



## Calibration of reading self-concept and reading achievement among 15-year-olds: Cultural differences in 34 countries

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### ABSTRACT

Self-concept is linked to student achievement in many domains. In this study, we examined reading self-concept's (RSC) and RSC calibration accuracy's links to reading achievement across different contexts via multi-level analyses of 34 countries' 158,848 fifteen-year-olds' reading tests and questionnaire responses. Students with higher RSC, higher calibration accuracy (of RSC to their reading scores) or underconfidence (relative to their reading scores) had higher reading scores. RSC was more strongly linked to reading scores in countries that were richer, less equal, more collective, less uncertainty averse, less hierarchical, or less rigid regarding gender roles. Calibration accuracy was also more strongly linked to reading achievement in more hierarchical, individualistic, or uncertainty-tolerant countries. In more individualistic countries, underconfident students were more likely to have above average reading achievement. Hence, excessive confidence does not necessarily benefit students, especially in more individualistic countries.

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A growing number of educational psychologists have called for cross-cultural investigations that test the external validity and generalizability of achievement and motivation theories (e.g., Heine, 2004; Klassen, 2004; Marsh & Hau, 2003; Pajares, 2000). Cultural differences in motivation beliefs challenge the foundations of current theories, and provide new ways of looking at the self in different contexts. Current Western-based motivation theories built on an understanding of self and others may differ from those in non-Western cultural settings (Markus & Kitayama, 1991). Researchers have shown that motivation beliefs like self-concept (SC) operate differently across cultures (e.g., Eaton & Dembo, 1997; Oettingen & Zosuls, 2006; Zusho, Pintrich, & Cortina, 2005), but few studies have compared more than three countries in their analyses or explored cross-cultural variations in the calibration – relationship between appraisals of competence and actual achievement – of SC and achievement. Examining cross-cultural differences in self-concept and achievement might yield more contextualized knowledge of people's motivation beliefs and a deeper understanding of human behaviors in academic settings.

In this study, we extend the research on motivation and achievement in four ways by examining the SC and reading achievement of 158,848 15-year olds in 34 countries. First, we examine whether students with higher SC have higher reading scores across countries. Second, we test whether closer calibration of SC with reading achievement is linked to higher reading scores. Third, we test whether overconfident or under-

confident students tend to have higher reading achievement. Fourth, we analyze how cultural values are linked to achievement and whether they moderate the above SC-related links to achievement.

### 1. Self-concept, calibration and cultural values

First, we define SC and describe how SC operates in adolescence. Then, we define calibration, examine calibration of SC with performance, and discuss the implications of mis-calibration. Finally, we explore how culture might be linked to academic performance or might moderate the links between SC-related variables and performance.

#### 1.1. Self-concept

Social cognitive theory contends that human behavior, environment, and personal factors (like cognition, emotion, and motivation) operate reciprocally on one another. Thus, self-beliefs influence behavior, but at the same time, behaviors and environment influence self-beliefs. Self-concept is defined as self-perceptions about relative abilities and competences (Byrne & Shavelson, 1986) that influence the likelihood of success in a wide range of endeavours. Positive self-concept has been shown to increase motivated behaviors and perseverance with challenging tasks (e.g., Stipek, 1998). Self-concept – considered one of the central constructs in the social sciences (Marsh & Hau, 2003) – consists of cognitive self-appraisals that are formed through interaction with the environment. In comparison to other motivation variables like self-efficacy, SC emphasizes comparison with others, evaluation of affect, and past versus future orientation (Bong & Skaalvik, 2003). Historically, SC

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was viewed as a global construct that reflected a composite of domain-specific SCs (e.g., Piers & Harris, 1964), but recent theory and research show that SC is a multidimensional, hierarchical, self-belief that is influenced by social comparison, causal attribution, appraisals from significant others, and mastery experiences (Bong & Skaalvik, 2003; Marsh, 1990). The hierarchical or domain-specific nature of self-concept suggests that academic self-concept varies according to domain, with recent research showing considerable variability in intra-person self-concept, with only weak correlations between verbal and math self-concepts, for example (Marsh, Craven, & Debus, 1998). Specifically, reading SC captures beliefs in one's competence about reading abilities ("I'm good at reading," or "compared to others, I'm good at reading") and is formed very early in a child's school career, often through appraisals or interpretation of reading experience (Chapman, Tunmer, & Prochnow, 2000).

Because views of self are influenced by socio-cultural factors, appraisals of self-concept may vary according to culture and context. Cultural psychologists note that Westerners may be more prone to a self-enhancement bias, whereas individuals from an Eastern cultural setting may display a modesty bias when rating their SC (Heine, 2004). In choosing social comparisons, individuals from East Asian backgrounds tend to seek upward comparisons, whereas Westerners boost their self-evaluations by choosing downward comparisons (White & Lehman, 2005). Westerners display higher self-beliefs but lower performance than non-Westerners (e.g., Eaton & Dembo, 1997). Self-concept researchers (e.g., Wästlund, Norlander, & Archer, 2001) have found academic SC beliefs to be lower for Asians and Asian-Americans, even though their achievement scores may be higher than in non-Asian comparison groups. Cultural background explains some of the differences in calibration of self-beliefs and performance, but cross-national factors such as relative wealth, equality, and cultural values may also explain the relationship between achievement and appraisal of self-beliefs.

### 1.2. Self-concept in adolescence

Perceptions of SC develop early in a child's schooling, with a strong relationship between reading SC and reading achievement established within two years of starting school (Chapman et al., 2000). Developmental cognitive changes also influence SC as a child enters adolescence. During adolescence, previously optimistic children experience increasing awareness of peers and their relative abilities (Stipek, 1998); hence, their achievement motivation often declines during this phase in Western cultures (Wigfield & Eccles, 1994). Anderman and Maehr (1994) note that Anglo-American students' domain-specific attitudes, overall school-related attitudes, and motivation all suffer a significant drop in the middle school years. Adolescents often face uncertainty and have falling SCs in specific contexts: school transitions, less personalized instruction, and academic pressures (Pajares & Cheong, 2003). During adolescence, academic SC may decline, but non-academic SC like perceptions of social competence (social SC) can increase (Shapka & Keating, 2005).

The levels of SC in adolescence vary across cultures and across domains (Wästlund et al., 2001). As SC depends on a standard of comparison or frame of reference for evaluation, academic SC's relationship with achievement may operate differently across cultural settings. Cultural values influence how adolescents appraise their self-beliefs, partly through influencing the sources of self-beliefs (e.g., the nature of social comparison may vary according to cultural context), and partly through differing levels of attention to in-group expectations (Oettingen & Zosuls, 2006). Hence, SC is an important motivation variable that is predictive of performance in a wide variety of settings, and the interaction between SC and achievement may differ across cultural groups. Cultural values and developmental changes may influence not only the levels of self-beliefs, but also the nature of the relationship of self-belief to performance; i.e., calibration.

### 1.3. Calibration accuracy of self-concept and performance

The construct of SC implies a self-appraisal of ability that can be an accurate calibration with performance or a mis-calibrated estimate of subsequent performance. SC calibration refers to the degree to which appraisals of one's competence in a domain correspond to actual ability and performance (Bol, Hacker, O'Shea, & Allen, 2005). Calibration can reflect over-estimated, under-estimated, or accurate assessments of competence in relation to performance. For example, a student who states, "I'm very good at reading" is making a SC judgment that can be calibrated with level of reading performance. Self-assessment is a challenging cognitive task (Harter, 1998), and mis-calibration can result from information deficit, uncertain or misinterpreted feedback from others, incomplete knowledge of competence, neglect of relevant information, or an exclusive focus on one's own competence while neglecting comparison to the competence and performance of others (Dunning, Heath, & Suls, 2004). In many contexts, students, especially lower-achieving ones, tend to over-estimate their competence in a domain (Dunning et al., 2004).

Children's self-appraisals increase in accuracy as they enter adolescence, becoming more aware of their own competence, more realistic about task demands, and more sensitive to social comparisons (Harter, 1998; Stone & May, 2002). Adolescents' lowered self-appraisals may be viewed as a decline in motivational self-beliefs or as a developmental improvement in self-assessment skills with respect to a specific task (*calibration* ability; Schunk & Pajares, 2002). Whereas young children are typically optimistic in their self-beliefs, adolescents gain the cognitive capability to be more self-perceptive and aware of their own abilities and limitations (Stipek, 1998). A worrisome adolescent decline in self-beliefs may actually be a sign of greater self-awareness and an improvement in calibration skills.

According to social cognitive theory, positive self-beliefs influence choice and planning in a wide variety of domains, leading to higher levels of achievement, whereas negative self-concept is believed to undermine achievement (e.g., Bandura, 1997; Marsh & Hau, 2003). However, empirical support for this contention is not extensive. In fact, several studies have shown that in some cases, overly positive self-beliefs lead to poor preparation and lower performance (e.g., Vancouver & Kendall, 2006). In theory, moderately positive self-beliefs provide an impetus to individuals to attempt tasks they haven't yet mastered, whereas more cautious self-beliefs stifle individuals from generating the extra effort needed to surpass their normal accomplishments. Overly positive SC (i.e., overconfidence) may result in poor performance because accuracy of self-perception is key to preparation, help-seeking, and self-advocacy (Stone & May, 2002). Some individuals may display overconfidence based on the self-enhancement bias known as the better-than-average (BTA) effect; that is, the common belief many people hold that they are outperforming their peers (Ackerman & Wolman, 2007). Conversely, some individuals display underconfidence when asked about potential performance due to self-handicapping tendencies, in which individuals underestimate their abilities to protect their self-esteem (Elliot & Church, 2003). Pessimistic (i.e., lower than warranted, or underconfident) SC may show a negative affect on performance, as individuals might accomplish more if they feel positive about their skills and abilities (Marsh & Hau, 2003). SC theory proposes that positive self-belief leads to better performance, but little attention has been paid to the way that cultural values might influence self-appraisal.

Although research on the topic is limited, cultural context may influence how self-beliefs and performance are calibrated. In any culture, students can mis-calibrate their self-beliefs and performance, either through self-appraisals that are inflated and reflect overconfidence, or through a negative appraisal of knowledge and skills that results in underconfidence. Students from western cultures may be encouraged to display overconfidence due to cultural expectations to present oneself in positive terms, regardless of level of skill and

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