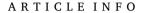# A cognitive cost of the need to achieve?
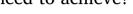
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ABSTRACT

Although students in affluent communities most often excel in academic performance, potential downsides of their achievement focus are an increasing concern. Common risk factors in the socio-emotional domain have been identified. Yet less explored is the possibility that such risk extends to intellectual dimensions. In a multi-method study, we administered two measures of self-regulation to middle-schoolers (n = 90) – an individually administered measure of cognitive regulation and an observational assessment of behavior regulation, in addition to a learning task in which students had to discover how multiple variables were related and apply this knowledge. In both an affluent and a middle-class sample, cognitive regulation, not behavior regulation, predicted learning. A comparison of the two samples showed the affluent group to be superior to the middle-class group in behavior regulation. However, middle-class students outperformed affluent students in learning and, even more strikingly, in cognitive regulation. These findings suggest that potential learning and cognitive development may be compromised in environments that put very high value on scholastic achievement.

Students from affluent communities typically excel in academic performance. Yet, costs to their well-being have become increasingly evident. Socio-emotional risk factors in communities with strong emphasis on scholastic achievement have been identified (Becker & Luthar, 2002; Luthar, 2003), with anxiety and depression typical symptoms associated with extreme pressure to achieve (Luthar & Latendresse, 2005). Relatively little attention has been given to the possibility that such risk extends to intellectual as well as emotional self-regulatory functions. In other words, there may be an intellectual cost to high academic achievement. We address that possibility here.

Although learning is closely associated with academic performance, they warrant treatment as distinct constructs. They have enough non-shared variance that different constellations of cognitive and behavioral processes may mediate them (Linnenbrink & Pintrich, 2000). Learning and academic performance assessments thus deserve to be distinguished. Most classroom assessments are performance assessments in which the student must demonstrate mastery of information that has already been presented to them and they must have it retained in memory in order to successfully reproduce it on an assessment. Rarely do assessments ask students to construct knowledge never conveyed to them that they have acquired for themselves. A test may ask students to solve a problem, but the techniques for doing so have been taught prior to the test. Both socioeconomic status (SES) and behavior are predictive of academic outcomes (Duckworth & Seligman, 2005; Sirin, 2005), consistent with the fact that educational outcomes are measured by performance indicators. But this fact does not establish how closely performance indicators are associated with actual learning.

It is the process of knowledge acquisition that we wish to identify here as learning and distinguish from academic achievement as assessed by performance measures of mastery of knowledge that has been directly taught. Why, we ask, does there exist great

individual variation in how effectively students learn? In the measure of learning we employ in the present work, students must make use of material at hand to construct an understanding that they reach on their own. Such learning is often referred to as inquiry learning, which presumably involves some degree of self-regulation on the part of the learner. The factors influencing individual variation in the effectiveness of this form of learning have not been extensively studied (Kuhn, 2016), especially among the age group of interest to us here.

One possibility that has been proposed, however, is that better learners demonstrate higher levels of self-regulation (Prince, 2004). There exists a growing literature on self-regulation (Cleary, Callan, & Zimmerman, 2012; Munakata, Snyder, & Chatham, 2012 Zimmerman, 2000), and self-regulation can be hypothesized to play a potentially critical role in learning, given that students must monitor and manage both the learning goal and their own learning strategies. We therefore investigate self-regulation in the present work, anticipating that it will prove central to understanding individual differences in learning defined as students' construction of their own new understandings.

Self-regulation has been conceptualized as a multidimensional process whereby individuals seek to control aspects of their cognition and/or behavior (Zimmerman, 2000). Recent research goes beyond self-regulation as a global construct to distinguish distinct components of self-regulation, such as differentiating between internalizing and externalizing behaviors (Conway, Miller, & Modrek, 2016), with a major division being between cognitive regulation (Chevalier, Huber, Wiebe, & Espy, 2013) and behavior regulation (Prencipe, Kesek, Cohen, Lamm, Lewis, & Zelazo, 2011).

Cognitive regulation includes several functions (Munakata et al., 2012), primary ones being inhibition (dismissing a distracting thought), and switching (of attention from one task to another). Behavior regulation includes both suppressing negative behaviors and executing positive ones (e.g., following a teacher's instruction to attend to what is being presented; Ponitz, McClelland, Jewkes, Connor, Farris, & Morrison, 2008).

Research on learning as defined in this present work offers a further reason to implicate cognitive regulation as a potentially consequential factor. Kuhn and Pease (2006, 2008, 2010) have shown that students must construct and perfect more advanced strategies necessary to a task but must also learn to inhibit the more immediately available but misleading and inadequate strategies. The latter challenge, Kuhn and Pease (2010) found, was the more challenging one and more predictive of success.

Self-regulation has been proposed by some theorists as fundamental to learning (Corno & Mandinach, 1983), as well as academic performance (Corno & Rohrkemper, 1985). Studies show a relation between behavior regulation and academic achievement (Duckworth & Seligman, 2005), although possibly only for a limited time (Salmela-Aro, 2015). Self-regulation aimed at satisfying external pressures and demands may deplete more internal regulatory processes (Ackerman, Goldstein, Shapiro, & Bargh, 2009).

The role of self-regulation in learning as it is defined in the present work remains an open question. To address it, we sought to examine young adolescents from a wide range of family and educational backgrounds. We examine two middle-school samples, one a diverse sample from a range of working to middle-class backgrounds and the other a more homogeneous sample from an affluent background. Students engaged in a task requiring them to learn independently. Assessments of behavior regulation and cognitive regulation were also conducted on separate occasions.

1. Method

1.1. Participants

Participants in the middle-class sample were 58 sixth graders (55% female; age $M = 11.3$, range = 11–12, $SD = 0.67$). They attended a public middle school in a working-class neighborhood of a large city in the Northeast US. Fifty-two percent were Caucasian/European, 12% Asian, 10% African-American, 5% Hispanic and 19% of mixed background. According to state DOE data, the school's performance ranking is in the 47th percentile, in comparison to other schools in the city. All students had at least one parent who had at least a high school diploma. Household income ranges reported by parents were between $66k and $199k. The teacher of this group had a master's degree and ten years of teaching experience. Ten percent of students qualified for free or reduced-price lunch. (We followed the approach used by the State Council and used the Area Median Income (AMI) standard utilized by the federal Department of Housing and Urban Development (HUD) to define the middle class; FY 2012). This income level is calculated from the American Community Survey for the City's Metropolitan Statistical Area (MSA) and is adjusted for family size. Conversation with school staff indicated that the majority of students at the school were not under strong pressure to excel in schoolwork or to undertake independent learning in pursuing out-of-school activities. School administration and teachers indicated that students had limited prior experience with inquiry activities or collaborative work.

Participants in the affluent sample were 32 seventh graders (78% female; age $M = 12.2$, range = 12–13, $SD = 0.34$) attending an elite school located in a high socioeconomic status neighborhood, in the same large city in the Northeast US. Racial/ethnic composition was comparable to that of the middle-class sample: 53% of students were Caucasian/European, 12% Asian, 3% African-American/, 16% Hispanic, and 16% of mixed ethnicities. According to the state DOE reports, these students' average pass rate for courses in Math, English, Social Studies, and Science is 98% and the school's performance ranking is in the 100th percentile, relative to other schools in the city. All students had at least one parent who held a graduate degree and both parents had attained a college degree. The sample qualified as affluent/upper-class, given household income range reported by parents were all above $199k. No students qualified for free or reduced-price lunch. The teacher of this group similarly had a master's degree and approximately ten years of teaching experience. (We again followed the approach used by the State Council and used AMI standard utilized by the HUD to define upper-class; FY 2012). Discussion with school staff confirmed that students at this school come from families in which parental investment in education is substantial and expectations very high. School staff indicated that students had limited prior