs are taught in small groups by special education teachers" (Löser & Werning, 2011, p. 91). Special education teachers are trained to use individual frame-of-reference to support