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Motivational characteristics of students in gifted classes: The pivotal role of need for cognition

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ABSTRACT

We contrasted different motivational variables related to learning and achievement in order to identify which types of academic motivation predict students' attendance of a special class for the gifted (full-time ability grouping). We drew on a sample of 5th grade students in special classes for gifted and compared them to students in regular classes ($N = 921$; 31% in gifted classes) while controlling for confounding factors — that is, students' cognitive ability, academic achievement, sex, and parental level of education. Logistic regression analysis revealed that need for cognition (NFC) best predicted attendance of special classes for the gifted as compared to academic self-concepts, academic interests, or mastery and performance goals. Thus, it might be useful to explore NFC as an indicator for students' need for advancement options. In addition, our findings might stimulate the discussion on whether students high in NFC would benefit from being included in gifted programs.

1. Introduction

Experts agree on the need for advancement options for gifted children at school (e.g., Rogers, 2007). However, the definition of giftedness remains a highly controversial issue (Dai, Swanson, & Cheng, 2011), which makes it difficult for schools to identify the gifted (Makel, Putallaz, & Wai, 2012). For intellectual giftedness, it is widely agreed that high cognitive ability is a central characteristic. In addition, various noncognitive factors are discussed as further indicators. According to multidimensional conceptions of giftedness (e.g., Gagné, 2004), the potential for extraordinary achievement (as one prominent understanding of giftedness) relies not only on high cognitive ability but also on noncognitive personality characteristics and environmental conditions. Intrapersonal characteristics highlighted in this context are, for example, self-regulatory strategies, control expectations, effort or motivational characteristics.

The literature further highlights gifted students' need for cognitive challenge and their thirst for knowledge (e.g., Preckel, Götz, & Frenzel, 2010; Winner, 1996). This need could also be termed need for cognition (NFC), defined by Cacioppo and Petty (1982) as a tendency to engage in and enjoy effortful cognitive endeavors. People with high NFC intrinsically devote their cognitive resources to thinking and they actively approach cognitively challenging situations (Fleischhauer, Enge, Brocke, Ullrich, & Strobel, 2010). NFC not only relates to what people are intellectually able to do but also corresponds to how they typically tend to invest their cognitive resources (von Stumm & Ackerman, 2013). Despite similarities in the description of NFC and gifted students' cognitive needs, to our knowledge NFC has not yet been investigated as a motivational characteristic of the gifted.

In order to answer the question about who needs special advancement in school, it might be useful to explore who seeks special advancement. When parents of gifted children are asked about the reasons why their child attends a gifted class, they frequently highlight that gifted classes offer a better fit for their child's cognitive as well as motivational needs (Schneider, Stumpf, Preckel, & Ziegler, 2012). Gifted students are more likely to be underchallenged in regular classes (e.g., Emerick, 1992; Preckel et al., 2010) and accelerated and enriched curricula help to preserve interest in school and motivation to learn and prevent frustration, boredom, and subsequent demotivation (Baker, Bridger, & Evans, 1998; Feldhusen & Moon, 1992). In addition, these cognitively challenging programs might attract in particular students who are motivated to actively seek such challenge — like students with high NFC.

In our study, we explored different motivational characteristics of students in regular classes and in gifted classes. We took into account motivational constructs which have already been established in

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giftedness research (i.e., academic self-concept, goal orientations, and interests). Additionally, we investigated NFC. By doing so, we were able to explore which motivational variables explain the attendance of gifted classes and we were able to contribute to our knowledge on the role of NFC in gifted education.

2. Theory and current research

2.1. Motivational variables related to learning and achievement

Academic self-concept, goal orientations, and interest are core motivational constructs in educational research and they have also been theoretically or empirically linked to giftedness. Also, the impact of NFC on cognitive development and academic achievement is increasingly recognized (Richardson, Abraham, & Bond, 2012; von Stumm & Ackerman, 2013). However, NFC has not yet been linked to giftedness.

2.1.1. Academic self-concept

The academic self-concept refers to a person's self-evaluation regarding a specific academic domain or ability (Marsh & Shavelson, 1985). Academic self-concept has beneficial effects on a wide range of educational variables and outcomes like coursework selection (Marsh, 1991), career aspirations (Nagengast & Marsh, 2012), academic emotions (Goetz, Frenzel, Hall, & Pekrun, 2008), and self-efficacy (Pajares, 1996). It is positively related to achievement (Marsh & O'Mara, 2008; Valentine & DuBois, 2005). Recent studies highlight the reciprocity of the effects of academic self-concept and achievement (e.g., Niepel, Brunner, & Preckel, 2014). Accordingly, with the exception of underachievers, gifted students are more likely to develop positive academic self-concepts (Hoge & Renzulli, 1993; Rost, 2009). There is no evidence suggesting differences in structure or development of academic self-concepts of the gifted as compared to students of average ability (McCoach & Siegle, 2003; Plucker & Stocking, 2001). However, academic self-concept is affected by the average ability of the reference group or class of a student (big-fish little pond-effect; Marsh et al., 2008). Of note, for gifted classes both negative contrast effects of the high-ability reference group on academic self-concept and counterbalancing positive assimilation effects exist (Preckel & Brüll, 2010).

2.1.2. Academic interest

Individual (academic) interests are relatively stable personal predispositions and positive affective orientations towards certain (academic) domains (Eccles & Wigfield, 2002). Academic interests relate to course selection (e.g., Köller, Schnabel, & Baumert, 2000), can improve the quality of learning, and promote intrinsic motivation towards a certain subject. They direct students' attention and enhance the quality of learning by the use of adaptive learning strategies (Hidi, Renninger, & Krapp, 2004; Krapp, 1999). Köller et al. (2000) highlighted reciprocal effects of academic interest and performance. In general, gifted students report higher academic interest than non-gifted students (e.g., Roznowski, Hong, & Reith, 2000), especially in mathematics (Pruisken & Rost, 2005; Vlahovic-Stetic, Vidovic, & Arambasic, 1999).

2.1.3. Goal orientations

Goal orientations describe cognitive representations of individuals' goals and reasons for pursuing them (Pintrich, 2000). The 2×2 achievement goal framework by Elliot and McGregor (2001) distinguishes between mastery approach, mastery avoidance, performance approach, and performance avoidance goals. Individual preferences of goal orientations are well-established determinants of academic performance. Current research suggests positive effects of mastery approach goals (Elliot & McGregor, 2001; van Yperen, 2003) and performance approach goals (e.g., Barron & Harackiewicz, 2001) on achievement. Mastery approach goals positively affect career aspirations as mastery goal approach oriented students explore, develop, and realign their career choices based on preferences and interests (Creed, Tilbury, Buys, & Crawford, 2011). Mastery avoidance as well as performance avoidance goals are mostly related to negative outcomes, such as fear of failure or negative self-determination (Creed et al., 2011). In general, goal orientations are independent of intelligence level (Bipp, Steinmayr, & Spinath, 2008; Payne, Youngcourt, & Beaubien, 2007). Studies regarding differences in goal orientations of gifted and non-gifted students are rare (Dai, Moon, & Feldhusen, 1998). While some studies do not find systematic differences (e.g., Ziegler, Heller, & Broome, 1996), a study by Stumpf and Schneider (2009) suggests that students in gifted classes show lower performance goal orientations than students of similar intelligence in regular classes.

2.1.4. Need for cognition (NFC)

Individuals high in NFC are more likely to engage in and enjoy thinking, whereas persons low in NFC rather lack this tendency. NFC has been conceptualized as a general and relatively stable intrinsic motivational trait (Cacioppo & Petty, 1982). Cacioppo, Petty, Feinstein, and Jarvis (1996) literature review illustrates the extensive amount of empirical evidence suggesting that NFC is positively related to effortful information processing. NFC contributes not only to the acquisition of knowledge (Tidwell, Sadowski, & Pate, 2000) but also to the acquisition of complex skills (Day, Espejo, Kowollik, Boatman, & McEntire, 2007). NFC is positively related to performance in class (Bertrams & Dickhäuser, 2009; Elias & Loomis, 2002) and negatively related to underachievement (Preckel, Holling, & Vock, 2006). A current meta-analysis supports the positive relationship of NFC and university students' grade point average (Richardson et al., 2012). Several studies have linked higher NFC to higher intelligence (e.g., Cacioppo et al., 1996). More recent studies show that NFC is rather associated with fluid than with crystallized aspects of intelligence (Fleischhauer et al., 2010; Hill et al., 2013; von Stumm & Ackerman, 2013). However, correlations are usually small. NFC has not yet been studied in connection with giftedness even though the tendency to engage in and enjoy effortful cognitive endeavors (Cacioppo & Petty, 1982) strikes one as a very likely motivational characteristic of gifted (Lovecky, 1992; Preckel et al., 2010; Winner, 1996).

2.2. The present study

We examined which motivational variable(s) explain(s) the attendance of special advancement options for the gifted at school. By doing so, we wanted to contribute to our knowledge about the role of NFC in gifted education. To provide a context for the study, we will briefly describe the gifted classes in Germany and the corresponding selection process. Some schools of the top track of the German secondary school system (Gymnasium) offer gifted classes in addition to regular classes from grade five on. In these classes the standard curriculum is presented at a faster pace (acceleration) and more in depth (enrichment) than in regular classes. Admission to gifted classes is usually based on multiple criteria (e.g., cognitive ability, motivational variables, prior achievement). The schools in our study employ similar multistage selection procedures for gifted classes: they require completion of an application form with general information on family and child (e.g., school career), previous school certificates, and the results of an intelligence test (usually, a minimum IQ of 120 is required). The selection process is completed by teacher observations of behavior during 1 or 2 days of probationary class. Applicants are selected in a conference of teachers, school psychologists, and school board members based on a partly compensatory strategy (that is, high achievement can partly compensate for an IQ below 120, and vice versa).

Application for gifted classes is voluntary, which very likely leads to a preselected sample. Therefore, the question arises: Why do some highly able students seek special advancement options while other similarly intelligent students chose to attend regular classes? To add to our understanding about which motivational concept(s) might best explain the need for special advancement options we not only investigated core motivational constructs commonly related to learning, i.e.,