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Making it Real: How High Schools Can Be Held Accountable for Developing Students' Career Readiness

Svetlana Darche,
WestEd

David Stern,
University of California, Berkeley

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Introduction

College and career readiness is the stated goal of the common core standards that have now been adopted by almost all the states. The Obama administration's proposed budget for 2013 included a new name for Title I of the Elementary and Secondary Schools Act: "college and career ready schools." There is widespread agreement on the goal of preparing every high school graduate both for postsecondary education and for a lifetime of fulfilling work. The days of distinguishing "college-bound" from "non-college-bound" students are over; instead, high schools aim to give all students a range of options for postsecondary education and technical training that will lead to rewarding careers.

The question of what constitutes career readiness, and how that relates to college readiness, is the subject of much ongoing discussion. Our own view is that career readiness and college readiness entail many of the same skills, bodies of knowledge, and dispositions — but being ready for adult professional life is not exactly the same as being ready for postsecondary education. It may require more, as we will describe. Other groups and observers have come to this same conclusion

Executive Summary

There is widespread agreement on the goal of preparing every high school student for both postsecondary education and a lifetime of fulfilling work, that every graduate should be "college and career ready." The authors' view is that career readiness and college readiness entail many of the same skills, bodies of knowledge, and dispositions, but being ready for adult professional life is not exactly the same as being ready for postsecondary education. It may require more.

In this paper the authors focus on the practical question of how high schools might be held accountable for developing students' career readiness — beyond implementing the assessments being developed to measure students' attainment of the new common core standards in math and English language arts.¹ Their goal is to propose a feasible indicator of high school students' career readiness that could be included among the measures used by states to hold schools accountable, and would complement and enhance the assessments of proficiency in academic subjects. Such an indicator could address the requirement for a career readiness

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Svetlana Darche is a Senior Research Associate in WestEd's Health and Human Development Program. She conducts studies, develops tools, and supports schools in the area of career-related education reform, with a focus on student engagement and long-term success. She has worked closely with ConnectEd, the National Academy Foundation, the College & Career Academy Support Network and others on defining and measuring "college and career readiness."

David Stern is Professor of Education Emeritus and Director of the College & Career Academy Support Network at the University of California, Berkeley. He has long been involved in promoting research-based practice, and conducting practice-based research, to make education more meaningful, effective, and equitable for young people of high school age.

Executive Summary (Cont.)

measure as stated in a new provision of the California Education Code enacted in September 2012: “the Superintendent, with approval of the state board, may incorporate into the index for secondary schools valid, reliable, and stable measures of pupil preparedness for postsecondary education and career” (EC 52052 (a) (4) (F) (ii)).

The authors’ aim is not to spell out a complete list of possible indicators. They focus on one measure: the *percentage of students who have obtained, by the end of grade 12, a satisfactory performance rating by a supervisor in a paid job, paid or unpaid internship, school-based enterprise, or other qualifying experience that allows students to apply and demonstrate important career-related transferable skills.*

This measure would be relatively easy to implement, would create an appropriate incentive for high schools, and is related to the development of capabilities that contribute to students’ long-term career success, as indicated by the summarized research. In addition to their proposed indicator, the authors also suggest some additional indicators.

(Conley et al., 2011; ConnectEd, 2012; Career Readiness Partner Council, 2012). All emphasize the importance of many transferable skills, in addition to those imparted by academic instruction or technical training, that will support long-term success through a lifetime of changing circumstances.

In this paper we focus on the practical question of how high schools might be held accountable for developing students’ career readiness — beyond implementing the assessments being developed to measure students’ attainment of the new common core standards in math and English language arts.¹ Our goal is to propose a feasible indicator of high school students’ career readiness that could be included among the measures used by states to hold schools accountable, and would complement their assessments of proficiency in academic subjects. Such an indicator could address the requirement for a career readiness measure as stated in a new provision of the California Education Code enacted in September 2012: “the Superintendent,

with approval of the state board, may incorporate into the index for secondary schools valid, reliable, and stable measures of pupil preparedness for postsecondary education and career” (EC 52052 (a) (4) (F) (ii)).

Our aim is not to spell out a complete list of possible indicators. We focus on one that would be relatively easy to implement, would create an appropriate incentive for high schools, and is related to the development of capabilities that contribute to students’ long-term career success, as indicated by research we will summarize. In addition to our proposed indicator, we also suggest what some additional indicators might be. The measure that we propose is described in the box below.

Proposed Measure and Brief Rationale

As one measure of pupil preparedness for careers, to be included with other indicators for holding high schools accountable, we recommend that each school report the *percentage of students who have obtained, by the end of grade 12, a satisfactory performance rating by a supervisor in a paid job, paid or unpaid internship, school-based enterprise, or other qualifying experience that allows students to apply and demonstrate important career-related transferable skills.* The rating could be documented on one of several forms approved by the California Department of Education (CDE), such as the Supervisor Assessment of College and Career Readiness for student interns developed by the National Academy Foundation

(NAF). Use of such a form ensures that a student’s experience provided opportunities to develop capabilities that are related to long-term career success in a very wide range of occupations. The CDE would determine requirements such as the minimum duration of the job or internship (e.g., 120 hours), and the manner of attesting that the person completing the student’s performance rating was a bona fide supervisor.

A school-based enterprise is an activity that produces goods or services for sale or use by people other than the students or their families. For instance, in many schools students operate restaurants or catering services, build houses, design web sites

for public or nonprofit organizations, repair cars, run retail shops, staff child care centers, or conduct studies for local public agencies. Certain co-curricular experiences also might qualify, such as editing a school newspaper, managing a recycling service, or directing a theatrical production. Some good examples of curricular and co-curricular school enterprises are sponsored by career technical student organizations (DECA, FFA, HOSA, etc.). Other activities that might qualify include integrated projects that produce documents containing new information or analysis for clients beyond the classroom, or performances or publications for audiences beyond the classroom.

The supervisor in one of these school-based activities would normally be a teacher, preferably with a credential in career technical education (CTE), who is familiar with the standards applied in adult professional work. The CDE would determine requirements for a qualifying school-based enterprise or other experience, such as the minimum duration of the student's experience, the qualifications of the teacher who rates the student's performance, and whether students' performance is judged according to standards that apply in adult professional work.

Satisfactory performance in a work role with real responsibility is a more direct demonstration of career readiness than scores on work-readiness

tests that have no consequences for the student and are often intended for students entering employment directly out of high school or a GED program. Assessment of students' actual performance by adults familiar with professional work standards would include explicit attention to important abilities and behaviors including communication, creative problem solving, critical thinking, collaboration, and self-directed learning in the context of real productive activity. This would reinforce the measurement of similar capabilities that will be part of the new assessment of proficiency in common core academic subjects.

In the remainder of this paper, we explain why we think this is a good measure to include in an index of career readiness. Here is the rationale, in briefest terms:

- A direct way to determine whether a high school's students are well prepared for careers would be to measure occupational success after students have graduated. However, to give an accurate picture these surveys would have to wait until graduates have reached age 30 or so, which would be too late to inform current practice.
- The percentage of students who have performed successfully in a job, internship, school-based enterprise, or other qualifying experience

can be determined at the end of senior year, and has face validity as an indication that students have already begun to develop career-related capabilities in real productive settings.

- Working in a job, internship, or school-based enterprise can develop abilities and behaviors that are not usually developed in regular school classrooms (e.g., collaboration with people of different ages). We will describe evidence showing that these abilities and behaviors affect career success later in life, over and above the impact of cognitive skills and years of schooling.
- The judgment that a student has performed satisfactorily in a job,

internship, school-based enterprise or other qualifying experience must involve explicit indications of whether the student has developed these work-related abilities and behaviors. For instance, the NAF Supervisor Assessment form lists seven foundational skills (e.g., oral communication, precision and accuracy); seven applied workplace skills (e.g., creativity and innovation, ability to work with diverse individuals); nine skills reflecting self-management and personal responsibility (e.g., persistence, taking responsibility for learning); four indicators of knowledge of the field (e.g., understanding of career opportunities and requirements in the industry or field overall); as well

as position-specific technical skills that are named by the supervisor.²

- Including such work-related skills, abilities, and behaviors in the definition of satisfactory performance ensures that the job, internship, school-based enterprise, or other qualifying experience has provided opportunities to develop these.
- A high-quality work-based learning experience helps students develop abilities and behaviors that are related to long-term career success. Rewarding high schools where higher percentages of seniors have performed satisfactorily in a job, internship, school-based enterprise, or other qualifying experience will encourage schools to develop these forms of work-based learning as part of the curriculum, and will thus promote development of abilities and behaviors that contribute to students' later career success.
- It is better to measure students' career-related abilities and behaviors in the context of actual work performance than by giving students a battery of tests. Evidence from longitudinal studies, which we will describe, confirms that abilities and behaviors developed by late adolescence strongly affect career success later in life, but there has not been enough research to determine exactly which of these abilities and behaviors are *most* important, and in which combinations. Therefore, while testing many of these skills may be useful in formative assessment to inform

teaching and service provision, administering a single test for state accountability purposes would be inappropriate, and administering a battery of tests that might capture the full range of abilities would be infeasible. To measure students' development of capabilities related to future career success, performance in an authentic productive context is a better indicator than performance on a test. Even if the test includes scenarios to measure situated decision-making, students' answers are less predictive than their actual behavior in a context where their performance has real consequences for themselves and others. This is especially true in trying to measure key qualities such as a student's ability to apply learning to novel situations or adapt quickly to changing demands.

- A career readiness index for schools could also include other indicators, such as the percentage of seniors who have constructed a written plan for their postsecondary education and careers, completed a sequence of CTE courses, or obtained an industry-recognized skill certificate or credential. Postsecondary educational attainment or technical certificates also could be considered measures of career readiness. We will comment later on some of these other indicators, but this paper focuses mainly on the measure we have described. Our goal is to keep it simple, and make it real.

Measuring Actual Career Success of High School Graduates Takes Too Long

The best way to ascertain long-term career success is to observe various indicators of success after graduation from high school. While student success in postsecondary education, including attainment of technical certificates, associate's or bachelor's degrees, can be estimated fairly accurately within three to six years after high school — fast enough to inform the high school's current practice — measuring students' occupational success in a timely fashion is much more problematic. In the first several years after high school most young people pursue some combination of school and work. Students' part-time jobs while in postsecondary education usually are not an indication of what they will do after they finish. It often takes students five or six years to finish bachelor's degrees, and an additional two to five years to finish post-graduate education. Those who complete a bachelor's or advanced degree usually experience relatively rapid gains in earnings during the first several years of full-time work. So the range of occupational trajectories for a high school graduating class will not become evident until 10 to 15 years after graduation, around age 30. By that time, the high school's program and personnel most likely would have changed so much that the information would not be useful as a guide to current practice.

Academic Achievement is One Predictor of Later Career Success, But is Far From Sufficient

Since graduates' eventual success in the workforce takes so long to become evident, holding high schools accountable for developing students' career readiness must depend on measuring something about students while they are still in high school that is known to predict eventual career success. Social scientists have done thousands of statistical studies to determine what characteristics of young people predict later occupational success, usually measured by earnings. The best school-related predictors are the number of school years completed, and test scores that measure academic knowledge or cognitive skills. Keeping students in school and promoting academic achievement will improve students' career prospects, so it makes sense to hold high schools accountable for graduation rates and academic achievement.

However, the combined effects of school years and cognitive achievement typically account for only about 10 to 20 percent of the observed variation in individual earnings. Adding demographic characteristics, family background, and work experience still usually leaves about two-thirds of the variance in earnings unexplained (Bowles, Gintis, & Osborne, 2001).

Various Abilities and Behaviors, Other Than Knowledge of School Subjects, Must be Considered

The search for other variables to predict career success has led recently

to a focus on abilities, behaviors, and preferences that are distinct from knowledge of school subjects. The idea that aspects of personality developed at a young age can predict success later in life is as old as child raising, of course. But systematic empirical research requires unusual longitudinal data. An early example of such research was Clausen's (1991) finding, based on a 50-year longitudinal study using extensive interviews and observations during childhood and adolescence, that males who exhibited more "planful competence" as teenagers achieved higher occupational status at age 53 to 62. This analysis controlled for parents' socioeconomic status, IQ at age 18, and educational attainment. In this small sample of about 80 men, the influence of planful competence — the ability and tendency to think about the future, set goals, and carry out plans — was the most powerful predictor of eventual occupational status, accounting for 36 percent of the variance in occupational status even with the other predictors in the equation (Table 3, page 823).

Research on the influence of other abilities and skills was given new impetus by a series of studies led by Nobel-winning economist James Heckman. One motivation for these studies was a desire to explain why people who had GED certificates earned less than people who had regular high school diplomas, even though the GED holders had equal or better academic or cognitive abilities. They discovered that the GED holders scored lower on certain personality variables, namely self-esteem and locus of control, and

that these variables helped explain their lower earnings (Heckman, Hsee, & Rubinstein, 2001).

Reviews of the evidence on how various abilities and behaviors affect measures of career success such as wages or earnings have generally found that personality³ variables measured during adolescence are significant predictors of later success in the labor market (Bowles, Gintis, & Osborne, 2001; Borghans, Duckworth, Heckman, & ter Weel, 2008; Brunello & Schlotter, 2010; Levin, 2011; National Research Council, 2011). Some of the most-cited individual studies are by Heckman, Stixrud, & Urzua (2006), Deke & Haimson (2006), and Rosenbaum (2001).⁴ The effects of personality variables are sometimes found to be quite large. For instance, Bowles, Gintis, & Osborne report findings from a study by Duncan and Dunifon, where adding attitudinal and motivational variables reduced the unexplained variance in hourly wages by five percent, compared to a typical reduction of about one percent in 57 studies where a cognitive measure was added to the equation (page 1164).

Reviews have pointed out that the actual predictive power of personality variables is likely to be greater than what the available evidence indicates, because the longitudinal studies used in this research have included very limited measures of personality. Large-sample studies have measured abilities and behaviors (self-esteem, locus of control, work habits, leadership skills, teamwork and other sports-

related skills, discipline problems in high school, popularity) that do not represent a thorough sampling of personality dimensions — leaving out variables such as conscientiousness, motivation, and planfulness. In addition, the measures have relied on short questionnaires, which are prone to much measurement error.

Only one study to date has been able to use more reliable personality data from a large sample of individuals to test how well personality at age 18 or 19 predicts later occupational success, controlling for cognitive ability, educational attainment, and family background. Lindqvist and Vestman (2011) analyzed labor market outcomes in 2006 for 14,703 Swedish men born from 1965 through 1974. For each man, the researchers obtained the personality scores from interviews at the time of military enlistment, which was compulsory for all men during those years. The 25-minute interviews, conducted by trained psychologists who had access to each man's background profile and self-descriptive questionnaires, used the same format for all the men in the study. It resulted in a score from 1 to 9, indicating overall psychological fitness for military service. The interview was designed to assess ability to function in a cohesive small group, as well as independence, persistence, initiative, outgoing character, ability to tolerate military discipline, and emotional stability, though these traits were not scored separately. Personality measured at age 18 or 19 had a strong effect on wages and employment at age 32 to 41. The effect was larger than in

previous studies that used less reliable measures of personality. In the sample as whole, a one standard deviation increase in cognitive ability predicted about a nine percent increase in wages, compared to seven percent for the personality measure. However, the effect was especially important at the low end of the earnings distribution, where the effect of the personality measure was three to four times greater than the effect of cognitive ability.

While Personal Abilities and Behaviors Are Critical, Trying to Measure These Directly is Not the Best Way to Hold High Schools Accountable

As described, the research to date has found solid evidence that abilities, behaviors, and aspects of personality measured in adolescence strongly predict occupational success later in life, even when educational attainment and knowledge of school subjects are taken into account. In the fields of career development, adult education, and industry-based training and development, many assessments have been developed to measure such abilities and behaviors. Examples include the ACT's WorkKeys, the National Work Readiness Credential (NWRC) based on "Equipped for the Future" standards, and the CASAS Workforce Skills Certification System (WSCS). This might suggest trying to hold high schools accountable by administering such tests.

However, this would be problematic for several reasons. First, there are many abilities and behaviors that might be relevant to eventual career success

(Borghans et al., 2008; Wilson-Ahlstrom et al., 2011), and the longitudinal data currently available has allowed researchers to test only a few of these. The research is sufficient to confirm that abilities and behaviors other than knowledge of school subjects do matter — but no one yet knows which of these, individually or in various combinations, matter most. In particular, we have not been able to find any studies that correlate high schools students' scores on WorkKeys, NWRC, or WSCS with career success later in life. Equally important, some of the measures are based on self-report responses, and most of these assessments are meant to be used with other observations of work readiness — not as stand-alone measures. Giving students another battery of tests to measure career readiness would also take a substantial amount of time and money. Finally, if these tests have no consequences for the students themselves, many students probably would not take them seriously, and the scores would therefore not be meaningful.

For these reasons, our recommendation for high school accountability does not rely on trying to measure these abilities and behaviors by giving students more tests. Instead, we recommend measuring students' *actual performance in demanding work roles*. This is a direct and authentic measure of career readiness, where the demands of real work are the standards for judging students' performance and the work itself becomes the measured "performance task." Requiring supervisors and teachers to assess a range of abili-

ties and behaviors ensures that schools can only count activities where students can exercise those abilities and behaviors. Encouraging schools to recognize this kind of work experience as part of education will encourage high schools to provide more work-based learning — which will help students develop these career-related capabilities.

High-Quality Work Experience Does Develop Students' Career-Related Abilities and Behaviors

How does anyone become proficient at baseball or piano? Practice, practice! The same applies to becoming proficient at work. But the expansion of high school enrollment from 1900 to 1970 coincided with enforcement of child labor laws that excluded young people from employment during school hours. Although high school has always been expected to prepare students for work, it has not generally included time for students to practice.

Nevertheless, most students do have paid jobs sometime during their high school years — in the summer, on weekends, or weekdays after school. Students who work while in high school have been found to obtain higher earnings during the few years after high school. This is likely to lead to higher earnings later in life, unless working while in high school reduces participation in postsecondary education (Stern & Nakata, 1989; Carr et al., 1996; Marsh & Kleitman, 2005). The best longitudinal study on the effects of employment during high school was the Youth Development Study headed by Jeylan Mortimer. With regard to participa-

tion in postsecondary education, this study found that students who worked steadily rather than sporadically while in high school, and who kept their work hours under 20 hours a week during the school year, were actually more likely to enroll in college, compared to students who worked more than 20 hours a week, and also compared to students who did not work at all (Mortimer et al., 2003). In sum, high school employment consistently leads to higher earnings in the first few years after high school, and does not diminish participation in postsecondary education if it is steady and takes less than 20 hours a week.

The long-term effect of high school employment on occupational success depends on development of productive abilities and behaviors. A large number of studies have pointed to the positive effects of high school employment on development of positive work values, self-confidence, sense of efficacy, planfulness, commitment, and identity formation, among other qualities (Zimmer-Gembeck & Mortimer, 2006).

The quality of the employment experience is also important (Stern & Nakata, 1989). Zimmer-Gembeck and Mortimer summarize,

The following positive dimensions of work may be especially salient: opportunities to use and develop work-related skills; develop interpersonal competencies and overcome social anxiety; take on new responsibilities managing money, customers, supervisees, or time; practice juggling multiple tasks

and problem solving; access others with information about work and career opportunities; and rule out future jobs based on knowledge gained through employment about one's competencies, preferences, and interests. Negative qualities might include unstructured or chaotic work environments; experiences of failure at important work tasks; punitive, coercive, or hostile supervisors, coworkers, and customers; lack of opportunities to learn skills; and dirty, stressful, tiring work. (p. 553)

There is some evidence that the quality of the employment experience is better — and the effects on development of productive abilities and behaviors therefore likely to be greater — in situations where the student's work is supervised by the school. While most students' jobs are completely unrelated to school, some are connected to the high school program — for example, internships, cooperative education placements, and student-run enterprises. Neumark and Rothstein (2007) found that participation in internships, cooperative education, and school-based enterprises had positive effects in the first few years after high school, on both employment and participation in postsecondary education.

The higher quality of school-supervised work experience, compared to students' outside jobs, was evident in studies by Stern et al. (1990, 1992). Students in school-supervised employment reported more favorably than students in non-school-supervised jobs on char-

acteristics such as whether the experience offered opportunities to learn new things, work in teams, perform a variety of tasks, and take initiative. Similar differences appeared when students who were currently participating in both a school-based enterprise and a job outside of school were asked to compare the two experiences: students reported that the school-based enterprise offered more variety, opportunity to learn, and collaboration (Stern et al., 2004). Case studies of school-supervised work-based learning by Bailey et al. (2004) described how this kind of experience can contribute to students' development of confidence, work identity, career awareness, and new modes of thought, in addition to mastery of specific job skills. In addition, teacher supervision of work-based learning makes it easier to connect it with classroom learning, and to give students a place for reflection and analysis of the work experience, contributing to their metacognitive skills and self-knowledge (Darche et al., 2009; Grubb & Badway, 1998; NAF, 2010).

Co-curricular experiences, such as editing a school newspaper, managing a recycling service, or directing a theatrical production, can also build the skills sought. Clubs and co-curricular activities have been shown to produce positive academic and labor market outcomes (Eccles, Barber, Stone, & Hunt, 2003; Eccles, Barber, & Stone, 2003; Kosteas 2010; Feldman & Matjasko, 2005).

Building on past research, the Linked Learning Alliance has developed draft

materials (Linked Learning Alliance, 2012) to define high-quality work-based learning experiences that may include school-based enterprises and similar co-curricular activities as well as traditional work-based learning activities such as internships. Criteria include a clear focus on learning and student outcomes (including development of critical thinking and other important transferable cognitive skills as well as other abilities and behaviors); careful preparation; systematic interaction with professionals; and opportunities for reflection, among others. Adoption of such criteria, or other means to ensure high quality experiences, can help mitigate concerns about the rigor or broad applicability of the proposed measure.

Other Possible Measures

A career readiness index for schools could be constructed to include other indicators, such as the percentage of seniors who have made a written plan for their postsecondary education and careers, completed a CTE course sequence, or obtained an industry-recognized skill certificate or credential. These may have value as additional measures, but we would not consider them substitutes for direct assessment of students' performance at work. Having an educational and career plan may foster "planful competence" and knowledge about next steps that researchers have highlighted as critical to successful transitions (Conley, 2012; ConnectEd, 2012; CCTC, 2012; CRPC, 2012). But, by themselves, plans do not provide sufficient evidence of readiness. Completion of a CTE course sequence

may also be a useful measure, especially if it includes completion of a capstone experience. If the capstone experience is an internship or juried performance, it would already be included in the performance-based measure we propose. Finally, attainment of an industry certificate, either during high school or as a result of postsecondary education, would offer evidence of mastery in a particular occupational area and may also signal qualities such as self-esteem, self-efficacy, and persistence. However, an industry certificate would not explicitly cover the broad range of skills and behaviors we propose to assess through high school students' performance in a job, internship, school-based enterprise, or other qualifying experience. Further, we are seeking a measure that can apply to all students, not only those in CTE programs, just as attainment of the common core state standards in English/language arts and mathematics will apply to all students. If California does decide to count industry certificates as part of its career readiness index, the CDE would have to maintain a list of which certificates would qualify, as some other states have done.

Conclusion

To hold high schools accountable for developing students' career readiness, states need a practical measure that is not too burdensome. Students who perform well in regular, paid jobs are directly demonstrating their readiness for employment, and they are developing abilities and behaviors that contribute to long-term career success. The supervisor's judgment of

a student's performance should include explicit attention to a range of productive abilities and behaviors, to ensure that the job actually provides opportunities to exercise and develop those abilities and behaviors. Satisfactory performance in internships, school-based enterprises, and other qualifying experiences also demonstrates career readiness. Although it might seem that unpaid internships and school-based enterprises are less valid than paid jobs as settings to demonstrate career readiness, the evidence indicates that these school-supervised work experiences actually provide more opportunity to learn and develop the productive abilities and behaviors that contribute to long-term career success.

Giving schools credit for a higher percentage of seniors who earn satisfactory performance ratings in paid jobs, unpaid internships, school-based enterprises, or other qualifying experiences will effectively encourage schools to engage more students in high-quality work-based learning that promotes long-term career success. This measure would supplement assessments of how well students have mastered the common core standards in math and English language arts. The combination of these measures will provide a more balanced and complete assessment of how well students at a high school are prepared for both college and careers.

Endnotes

The authors wish to thank David Plank, Michael Strait, and two anonymous reviewers for comments on earlier drafts.

1 A set of common core standards for CTE has been produced under the leadership of the National

Association of State Directors of Career Technical Education Consortium (2012), but assessments tied to these standards have not yet been developed.

2 The presumption is that a job supervisor or teacher familiar with professional work standards can accurately rate a student's performance. This is the same presumption that applies to the awarding of grades by classroom teachers. NAF is also developing procedures to ensure consistency of ratings by different supervisors.

3 A note on terminology: Heckman labeled these personality variables "non-cognitive," to contrast them with the academic skills and knowledge explicitly taught in schools. For a while, economists followed Heckman in using the term "non-cognitive" as a kind of shorthand for various skills, abilities, dispositions, and behaviors that have not usually been part of the curriculum schools are expected to teach. However, "non-cognitive" is not an accurate label because virtually all human functioning in the context of work involves some kind of cognition, and neurological studies indicate that problem solving involves the limbic system and other subcortical parts of the brain (Damasio, 1994; Phelps, 2006). From an institutional perspective, Bowles, Gintis, & Osborne (2001) characterize the relevant work-related personality traits as "incentive-enhancing preferences" that tend to make people more productive when their effort cannot be continuously monitored by employers. Borghans, Duckworth, Heckman, & ter Weel (2008), discarded the term "non-cognitive skills" in favor of "personality traits," defined as patterns of thought, feelings, and behavior. The word "trait" may be misleading, however, as it suggests immutability — and in fact Borghans et al. show that personality traits are not all determined at an early age. They provide evidence that some work-related traits do not fully develop until the fifth or sixth decade of life. We will therefore minimize the use of the word "trait" in favor of terms such as "personality variables," "capabilities," or "abilities and behaviors."

4 An intriguing puzzle appears in Rosenbaum's analysis (Table 8.3), which uses high school data from the High School and Beyond survey to predict earnings at age 30. Controlling for high school grades, postsecondary educational attainment, and background characteristics, the personality variables that have significant associations with earnings are lack of discipline problems in high school, being popular while in high school, and sometimes cutting class. This last result is anomalous: why should cutting class during high school be associated with higher earnings at age 30? Cutting class was negatively associated with high school grades, as one would expect. One conjecture

(ours, not Rosenbaum's) is that students who cut class were more likely to have jobs during high school, which caused them sometimes to oversleep if they worked late or to choose to work instead of go to class sometimes. Since working during high school can lead to higher earnings later, this could explain the puzzling result. Another study (Hart Research Associates, 2012) found that most students skipped school because they were bored and most did not see skipping school occasionally as a problem. Another conjecture might therefore be that some students are ready for more meaningful challenges than school affords and/or are willing to take calculated risks, as is necessary in real work situations.

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