



## Understanding Conscientiousness and Its Role in Improved Student Achievement

by Jane Best and Allison Dunlap

Today's rapidly changing global economy requires that students develop a complex set of skills and qualities that encompass far more than proficiency in basic academic subjects. Rather than merely master mathematics and English language arts, children must develop both the cognitive and non-cognitive competencies—the “21st century skills”—that allow for success in school and beyond. Prominent among these is conscientiousness, a personality trait directly correlated with academic and workplace success (Pellegrino & Hilton, 2012).

Conscientiousness is defined as “the propensity to follow socially prescribed norms for impulse control, to be goal directed, to plan, and to be able to delay gratification and to follow norms and rules” (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009, p. 369). According to the National Research Council (NRC), conscientiousness encompasses numerous 21st century skills including grit, defined as “perseverance and passion for long-term goals”; self-regulation, defined as “the ability to set and achieve one’s goals”; and self-direction, defined as the ability to work independently while managing goals and time (Pellegrino & Hilton, 2012; Duckworth, Peterson, Matthews & Kelly, 2007; Partnership for 21st Century Skills, 2009).

When compared to other traits and skills such as teamwork or intellectual openness, conscientiousness correlates most strongly with success in school and the workplace (Pellegrino & Hilton, 2012). Indeed, extensive research has shown that students who demonstrate high levels of conscientiousness have higher grades, earn higher wages, and perform better on the job (Poropat, 2009; Almlund, Duckworth, Heckman, & Kautz, 2011; Barrick, Mount, & Judge, 2001).

Noting the correlation between conscientiousness and student achievement, some education leaders have begun attending to this trait in classrooms, using various terms to describe the qualities and skills that they would like to see children develop—perseverance, tenacity, resilience, self-control, responsibility, self-management, and self-discipline, to name a few. Although research related to these skills and mindsets abounds, disagreement over terms still exists among researchers and laypeople alike. In using the term “conscientiousness,” this brief follows the NRC, a division of the National Academy of Sciences and the National Academy of Engineering, which is committed to the dissemination of scientific research to inform policy (Pellegrino & Hilton, 2012).<sup>1</sup>

This brief provides an overview of conscientiousness and its relationship to student achievement for policymakers and presents relevant policy issues for consideration. Questions to consider and recommendations appear at the end of the document.

### Understanding Conscientiousness

Conscientiousness is one of five major personality traits known as “the Big Five,” which also include agreeableness, extraversion, neuroticism, and openness. People exhibiting conscientiousness tend to be hardworking, self-disciplined, persistent, thorough, and reliable. Additionally, conscientiousness is strongly associated with inhibitory control, one of the three major executive functions essential to student success (Center on the Developing Child [CDC], 2011).

<sup>1</sup> In its taxonomy of 21st century skills, the NRC describes conscientiousness as an intrapersonal competency that includes the following 21st century skills: “initiative, self-direction, responsibility, perseverance, productivity, grit, Type 1 self-regulation (metacognitive skills, including forethought, performance, and self-reflection), professionalism/ethics, integrity, citizenship, career orientation” (2012 p. 33). For the purposes of this brief, these various components of conscientiousness will be referred to as “skills” and “behaviors” related to conscientiousness.

The NRC found that conscientiousness and its related 21st century skills better predict student success than any other personality trait (Pellegrino & Hilton, 2012). Some have argued that conscientiousness better predicts student success than does intelligence, with one study finding that self-discipline accounted for more than twice as much variance as IQ in grades, attendance, and the number of hours students spent doing homework (Duckworth & Seligman, 2005).

Historically, many viewed traits such as conscientiousness as fixed aspects of personality, but recent research demonstrates that personality traits can change in response to coordinated interventions and experiences and that behaviors can be trained (Almlund et al., 2011; Farrington et al., 2012; Duckworth & Allred, 2012). Studies have shown, for example, that students will put forth more effort when they believe that intelligence is malleable and can be improved with hard work (Dweck 2006; Blackwell, Trzesniewski, & Dweck, 2007).

Indeed, certain learning environments can promote a students' willingness to persevere on a task. Such environments have two major characteristics:

- they provide students with challenges that are neither too difficult nor too easy, and
- they are both demanding and supportive, allowing students to develop an academic mindset, effortful control, and strategies for dealing with setbacks (Shechtman, DeBarger, Dornsife, Rosier, & Yarnall, 2013).<sup>2</sup>

At the same time, when children experience significant amounts of stress or face overwhelming challenges, their ability to develop skills related to conscientiousness and inhibitory control diminishes (Shechtman et al., 2013; CDC, 2011).

## Policy Considerations for Promoting Conscientiousness

Education policymakers may wish to consider the following formative experiences and interventions relevant to promoting conscientiousness and its associated skills.

### *Early Education*

Research shows that conscientiousness and its related behaviors emerge during a child's early years (Eisenberg, Duckworth, Spinrad, & Valiente, 2014). Early childhood programs that cultivate skills related to conscientiousness include those that

- explicitly aim to promote executive function skills;
- use curriculum emphasizing social-emotional skills, self-control, opportunities for play and physical activity, and scaffolding for students as they learn to self-regulate;
- incorporate activities related to physical and mental self-discipline; and
- train teachers to help students develop social-emotional skills, plan and achieve goals, productively convey emotions, and control impulses (CDC, 2011; Diamond & Lee, 2011; Shechtman et al., 2013; Duckworth & Allred, 2012).

### *Middle and High School Interventions*

Developmental psychologists have shown that students fine-tune the ability to establish goals, control themselves, and define themselves as successful or unsuccessful learners during adolescence (Farrington et al., 2012). Middle and high school interventions that may support adolescents' development of these conscientiousness-related skills include:

- explicitly teaching adolescents strategies for self-regulation, stress management, goal setting, and progress monitoring;
- ensuring that middle grades provide students with scaffolding and developmentally appropriate tasks;
- fostering students' sense of belonging by promoting positive relationships among peers and ensuring that all students trust in at least one adult at their school; and
- supporting adolescents with changes that may affect their sense of self-efficacy and willingness to persevere, such as transitions to high school and college (Brigman & Webb, 2007; Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2010; Farrington et al., 2012; Dweck, Walton, & Cohen, 2014).

---

<sup>2</sup> Academic mindsets include feelings of self-efficacy and a student's tendency to believe that s/he grows as a result of effort; effortful control includes a student's ability to regulate him/herself to accomplish tasks that are undesirable but necessary for achieving long-term goals; and strategies for dealing with setbacks include skills such as defining a task, setting goals, taking actions, organizing information, managing time, monitoring progress, evaluating the effectiveness of actions, and adapting plans and actions as needed (Shechtman et al., 2013).

## ***Professional Development and Educator Preparation***

Research has demonstrated that educators can cultivate conscientiousness-related behaviors by

- asking students to work toward long-term goals that are challenging, achievable, and personally meaningful;
- reframing their views of student perseverance and tenacity to see these as malleable qualities that can be enhanced or diminished in response to classroom environments;
- praising effort more than innate ability;
- explicitly teaching students about the plasticity of the brain;
- providing students with appropriate feedback and scaffolding;
- creating an environment in which students feel they belong to a community of learners and supporting students' sense of self-efficacy; and
- helping students develop metacognitive and self-regulatory strategies by giving them opportunities to practice skills such as defining tasks, setting goals, taking actions, organizing information, managing time, monitoring progress, evaluating the effectiveness of actions, and adapting plans and actions based on evaluation results (Blackwell et al., 2007; Farrington et al., 2012; Dweck, 2006; Dweck et al., 2014; Shechtman et al., 2013).

Professional development, coaching, and preparation programs that help educators understand the skills related to conscientiousness and that promote the use of the above and similar strategies may increase conscientiousness-related behaviors among students.

## ***Parent and Family Support***

Providing appropriate support and training for parents, family members, and other caregivers may help children develop skills related to conscientiousness, avoid the circumstances that inhibit that development, and enter school ready to learn. Caregivers may use numerous strategies to promote skills related to conscientiousness and inhibitory control, including

- guiding children from a state of dependence on adults to increased autonomy;
- providing children with scaffolding to help them practice skills before performing them independently;
- praising effort more than innate ability;
- offering responsive and individualized care;
- helping children understand and control emotions;
- creating safe, orderly, and predictable environments with minimal distractions; and
- avoiding placing children in stressful environments, including those marked by chaos, neglect, abuse, or violence (Dweck, 2006; Eisenberg et al., 2014; Hammond et al., 2012; CDC, 2011).

Providing parents and other caregivers with training that helps them understand and apply these practices via home visits, workshops, meetings, parent academies, and other means is likely to support student conscientiousness and its benefits.

## ***Further Research on Non-cognitive Competencies***

Current research on conscientiousness and its related skills and behaviors has successfully identified numerous promising practices related to these and other non-cognitive competencies. Further research, however, is still needed. Research to support the promotion of skills related to conscientiousness and other non-cognitive competencies would

- work toward greater consistency and clarity regarding the terms associated with conscientiousness, perseverance, tenacity, resilience, and similar concepts;
- determine best practices for incorporating non-cognitive skills into standards, curricula, and assessments;
- develop more advanced measures of non-cognitive competencies and create practical assessment tools for educators;
- continue to identify best practices for promoting non-cognitive competencies;
- use action research and continuous improvement processes to test and refine school interventions related to non-cognitive competencies;
- unite work across disciplines, including psychology, education, economics, and neuroscience; and
- evaluate efforts to implement and scale promising practices related to conscientiousness, its behaviors, and other non-cognitive competencies.

## State and District Examples

While further research on best practices for promoting non-cognitive competencies among students is still needed, some states and districts have already taken steps to improve student behaviors related to conscientiousness. Examples follow.

The **Arizona** Department of Education (AZDOE) offers schools and districts a character education curriculum that focuses on promoting 17 core attributes among students, including those related to conscientiousness, such as diligence, initiative, orderliness, and responsibility. Schools wishing to implement the program may apply for matching grants to secure third-party vendors to support implementation. Fifty Arizona schools received such grants for the 2014–15 school year. Schools and districts may also use materials provided by AZDOE to implement the program independently. Pursuant to Arizona Revised Statute 15-719, a school that successfully implements the program may be certified as an Arizona School of Character (Arizona Department of Education, 2014).

In **Illinois**, the Chicago School Readiness Project (CSRP) works to increase school readiness among Head Start students by focusing on self-regulation skills. CSRP coaches Head Start teachers in implementing behavior management strategies in the classroom and managing stress. Although CSRP does not provide academic support to teachers, participating students demonstrate improvements in executive functioning, self-regulation skills, vocabulary, letter recognition, and math when compared to control groups (Raver et al., 2009, 2011).

In **Kentucky**, Erlanger-Elsmere Independent School District has joined several other districts and schools across the U.S. to implement Student Success Skills (SSS), a professional school counseling program. As part of the district's improvement plan, SSS helps students develop self-regulation skills, including those related to goal-setting, progress monitoring, and stress management. Research on SSS has demonstrated that participating students consistently earn higher scores in math and reading than do similar students in control groups (Lemberger, Brigman, Webb, & Moore, 2012). Further, students across racial and ethnic subgroups see gains on standardized test scores, and these gains persist for at least two years after student participation in SSS (Brigman & Webb, 2007; Lemberger et al., 2012).

The **New York** City Department of Education (NYCDOE) has established College and Career Readiness Benchmarks that identify the qualities that students need to succeed in college and careers. Included in these benchmarks are behaviors such as persistence, engagement, work habits, organizational skills, and self-regulation (New York City Department of Education, 2013). NYCDOE provides schools with various resources to help educators promote these behaviors among students, including documents describing school-developed activities and lessons related to the behaviors, tools for promoting effort and a growth mindset among students, and research related to non-cognitive competencies (New York City Department of Education, 2014).

<b>Policy Issue</b>	<b>Questions to Consider Regarding Conscientiousness</b>
<b>Supporting schools and educators through early childhood education, middle and high school interventions, and professional development</b>	<ol style="list-style-type: none"> <li>1. What early childhood programs are currently available to children in my state or district? Do these programs promote executive function skills, social-emotional skills development, and other skills related to conscientiousness?</li> <li>2. What resources might be leveraged or enhanced to promote early education for conscientiousness?</li> <li>3. How do middle and high school programs in my state or district address adolescent development? Do current programs support self-regulation, sense of belonging, healthy self-definition, stress management, goal setting, and progress monitoring? Do current programs provide appropriate scaffolding and support to adolescents during times of transition?</li> <li>4. What middle and high school interventions aimed at promoting conscientiousness-related skills are appropriate for my state or district?</li> <li>5. Do professional development, coaching, and preparation programs in my state or district successfully build educator capacity to cultivate student skills related to conscientiousness? How might current opportunities be enhanced to provide educators with appropriate training on conscientiousness and other non-cognitive competencies?</li> </ol>
<b>Building parent capacity</b>	<ol style="list-style-type: none"> <li>1. What programs for parent and family involvement in education currently exist in my state or district? Is there a mechanism for gauging the success of these programs? Do current programs provide caregivers with the knowledge and skills they need to cultivate conscientiousness among children?</li> <li>2. How can current resources for parents—including parent training programs, homes visits, parent resource centers, workshops, meetings, and academies—more effectively incorporate training to cultivate skills related to conscientiousness?</li> </ol>
<b>Enhancing existing research and resources</b>	<ol style="list-style-type: none"> <li>1. What resources related to conscientiousness and other non-cognitive competencies can educators in my state or district access? Do these resources provide clear, consistent, and actionable guidance?</li> <li>2. How might diverse actors in my state or district—including state and district education agencies, community organizations, child care providers, and federally funded programs such as Head Start, Regional Comprehensive Centers, National Content Centers, and Regional Educational Laboratories—support the development of clear, consistent, and actionable guidance related to conscientiousness and other non-cognitive competencies?</li> <li>3. Do current policies in my state or district allow schools to conduct action research to test and refine interventions, such as those related to promoting conscientiousness and other non-cognitive competencies?</li> </ol>

## Recommendations

Researchers have demonstrated that the skills and behaviors related to conscientiousness—ranging from self-discipline to grit to initiative—are strongly correlated with success in school and the workplace. Further, several interventions have shown that teachers, parents, and schools can help students develop these skills and behaviors. The following recommendations may assist policymakers as they consider ways to promote conscientiousness among students:

- Examine early childhood education policies in your state or district to determine whether they promote early education for executive function, social-emotional skills development, and other behaviors related to conscientiousness.
- Investigate middle and high schools in your state or district to determine whether they provide appropriate scaffolding to adolescents during times of transition and whether current programs successfully promote self-regulation, sense of belonging, healthy self-definition, stress management, goal setting, and progress monitoring among adolescents.
- Research professional development, coaching, and preparation programs in your state or district to determine whether current practices allow educators to develop the skills they need to promote behaviors related to conscientiousness.
- Review current resources and policies related to parents and families to determine whether existing programs successfully engage caregivers and provide them with the knowledge and skills they need to promote conscientiousness among children.
- Identify strategies to advance research related to conscientiousness and other non-cognitive competencies.
- Determine whether existing standards, curricula, and assessments in your state or district account for non-cognitive competencies, and identify strategies for including skills related to conscientiousness into those standards, curricula, and assessments.
- Identify mechanisms for program evaluation and determine whether current practices allow for the measurement of interventions related to conscientiousness and non-cognitive competencies.

## References

- Almlund, M., Duckworth, A., Heckman, J., & Kautz, T. (2011). Personality psychology and economics. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education* (pp. 1–181). Amsterdam, Netherlands: Elsevier.
- Arizona Department of Education (2014). *Character education*. Retrieved from <http://www.azed.gov/character-education/>
- Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection & Assessment*, 9(1–2), 9–30. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/1468-2389.00160/pdf>
- Blackwell, L. A., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, 78(1), 246–263. Retrieved from <https://web.stanford.edu/dept/psychology/cgi-bin/drupal/system/files/Implicit%20Theories%20of%20Intelligence%20Predict%20Achievement%20Across%20an%20Adolescent%20Transition.pdf>
- Brigman, G., & Webb, L. (2007). Student Success Skills: Impacting achievement through large and small group work. *Group Dynamics: Theory, Research, and Practice*, 11(4), 283–292.
- Center on the Developing Child at Harvard University. (2011). *Building the brain's "air traffic control" system: How early experiences shape the development of executive function* (Working Paper No. 11). Retrieved from [http://developingchild.harvard.edu/resources/reports\\_and\\_working\\_papers/working\\_papers/wp11/](http://developingchild.harvard.edu/resources/reports_and_working_papers/working_papers/wp11/)
- Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science*, 333(6045), 959–964. Retrieved from <http://www.sciencemag.org/content/333/6045/959>
- Duckworth, A. L., & Allred, K. M. (2012). Temperament in the classroom. In R. L. Shiner & M. Zentner (Eds.), *Handbook of Temperament* (pp. 627–644). New York: Guilford Press.
- Duckworth, A.L., & Seligman, M. E. P. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science*, 16(12), 939–944. Retrieved from <http://www.sas.upenn.edu/~duckwort/images/PsychologicalScienceDec2005.pdf>
- Duckworth, A. L., Grant, H., Loew, B., Oettingen, G., & Gollwitzer, P. M. (2010) Self-regulation strategies improve self-discipline in adolescents: Benefits of mental contrasting and implementation intentions. *Educational Psychology*, 31(1), 17–26. Retrieved from [http://www.sas.upenn.edu/~duckwort/images/publications/DuckworthGrantLoewOettingenGollwitzer\\_2011\\_Self-regulationStrategiesImproveSelf-DisciplineinAdolescents.pdf](http://www.sas.upenn.edu/~duckwort/images/publications/DuckworthGrantLoewOettingenGollwitzer_2011_Self-regulationStrategiesImproveSelf-DisciplineinAdolescents.pdf)
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087–1101. Retrieved from <http://www.sas.upenn.edu/~duckwort/images/Grit%20JPSP.pdf>
- Dweck, C. S. (2006). *Mindset*. New York: Random House.
- Dweck, C. S., Walton, G. M., & Cohen, G. L. (2014). *Academic tenacity: Mindsets and skills that promote long-term learning*. Seattle, WA: Gates Foundation. Retrieved from [http://web.stanford.edu/~gwalton/home/Welcome\\_files/DweckWaltonCohen\\_2014.pdf](http://web.stanford.edu/~gwalton/home/Welcome_files/DweckWaltonCohen_2014.pdf)
- Eisenberg, N., Duckworth, A. L., Spinrad, T. L., & Valiente, C. (2014). Conscientiousness: Origins in childhood? *Developmental Psychology*, 50(5), 1331–1349.
- Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *Teaching adolescents to become learners: The role of non-cognitive factors in shaping school performance*. Chicago: University of Chicago Consortium on Chicago School Research. Retrieved from <https://ccsr.uchicago.edu/publications/teaching-adolescents-become-learners-role-non-cognitive-factors-shaping-school>
- Lemberger, M. E., Brigman, G., Webb, L., & Moore, M. M. (2012). Student Success Skills: An evidence-based cognitive and social change theory for student achievement. *Journal of Education*, 192(2/3), 89–99. Retrieved from <http://web.b.ebscohost.com/ehost/detail/detail?vid=9&sid=3563a1d7-8282-4aac-be53-d667e3112ac1%40sessionmgr114&hid=113&bdata=JnNpdGU9ZW/hvc3QrbG1ZQ%3d%3d#db=ehh&AN=85920665>

- Hammond, S. I., Müller, U., Carpendale, J. I. M., Bibok, M. B., & Liebermann-Finestone, D. P. (2012). The effects of parental scaffolding on preschoolers' executive function. *Developmental Psychology*, 48(1), 271–281.
- New York City Department of Education. (2014). *College and career readiness: Academic and personal behaviors*. Retrieved from <http://schools.nyc.gov/Academics/CommonCoreLibrary/About/CCR/AcademicPersonalBehaviors.htm>
- New York City Department of Education. (2013). *Resources for schools*. Retrieved from <http://schools.nyc.gov/NR/ronlyres/68BD3285-151C-45C6-B064-A1D310235349/0/Resourcespacket51413FINAL.pdf>
- Partnership for 21st Century Skills (2009). *P21 framework definitions*. Retrieved from [http://www.p21.org/storage/documents/P21\\_Framework\\_Definitions.pdf](http://www.p21.org/storage/documents/P21_Framework_Definitions.pdf)
- Pellegrino, J. W., & Hilton, M. L. (Eds.). (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st century*. Washington, DC: The National Academies Press.
- Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, 135(2), 322–338.
- Raver, C. C., Jones, S. M., Li-Grining, C., Zhai, F., Bub, K., & Pressler, E. (2011). CSRP's impact on low-income preschoolers' pre-academic skills: Self-regulation as a mediating mechanism. *Child Development*, 82(1), 362–378. Retrieved from <http://steinhardt.nyu.edu/scmsAdmin/uploads/006/448/Raver%20Jones%20Li-Grining%20Zhai%20Bub%20Pressler%202011.pdf>
- Raver, C. C., Jones, S. M., Li-Grining, C., Zhai, F., Metzger, M. W., & Solomon, B. (2009). Targeting children's behaviors in preschool classrooms: A cluster-randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 77(2), 302–316. Retrieved from <https://steinhardt.nyu.edu/scmsAdmin/uploads/003/327/Raver%20et%20al%202009.pdf>
- Roberts, B. W., Jackson, J. J., Fayard, J. V., Edmonds, G., & Meints, J. (2009). Conscientiousness. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 369–381). New York: Guilford.
- Shechtman, N., DeBarger, A. H., Dornsife, C., Rosier, S., & Yarnall, L. (2013). Promoting grit, tenacity, and perseverance: Critical factors for success in the 21st century. Retrieved from [http://www.sri.com/sites/default/files/publications/oet-grit-report\\_updated.pdf](http://www.sri.com/sites/default/files/publications/oet-grit-report_updated.pdf)