

No cover
image
available

The Oxford Handbook of Social Stratification

Markus Gangl (ed.) et al.

<https://doi.org/10.1093/oxfordhb/9780197539484.001.0001>

Published: 2023

Online ISBN: 9780197539514

Print ISBN: 9780197539484

CHAPTER

The “Dark Matter” of Stratification Research: Noncognitive Characteristics, Socioeconomic Attainment, and Social Mobility

Michelle Jackson, Sophie Moullin

<https://doi.org/10.1093/oxfordhb/9780197539484.013.32> Pages C32S1–C32P146

Published: 20 June 2023

Abstract

For many decades, it has been clear that noncognitive characteristics play an important role in processes of stratification and mobility, yet it has only been recently that the study of noncognitive characteristics has coalesced into a distinctive subfield of stratification research. Many social scientists are unfamiliar with standard measures of noncognitive characteristics and thus have not considered how basic models of the stratification and mobility process might be adapted to take account of noncognitive characteristics. This chapter provides stratification researchers with a clear introduction to noncognitive characteristics, covering measurement, theory, and the existing empirical consensus with respect to educational and occupational attainment, earnings, and mobility. It discusses outstanding theoretical and empirical challenges within the field and calls for a renewed focus on theory development in future studies of noncognitive characteristics and socioeconomic attainment.

Keywords: [noncognitive characteristics](#), [educational attainment](#), [occupational attainment](#), [social mobility](#), [human capital](#)

Subject: [Economic Sociology](#), [Sociology](#)

Series: [Oxford Handbooks](#)

Collection: [Oxford Handbooks Online](#)

1. Introduction

The idea that character matters is central to our great works of literature and the dramatic arts. Modern-day politicians routinely appeal to founding myths linking flair and fortune, and in one of the most famous speeches of the twentieth century, Dr. Martin Luther King imagined a future in which children would “not be judged by the color of their skin but by the content of their character.” Yet despite the ubiquity of character in our historical and contemporary narratives, the study of noncognitive characteristics has only recently coalesced into a distinctive subfield of stratification research. The slow development of this field is

understandable considering the many challenges that confront researchers. These include a lack of conceptual and theoretical clarity with respect to noncognitive characteristics; a lack of agreement on which characteristics should be classified, measured, and studied; and the fragmentation of research across different social science disciplines.

There is not even agreement on how the diverse set of noncognitive characteristics should be labeled. The term “non-cognitive skills” came to dominate the field following its introduction by Heckman and Rubinstein (2001), though the label was originally designed to simply describe differences in wages not captured by standard measures of skills or human capital. As Heckman and Rubinstein explained, their work was “written in the spirit of ‘dark matter’ research in astrophysics ... [and] established the quantitative importance of non-cognitive skills without identifying any specific non-cognitive skill” (149). However, the descriptor “skill” contains strong assumptions about whether noncognitive characteristics are productive, inherited, or malleable. In this chapter, we therefore use the term *noncognitive characteristics* as an umbrella label for a set of self-beliefs, including self-efficacy, self-esteem, aspirations, and personality identifications, and self-related behaviors—including self-control and the absence of internalizing and externalizing problem behaviors.

Our primary aim is to provide an overview that will reduce the costs of entry to this important field. We provide a brief history of the social stratification research on noncognitive characteristics, before describing the major conclusions of the field as it stands today. We then turn to issues of theory and measurement and provide an overview of the standard concepts and measures of noncognitive characteristics included in the data sources that are typically available to social scientists. We ask how malleable noncognitive characteristics are, speaking to the question of whether they should properly be characterized as “skills” rather than “traits.” Finally, we consider outstanding questions that need to be addressed to advance our understanding of the role of noncognitive characteristics in the stratification and mobility process.

2. A Brief History of Social Stratification Research on Noncognitive Characteristics

The slow development of a coherent field focusing on noncognitive characteristics may be surprising to those familiar with the stratification literature of the past five decades, where the study of noncognitive characteristics has been hiding in plain sight. Key contributions are found in sociology, economics, and psychology from the mid-twentieth century on.

2.1. 1950s–1970s: The Status Attainment Model and Its Critics

In the late 1950s, scholars at the University of Wisconsin–Madison were working to develop a comprehensive model of status attainment using individual and family characteristics to predict educational and occupational attainment. The classic model of status attainment explained the process of intergenerational mobility via the mechanism of educational attainment, and research based on that model showed that much of the intergenerational transmission of socioeconomic status (SES) could, in fact, be accounted for by the effects of parents' SES on child's education, and the effects of educational attainment on child's SES (Blau and Duncan 1967). Further development of status attainment models expanded the set of causal mechanisms linking parents' and child's socioeconomic positions, culminating in the Wisconsin model of status attainment (Sewell and Hauser 1974; Sewell, Haller, and Ohlendorf 1970; Sewell, Haller, and Portes 1969). The Wisconsin model proposed that “social-psychological variables” played a central role in the process of status attainment; and indeed, Haller and Portes (1973, 88) concluded that “practically all the effect of family's position on educational and occupational attainments is due to its impact on the formation of status aspirations and significant others' encouragement of their enactment.”

The Wisconsin model's social-psychological variables are primarily attitudinal measures and account for a limited set of all the noncognitive characteristics that could be included in a stratification model. An alternative approach to including noncognitive characteristics in an explanatory model of the stratification process is found in *Who Gets Ahead?*, published by Jencks and colleagues (1979). One study in this influential collection highlighted that an array of noncognitive characteristics, including “industriousness” and “executive leadership,” were consequential for educational and occupational attainment, and that, notably, the effects of noncognitive characteristics largely operated independently of the effects of social background and cognitive ability (i.e., adjusting for noncognitive characteristics did not reduce the origin–destination association). As a reviewer of the book observed, “We have a long way to go before we meld personality theory on status attainment models or empirically identify and measure a few simple personality traits that are essential” (Smith 1981, 426).

The 1970s, then, saw important contributions by sociologists to the literature on noncognitive characteristics. But the decade also saw the publication of work by economists that would be influential for how social scientists would think about noncognitive characteristics in processes of status attainment. The publication of *Schooling in Capitalist America*, by “heterodox economists” Samuel Bowles and Herbert Gintis, was a defining moment in the history of the noncognitive field. Bowles and Gintis (1976) argued, not just that “non-cognitive personality factors” mattered for social reproduction, but also that schools actively inculcated those noncognitive characteristics that would be valued in the workplace. Because schools rewarded self-motivation and self-discipline in the classroom, the characteristics needed for success in school corresponded to those needed for success at work (116). Bowles and Gintis's emphasis on the demand side—the noncognitive characteristics valued and promoted by educational and workplace institutions—was a stark departure from previous models of status attainment that conceptualized noncognitive characteristics simply as attributes of individuals that were inherently valuable. Instead, noncognitive characteristics were desirable in the workplace because they were vital to the functioning of low-skilled labor markets (Bowles, Gintis, and Osborne 2001; see Acemoglu, 2021, for an updated, formalized version of this argument).

2.2. 1980s and 1990s: Preferences, Choices, and Cultural Capital

Although research on noncognitive characteristics continued in the 1980s, the gains of the 1970s studies were exploited mainly by researchers outside the stratification field. Work on noncognitive characteristics proliferated in psychology and management studies, where the focus was on the fit between “personality characteristics” and different occupations. Personality was considered to be an innate preference that influenced occupational choices rather than a malleable and productive skill (Holland 1985). In a meta-analysis of over a hundred studies of personality characteristics, Barrick and Mount (1991) found strong differences across occupations in the types of noncognitive characteristics that were valued. Extraversion was valued when it came to entry into managerial and sales occupations but was less important for accessing other occupations. For entry into professional occupations, emotional stability was a negative predictor, and indeed, “highly-strung” individuals performed better (Barrick and Mount 1991, 20). Such results, Filer (1986) concluded, “are generally consistent with a well-functioning labor market that sorts workers into jobs satisfying their individual preferences” (412).

Although personality research in the human resources field often sidestepped the questions that were of most interest to stratification researchers, this period also marked the beginning of a cultural turn in sociology, primarily due to the influence of Bourdieu’s work on cultural capital. Bourdieu stressed that a person’s behavioral dispositions and personality were tightly connected to both their family of origin’s social and economic position and their chances of success in education and employment. At the same time he emphasized—through his concept of *habitus*—that while a person can change the way they think, feel, and behave, they cannot do so easily or independently of their past, present, or imagined future social context (Lamont and Lareau 1988; Bourdieu and Wacquant 1992). Work in the cultural capital tradition therefore placed great weight on noncognitive characteristics in the stratification process, but conceptualized these characteristics as durable, embodied, and (socially) heritable, having payoff only within a given social and institutional context. In contrast to other stratification research on noncognitive characteristics, empirical work in the cultural capital tradition is unconcerned with identifying or quantifying associations between externally validated measures of noncognitive characteristics and particular outcomes.

2.3. 2000s Onward: Noncognitive “Skills” as Human Capital

When mainstream labor economists turned to the study of noncognitive characteristics in the early 2000s, they found the roots in Jacob Mincer’s classic research on wages. Mincer (1958) had proposed that differences in earnings should be understood as resulting from differences in investments in human capital, a latent concept capturing productive capacities and skills, operationalized in empirical work as educational investments and levels of experience (Becker 2006; Lemieux 2006). Over time, human capital models were refined, and in an influential 2001 paper on the General Educational Development (GED) Test of high-school-level cognitive skills, Heckman and Rubinstein (2001) recognized the limited ability of cognitive skills to account for heterogeneity in wages at the individual level. Heckman’s subsequent work, often carried out in collaboration with psychologists, expanded the notions of “skill” and “human capital” to include noncognitive characteristics.

Over the past two decades, studies of the effects of noncognitive characteristics on socioeconomic outcomes have proliferated across the social sciences. Three key conclusions may be drawn from the contemporary literature.

First, noncognitive characteristics are predictive of educational attainment at the elementary, secondary, and tertiary levels. In elementary and secondary schooling, noncognitive characteristics aid the learning process and improve performance on standardized tests, even if measures such as “grit” have been found to be much more predictive of teacher-assigned school grades than of standardized test scores (Duckworth and Seligman 2006). The effects of noncognitive characteristics on educational attainment differ by socioeconomic background and by cognitive skill. Conscientiousness, for example, has been shown to influence entry into the academic track in Germany, but the effects are much greater for children from high-SES families with low levels of cognitive skill (Gil-Hernández 2021). High levels of behavior problems negatively affect test scores for children across the parental SES distribution, but they affect grade retention only for those with low-SES parents (Currie and Stabile 2006). Noncognitive characteristics also help to account for racial and gender inequalities in education. Owens and McLanahan (2020) find that the behavioral problems exhibited by African American students are particularly heavily penalized by schools, and Owens (2016) finds that externalizing behavioral problems in early childhood help to account for boys’ lower educational attainment.

With respect to higher education, noncognitive characteristics are highly predictive of who gets into college, and who succeeds in college. Academic self-efficacy is associated with academic performance, college preparedness, and a successful transition to college (Chemers, Hu, and Garcia 2001; Granger and Noguera 2015; Heckman, Stixrud, and Urzua 2006). Once again, the effects of noncognitive characteristics differ by socioeconomic background and gender (Lundberg 2013).

A second key conclusion to be drawn from the contemporary literature is that noncognitive characteristics are predictive of earnings, occupational attainment, and socioeconomic position, although the effect is often indirect, operating through educational attainment. Higher self-efficacy, for example, predicts greater annual earnings and more rapid earnings growth (Heckman, Stixrud, and Urzua 2006; Judge and Hurst 2007; Kautz et al. 2014). Osborne Groves (2005) finds that, for White women, self-esteem and extraversion are associated with higher wages, while fatalism, aggression, and withdrawal are associated with lower wages. As with educational attainment, wage returns to noncognitive characteristics differ by gender. A recent analysis finds that personality characteristics have a larger effect on women’s wages than on men’s, and that some characteristics generally seen as desirable, such as agreeableness, are in fact penalized when they are found in women (Nyhus and Pons 2005).

With respect to occupational attainment and socioeconomic position, Heckman, Stixrud, and Urzua (2006) find that the probability of attaining a white-collar job in the United States is positively predicted by a latent measure of noncognitive skills. Similar results are found for social class and SES. For example, Moffitt and colleagues (2011) find that, in New Zealand, self-control is positively associated with occupational prestige, when conditioning on parental SES (see also Jackson 2006). In the United Kingdom, Moullin (2021) finds that even net of teacher-rated self-control, working-class children’s lower self-efficacy and self-esteem at age 10 helps to account for their lower chances of reaching the managerial and professional class. Noncognitive characteristics also increase the likelihood that an individual will enter self-employment. Blumberg and de Graaf (2004) find that while openness and creativity have positive effects on entry to self-employment, conscientiousness has a negative effect.

The third key conclusion that may be drawn from the contemporary literature is that there are payoffs and penalties to particular characteristics in particular occupations or sectors of the economy. Building on the gains of the psychology and human relations research of the 1980s, stratification researchers have identified a key distinction between occupations that involve social interaction with customers and fellow employees and occupations that are more solitary and reliant on technical skills. For example, Jackson (2006) shows that withdrawal behaviors measured in childhood are negatively associated with entry into managerial occupations. The variable importance of noncognitive characteristics across different types of occupation takes on particular significance when we consider recent changes in the structure of the labor market. The occupations that are most consistently found to reward noncognitive characteristics—in particular, managerial occupations and those in the sales and personal services sector—have increased as a proportion of the labor force in most late-industrial societies (Jackson, Goldthorpe, and Mills 2005; Deming 2017). Further, evidence shows that for professional occupations, which represent a large and growing sector of the economy, employers are very likely to include requirements for noncognitive characteristics in job advertisements (Dörfler and van de Werfhorst 2009; Jackson 2007). In contrast, for technical and manual occupations, which have been a declining sector for many decades, employers are less likely to require noncognitive characteristics. As we look to the future of the labor market, the occupations for which noncognitive characteristics are the most valued are the ones most likely to experience continuing growth.

3. Theory and Measurement

3.1. Theoretical and Terminological Considerations

Noncognitive characteristics are alternatively described as *skills* or *traits* in the research literature. These alternative characterizations are far from accidental. Rather, the terminology reflects the assumed model linking noncognitive characteristics to educational and occupational attainment. In broad terms, the skill descriptor is associated with human capital and supply-side theories of attainment; whereas demand-side theories are more likely to use the trait descriptor.

In the human capital framework, noncognitive skills are defined in opposition to cognitive skills, or intelligence. Heckman and Rubinstein (2001) introduced the term “non-cognitive skills,” as a label for the heterogeneity in individual economic outcomes not captured by standard measures of human capital. The skill descriptor is emphasized in the human capital tradition for two reasons. First, noncognitive characteristics are believed to be malleable and thus responsive to policy intervention. Heckman is explicit that it is the potential for malleability that justifies the use of *skill* as a descriptor rather than *trait* (Heckman and Kautz 2013). Noncognitive skills are considered particularly responsive to intervention in the preschool period, and much of the research on early intervention focuses on the payoffs to the noncognitive skill development achieved through preschool programs. Whether noncognitive characteristics are malleable is an active area of research, as we discuss below, but psychologists often emphasize the heritability and stability of personality over the life course.

A second reason one might embrace the skill descriptor is that noncognitive characteristics have payoff throughout the life course. Noncognitive characteristics are the “skills that beget skills”; they are the mental capacities, orientations, and motivations that allow for self-development (Borghans et al. 2008; Heckman, Jagelka, and Kautz 2019). Noncognitive characteristics also provide the skills for self-regulation—that is, the effort, application, and motivation needed to be productive. Expanding the skill concept to include noncognitive characteristics improves the predictive power of the human capital model, while also preserving the principle that individual economic outcomes should reflect differences in productivity.

An alternative treatment of noncognitive characteristics can be found in approaches that give more weight to the demand side of occupational attainment. From a demand-side perspective, the labor market payoff to noncognitive characteristics must be understood in terms of the match between individual characteristics and workplace requirements. Noncognitive characteristics can be understood to be of value to employers, because such characteristics are productive within a particular labor market configuration or because they signal that individuals are a good “fit” with the prevailing cultural norms. In the former tradition, research has consistently demonstrated that certain noncognitive characteristics are valuable for performance in particular occupations. *Schooling in Capitalist America* (Bowles and Gintis 1976), for example, describes schools rewarding docility and conformity to prepare students for entry into the labor market. Some characteristics—such as extraversion and friendliness—are associated with increased rewards in occupations that require social interactions between employees and customers (Jackson, Goldthorpe, and Mills 2005). Studies such as these emphasize that the functional requirements of occupations lead to selection on those noncognitive characteristics that increase productivity, and to increased wages and promotion prospects for individuals with the requisite attributes. The latter demand-side tradition is associated with sociological, cultural capital approaches to understanding the payoff to noncognitive characteristics. Although cultural capital approaches accept that noncognitive characteristics are valuable in the labor market, the cultural capital model emphasizes that the value of any noncognitive characteristic is determined through relational and institutional processes.

Demand-side approaches tend to use the term *trait* rather than *skill* to emphasize that the value of a given noncognitive characteristic to an individual is determined by those valuing the characteristic. The trait descriptor also emphasizes, consistent with the idea of cultural capital, that noncognitive characteristics might be difficult for an individual to acquire or change. The skill descriptor is inconsistent with a conception of noncognitive characteristics that assumes them to be relatively fixed.

A further complication is that the term “noncognitive” is a misnomer. Many noncognitive constructs and measures are developed in cognitive psychology and emphasize the primacy of thought or cognition over behavior. Many commonly referenced characteristics, including conscientiousness, effort, persistence, and delay of gratification, are classified by psychologists under the construct of “cognitive control” (Mischel et al. 2011). Psychiatrists use behaviors indicating a lack of self-control to diagnose attention deficit hyperactivity disorder (ADHD) and other forms of neurodiversity. It is simply not practical, then, to draw a bright line between cognitive and noncognitive characteristics, such that the “noncognitive” characteristics can be identified straightforwardly as not cognitive.

3.2. The Measurement of Noncognitive Characteristics

One important consequence of the lack of consensus within the noncognitive field is that there is little agreement on which noncognitive characteristics should be measured, and which measures might be of most value to stratification researchers. To a very large extent, empirical research has been forced to rely on whichever measures of noncognitive characteristics data collectors have chosen to include. Measures differ across countries, time periods, and data sources, making cumulation difficult, and direct replication across multiple datasets almost impossible.

Regardless of the underlying theory linking noncognitive characteristics to occupational and economic attainment, most empirical studies in this field make use of two broad kinds of measures: *behaviors* and *(self-)beliefs*. The gold standard for the measurement of noncognitive characteristics is direct observation of behaviors and self-beliefs. However, stratification researchers almost never have access to data in which such measures are included. This is because to quantify the effects of noncognitive characteristics on subsequent attainment, social scientists require individual-level data, ideally longitudinal, with a sample size large enough to permit reliable inference. Most of the studies cited in this chapter relied on survey data that included questions eliciting information on behaviors and self-beliefs. Relative to direct observational measures, survey measures are likely to have weaker correspondence with real-world behaviors (Humphries and Kosse 2017).

Table 1 summarizes the most common measures exploited in the literature on noncognitive characteristics. We distinguish between the measures of behavior and of beliefs, but the two types of measures are, of course, linked. Beliefs, especially core beliefs, both influence and reflect behaviors; a person's beliefs are a consequence, as well as a cause, of their behaviors.

Behavioral measures are almost always measures of behavioral problems observed during childhood. These measures are usually captured via reports of behavior in childhood and adolescence, usually elicited from parents (most often, the mother) or teachers. In line with clinical psychologists' classifications of mental health and behavioral disorders, these negative behaviors are usually subcategorized into *internalizing* behaviors, directed inward toward the self, and *externalizing* behaviors, directed outward toward others. In early to middle childhood, internalizing behaviors include crying on arrival at school; externalizing behaviors include irritability and hyperactivity, as well as aggression and defiance. In general, a threshold will be established that captures whether the behavior is a "problem"; such thresholds often correspond to those used in the diagnosis of mental health or behavioral disorders. Although behavioral measures typically rely on the direct observation of behaviors in "natural" settings, research shows that parent and teacher assessments frequently differ from one another and from clinical observations (Clarke-Stewart et al. 2003; Rescorla et al. 2014). It is unknown to what extent these divergences reflect differences in children's behavior in different settings or differences in the ability of different observers to provide unbiased assessments.

A frequently exploited concept in the literature on noncognitive characteristics is *self-control*. Self-control is an umbrella construct describing the generalized capacity to control one's behavior, and it was initially identified through observation of behaviors in an experimental context. Self-control was famously examined in Mischel et al.'s (2011) Marshmallow test experiment, in which preschool children were presented with a marshmallow or pretzel stick and instructed that they were welcome to eat the treat, but that they would receive two treats if they waited for fifteen minutes without eating the first. Longitudinal surveys more commonly ask parents or teachers about young children's task persistence or completion, attention, and ability to delay gratification (Moffitt et al. 2011). For adults and older children, self-control is measured through self-reports and so is more accurately described as a belief about one's behaviors. Angela Duckworth's Grit Scale measure, for example, asks individuals to report their own persistence behavior and elicits their passions, or preferences, for long-term goals (Duckworth et al. 2007).

Measurements of beliefs capture beliefs about the self, including beliefs about one's worth, capacity to change and control one's environment, and expectations of and aspirations for one's future. Psychological, cognitive, and emotional processes can be thought of as behaviors that act on the person's self (Stets and Burke 2003). Because such behavioral processes are difficult to observe, most studies do not measure a person's actual psychological, cognitive, or mental behaviors but their beliefs about those behaviors. Behavioral measures are commonly used in studies of early childhood, but cognitive capacity has developed sufficiently by mid-childhood to support a concept of self, and measures of beliefs can be used instead.

In general, the questions used to measure self-beliefs ask respondents how far a thought pattern or adjective accurately describes them. For example, a respondent might be asked to indicate on a continuous scale how far they agree with the statement, “I work hard in my job.” As with all measures of beliefs, such measures tell us how people think about themselves; we do not observe how they actually behave in a range of circumstances. An employee’s assessment of their conscientiousness (as measured via their identification with the words “hardworking” or “responsible”) may be at odds with their manager’s assessment. Many studies, in fact, suggest that beliefs do not correspond well to observed behaviors (Borgonovi, Ferrara, and Piacentini 2020). It is vital to keep in mind that measures of self-belief reflect a desired or imagined self, as well as an extant self.

One class of measures of beliefs captures *self-concept*, a summary evaluation that refers to core beliefs about oneself. Within this class, we find measures of self-efficacy, locus of control, and self-esteem. *Self-efficacy* refers to beliefs about one’s capacity to complete tasks successfully, and thus to shape one’s environment and life. Although the recently popular “growth mindset” concept is related to self-efficacy, it is focused on the belief in one’s ability to develop and improve one’s skills (Claro, Paunesku, and Dweck 2016). *Locus of control* describes beliefs about one’s capacity to determine the course of one’s own life: individuals with an internal locus of control believe that they have a high degree of control over their life; those with an external locus of control believe that forces outside their control determine their life. Although self-efficacy and locus of control are similar concepts, self-efficacy is situationally specific; whereas locus of control captures generalized beliefs. Locus of control is usually measured via the Rotter Scale (Rotter 1966), which is included in a number of the longitudinal surveys exploited in stratification research. Finally, *self-esteem* is a belief about one’s worth or value as an individual, usually elicited relative to the perceived value or worth of others (Cast and Burke 2002). Low self-esteem is typically associated with internalizing problem behaviors, but it also predicts externalizing behaviors (Donnellan et al. 2005).

A second class of belief measures captures *personality*. Measures of personality are numerous, and range from the Myers-Briggs classification, widely used in human resources applications, to the “Big Five” model of personality that is frequently exploited in scientific research. The Big Five refers to the traits derived from the Five-Factor Model (FFM) of personality: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Under the FFM, it is assumed that certain personality characteristics will have a clear relationship with socioeconomic attainment (Hoyle 2010). It is hypothesized, for example, that more openness to experience, a higher degree of conscientiousness, agreeableness, and less neuroticism are associated with higher attainment. Insofar as the datasets exploited by social scientists include direct measures of personality, those measures are likely to be the Big Five. Nevertheless, the validity of the FFM has been challenged, and a wide range of different personality classifications are found in the literature on noncognitive characteristics (Boyle 2008).

The final type of belief measure, long employed in stratification research, is *expectations and aspirations*, used to capture beliefs about one’s future attainment. In theory, expectations and aspirations may be distinguished from each other: *expectations* capture realistic appraisals, whereas *aspirations* may (in some cases) reflect idealistic fantasies. In practice, however, as Morgan (2007) notes, the questions used to measure each are similar, and both capture beliefs about the future self. In the stratification field, we may also distinguish between measures of specific expectations and aspirations and more general expectations and aspirations. Specific measures ask respondents about their expected future educational or occupational attainment; general expectations or aspirations ask respondents about their chances of obtaining a “well-paying job” or having a better life than their parents. Measures of expectations and aspirations are sometimes combined with other noncognitive measures. Hitlin and Johnson (2015), for example, argue that a combination of optimistic general life expectations and self-efficacy indicates that a respondent has agency over their life.

There are, of course, many other characteristics that are measurable at the individual-level, and that could explain at least some of the residual variation in attainment that is unexplained by cognitive ability. Attractiveness has been found to have substantial effects on socioeconomic outcomes (Monk, Esposito, and Lee 2021) and plausibly also reflects and shapes personality and self-concept. The effects of health status or disability on attainment remain understudied, and the distinction between the physical and mental components of health and disability is rarely a sharp one. Nonacademic or extracurricular activities might also be understood to be signals of underlying preferences or personality characteristics (Protsch and Solga 2015). Motivation and attitudes about risk, money, and work—often labeled *preferences* in the economic literature—are related to personality and associated with socioeconomic attainment (Heckman, Jagelka, and Kautz 2019). Even from this partial list, it is clear that many human behaviors and characteristics exist outside standard measures of cognitive traits. For this reason, the study of noncognitive characteristics within stratification is best advanced when we restrict its scope to the study of social-psychological beliefs and closely associated behaviors.

Table 1. Common Measures of Noncognitive Characteristics

Constructs				Example Questions
BEHAVIORS	Mental health	Anxiety	Internalizing behavior problems	“Is nervous or fidgety” “Frequently wets bed” “Cries on arrival at school”
		Self-regulation (Conduct disorders /ADHD)	Externalizing behavior problems	“Frequently fights with other children” “Very restless” “Engages in risky behaviors”
			Self-control <i>(Attention, task persistence, delayed gratification)</i>	“Pays attention in class” “Fails to finish tasks”
BELIEFS	Self-evaluation (Self-concept)		Self-efficacy and locus of control <i>(Mastery, locus of control)</i>	“It’s almost useless to try in school.” (Reversed) “There is little I can do to change the important things in my life.” (Reversed)
			Self-esteem	“There are lots of things about myself I would change.” (Reversed)
	Personality (Big 5)		Openness to experience	“Curious”
			Conscientiousness	“Hardworking”
			Extraversion	“Sociable”

Expectations and Aspirations	Agreeableness	“Warm”
	Neuroticism	“Worrying”
	Specific	“In school in five years’ time” “Highest grade expected” “Occupational plans at age 35”
	General	“Life will turn out better for you than it has for your parents.” “You will have a job that pays well.”

4. Intergenerational Transmission, Training, and Malleability

For stratification and mobility researchers, a fundamental question is whether noncognitive characteristics are intergenerationally transmitted. If noncognitive characteristics aid educational or occupational attainment, and if these traits are transmitted across generations, then noncognitive characteristics must be included in any plausible model of intergenerational inheritance. A further issue of interest to researchers is whether noncognitive characteristics are malleable, and if they are, whether training or other policy interventions could aid in the development of these traits. Drawing on separate lines of research, we consider how far noncognitive characteristics exhibit intergenerational *continuity*, genetic *heritability*, *stability* over the life course, and *responsiveness* to policy interventions and social change.

Assessments of intergenerational *continuity* focus on the associations between parents' and children's noncognitive characteristics. The number of datasets containing measures of noncognitive characteristics over two or more familial generations is small, so such assessments as we do have cannot be assumed to be conclusive. But research shows that continuity in levels of noncognitive skills between parents and children is substantial, and comparable to the intergenerational continuity in cognitive ability (Mood, Jonsson, and Bihagen 2012). Even so, parental and child noncognitive characteristics are far from perfectly correlated. Studies of sibling correlations in noncognitive traits return estimates between 0.2 and 0.4, with the estimate sizes differing across specific traits and samples (Mazumder 2007; Anger and Schnitzlein 2016). Sibling correlations with respect to cognitive skills tend to be around twice as large. The sibling correlations estimated for noncognitive characteristics tend to be higher for sisters than for brothers, marking an important contrast with correlations estimated for cognitive skills, which are similarly correlated between sisters and brothers.

Similarities in skill levels within families reflect both shared environments and genetic similarities, and there is a rapidly developing field that is working to understand the genetic foundations of noncognitive characteristics, usually described as *heritability*. Recent studies suggest that genetic contributions to noncognitive characteristics might be substantial. Estimates of heritability from twin studies average around 0.50 for self-beliefs, self-concept, and personality, although this average conceals a wide range of reported estimates across relevant studies (Bouchard and McGue 2003). For self-control and behavior problems, measures of heritability are much higher when using teacher and parent reports (up to 0.79) rather than self-reports (as low as 0.44; Willems et al. 2018). Heritability estimates also vary according to the age at which they are assessed and how stable the trait is over the life course. In a recent study using a range of noncognitive characteristics measured at multiple points from early childhood onward, consistent nonzero heritability estimates were observed only for problem behaviors (Morris et al. 2021).

Genome-wide association studies (GWAS), which examine population-level associations between genetic variants and particular outcomes, have opened a new avenue of investigation. One study, by Demange et al. (2021), shows that about half of the genetic variation in educational attainment is not accounted for by performance on cognitive tests. In describing their results, the authors summarize, "Noncognitive genetics were enriched in the same brain tissues and cell types as cognitive performance, but showed different associations with gray-matter brain volumes ... For socioeconomic success and longevity, noncognitive and cognitive-performance genetics demonstrated associations of similar magnitude" (35).

It is likely that GWAS will contribute a great deal to research on noncognitive characteristics in the coming years. However, it is important to resist the temptation to counterpose genetic influences against environmental influences when explaining patterns of attainment and stratification, because there is a range of conditions under which genetic differences in noncognitive characteristics might be accentuated (or mitigated) by environmental influences. As Freese (2008, S24) writes, “Individuals with emotional instabilities select and are selected into environments that may pose the greatest risk for individuals with emotional instabilities ... Through fundamentally social processes, the life consequences of genetic differences contributing to the pertinent traits are widened.” A future challenge for researchers will be to understand how genetic and environmental influences work together to produce differences in attainment and constancy or change over time in intergenerational persistence.

Questions about genetic heritability are closely related to the issue of life-course *stability* in noncognitive characteristics. Heritability estimates for noncognitive characteristics, as for cognitive skills, rise with age. Gaps in noncognitive characteristics by parental socioeconomic status also rise with age, to a rather greater extent than for cognitive skills (Falci 2011; Hsin and Xie 2017; Fletcher and Wolfe 2016). Measured beliefs and behaviors vary over an individual’s life course and are particularly variable during some life stages, such as adolescence. However, there is also a relatively high degree of rank stability in beliefs and behaviors: an individual’s measured beliefs and behaviors relative to those of others in the same cohort will remain similar over the life course (Coyne and Wright 2014; Hampson and Goldberg 2006). High rank-order stability is consistent with noncognitive characteristics becoming crystallized, or even exaggerated, with greater social experience.

Early childhood experiences, particularly relationships with parents, are of special importance in the development of noncognitive characteristics. Styles of parenting and early attachment are highly correlated intergenerationally, and the types of parenting interaction that are needed to support the development of noncognitive characteristics are quite distinct from interactions that provide more general educational stimulation (Moullin, Waldfogel, and Washbrook 2018). Socioeconomic position is associated with parenting styles that support the development of noncognitive characteristics, and policy interventions focused on parenting style have been successful in improving children’s outcomes. For example, out of six experimentally evaluated intensive home visiting programs in which the parenting styles of socioeconomically disadvantaged parents were in focus, four programs demonstrated improvements in children’s socio-emotional outcomes (Molloy et al. 2021).

Noncognitive characteristics, particularly as compared to cognitive skills or academic attainment, do appear to have a high degree of *responsiveness* to policy. Heckman’s work on the long-term effects of early childhood interventions has focused attention on the responsiveness of noncognitive characteristics to policy investments in both family and school domains. Notably, the Perry Preschool Project, which provided parental education and home visiting alongside part-time early learning for low-income African American families, had positive and long-term effects on the educational and economic attainment of the children assigned to it, with around a fifth of the program’s effect attributed to reductions in externalizing behavior problems (Heckman, Pinto, and Savelyev 2013). On such grounds, Heckman has been a consistent advocate of early childhood intervention, arguing that “poverty is not caused by a lack of character among the poor, but rather by society’s failure to provide the proper resources and environments for developing character skills that promote success in life” (Heckman, Pinto, and Savelyev 2014, 2).

Heckman's optimism with respect to interventions designed to improve noncognitive skills is by no means universally shared. There are, for example, concerns that the effects of early childhood intervention might not generalize to the population level or to weaker policies enacted at scale (Xie et al. 2020). Subsidies for childcare, as distinct from high-quality early education, for example, have even been linked to *decreases* in children's noncognitive skills (Baker, Gruber, and Milligan 2015). Heckman's position is that the positive effects of early childhood intervention are largest for "gold-standard" programs, and indeed, effect sizes do appear to be larger than average in these programs (Camilli et al. 2010; Smithers et al. 2018).

Research shows that beyond the early childhood years, both teachers and peers affect the development of noncognitive characteristics. Both positive and negative effects on noncognitive development can be found in the literature on teachers and peers (Jennings and DiPrete 2010; Willingham 2011). Notably, the teachers who have the largest effects on the development of noncognitive characteristics are not the same as those who have the largest effects on cognitive test performance (Jackson 2012). Noncognitive and cognitive skills also develop differently in response to school settings. Attending a charter school, for instance, is associated with lower self-evaluation, conscientiousness, and self-control, even though charter school attendance is associated with higher educational attainment (Dobbie and Fryer 2013; West et al. 2016).

Finally, there is evidence that noncognitive characteristics are responsive to other social changes and policies that are not specifically oriented toward the development of these traits. For example, in both US and UK data, we have seen in recent cohorts an increase in inequality in noncognitive characteristics by socioeconomic origins (Attanasio et al. 2020; Mazumder 2015). Studies of cohorts of young Americans from the 1980s onward show declines in levels of self-efficacy and increases in behavior problems (Twenge, Zhang, and Im 2004; Twenge 2011). Alongside these troubling changes, we also see evidence that progressive social policies have had positive consequences for the development of noncognitive characteristics. One effect of affordable housing policies that moved families out of segregated, low-income, and high-crime neighborhoods in the United States was to reduce externalizing behaviors among boys (Leventhal and Brooks-Gunn 2003; Massey et al. 2013). Quasi-experimental studies also show that neighborhood violence decreases impulse control and attention, raising the possibility that reductions in neighborhood violence might reverse this effect (Sharkey et al. 2012). Even a straightforward unconditional cash transfer has been found to have positive effects: a natural experiment found that a simple payment to families with children in the United States had positive effects on noncognitive beliefs and behaviors among children and adolescents, and the effects were stronger for young people who had previously had lower levels of noncognitive skills (Akee et al. 2015). To the extent that policy interventions affect the contexts in which children develop, effects on noncognitive characteristics should be anticipated.

5. Bringing Dark Matter into the Light

In the noncognitive field there remains a basic lack of consensus with respect to theory, concepts, and measurement. In this section, we point to unresolved issues in the literature that researchers might productively address to push the field forward.

First, a lack of consistency in the noncognitive characteristics that are measured in social science data sources is a fundamental problem for the field. In relating their findings to the existing literature, researchers are faced with results pertaining to a wide variety of measures. From this cornucopia of measures, it might be straightforward to conclude that noncognitive characteristics matter for a given outcome; but it might also be difficult to explain just how and how much they matter. The known facts about specific noncognitive characteristics are relatively sparse in most cases, and mechanism-based studies that fully identify the causal processes linking social origin to noncognitive characteristics to outcomes are subsequently absent. This, in turn, makes it challenging for scientists to explain why new studies add value to the literature.

There is no simple solution to the measurement problem. As we described earlier, the number of noncognitive characteristics that *could* be measured is vast, and few data collectors would be able to measure even a fraction of that number. Further, because many of the datasets that social scientists exploit are longitudinal, even immediate improvements to data collection will only be felt many years from now. We see two priorities for future research. First, as we describe below, it would be helpful for social stratification researchers to work to identify the mechanisms linking noncognitive characteristics to outcomes. This theoretical work, taken alongside meta-analyses of existing studies, would help to identify characteristics that are the most important for educational and occupational attainment. Second, any new measures must be included *alongside* the existing measures that are present in older datasets. This will make it possible for researchers to build on prior research and to observe changes over time. Where measures have been included in multiple data sources, cross-study comparisons are more easily made, and cumulative science is possible. Given that the Rotter Scale and the Big Five are well-established, both measures would be reasonable candidates for inclusion in future data collection efforts. Indeed, a recent analysis found that most of the psychological traits and scales that have proliferated in the field can be organized under the Big Five taxonomy (Bainbridge, Ludeke, and Smillie 2022).

A second unresolved issue that could be productively addressed is that of complementarities. It is likely that some combinations of noncognitive—and cognitive—characteristics are particularly valuable for educational and occupational attainment, and that other combinations are associated with poor outcomes. It is also likely that these combinations of noncognitive characteristics will have different payoffs when found in combination with different types of cognitive skills, or for those of different social background. Complementarities are of special importance in designing policy interventions, as attempts to manipulate any single characteristic could be undermined by unanticipated effects on other characteristics. Measurement problems are inevitably magnified when we aim to examine patterns of interaction among multiple noncognitive characteristics, but as we make progress in this domain it should become possible to undertake rigorous study of noncognitive complementarities.

Finally, although there is theoretical work outlining how noncognitive characteristics are related to socioeconomic outcomes, almost all of this work is at a relatively high level of analysis. There are many arguments about why, for example, employers or schoolteachers might value the expression of certain noncognitive characteristics or in which types of labor market configuration the possession of certain characteristics is likely to have payoff. But there is much less emphasis on the microlevel mechanisms that might account for these hypothesized relationships or on how social background comes into play. How do noncognitive characteristics influence microlevel interactions among individuals? Why do certain traits come to be seen as desirable or undesirable in particular contexts and for particular sociodemographic groups? When individual employers express preferences for noncognitive characteristics, can these characteristics be detected easily during interactions? Identifying microlevel mechanisms is essential in coming to a deeper understanding of how associations between noncognitive characteristics and outcomes are formed. Contributions from both qualitative and quantitative researchers are likely to aid social scientists in building a full model of noncognitive characteristics and the stratification process.

Perhaps the most important task with respect to microlevel mechanisms is building a theory of noncognitive characteristics that is strongly tethered to the literature on social stratification and mobility. Although most of the early studies of noncognitive characteristics in the stratification field were oriented to explaining intergenerational persistence (i.e., the extent to which the association between social origin and destination is mediated by noncognitive characteristics), studies in more recent decades have focused instead on examining the effect of noncognitive characteristics on educational and occupational attainment, with or without controlling for social origin. In part, this reflects data availability: representative, long-run panel datasets are needed to properly examine the intergenerational mobility process, but these datasets do not always include good measures of noncognitive characteristics. But it is perhaps also attributable to changes in the quantitative social science of stratification and mobility, where the dominance of human capital models has pulled attention away from mobility. Since the Wisconsin model fell out of favor, there has been no widely accepted mobility model to guide research on noncognitive characteristics. A strong sociological theory that outlines the relationships between origin, education, cognitive and noncognitive characteristics, and destination is required if the field is to make sense of an increasingly large and diverse set of relevant empirical findings.

A healthy scientific field is characterized by both known facts and unresolved questions. The noncognitive field surely has many of the latter, but it also contains known facts on which researchers can build. As the labor market develops over the coming decades, it is likely that noncognitive characteristics will be ever more consequential for life chances. Transforming the unresolved questions into known facts will be key to providing complete explanations of stratification and mobility in late-industrial economies and societies.

References

Acemoglu, Daron. 2021. "Obedience in the Labor Market and Social Mobility: A Socio-economic Approach." Working Paper no. 29125. National Bureau of Economic Research, Cambridge, MA.

Akee, Randall K. Q., Emilia Simeonova, Jane Costello, William E. Copeland, Gordon Keeler, Adrian Angold, et al. 2015. "Parents' Incomes and Children's Outcomes: A Quasi-experiment Using Transfer Payments from Casino Profits." *American Economic Journal: Applied Economics* 2 (1): 86–115. <https://doi.org/10.1007/s13398-014-0173-7.2>.
[Google Scholar](#) [WorldCat](#)

Anger, Silke, and Daniel D. Schnitzlein. 2016. "Cognitive Skills, Non-cognitive Skills, and Family Background: Evidence from Sibling Correlations." *Journal of Population Economics* 30 (2): 591–620. <https://doi.org/10.1007/s00148-016-0625-9>.
[Google Scholar](#) [WorldCat](#)

Attanasio, Orazio, Richard Blundell, Gabriella Conti, and Giacomo Mason. 2020. "Inequality in Socio-emotional Skills: A Cross-Cohort Comparison." *Journal of Public Economics* 191: 104171. <https://doi.org/10.1016/J.JPUBECO.2020.104171>.
[Google Scholar](#) [WorldCat](#)

Bainbridge, Timothy F., Steven G. Ludeke, and Luke D. Smillie. 2022. "Evaluating the Big Five as an Organizing Framework for Commonly Used Psychological Trait Scales." *Journal of Personality and Social Psychology* 122 (4): 749–777. <https://doi.org/10.1037/PSPP0000395>.
[Google Scholar](#) [WorldCat](#)

Baker, Michael, Jonathan Gruber, and Kevin Milligan. 2015. "Non-cognitive Deficits and Young Adult Outcomes: The Long-Run Impacts of a Universal Child Care Program." Working Paper 21572. National Bureau of Economic Research, Cambridge, MA. <https://doi.org/10.3386/w21571>.

Barrick, Murray R., and Michael K. Mount. 1991. "The Big Five Personality Dimensions and Job Performance: A Meta-Analysis." *Personnel Psychology* 44 (1): 1–26. <https://doi.org/10.1111/j.1744-6570.1991.tb00688.x>.
[Google Scholar](#) [WorldCat](#)

Becker, Gary S. 2006. "Working with Jacob Mincer: Reminiscences of Columbia's Labor Workshop." In *Jacob Mincer: A Pioneer of Modern Labor Economics*, edited by Shoshana Grossbard, 23–27. New York, NY: Springer. https://doi.org/10.1007/0-387-29175-x_4.
[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Blau, Peter M., and Otis Dudley Duncan. 1967. *The American Occupational Structure*. New York: Free Press.
[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Blumberg, Boris F., and Paul M. de Graaf. 2004. "Dutch Self-Employment between 1980 and 1997." In *The Reemergence of Self-Employment: A Comparative Study of Self-Employment Dynamics and Social Inequality*, edited by Richard Arum and Walter Müller. Princeton, NJ: Princeton University Press.
[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Borghans, Lex, Angela Lee Duckworth, James J. Heckman, and Bas ter Weel. 2008. "The Economics and Psychology of Personality Traits." *Journal of Human Resources* 43 (4): 972–1059.
[Google Scholar](#) [WorldCat](#)

Borgonovi, Francesca, Alessandro Ferrara, and Mario Piacentini. 2020. "From Asking to Observing: Behavioural Measures of Socio-emotional and Motivational Skills in Large-Scale Assessments." DoQSS Working Paper, No. 20–19. Department of Quantitative Social Science. UCL Social Research Institute, University College London.

Bouchard, Thomas J., and Matt McGue. 2003. "Genetic and Environmental Influences on Human Psychological Differences." *Journal of Neurobiology* 54 (1): 4–45. <https://doi.org/10.1002/neu.10160>.

[Google Scholar](#) [WorldCat](#)

Bourdieu, Pierre, and Loic J. D. Wacquant. 1992. *An Invitation to Reflexive Sociology*. Chicago: Chicago: University of Chicago Press.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Bowles, Samuel, and Herbert Gintis. 1976. *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life*. New York: Basic Books.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Bowles, Samuel, Herbert Gintis, and Melissa Osborne. 2001. "Incentive-Enhancing Preferences: Personality, Behavior, and Earnings." *American Economic Review* 91 (2): 155–158.

[Google Scholar](#) [WorldCat](#)

Boyle, Gregory J. 2008. "Critique of the Five-Factor Model of Personality." In *The Sage Handbook of Personality Theory and Assessment*, vol. 1, *Personality Theories and Models*, edited by Gregory J. Boyle, G. Matthews, and D. H. Saklofske, 295–312. Thousand Oaks, CA: Sage Publications.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Camilli, Gregory, Sadako Vargas, Sharon Ryan, and W. Steven Barnett. 2010. "Meta-Analysis of the Effects of Early Education Interventions on Cognitive and Social Development." *Teachers College Record* 112 (3): 579–620.

[Google Scholar](#) [WorldCat](#)

Cast, Alicia D., and Peter J. Burke. 2002. "A Theory of Self-Esteem." *Social Forces* 80 (3): 1041–1068.

<https://doi.org/10.1353/sof.2002.0003>.

[Google Scholar](#) [WorldCat](#)

Chemers, Martin M., Lit Tze Hu, and Ben F. Garcia. 2001. "Academic Self-Efficacy and First-Year College Student Performance and Adjustment." *Journal of Educational Psychology* 93 (1): 55–64. <https://doi.org/10.1037/0022-0663.93.1.55>.

[Google Scholar](#) [WorldCat](#)

Clarke-Stewart, K. Alison, Virginia D. Allhusen, David J. McDowell, Luke Thelen, and Justin D. Call. 2003. "Identifying Psychological Problems in Young Children: How Do Mothers Compare with Child Psychiatrists?" *Journal of Applied Developmental Psychology* 23 (6): 589–624. [https://doi.org/10.1016/S0193-3973\(03\)00006-6](https://doi.org/10.1016/S0193-3973(03)00006-6).

[Google Scholar](#) [WorldCat](#)

Claro, Susana, David Paunesku, and Carol S. Dweck. 2016. "Growth Mindset Tempers the Effects of Poverty on Academic Achievement." *Proceedings of the National Academy of Sciences of the United States of America* 113 (31): 8664–8668.

<https://doi.org/10.1073/pnas.1608207113>.

[Google Scholar](#) [WorldCat](#)

Coyne, Michelle Anne, and John Paul Wright. 2014. "The Stability of Self-Control across Childhood." *Personality and Individual Differences* 69:144–149. <https://doi.org/10.1016/j.paid.2014.05.026>.

[Google Scholar](#) [WorldCat](#)

Currie, Janet, and Mark Stabile. 2006. "Child Mental Health and Human Capital Accumulation: The Case of ADHD." *Journal of Health Economics* 25 (6): 1094–1118. <https://doi.org/10.1016/j.jhealeco.2006.03.001>.

[Google Scholar](#) [WorldCat](#)

Demange, Perline A., Margherita Malanchini, Travis T. Mallard, Pietro Biroli, Simon R. Cox, Andrew D. Grotzinger, et al. 2021. "Investigating the Genetic Architecture of Noncognitive Skills Using GWAS-by-Subtraction." *Nature Genetics* 53: 35–44.

[Google Scholar](#) [WorldCat](#)

Deming, David J. 2017. "The Growing Importance of Social Skills in the Labor Market." *Quarterly Journal of Economics* 132 (4): 1593–1640. <https://doi.org/10.1093/qje/qjx022>.

Dobbie, Will, and Roland G. Fryer. 2013. "Getting beneath the Veil of Effective Schools: Evidence from New York City." *American Economic Journal: Applied Economics* 5 (4): 28–60.

[Google Scholar](#) [WorldCat](#)

Donnellan, M. Brent, Kali H. Trzesniewski, Richard W. Robins, Terrie E. Moffitt, and Avshalom Caspi. 2005. "Low Self-Esteem Is Related to Aggression, Antisocial Behavior, and Delinquency." *Psychological Science* 16 (4): 328–335.

<https://doi.org/10.1111/j.0956-7976.2005.01535.x>.

[Google Scholar](#) [WorldCat](#)

Dörfler, Laura, and Herman G. van de Werfhorst. 2009. "Employers' Demand for Qualifications and Skills." *European Societies* 11 (5): 697–721. <https://doi.org/10.1080/14616690802474374>.

[Google Scholar](#) [WorldCat](#)

Duckworth, Angela L., Christopher Peterson, Michael D. Matthews, and Dennis R. Kelly. 2007. "Grit: Perseverance and Passion for Long-Term Goals." *Journal of Personality and Social Psychology* 92 (6): 1087–1101. <https://doi.org/10.1037/0022-3514.92.6.1087>.

[Google Scholar](#) [WorldCat](#)

Duckworth, Angela L., and Martin E. P. Seligman. 2006. "Self-Discipline Gives Girls the Edge: Gender in Self-Discipline, Grades, and Achievement Test Scores." *Journal of Educational Psychology* 98 (1): 198–208. <https://doi.org/10.1037/0022-0663.98.1.198>.

[Google Scholar](#) [WorldCat](#)

Falci, Christina D. 2011. "Self-Esteem and Mastery Trajectories in High School by Social Class and Gender." *Social Science Research* 40 (2): 586–601. <https://doi.org/10.1016/j.ssresearch.2010.12.013>.

[Google Scholar](#) [WorldCat](#)

Filer, Randall K. 1986. "The Role of Personality and Tastes in Determining Occupational Structure." *ILR Review* 39 (3): 412–424. <https://doi.org/10.1177/001979398603900308>.

[Google Scholar](#) [WorldCat](#)

Fletcher, Jason M., and Barbara Wolfe. 2016. "The Importance of Family Income in the Formation and Evolution of Non-cognitive Skills in Childhood." *Economics of Education Review* 54: 143–154. <https://doi.org/10.1016/j.econedurev.2016.07.004>.

[Google Scholar](#) [WorldCat](#)

Freese, Jeremy. 2008. "Genetics and the Social Science Explanation of Individual Outcomes." *American Journal of Sociology* 114 (S1): S1–S35. <https://doi.org/10.1086/592208>.

[Google Scholar](#) [WorldCat](#)

Gil-Hernández, Carlos J. 2021. "The (Unequal) Interplay between Cognitive and Noncognitive Skills in Early Educational Attainment." *American Behavioral Scientist*, 65(11): 1577–1598. <https://doi.org/10.1177/0002764221996764>.

[Google Scholar](#) [WorldCat](#)

Granger, Lindsay R., and Pedro A. Noguera. 2015. "College Readiness and Urban Schools." *Handbook of Urban Educational Leadership*, edited by Muhammad Khalifa, Azadeh F. Osanloo, Stan Fulton, and Cosette M. Grant, Rowan and Littlefield, 470.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Haller, Archibald O., and Alejandro Portes. 1973. "Status Attainment Processes." *Sociology of Education* 46 (1): 91.

<https://doi.org/10.2307/2112205>.

[Google Scholar](#) [WorldCat](#)

Hampson, Sarah E., and Lewis R. Goldberg. 2006. "A First Large Cohort Study of Personality Trait Stability over the 40 Years between Elementary School and Midlife." *Journal of Personality and Social Psychology* 91 (4): 763–779.

<https://doi.org/10.1037/0022-3514.91.4.763>.

[Google Scholar](#) [WorldCat](#)

Heckman, James J., Tomáš Jagelka, and Timothy Kautz. 2019. "Some Contributions of Economics to the Study of Personality." *Journal of Personality* 5 (2): 155–159. <https://doi.org/10.3386/w26459>.

[Google Scholar](#) [WorldCat](#)

Heckman, James J., and Tim Kautz. 2013. "Fostering and Measuring Skills: Interventions That Improve Character and Cognition." Working Paper 19656. National Bureau of Economic Research, Cambridge, MA.

Heckman, James J., Rodrigo Pinto, and Peter Savelyev. 2013. "Understanding the Mechanisms through Which an Influential Early Childhood Program Boosted Adult Outcomes." *American Economic Review* 103 (6): 2052–2086.

<https://doi.org/10.1257/aer.103.6.2052>.

[Google Scholar](#) [WorldCat](#)

Heckman, James J., Rodrigo Pinto, and Peter Savelyev. 2014. "Perry Preschool and Character: Character Skills Are More Important Than IQ in Driving Better Life Outcomes." <https://heckmanequation.org/resource/research-summary-perry-preschool-and-character-skill-development/>.

[WorldCat](#)

Heckman, James J., and Yona Rubinstein. 2001. "The Importance of Noncognitive Skills: Lessons from the GED Testing Program." *American Economic Review* 91 (2): 145–149. <https://doi.org/10.1257/aer.91.2.145>.

[Google Scholar](#) [WorldCat](#)

Heckman, James J., Jora Stixrud, and Sergio Urzua. 2006. "The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior." *Journal of Labor Economics* 24 (3): 411–482. <https://doi.org/10.1086/504455>.

[Google Scholar](#) [WorldCat](#)

Hitlin, Steven, and Monica Kirkpatrick Johnson. 2015. "Reconceptualizing Agency within the Life Course: The Power of Looking Ahead." *American Journal of Sociology* 120 (5): 1429–1472.

[Google Scholar](#) [WorldCat](#)

Holland, John L. 1985. *Making Vocational Choices: A Theory of Vocational Personalities and Work Environments*. Englewood Cliffs, NJ: Prentice-Hall.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Hoyle, Rick H. 2010. *Handbook of Personality and Self-Regulation*. Hoboken, NJ: Wiley-Blackwell.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Hsin, Amy, and Yu Xie. 2017. "Life Course Changes in the Mediation of Cognitive and Non-cognitive Skills for Parental Effects on Children's Academic Achievement." *Social Science Research* 63 (March): 150–165.

<https://doi.org/10.1016/j.ssresearch.2016.09.012>.

[WorldCat](#)

Humphries, John Eric, and Fabian Kosse. 2017. "On the Interpretation of Non-cognitive Skills: What Is Being Measured and Why It Matters." *Journal of Economic Behavior and Organization* 136 (April): 174–185. <https://doi.org/10.1016/j.jebo.2017.02.001>.

[WorldCat](#)

Jackson, C. Kirabo. 2012. "Non-cognitive Ability, Test Scores, and Teacher Quality." Working Paper no.18624. National Bureau of Economic Research, Cambridge, MA.

Jackson, Michelle. 2006. "Personality Traits and Occupational Attainment." *European Sociological Review* 22 (2): 187–199.

<https://doi.org/10.1093/esr/jci051>.

[Google Scholar](#) [WorldCat](#)

Jackson, Michelle. 2007. "How Far Merit Selection? Social Stratification and the Labour Market." *British Journal of Sociology* 58 (3): 367–390. <https://doi.org/10.1111/j.1468-4446.2007.00156.x>.

[Google Scholar](#) [WorldCat](#)

Jackson, Michelle, John H. Goldthorpe, and Colin Mills. 2005. "Education, Employers and Class Mobility." *Research in Social Stratification and Mobility* 23:3–33.

[Google Scholar](#) [WorldCat](#)

Jencks, Christopher, Susan Bartlett, Mary Corcoran, James Crouse, David Eaglesfield, Gregory Jackson, et al. 1979. *Who Gets Ahead? The Determinants of Economic Success in America*. New York: Basic Books.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Jennings, Jennifer, and Thomas A. DiPrete. 2010. "Teacher Effects on Social and Behavioral Skills in Early Elementary School." *Sociology of Education* 83 (2): 135–159. <https://doi.org/10.1177/0038040710368011>.

[Google Scholar](#) [WorldCat](#)

Judge, Timothy A., and Charlice Hurst. 2007. "Capitalizing on One's Advantages: Role of Core Self-Evaluations." *Journal of Applied Psychology* 92 (5): 1212–1227. <https://doi.org/10.1037/0021-9010.92.5.1212>.

[Google Scholar](#) [WorldCat](#)

Kautz, Tim, James J. Heckman, Ron Diris, Bas ter Weel, and Lex Borghans. 2014. "Fostering and Measuring Skills: Improving Cognitive and Noncognitive Skills to Promote Lifetime Success." Working paper no. 20749. National Bureau of Economic Research. Cambridge, MA. <https://doi.org/10.3386/W20749>.

Lamont, Michèle, and Annette Lareau. 1988. "Cultural Capital: Allusions, Gaps and Glissandos in Recent Theoretical Developments." *Sociological Theory* 6: 153–168.

[Google Scholar](#) [WorldCat](#)

Lemieux, Thomas. 2006. "The 'Mincer Equation' Thirty Years after Schooling, Experience, and Earnings." In *Jacob Mincer: A Pioneer of Modern Labor Economics*, edited by Shoshana Grossbard, 127–145. New York, NY: Springer. https://doi.org/10.1007/0-387-29175-x_11.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Leventhal, Tama, and Jeanne Brooks-Gunn. 2003. "Moving to Opportunity: An Experimental Study of Neighborhood Effects on Mental Health." *American Journal of Public Health* 93 (9): 1576–1582.

[Google Scholar](#) [WorldCat](#)

Lundberg, Shelly. 2013. "The College Type: Personality and Educational Inequality." *Journal of Labor Economics* 31 (3): 421–441. <https://doi.org/10.1086/671056>.

[Google Scholar](#) [WorldCat](#)

Massey, Douglas S., Len Albright, Rebecca Casciano, Elizabeth Derickson, and David Kinsey. 2013. *Climbing Mount Laurel: The Struggle for Affordable Housing and Social Mobility in an American Suburb*. Princeton, NJ: Princeton University Press.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Mazumder, Bhashkar. 2007. "Sibling Similarities and Economic Inequality in the US." *Journal of Population Economics* 21 (3): 685–701. <https://doi.org/10.1007/s00148-006-0127-2>.

[Google Scholar](#) [WorldCat](#)

Mazumder, Bhashkar. 2015. "Inequality in Skills and the Great Gatsby Curve." *Chicago Fed Letter*, No. 330.

Mincer, Jacob. 1958. "Investment in Human Capital and Personal Income Distribution." *Journal of Political Economy* 66 (4): 281–302.

[Google Scholar](#) [WorldCat](#)

Mischel, Walter, Ozlem Ayduk, Marc G. Berman, B. J. Casey, Ian H. Gotlib, John Jonides, et al. 2011. "'Willpower' over the Life Span: Decomposing Self-Regulation." *Social Cognitive and Affective Neuroscience* 6 (2): 252–256.

<https://doi.org/10.1093/scan/nsq081>.

[Google Scholar](#) [WorldCat](#)

Moffitt, Terrie E., Louise Arseneault, Daniel Belsky, Nigel Dickson, Robert J. Hancox, Honalee Harrington, et al. 2011. "A Gradient of Childhood Self-Control Predicts Health, Wealth, and Public Safety." *Proceedings of the National Academy of Sciences of the United States of America* 108 (7): 2693–2698. <https://doi.org/10.1073/pnas.1010076108>.

[Google Scholar](#) [WorldCat](#)

Molloy, Carly, Ruth Beatson, Christopher Harrop, Nicholas Perini, and Sharon Goldfeld. 2021. "Systematic Review: Effects of Sustained Nurse Home Visiting Programs for Disadvantaged Mothers and Children." *Journal of Advanced Nursing* 77 (1): 147–161. <https://doi.org/10.1111/jan.14576>.

[Google Scholar](#) [WorldCat](#)

Monk, Ellis P., Jr., Michael H. Esposito, and Hedwig Lee. 2021. "Beholding Inequality: Race, Gender, and Returns to Physical Attractiveness in the United States." *American Journal of Sociology* 127, no. 1 (July): 194–241. <https://doi.org/10.1086/715141>.

[WorldCat](#)

Mood, Carina, Jan O. Jonsson, and Erik Bihagen. 2012. "Socioeconomic Persistence across Generations: The Role of Cognitive and Non-cognitive Processes." In *From Parents to Children: The Intergenerational Transmission of Advantage*, edited by John F. Ermisch, Markus Jäntti, and Timothy M. Smeeding, 53–83. New York: Russell Sage Foundation.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Morgan, Stephen L. 2007. "Expectations and Aspirations." In *The Blackwell Encyclopedia of Sociology*, 1528–1531. John Wiley and Sons, Ltd..

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Morris, Tim T., George Davey Smith, Gerard van den Berg, and Neil M. Davies. 2021. "Consistency of Non-cognitive Skills and Their Relation to Educational Outcomes in a UK Cohort." *Translational Psychiatry* 11, 563. <https://doi.org/10.1038/s41398-021-01661-8>.

[Google Scholar](#) [WorldCat](#)

Moullin, Sophie. 2021. "The Character of Class: Self-Concept, Self-Control and Social Immobility." SocArXiv. Last updated, October 8, 2021. <https://doi.org/10.31235/osf.io/ckgt2>.

Moullin, Sophie, Jane Waldfogel, and Elizabeth Washbrook. 2018. "Parent-Child Attachment as a Mechanism of Intergenerational (Dis)Advantage." *Families, Relationships, Societies* 7 (2): 265–284.

[Google Scholar](#) [WorldCat](#)

Nyhus, Ellen K., and Empar Pons. 2005. "The Effects of Personality on Earnings." *Journal of Economic Psychology* 26 (3): 363–384. <https://doi.org/10.1016/J.JOEP.2004.07.001>.

[Google Scholar](#) [WorldCat](#)

Osborne Groves, Melissa. 2005. "How Important Is Your Personality? Labor Market Returns to Personality for Women in the US and UK." *Journal of Economic Psychology* 26 (6): 827–841. <https://doi.org/10.1016/j.joep.2005.03.001>.

[Google Scholar](#) [WorldCat](#)

Owens, Jayanti. 2016. "Early Childhood Behavior Problems and the Gender Gap in Educational Attainment in the United States." *Sociology of Education* 89 (3): 236–258. <https://doi.org/10.1177/0038040716650926>.

[Google Scholar](#) [WorldCat](#)

Owens, Jayanti, and Sara S. McLanahan. 2020. "Unpacking the Drivers of Racial Disparities in School Suspension and Expulsion." *Social Forces* 98 (4): 1548–1577. <https://doi.org/10.1093/SF/SOZ095>.

[Google Scholar](#) [WorldCat](#)

Protsch, Paula, and Heike Solga. 2015. "How Employers Use Signals of Cognitive and Noncognitive Skills at Labour Market Entry: Insights from Field Experiments." *European Sociological Review* 31 (532): 521–525. <https://doi.org/10.1093/esr/jcv056>.

[Google Scholar](#) [WorldCat](#)

Rescorla, Leslie A., Lauren Bochicchio, Thomas M. Achenbach, Masha Y. Ivanova, Fredrik Almqvist, Ivan Begovac, et al. 2014. "Parent-Teacher Agreement on Children's Problems in 21 Societies." *Journal of Clinical Child and Adolescent Psychology* 43 (4): 627–642. <https://doi.org/10.1080/15374416.2014.900719>.

[Google Scholar](#) [WorldCat](#)

Rotter, Julian B. 1966. "Generalized Expectancies for Internal versus External Control of Reinforcement." *Psychological Monographs* 80 (1): 1–28. <https://doi.org/10.1037/H0092976>.

[Google Scholar](#) [WorldCat](#)

Sewell, William H., Archibald O. Haller, and George W. Ohlendorf. 1970. "The Educational and Early Occupational Status Attainment Process: Replication and Revision." *American Sociological Review* 35 (6): 1014. <https://doi.org/10.2307/2093379>.

[Google Scholar](#) [WorldCat](#)

Sewell, William H., Archibald O. Haller, and Alejandro Portes. 1969. "The Educational and Early Occupational Attainment Process." *American Sociological Review* 34 (1): 82. <https://doi.org/10.2307/2092789>.

[Google Scholar](#) [WorldCat](#)

Sewell, William H., and Robert M. Hauser. 1974. *Education, Occupation, and Earnings. Achievement in the Early Career*. New York: Academic Press.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Sharkey, Patrick T., Nicole Tirado-Strayer, Andrew V. Papachristos, and C. Cybele Raver. 2012. "The Effect of Local Violence on Children's Attention and Impulse Control." *American Journal of Public Health* 102 (12): 2287–2293.

<https://doi.org/10.2105/AJPH.2012.300789>.

[Google Scholar](#) [WorldCat](#)

Smith, James P. 1981. "Who Gets Ahead: A Review Article." *Economics of Education Review* 1 (4): 421–436.

[https://doi.org/10.1016/0272-7757\(81\)90013-3](https://doi.org/10.1016/0272-7757(81)90013-3).

[Google Scholar](#) [WorldCat](#)

Smithers, Lisa G., Alyssa C. P. Sawyer, Catherine R. Chittleborough, Neil Davies, George Davey Smith, and John Lynch. 2018. "A Systematic Review and Meta-Analysis of Effects of Early Life Non-cognitive Skills on Academic, Psychosocial, Cognitive and Health Outcomes." *Nature Human Behaviour* 2 (11): 867–880. <https://doi.org/10.1038/s41562-018-0461-x>.

[Google Scholar](#) [WorldCat](#)

Stets, Jan E., and Peter J. Burke. 2003. "A Sociological Approach to Self and Identity." In *Handbook of Self and Identity*, edited by Mark Learey and June Tangney, 128–152. New York, NY: Guilford Press. <https://doi.org/10.1108/S0882-614520140000031002>.

[Google Scholar](#) [Google Preview](#) [WorldCat](#) [COPAC](#)

Twenge, Jean M. 2011. "Generational Differences in Mental Health: Are Children and Adolescents Suffering More, or Less?" *American Journal of Orthopsychiatry* 81 (4): 469–472. <https://doi.org/10.1111/j.1939-0025.2011.01115.x>.

[Google Scholar](#) [WorldCat](#)

Twenge, Jean M., Liqing Zhang, and Charles Im. 2004. "It's beyond My Control: A Cross-Temporal Meta-Analysis of Increasing Externality in Locus of Control, 1960–2002." *Personality and Social Psychology Review* 8 (3): 308–319.

https://doi.org/10.1207/s15327957pspr0803_5.

[Google Scholar](#) [WorldCat](#)

West, Martin R., Amy S. Finn, Angela L. Duckworth, Christopher F. O. Gabrieli, and John D. E. Gabrieli. 2016. "Promise and Paradox: Measuring Students' Non-cognitive Skills and the Impact of Schooling." *Educational Evaluation and Policy Analysis* 38 (1): 148–170.

[Google Scholar](#) [WorldCat](#)

Willems, Yyouk E., Conor V. Dolan, Catharina E. M. van Beijsterveldt, Eveline L. de Zeeuw, Dorret I. Boomsma, Meike Bartels, et al. 2018. "Genetic and Environmental Influences on Self-Control: Assessing Self-Control with the ASEBA Self-Control Scale."

Behavior Genetics 48 (2): 135–146. <https://doi.org/10.1007/s10519-018-9887-1>.

[Google Scholar](#) [WorldCat](#)

Willingham, Daniel T. 2011. “Can Teachers Increase Students’ Self-Control?” *American Educator*, Summer: 22–27.

Xie, Yu, Christopher Near, Hongwei Xu, and Xi Song. 2020. “Heterogeneous Treatment Effects on Children’s Cognitive/Non-cognitive Skills: A Reevaluation of an Influential Early Childhood Intervention.” *Social Science Research* 86 (February).

<https://doi.org/10.1016/j.ssresearch.2019.102389>.

[WorldCat](#)