



When you say nothing at all: The predictive power of student effort on surveys



Collin Hitt, Julie Trivitt, Albert Cheng*

University of Arkansas, Department of Education Reform, 208 Graduate Education Building, Fayetteville, AR 72701, United States

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ABSTRACT

Character traits and noncognitive skills are important for human capital development and long-run life outcomes. Research in economics and psychology now shows this convincingly. But research into the exact determinants of noncognitive skills has been slowed by a common data limitation: most large-scale datasets do not contain adequate measures of noncognitive skills. This is particularly problematic in education policy evaluation. We demonstrate that within any survey dataset, there is important latent information that can be used as a proxy measure of noncognitive skills. Specifically, we examine the amount of conscientious effort that students exhibit on surveys, as measured by their item response rates. We use six nationally-representative, longitudinal surveys of American youth. We find that the percentage of questions skipped during the baseline year when respondents were adolescents is a significant predictor of later-life educational attainment, net of cognitive ability. Insofar as item response rates affect employment and income, they do so through their effect on educational attainment. The pattern of findings gives compelling reasons to view item response rates as a promising behavioral measure of noncognitive skills for use in future research. We posit that response rates are a measure of conscientiousness, though additional research is required to determine what exact noncognitive skills are being captured by item response rates.

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1. Introduction

Noncognitive skills have an important influence on educational attainment, labor market outcomes, and other measures of well-being. This finding has been a key contribution of human capital research and personality psychology over the past two decades (Almlund, Duckworth, Heckman, & Kautz, 2011; Borghans, Duckworth, Heckman, & Weel, 2008a; Borghans, Weel, & Weinberg, 2008b; Bowles, Gintis, & Osborne, 2001; Deke & Haimson, 2006; Heckman, 2000; Heckman & Kautz, 2012; Heckman & Rubinstein 2001; Heckman, Stixrud, & Urzua, 2006; Kaestner & Callison, 2011; Lindqvist & Vestman, 2011;

Lundborg, Nystedt, & Rooth, 2014; Mueller & Plug, 2006). However, as researchers turn to policy questions regarding noncognitive skills, they encounter a pervasive data challenge: the large national datasets commonly used in economics, and the administrative datasets used in public policy research, do not contain adequate measures of noncognitive skills.

Some survey and administrative datasets contain no measures of noncognitive skills at all. Other survey datasets do contain just a few self-reported scales designed to capture skills such as academic effort and locus of control. But even when self-reported data are collected, scale scores based on self-reports contain poor information about students who are not conscientious enough to complete the survey. We explore a new noncognitive measure based on the effort that students seem to exhibit on the surveys.

* Corresponding author. Tel.: +1 4795756345.

E-mail addresses: cehitt@uark.edu (C. Hitt), jtrivitt@walton.uark.edu (J. Trivitt), axc070@uark.edu (A. Cheng).

Specifically, we examine the frequency with which students skip questions or answer “I don’t know.” This variable can be used in datasets that contain no other variables of noncognitive skills. And in datasets that contain at least some traditional measures such as student self-reports, item response rates can be added to gain a fuller picture of students’ noncognitive skills.

Survey methodology research (e.g. [Krosnick & Presser, 2010](#); [Smith, 1995](#)) has shown that survey response rates—the rate at which respondents actually answer the questions posed to them—are driven strongly by factors other than cognitive ability. Long, low-stakes surveys require conscientious effort to complete, much like the daily busy-work of school and employment. In education and human capital research, little work has been done using item response rates, or other indicators of effort on surveys, as a measure of noncognitive skills.

In our analyses of six large-scale datasets, we seek to validate item nonresponse as a control variable for noncognitive skills. We show that it is predictive of educational outcomes, after controlling for a broad range of student and household demographic characteristics. The specific datasets we examine are the National Longitudinal Survey of Youth 1979 (NLSY:79), the National Longitudinal Survey of Adolescent Health (Add Health), The National Educational Longitudinal Study of 1988 (NELS:88), High School and Beyond (HSB:80), the National Longitudinal Study of Youth 1997 (NLSY:97), and the Educational Longitudinal Study of 2002 (ELS:02). These are important datasets for social science research. All of them follow nationally representative samples of American adolescents into adulthood.

We find evidence that survey item response rates capture important behavioral traits that are largely not captured by cognitive tests. By definition, they appear to capture noncognitive skills. Item response rates consistently predict later educational attainment as standalone variables in sparse models. Before controlling for cognitive ability, item response rates are significantly predictive of later educational attainment in all six datasets. In the four datasets where item nonresponse is a significant predictor of educational attainment while controlling for cognitive ability, a one standard deviation increase in item response rates is associated with completing 0.10–0.30 additional years of schooling. We also examine the association with labor-market outcomes. Insofar as the skills captured by item response rate and self-reports influence wages and employment, they appear to do so mostly through their effect on educational attainment.

This study makes three important contributions. First, it shows that most surveys also contain a behavioral, non-self-reported measure of noncognitive skills. It is important to have an objective measure. What respondents say about their noncognitive skills does not always reflect how they behave; item response rates provide behavioral information about respondents who may not have otherwise provided reliable information about themselves. Second, we identify a measure that can be used in datasets that contain no other valid measures of conscientiousness or academic effort. And third, we demonstrate the importance of thinking more creatively about existing data. Surely other latent measures of noncognitive skills exist in

survey data that can provide additional new information about noncognitive skills, which we urge other researchers to explore.

The article proceeds as follows. In [Section 2](#), we review the economics literature on noncognitive skills, recent work from psychology highlighting measurement challenges, and survey methodology research on the problem of item nonresponse. In [Section 3](#), we describe the national datasets used for our analysis. In [Section 4](#) we discuss our empirical models. In [Section 5](#), we present the results of our analyses. In the final section, we discuss the results that suggest survey item response rates are a relevant source of missing information on important student noncognitive skills.

2. Literature review

2.1. Survey research in economics and psychology

Noncognitive skills are called *non-cognitive* for a simple reason. They are the personality factors, character traits, emotional dispositions, and social skills that tests of cognitive skills fail to capture. Both noncognitive and cognitive skills influence educational attainment and earnings. Economists have recognized that students with similar cognitive abilities vary widely in educational and labor-market outcomes later in life ([Heckman & Rubinstein, 2001](#)). However, the specific noncognitive skills that predict educational attainment and earnings are often unobserved. In such analyses, the effect of noncognitive skills on these outcomes was presumably relegated to the residual, ascribed as measurement error or as a problem of omitted variables. This measurement challenge affects program evaluation and public policy analysis: for example, preschool and school-voucher programs have been shown to improve educational attainment without improving cognitive skills. The implied effect on noncognitive skills went unmeasured in the years immediately following the intervention ([Chingos & Peterson, 2015](#); [Duncan & Magnuson, 2013](#)).

The field of personality psychology provides key insights into the noncognitive skills that play an important role in educational attainment. A personality trait that continually reemerges in the literature is conscientiousness. It and related behavioral traits such as grit and locus of control are now understood to be independently linked to academic and labor-market outcomes ([Almlund et al., 2011](#)). Conscientiousness is “the degree to which a person is willing to comply with conventional rules, norms, and standards” ([Borghans et al., 2008b](#); [Hogan & Joyce, 2007](#)). Facets of conscientiousness include orderliness, industriousness, responsibility and self-control ([Jackson et al., 2010](#)). With respect to educational outcomes, conscientious students are more likely to complete homework assignments, less likely to skip class, and tend to attain higher levels of education ([Credé, Roch, & Kieszczynka, 2010](#); [MacCann, Duckworth, & Roberts, 2009](#); [Poropat, 2009](#); [Trautwein, Lüdtke, Schnyder, & Niggli, 2006](#); [Tsukayama, Duckworth, & Kim, 2013](#)). Conscientious workers are less likely to engage in counterproductive behaviors at work ([Dalal, 2005](#); [Roberts, Harms, Caspi, & Moffitt, 2007](#)); for

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