

The Cultural Nature of Valued Skills: A Qualitative Investigation of Postsecondary Science Education and the “Skills Gap” in Wisconsin

WCER Working Paper No. 2016-06

August 2016

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Benbow, R. J., & Hora, M. T. (2016). *The Cultural Nature of Valued Skills: A Qualitative Investigation of Postsecondary Science Education and the “Skills Gap” in Wisconsin* (WCER Working Paper No. 2016-06). Retrieved from University of Wisconsin–Madison, Wisconsin Center for Education Research website: <http://www.wcer.wisc.edu/publications/workingPapers/papers.php>

The Cultural Nature of Valued Skills: A Qualitative Investigation of Postsecondary Science Education and the “Skills Gap” in Wisconsin

Ross J. Benbow and Matthew T. Hora

The narrative of the “skills gap,” or the notion that the United States economy suffers because employers are not able to find job applicants with workplace-ready skills (e.g., American Society for Training and Development, 2012), has become an influential rallying cry in higher education funding circles in recent years. While a number of independent analysts have called into question the narrative’s empirical and ideological foundations (e.g., Cappelli, 2012), privately funded surveys of employers (e.g., Career Builder, 2015; Manpower Group, 2015) and findings from industry-backed studies (e.g., American Society for Training and Development, 2012; Morrison, Maciejewski, Giffi, DeRocco, McNelly, & Carrick, 2011) continue to provide support for far-reaching postsecondary policy changes designed to resolve the problem. In the state of Wisconsin, in particular, these changes are geared towards short-term skills training in science, technology, engineering, and mathematics (STEM) fields, closer connections between educators and employers, and, as some argue, further revisions to assumptions regarding the objectives of higher education (Cappelli, 2015; Grubb & Lazerson, 2009; Newfield, 2008; Newman, Couturier, & Scurry, 2010).

Despite the issue’s significance, however, the amount of empirical work that has been undertaken on the topic is limited, especially as it concerns the exploration of firsthand, contextualized accounts from those most closely involved. While employer views on important skills in the workplace, for instance, have been well documented (e.g., Carnevale, Gainer, & Meltzer, 1990; Cassner-Lotto & Barrington, 2006; Labi, 2014; Robles, 2012), the attitudes of postsecondary educators have not been tested and remain ambiguous in existing writing on workforce education. These limitations also extend to questions regarding the influence of social and cultural settings on what we call skill “valuation” (how important certain kinds of skills are considered) and “prevalence” (how well students, job applicants, or employees are perceived to utilize such skills). Indeed, though an ever-growing body of research and donor attention continues to underline the importance in life and work of “noncognitive” skills, or socio-emotional and self-regulation abilities such as communication, teamwork, and time management that facilitate learning and performance (Farrington et al., 2012; Heckman & Rubinstein, 2001; Savitz-Romer et al., 2015), it is still difficult to know how stakeholders in higher education and workplace spheres perceive such skills being influenced by the myriad of contexts that students live and work in during their lives. Though more recent scholarship has sought to consolidate terms and link multidisciplinary research on skills to educational practices and job-related demands (Pellegrino & Hilton, 2012), such work does not discuss in detail how social and cultural factors may influence the ways individuals perceive these issues in their daily lives or the shifting value of various facilities between higher education and employment spheres. The importance of culture and context, effectively, has been lost in recent skill-related education discussions.

Cultural Nature of Valued Skills

It is with these gaps in mind that this paper uses a qualitative case study of STEM-related Wisconsin postsecondary institutions and businesses, based on interviews with employer and educator respondents, to explore the following questions:

- 1) What skills are most highly valued by employers and college educators?
- 2) According to respondents, what social, organizational, or other contextual factors, if any, influence the value and prevalence of these skills?

Our findings, which we conceptualize with a field theoretical framework from relational sociology (Bourdieu, 1998; Martin, 2003), suggest not only that employers value noncognitive competencies like work ethic and communication that students internalize through family, friends, education, and work experiences, but also that many postsecondary educators understand how such cultural currency can influence students' future success in a variety of social spheres. Furthermore, employers and educators often discussed these competencies not as singular, isolated "skills," but as multifaceted and situated *habits of mind*, inextricably linked as dispositional practices and states of being. While results confirm the broad appeal of both technical and noncognitive skills, they also point to the need for a more culturally oriented, theoretically informed view of learned competence in higher education and workforce settings. Ultimately, we argue, such a perspective has a duel effect. First, it further focus debates surrounding postsecondary education reform on the kinds of research-based instructional techniques that have been shown to improve students' lives after graduation, which, in turn, underscores the limitations of an emphasis on short-term, mostly technical training programs by some lawmakers and industry advocacy organizations. Second, it lays bare the power dynamics that inherently shape discussions of school-to-work transitions, STEM- and workforce-oriented education policy, and the broader "skills-gap" narrative itself.

Background

We begin here by putting recent workforce-oriented education debates in context, outlining how historical, political, and economic events shaped a skills-gap narrative that led to specific policy changes in Wisconsin higher education programming. We then examine how skills have been (under)conceptualized in these debates, analyzing industry frameworks, increasingly popular "noncognitive" skill constructs and syntheses, and other existing skills taxonomies. Pointing out that most work on the topic has been *acultural*, we conclude that the literature would benefit from theoretically grounded, insider accounts of skill value, prevalence, and context across higher education and career settings.

The "Skills-Gap" Narrative and Wisconsin Workforce-oriented Higher Education Policy

Questions regarding postsecondary education's *objectives*—as a public or private good, an intellectual or economic project, or a conduit for democratic or vocational education—have been contested terrain in American society almost since the country's founding (e.g., Grubb & Lazerson, 2009). Postsecondary institutions and the people that govern them, in fact, have been continually modifying their educational approaches over the years in response to an array of

Cultural Nature of Valued Skills

social, cultural, economic, and political demands. Educators incorporated career-oriented, vocational education with the passage of the Morrill Acts in the late-1800s (e.g., Florer, 1968; Reynolds, 1992), for example, and expanded applied research and professional programming through the industrial booms of the early- to mid-20th century (Geiger, 1993; Goldin & Katz, 1999; Grubb, 2006), in response to contemporary pressures. Postsecondary policy changes influenced by the skills-gap narrative are an extension of this continuing phenomenon, though one based on thoroughly contemporary political and economic contexts.

Indeed, the view that deficiencies in the educational system could lead to skill declines has its roots in Cold War-era fears about the scientific accomplishments of the Soviet Union (Cappelli, 2015). In response, K–12 and postsecondary education—particularly in scientific fields—came to be seen as a means to foster national economic competitiveness. This idea was further reinforced by “human capital” theories equating educational attainment with economic production (e.g., Becker, 1964; Schultz, 1961), high profile skills reports through the 1980s and 1990s detailing the U. S. education system’s shortcomings (e.g., Department of Labor, 1991; National Center on Education and the Economy, 1990; National Commission on Excellence in Education, 1983), and a burgeoning political movement, personified by the ascendance of President Ronald Reagan, emphasizing privatization, deregulation, and market efficiency (e.g., Harvey, 2005). Though STEM skill shortages continued to gain attention through the 1990s and 2000s, specific references to a “skills gap” escalated with the Great Recession of 2007, the most damaging U.S. economic slump in the postwar era (Goodman & Mance, 2011). While the economy reeled and then struggled to recover, news outlets around the country began to pick up on concerns that, despite persistently high unemployment rates, employers were having difficulties finding workers with the skills necessary to fill available jobs (Cappelli, 2015). Without qualified workers, the argument went, businesses would be unable to keep up with orders and the economic recovery would continue to stall (e.g., Hirsh & Johnson, 2011). As the number of newspaper stories and articles referring to this “skills gap” multiplied, the idea began to take hold in both the popular imagination and policymaking circles (e.g., America COMPETES Act of 2007; National Academies of Science, Engineering, and the Institute of Medicine, 2005, 2010; National Research Council, 2008; President’s Council on Jobs and Competitiveness, 2012).

Based on anecdotal information from employers and data from employment surveys by Manpower Group, Career Builder, and other organizations (e.g., Career Builder, 2015; Dunkelberg & Wade, 2015; Manpower Group, 2015; Morrison et al., 2011), the resulting skill gap narrative’s assumptions were straightforward. First, employers, especially in STEM-related industries, were having trouble finding employees with the skills necessary to adequately perform their jobs, which in turn hurt businesses and the economy (e.g., Wisconsin Manufacturing and Commerce, 2015). Second, due to an under-emphasis on training in the trades, the skills that were missing were mostly technical in nature, though academic STEM-skills were also in short supply (Cappelli, 2015; Sullivan, 2012). Third, this state of affairs could be attributed to problems in the education sector, including a fixation on 4-year, liberal arts degrees and a mismatch between higher education curricula and employment needs which

created, as one organization put it, “critical disjunctions” (Business Higher Education Forum, 2010, p. 4). The solution, skills gap advocates argued, was to more closely “align” higher education and business sectors through workforce-oriented education partnerships (e.g., Business Higher Education Forum, 2010; Cleary & Van Noy, 2014; Gonzalez et al., 2015; Institute for Higher Education Policy, 2014; Kansas Board of Regents, 2013; Sullivan, 2012; Vandal, 2009).

Though serious questions have been raised regarding the empirical and ideological foundations of the argument (Cappelli, 2012, 2015; Eathington & Swenson, 2015; Lafer, 2004; Levine, 2013; Loritz, Nerad, Sletten, & Cuhna, 2013), its influence on higher education policy has been significant, particularly in Wisconsin. Due in part to the determined advocacy of industry groups and business organizations (Competitive Wisconsin, 2010, 2012; Sullivan, 2012; Morgan, 2013), a host of postsecondary reforms were passed into law after the Republican wave election of 2010 including, most prominently, Wisconsin Act 9, also known as Wisconsin Fast Forward, which significantly increased workforce grant funding for training modules tying technical colleges directly to local businesses (Wisconsin Legislature, 2013). These training modules, explicitly defined as “short-term” programs lasting no longer than 12 months, would receive a total of \$15 million over 4 years (Wisconsin Department of Workforce Development, 2014a) while an additional \$35 million dollars in funds would also be directed to programs focused on high demand technical fields and industry-recognized certification programs for high school students (Wisconsin Department of Workforce Development, 2014a).

Though policymakers focused on technical training programs, they also sent clear signals that the state’s network of 2- and 4-year public higher education campuses was insufficiently aligned with workforce needs, cutting some \$500 million from the state system between 2011 and 2015 (Hora, Benbow, & Oleson, in press). As state leaders floated the possibility that new “performance-based” funding mechanisms would soon link postsecondary budgets to post-graduate employment indicators (Opioen, 2016), government officials sought to modify the UW System’s mission statement from one focused on the “search for truth” to one intended to “meet the state’s workforce needs” (Strauss, 2015). Changes to university tenure and self-governance policies, ostensibly designed to make public institutions more accountable to state economic interests, followed, as did increasingly harsh rhetoric from leaders targeting 4-year educators (Davey, 2015; DeFour, 2015; McCalmont, 2015). In effect, economic and political shifts in Wisconsin had altered the objectives of the state’s postsecondary institutions—as they had in Alaska, Arizona, Illinois, Louisiana, and West Virginia (Deprez, 2015; Douglas-Gabriel, 2015) and even internationally (Carnoy, Froumin, Loyalka, & Tilak, 2014; Fredman & Doughney, 2012)—through the 2000s and immediately following the Great Recession.

Even as postsecondary institutions were being asked to focus on workforce-related skills, however, it remained unclear exactly *what skills* were considered most valuable or necessary or how these skills, once learned, might translate between more or less “aligned” postsecondary or work-related contexts. Indeed, despite the skills-gap narrative’s significant influence on higher education policy, the specific types of skills, abilities, and knowledge directly implicated in workforce education discussions have been ill-defined, usually characterized by terminological

confusion and conceptual ambiguity (e.g., Savitz-Romer et al., 2015). Industry advocacy organizations and state policies, for example, have stressed the importance of technical and trade skills (e.g., Morgan, 2013; Sullivan, 2012; Wisconsin Department of Workforce Development, 2014b), while others have emphasized the value of “STEM skills” writ large (e.g., Business Roundtable, 2014; Rothwell, 2014), even if such competencies are defined differently from context to context (e.g., Oleson, Hora, & Benbow, 2014). “Interpersonal” or “soft skills,” defined broadly in contrast to technical or scientific abilities, have more recently come to the fore in skills-gap discussions as well (Garcia, 2014; Labi, 2014), though definitional imprecision has often made it difficult to specify exactly what kinds of capacities discussants are referring to or in what context. Prominent employer surveys, which serve as a foundation for skills gap-oriented advocacy, have also pointed to a broad range of valued “hard” and “soft” skills across business sectors (e.g., Hart Research Associates, 2013; Manpower Group, 2015), but face serious methodological problems that have raised concerns about their results (e.g., Cappelli, 2015). Additionally, such surveys not only ignore the opinions of postsecondary educators whose careers focus on preparing students for life and work, but also decontextualize the daily experiences of educators, students, and employers that can help us better understand how these issues actually play out (e.g., Lincoln & Guba, 1985).

“Noncognitive” Skills, Extant Frameworks, and Culture: Missing Context, Missing Meaning

Though often ignored in skills gap-related policy debates, a wide body of scholarly literature has offered at least some clarification on these issues, helping us better conceptualize the types of competencies that lead to successful outcomes in a variety of life- and work-related endeavors. As a product of contemporary political and social contexts—most significantly the kinds of discourses discussed above stressing postsecondary education’s economic importance to states, businesses, students, and employees alike—this research is valuable in that it gives us some indication of how higher education programs may be able to help prepare students for the workplace after graduation. It is problematic, however, because it deemphasizes the influence of *culture*, which we define as networks of reoccurring, pervasive, and often motivating assumptions and meanings shared within social groups (Strauss & Quinn, 1997, p. 5–8), on which skills, abilities, and knowledge matter in certain contexts and why.

Perhaps unsurprisingly, a large portion of this work speaks to the importance not only of technical skills, on which programmatic reforms in Wisconsin have most recently focused, but also socio-emotional and self-regulation skills. Carnevale, Gainer, and Metzler’s *Workplace Basics* (1990) is a prominent example. Based on informal conversations with hundreds of employers between 1986 and 1989, Carnevale, Gainer, and Metzler (1990) give us an early example of a scheme for organizing various skills considered important in the modern workplace. The authors considered “learning to learn” foundational, and argued that higher order skills such as goal-setting, teamwork, and leadership necessarily build on lower level skills, including basic technical abilities, reading and writing, and problem solving (Carnevale et al.,

Cultural Nature of Valued Skills

1990). These complementary skill sets, they argued, allow employees to be more effective in rapidly changing work environments (Carnevale et al., 1990).

Levy and Murnane (2004) offered a similar perspective in support of their contention that computerization was rapidly altering skill demands in the new economy. Essentially, because workers with technically-oriented, mechanical skills would be the first employees to be replaced by advanced machinery, they argued that contemporary changes were slowly making technical skills *less valuable* in the workplace (Levy & Murnane, 2004). Using insights from cognitive science, economics, and computer science, the authors organized what they considered essentially human workforce competencies into two broad, overarching categories: “expert thinking,” which they defined as the ability to develop and then use knowledge to identify and solve new kinds of problems, and “complex communication,” defined as the social skill to exchange large amounts of complicated information with colleagues from a variety of backgrounds. Though their analysis, like Carnevale et al.’s (1990), concluded with tips for teaching these valuable skills in secondary classrooms, theirs was an acultural view of learned facility based on broad analyses of technological and occupational changes (Levy & Murnane, 2004) instead of participant perspectives.

Not coincidentally, scholarship in this vein relates closely to important research in psychology investigating valuable skills or “personality traits” (e.g., Almlund, Duckworth, Heckman, & Kautz, 2011) and measuring such traits for predictive purposes (e.g., Borghans, Duckworth, Heckman, & Ter Weel, 2008), a body of work that has been followed with increasing interest by postsecondary reformers. In particular, “noncognitive” skills, or learned strategies geared toward self-regulation and interpersonal communication (Heckman & Rubenstein, 2001), have received much attention because of their link to a host of positive academic, health-related, and, not unimportantly, career-oriented outcomes (e.g., Farrington et al., 2012; Heckman & Kautz, 2012; Heckman & Rubenstein, 2001; Savitz-Romer et al., 2015). Though the higher education and cultural implications of noncognitive research remain largely underexplored, several important psychometrically tested skill constructs, all shown to lead to successful life outcomes, have consequently emerged, including “openness to experience” (e.g., McRae, 1987), “grit,” a perseverance and passion for long-term goals (e.g., Duckworth, Peterson, Matthews, & Kelly, 2007), “mindfulness,” an affective attribute of conscientiousness (e.g., Brown & Ryan, 2003), “metacognition,” thinking about thinking (e.g., Zimmerman, 2002), and the “growth mindset,” the self-fulfilling belief that one can work to accomplish goals (e.g., Dweck, 1986).

Despite the work’s surprising disassociation from skills gap-oriented policy discussions, much noncognitive scholarship has been used to develop overarching skill frameworks meant to both overcome terminological inconsistency and synthesize important findings on what skills are valuable in contemporary life (e.g., American College Testing, 2011; Organization for Economic Cooperation and Development, 2009; Partnership for 21st Century Learning, 2015; United States Department of Education, 2016). Recent work by the National Research Council (NRC) (National Research Council, 2008, 2011; Pellegrino & Hilton, 2012), in particular, offers us a useful, if profoundly acultural, model in this regard. Pointing to a wide body of psychometric

findings across skill-related studies, the NRC conceives of three broad “domains” of competence linked directly in the literature to successful outcomes in life and work: “cognitive” competencies, by which they mean facilities related to reasoning, memory, and technical acuity; “intrapersonal” competencies, or the capacity to manage one’s behavior and emotions to achieve goals; and “interpersonal” competencies, meaning capacities involving expression, interpretation, and responding to messages from others (Pellegrino & Hilton, 2012, p. 32–34). Citing both terminological confusion as well as the view among cognitive scientists that skills, knowledge, and abilities learned in and transferred between educational and other social settings are often intertwined, the NRC purposefully uses the term “competencies” instead of “skills” (Organization for Economic Cooperation and Development, 2005; Occupational Information Network [O*Net], 2016), a convention we follow through the rest of this paper, though we retain *en vivo* descriptors in reporting respondent perspectives below (in regards to technical “ability” and technical “knowledge,” in particular).

The NRC’s work, like the work of Carnevale et al. (1990), Levy and Murnane (2004), and others exploring noncognitive competencies, offers a valuable, empirically-supported framework for those looking to clarify skill constructs for educational or vocational purposes, but falls short in important ways. Indeed, while research on noncognitive competencies, or what are now being called “21st century skills,” expands in reach and influence—most recently with scholarly forays into assessment techniques (e.g., NRC, 2011)—culture, context, and insider perspectives continue to be shortchanged in skills-related postsecondary discussions, despite their obvious connections to the value and prevalence of learned competencies (see, for instance, Farkas, 2003) or the success with which postsecondary graduates transfer competencies between social or cultural spheres (e.g., Bransford, Brown, & Cocking, 1999). A review of additional work touching on skill valuation and culture over the years bears this out, and reveals little pertaining directly to postsecondary education. Economists, for instance, have focused on how structural inequities in the United States education and economic systems influence what kinds of competencies or traits are valuable and how they are reproduced (e.g., Bowles & Gintis, 1976), how durable personality dimensions compare from national population to national population (Hofstede, 1980), and how character traits are influenced by an almost endless number of individual and environmental factors, including material or emotional deprivation, criminal justice policy, racism, and even the desire to conform (Sampson, 2016), though without qualitative, insider perspectives focused on higher education. Other scholars have aimed to better understand specific competencies in particular areas of professional expertise, both inside and outside of STEM fields. Communication scholars, for example, have studied the contextual nature of communicative competencies as well as how local biases influence interpersonal interactions in health care settings (e.g., Gallagher & Updegraff, 2012; Spitzberg, 2013), while experts on teamwork have investigated how collaborative competencies link to cohesiveness in aviation or business environments (e.g., Gibson & Zellmer-Bruhn, 2001; Helmreich & Merritt, 1998). Most of this work, again, still lacks a purposeful qualitative, socio-cultural viewpoint and does not reference higher education cultivation or transfer of skills in any depth, which is troubling, especially considering that new forms of noncognitive skill assessment for

employment, the military, school placement, and even postsecondary enrollment are informed by scholarship in the field (Kyllonen, 2013; also see Duckworth, 2016). Indeed, in our view, few researchers or policymakers taking part in skills-related debates explore how culture influences the value or prevalence of competencies, despite research showing that even well-tested, formal modes of skill assessment are context-specific and often subject to cultural bias (Early & Ang, 2003; Greenfield, 1997; Van de Vijver & Poortinga, 1997). While such work typically refers to transnational contexts, we argue the concept can just as easily be applied to the kind of social and cultural variation one would expect to find between states, regions, cities, organizations, neighborhoods, and even families.

Coupled with ill-defined and often ambiguous notions of the kinds of skills valued and cultivated between higher education and workplace spheres as well as the dearth of socio-cultural analyses focused on the lived meaning embedded in the skills-gap narrative itself, this review points to several ways the extant literature can benefit from the qualitative perspective we offer. First, to offset industry- and advocacy-organization accounts based mostly on survey research of employers, our analysis necessarily foregrounds the experiences of employers *and* educators whose daily lives revolve around workforce education issues in Wisconsin. Second, because social and cultural contexts have not played a significant role in previous research on this topic, this work uses ethnographic methods—primarily through free-list and interview techniques that privilege insider interpretations of cultural phenomena (e.g., Spradley, 2016)—to richly describe not only which skills are valued, but also how varying social and cultural contexts influence value and prevalence. Finally, to compensate for the inconsistent application of critical theory in previous workforce education research, and to address the multiple social and cultural contexts associated with questions of learned competence and transfer, we apply theory from relational sociology to conceptualize these various issues within a single framework.

Theoretical Framework

Centered on three interrelated concepts that seek to describe the underlying logic in human behavior, field theory (Bourdieu, 1998; Martin, 2003) allows us to think in nuanced ways about the different social spheres in which people live and work, the kinds of individual attributes that help people accrue resources in these varied contexts, and the power dynamics that are inherent in relations between educational and workforce sectors.

The framework relies on the concept of “fields,” or bounded social orders like families, workers’ unions, corporations, or research centers that encompass actors within webs of association with other actors striving for similar resources (Bourdieu & Wacquant, 1992; Fligstein & McAdam, 2012). Actors occupy specific hierarchical “positions” in these fields, or roles determined by social characteristics like gender, age, credentials, expertise, or economic status, which both shape their relationships with other actors as well as their perspective on what strategies may lead to success or failure within the social field (Martin, 2003). Fields and the actors or groups of actors who act within them can be related in many different ways. Many fields, for example, are incased within one another like Russian dolls, with macro-level social fields (like professional sports organizations in the United States) containing smaller fields (the

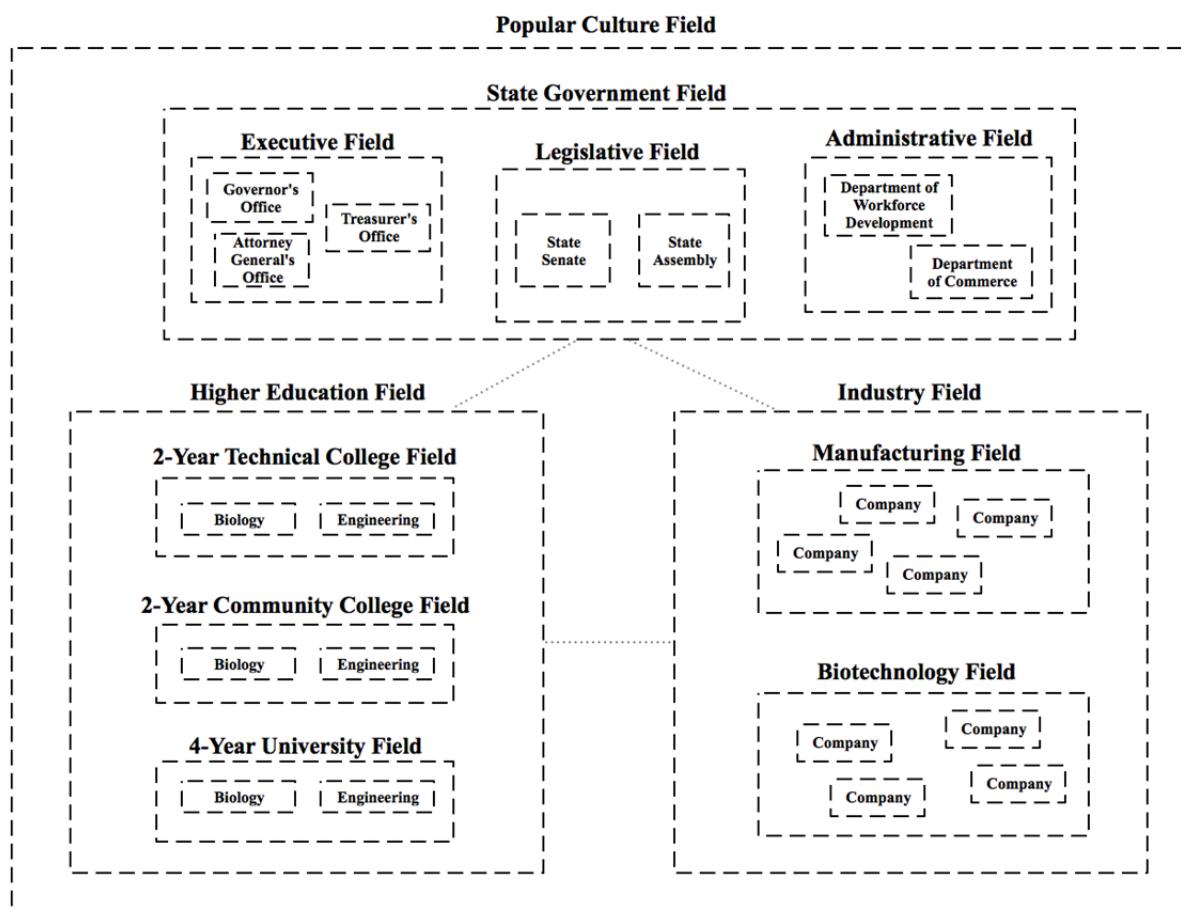
National Football League, Major League Baseball, or the National Association for Stock Car Racing), which in turn contain smaller social fields (the Green Bay Packers or the New York Yankees) that encase even smaller fields (wide receivers, outfielders, or pitchers) and so on (Fligstein & McAdam, 2012). While individual social fields are distinguished by their own values, norms, and ways of interacting, the social and cultural characteristics of smaller fields depend, in part, on the values, norms, and relations within the larger fields of which they are a part.

In this study, the multiple settings in which debates regarding postsecondary education and workforce policy over the last several years have taken place necessarily implicate a number of social fields (e.g., Cramer, 2016). The relationships and dependencies of these various arenas with and on one another—signified by financial, political, or personal connections or, importantly, similar actors occupying multiple fields simultaneously—are significant to relations within each field (Fligstein & McAdam, 2012). For instance, we envision a large, macro-level social field, encompassing all others herein, representing widely held cultural perceptions of higher education or industry. This social field, which can be represented in the ways community colleges or factory jobs are portrayed on television shows (e.g., Hawk & Hill, 2016; Signorielli & Kahlenberg, 2001), both reflects and influences wider cultural beliefs regarding the prestige of these community colleges or factory work. The state government is an important field of influence in this study as well, consisting of legislative (i.e., the state assembly and state senate), executive (i.e., the governor's office), and various administrative subfields (i.e., the Department of Workforce Development), which, as we have noted, exercise power over higher education and industry fields through regulatory and budgetary measures (e.g., McLendon, Hearn, & Mokher, 2009). The study herein focuses on relations and interactions within two connected but distinct fields: higher education and industry in Wisconsin. The higher education field contains smaller, embedded subfields with specific types of postsecondary institutions (2-year community colleges, 2-year technical colleges, and 4-year universities), each of which encases disciplinary fields (biology and engineering), while the industrial field contains specific industry fields (i.e., manufacturing and biotechnology) as well as subfields that are individual companies within these industries (Figure 1).

In addition to the kinds of spaces it demarcates for social and cultural interactions, field theory depends on a concept of *cultural currency*, not economic capital, as the crucial medium of exchange underlying social life (Bourdieu, 1984). “Cultural capital,” or the types of unequally distributed individual attributes that are valued and rewarded within particular field settings and contexts—like an especially brutal uppercut among boxers or an affinity for a particular kind of academic writing among sociologists—is at once a key determinant of each field’s distinctive norms and the subject of continued competition between actors (Bourdieu & Wacquant, 1992). In this way, cultural capital should be understood in a relative rather than an absolute sense (e.g., Prieur & Savage, 2011). Whether it comes through in an ability to present oneself in ways perceived as professional, a taste for fine wines, or the capacity to understand advanced mathematical theorems, cultural capital accrued through learning experiences allows an individual to advance in her social field, gaining competitive advantage, prestige, or economic capital depending on the situation and setting (Bourdieu, 1986; Bourdieu & Passeron, 1977).

Cultural Nature of Valued Skills

Figure 1. Skills-gap Fields



Educational institutions, importantly, are a critical site for such learning experiences, and one of the primary venues through which cultural capital is cultivated and reproduced (Bourdieu, 1986; Bourdieu & Passeron, 1977). Here particular competencies are conveyed, practiced, corrected, practiced some more, modified, and finally mastered, a consuming mental and physical process on the part of novices that “costs time,” Bourdieu wrote, “like the acquisition of a muscular physique or a suntan” (Bourdieu, 1986, p. 248). The investment in time and energy, of course, is meant to pay off, as the resulting competency—whether it be a new penchant for adaptability or an improved welding technique, depending on the particular dynamics of the social field in which one hopes to use it—may help the learner acquire cultural capital that they can in turn “exchange” for status or other resources. With this same logic in mind, we use the construct of cultural capital to refer to inculcated skills, knowledge, and abilities that act as a form of social and cultural currency and that, in our study, represent competencies differently valued by postsecondary educators and employers across varying fields (Bourdieu, 1986; Lareau & Weininger, 2003).

Bourdieu also added the concept of “habitus,” representing the deeply ingrained social, mental, and physical dispositions an individual develops through learning and socialization experiences in the family, community, and educational fields within which one has matured.

Describing it as “society written into the body” (Bourdieu, 1990, p. 63), or the physical internalization of social structure, Bourdieu envisioned the habitus as a set of resources that subconsciously guides one’s actions as an individual lives in or passes through various other fields later in life (Bourdieu, 1990). The individual’s habitus, essentially, gives one an instinctive sense of the unwritten (and typically arbitrary) “rules of the game” in certain fields (Bourdieu & Wacquant, 1992), particularly those she has acted in most intensely for longer periods of time, so that she can intuitively navigate common situations and interactions. Whether the skills or dispositions internalized in the habitus translate into valuable forms of cultural capital—with their attendant status, prestige, or power—depends entirely upon the unique relational values of the field in which one is acting, as a sociologist might discover in a boxing ring, for instance.

In essence, the interrelated concepts of field theory provide a way to situate particular types of valued cultural capital and individual experience within specific social and cultural contexts, while allowing us to account for the ways in which different industry and educational fields are connected (or not). Importantly, they also give us a framework for theorizing the ways that certain skills and dispositions are more valuable than others—even while value is assigned somewhat subjectively from field to field.

Methods

This paper uses a qualitative case study design (Yin, 2013)—an approach characterized by the exploration of a specific bounded issue or concrete problem using multiple data sources—to investigate insider views of skills in Wisconsin. Seeking to analyze respondent perspectives on valued cultural capital across STEM educational and employment fields, we focused specifically on *manufacturing* and *biotechnology* fields as they were represented in both higher education programs and businesses. These fields were chosen because they exemplify both old (in the case of the former) and new (in the case of the latter) science-related industries that have received policymaker attention in recent higher education-workforce discussions (e.g., Carnevale, Smith, & Melton, 2011; Rothwell, 2013, 2014).

Sampling

Using Wisconsin’s Economic Development region guidelines (e.g., Forward Wisconsin, 2016), we began by splitting the state into six regions, each of which contained a predefined “hub” city with a high concentration of manufacturing and biotechnology companies and 2- and 4-year college and university programs that could channel students into these companies (including biology, microbiology, engineering, and electrical repair courses). Using a non-random purposive sampling technique (Bernard, 2011), we created separate sampling frames for employers and educators in each of the six hub cities. Employer frames were populated by searches of online business consortiums and state workforce websites in which hiring managers, supervisors, and business owners were targeted. The educator frame was populated by online searches of postsecondary institution websites in which relevant biotechnology- and manufacturing-related instructors, administrators, and career counselors were targeted.

Cultural Nature of Valued Skills

With a list of 463 potential respondents, researchers contacted each individual via telephone or email to request her or his voluntary participation. After self-selecting into the study, 75 employers representing 52 companies and 70 educators representing 17 postsecondary education institutions ultimately participated in interviews ($n=145$) (Table 1).

Table 1. Description of Sample

| | Interview <i>n</i> | Percentage % | Free list <i>n</i> | Percentage % |
|------------------------|-----------------------|-----------------|-----------------------|-----------------|
| Total | 145 | 100.0 | 115 | 100.0 |
| <i>Sex</i> | | | | |
| Male | 85 | 58.6 | 76 | 66.1 |
| Female | 60 | 41.4 | 39 | 33.9 |
| <i>Region</i> | | | | |
| Southern | 44 | 30.3 | 39 | 33.9 |
| Central | 27 | 18.6 | 26 | 22.6 |
| Eastern | 26 | 17.9 | 16 | 13.9 |
| Southeastern | 19 | 13.1 | 15 | 13.0 |
| Northern | 18 | 12.4 | 14 | 12.2 |
| Western | 11 | 7.6 | 5 | 4.3 |
| <i>Employers</i> | | | | |
| All employers | 75 | 51.7 | 66 | 57.4 |
| Manufacturing | 64 | 44.1 | 59 | 51.3 |
| Biotechnology | 11 | 7.6 | 7 | 6.0 |
| <i>Educators</i> | | | | |
| All educators | 70 | 48.3 | 49 | 42.6 |
| 2-year | 34 | 23.4 | 26 | 22.6 |
| 2-year manufacturing | 18 | 12.4 | 18 | 15.7 |
| 2-year biotechnology | 8 | 5.5 | 8 | 7.0 |
| 2-year career advisors | 8 | 5.5 | 0 | 0 |
| 4-year | 36 | 24.8 | 23 | 20.0 |
| 4-year biotechnology | 17 | 11.7 | 13 | 11.3 |
| 4-year manufacturing | 11 | 7.6 | 10 | 8.7 |
| 4-year career advisors | 8 | 5.5 | 0 | 0 |

Data Collection

Educator and employer interviews, which usually lasted 45 minutes, were based on semi-structured interview protocols that included a free-list exercise, a questioning method used to determine the terms or phrases that individuals use to refer to a particular conceptual sphere (Weller & Romney, 1988). The interview started with this free-list exercise, which asked participants to list the single words or short phrases that immediately came to mind when they

thought, as we put it, “about the skills required for people to succeed in your industry.” Participants then orally listed the skills they believed necessary for people to succeed in the manufacturing or biotechnology industry, depending on the field with which they were affiliated as an employer or educator. These terms, as they represent various competencies differently valued across educator and employment fields, are our operationalization of the concept of cultural capital.

Following the free-list exercise, participants were asked to elaborate on the specific skills they mentioned, defining the terms they used and explaining why they believed the competencies were valuable. After speaking to these competencies, interviewers asked participants questions about a variety of topics, including local teaching and training processes, their personal and organizational connections to industrial or educational fields, and views on the skills gap and the purpose of higher education. Recordings of interviews were transcribed verbatim and uploaded to *NVivo 10* software, while free-list responses were loaded into *Anthropac* software for standardization and analysis (Borgatti, 1996). Researchers began fieldwork in Fall 2013 and finished data collection in mid-2015.

Please note that researchers had to disregard free-list data from 30 respondents in total ($n=115$; see Table 1) because these participants’ data were unviable. In several cases, respondents did not understand the free-list question, refused to be recorded, and/or believed their occupation or organizational role did not allow them to comment on valued skills.

Analysis

Free lists. Free-list data were analyzed in two stages. First, to discover what skills or competencies were valued by Wisconsin employers and college educators, free-list data were analyzed in *Anthropac* for term “salience,” a calculation that measures how often and in what order a specific term is reported across all respondent lists (Smith, 1993). The more common a term is, and the sooner it is mentioned, the higher the term’s salience score. Salience is a useful metric as it suggests which terms define a “cultural domain,” or shared information that is psychologically important for multiple members of a given cultural group (Romney, Weller, & Batchelder, 1986). Here, we specifically explore the employer and educator cultural domains for valued skills in manufacturing and biotechnology workplaces.

To calculate saliency, native phrases need to be converted into standardized terms to ensure analytical uniformity (Bernard, 2011), a process that alters phrases such as “the ability to work together” or “team player” into a single uniform term like “teamwork” that can better represent the confluence of specific values across a sample. With one analyst leading the process and using participants’ own words as a foundation for standardization, researchers met frequently to determine which respondent terms could be subsumed under standardized terms (e.g., placing “dependability” and “hard working” under “work ethic”) and what new terms should be included or parsed out (e.g., separating “ability to learn” from “lifelong learning”). If it was unclear whether one term could be subsumed under another due to idiosyncratic language, terms remained separate. For participants who answered the free-list question in prose, we carefully

distilled single words or short phrases from their statements to match as closely as possible the sentiment or thought interviewees were communicating, using both free-list responses as well as follow up interview questions on the free list. In cases where terms were ambiguous or unrelated to skills, those terms were removed.

Once the research team agreed on the standardized terms, they were applied across every participant's free list and entered into *Anthropac*. Term salience for all respondents, educators, and employers was collected and displayed to allow the researchers to see relative values for listed skills and to make inter-field comparisons. We report these results in answer to our first research question below. Results are reported, again, for those employers ($n=66$) and educators ($n=49$) who provided useable free-list data (Table 1). We also copied and pasted all terms from employers' and educators' standardized term lists, of which there were 97 in total, into Wordle.com (Feinberg, 2014), an online word cloud program that creates visual diagrams in which terms more often mentioned are larger proportionally than those less frequently mentioned (see, for instance, Ahearn, 2014). For comparative purposes, we include employers' and educators' word clouds in Figures 2 and 3, page 18.

Interviews. Responses to interview questions were analyzed using an inductive approach to qualitative data analysis (Bernard, 2011). Through multiple group readings of several transcripts, we began first cycle coding by developing an open coding scheme in which ideas from the text were used to name new codes (Charmaz, 2014; Chi, 1997), with each successive instance of an idea compared to previous instances to confirm or alter code definitions (i.e., the constant comparative method; Glaser & Strauss, 1967). This process continued until no new codes were being developed from the analysis of additional transcripts (Braun & Clarke, 2006). After discussing and testing multiple versions of these preliminary code lists, researchers finalized definitions for each code, then applied a definitive codebook consisting of 27 codes in 9 thematic categories to segment transcript data into more manageable units through simultaneous coding (Saldaña, 2013; Miles, Huberman, & Saldaña, 2014).

Next, based on respondent repetition as well as the relationship of emerging themes to our research questions and field theoretical framework (Ryan & Bernard, 2003), one analyst began a second cycle coding process focused on analyzing interview text concurrently categorized as "Valued Skillsets" (including any mention of skills or elaboration of terms mentioned during the free-list exercise) and "Contextual Factors" (including any contextual, situational, political, social, or cultural factors linked with the valuation or cultivation of a skill), further developing themes from this simultaneously coded data using the open and constant comparative coding processes (Charmaz, 2014; Miles et al., 2014). After developing preliminary themes based on an analysis of 15 transcripts, or approximately 10% of the corpus, the analyst gave the coded data to a lead analyst who independently reviewed the text segments and developed his own themes. The two analysts compared their results, refining the themes to ensure agreement, before the first analyst applied the resulting final thematic framework across the entire corpus of segmented data. The results of this analysis, which include employer and educator perceptions regarding

which contextual factors influence skill valuation, are used to answer our second research question below.

Study Limitations

Several limitations to this study should be taken into account when weighing our reported evidence. First, the industry sample is weighted heavily towards manufacturing employers ($n=64$) over biotechnology employers ($n=11$), as the biotechnology industry is much smaller proportionally in the state than manufacturing. This results in industry free-list and interview analyses that are skewed towards the perspectives of manufacturing employers. Second, the free-list standardization technique, a requirement for data analysis, inherently decreases the uniqueness and variation among respondent term responses. At the same time, standardization demands a certain level of interpretation from researchers which, in turn, can often signal a kind of regularity within cultural domains that does not exist in the real world. Third, we focus solely on only two industries and broad fields of study in Wisconsin, so external validity beyond these industries and fields and outside the state is untenable.

Finally, and most importantly, asking questions linking higher education instruction directly to the valuation of competencies in the workplace in many ways assumes the frame of the skills gap that we find problematic—along with that narrative’s suppositions regarding the prominence of employer needs (particularly as compared to those of students and educators) as well as the prominence of workforce-related objectives in postsecondary education. As we explain in more detail below, educators often do not perceive their teaching practice in such utilitarian terms.

Results

We first report our results by discussing free-list findings showing the competencies—or “cultural capital,” using field theoretic concepts—that Wisconsin employers and college educators in our sample believe are most valued in workplace social fields. We supplement these results with brief descriptions of how respondents defined and discussed key competencies from our thematic analysis of interview data. Next, we show how respondents perceived contextual factors in varying social fields shaping the value and prevalence of these competencies.

Research Question 1: Valued Cultural Capital

Here we examine the types of competencies that study respondents considered essential for success in the world of work. Again, terms with greater saliency scores represent competencies that were listed most frequently as well as higher on respondents’ free lists (Table 2).

Table 2. Free-list Salience Results (Total, Employers, and Educators)

| Total sample (n=115) | | Participant Group | | | |
|----------------------|----------|---------------------|----------|---------------------|----------|
| Term | Salience | Term | Salience | Term | Salience |
| Employers (n=66) | | Educators (n=49) | | | |
| Technical ability | 0.348 | Work ethic | 0.350 | Technical ability | 0.381 |
| Work ethic | 0.310 | Technical ability | 0.322 | Work ethic | 0.257 |
| Technical knowledge | 0.259 | Technical knowledge | 0.275 | Technical knowledge | 0.238 |
| Problem solving | 0.180 | Lifelong learning | 0.171 | Problem solving | 0.232 |
| Communication | 0.153 | Problem solving | 0.141 | Teamwork | 0.204 |
| Teamwork | 0.149 | Communication | 0.130 | Communication | 0.183 |
| Lifelong learning | 0.142 | Adaptable | 0.125 | Critical thinking | 0.156 |
| Innovative | 0.105 | Self motivated | 0.116 | Innovative | 0.154 |
| Detail-oriented | 0.101 | Interpersonal | 0.109 | Detail-oriented | 0.145 |
| Self-motivated | 0.099 | Teamwork | 0.107 | Lifelong learning | 0.103 |

As this analysis shows, the most salient term on employer free lists was work ethic (.35), followed by technical ability (.32), technical knowledge (.28), lifelong learning (.17), and problem solving (.14). For educators the most salient competencies included technical ability (.38), work ethic (.26), technical knowledge (.24), problem solving (.23), and teamwork (.20). As a point of comparison, these results are similar to word clouds—or visual representations of how often free-list terms were mentioned—of employer and educator free lists (Figures 2 and 3).

These tables and figures show the relative values of some competencies over others within and between employer and educator social fields, which in turn allows us to conceptualize, in field terms, how certain skills, knowledge, and aptitudes benefit individuals differently from social field to social field. Employer responses, for instance, show work ethic (.35) as the central skill in the industry domain while problem solving (.14) is less salient, indicating that work ethic may garner an individual higher status or prestige than problem solving in manufacturing and biotechnology employment fields. In the same way, results show that lifelong learning was more salient among employers (.17) than educators (.10), which suggests the ability to learn continuously is seen by educators to accrue somewhat less cultural capital in industry than it actually accrues. While space limitations do not allow us to examine and compare all of these competencies in detail, we offer here a brief synopsis of how employer and educator respondents discussed a few of the most salient terms in their free-list analysis: technical ability, work ethic, technical knowledge, problem solving, communication, and lifelong learning.

Figure 2. Word Cloud Visualization of Employer Free-list Term Frequencies



Figure 3. Word Cloud Visualization of Educator Free-list Term Frequencies



Technical ability. Terms related to technical ability, including mechanical and tool-related competencies, were the second most salient terms for employers (.322) and the most salient for educators (.381), indicating that technical abilities are perceived as valuable forms of cultural capital in both industry and education fields. For employers, computer competencies were perceived as particularly important across industry fields. A number of manufacturing employers spoke of the value of machine operation and programming, reading blueprints, and using shop-related tools or instruments, while biotechnology employers often listed terms related to being able to work in lab environments in general (e.g., working “under a hood,” using small lab-specific instruments, or keeping a good notebook), utilizing proficient bench practices, and being able to reliably repeat procedures. Educators perceived both general and specific technical abilities as highly valued in workplace settings. More generally, like employers, educators believed computer competencies would be important across a range of workplace fields. College educators teaching biology listed good lab habits, the capacity to do tedious tasks repeatedly, sterilization and mixing techniques, and using pipettes as particularly valuable, while educators across manufacturing-related programs focused on programming, welding, metal cutting, and plastic molding. *Physicality*, specifically in terms of instrument manipulation and hand eye coordination, was an important factor in respondent descriptions of technical ability across respondent groups, indicating important connections to Bourdieu’s concept of the often physical dispositions inculcated in the habitus that allow an individual to accrue (or not accrue) cultural capital (Bourdieu, 1990; Lizardo, 2004).

Work ethic. Work ethic was the most salient competency listed for all employers (.350) and the second most salient term across all educators (.257). By and large, employers most often spoke of work ethic using attitudinal and effort-oriented descriptors referring to dedication, diligence, quality work, and dependability that allowed one to gain status in employment fields. One employer in manufacturing, for instance, defined work ethic-related commitment as, “You’re here working, you believe in what we’re making.” Another employer said that work ethic involved “the attitude of being to work on time, ready to work.” Educators defined work ethic in similar ways, highlighting the importance of self regulation competencies in performing dependably and efficiently in educational and employment fields alike. A biotechnology educator at a 2-year technical college, for example, simply described work ethic as “fulfilling your obligation as an employee to your employer.” Employers and educators also highlighted what one person termed “the work ethic problem,” a widely held perception that transforming educational, family, and employment field norms were leading to a general decrease in dependability and hard work. As we will explain in more detail below, a number of employer and educator respondents linked changing work ethic-related values to what they saw as transformations in the family, a realm of social life that Bourdieu recognized as a major influence on an individual’s habitus (and field-oriented cultural capital) from an early age (Bourdieu & Wacquant, 1992).

Technical knowledge. Technical knowledge was another valuable form of cultural capital in both industry and education fields. Terms related to technical knowledge were the third most salient for all employers (.275) and all educators (.238). Employers across both industries spoke of general domains of knowledge that were closely related to their industry, including mathematics,

laboratory science, geologic principles, and liquid measurements. Several educators acknowledged the importance of technical knowledge in general, though biotechnology educators across both 2- and 4-year institutions mentioned the importance of understanding the project or experiment as well as the scientific principles on which the specific task was based. Manufacturing educators at both 2- and 4-year colleges, on the other hand, talked more about technical knowledge such as “technical know-how” or an understanding of “manufacturing technology.” Explaining the need for a particular type of manufacturing process knowledge, for example, an engineering educator at one 4-year university said, “Much of manufacturing these days is becoming more technically challenging, [so] it requires more broad knowledge and preparation.” Postsecondary educators, usually from 2-year colleges, also listed other domains of knowledge such as weights and measures, electronics, mechanics, and chemistry as important to students’ later success in workplace fields.

Problem solving. Problem solving was the fifth most salient term for all employers (.141) and the fourth most salient term for all educators (.232), indicating it was perceived as a valuable form of cultural capital across fields. Manufacturers, specifically, valued general as well as more directed aspects of the competency such as “practical” or “guided” problem solving techniques. Several manufacturing employers also used the term “analytical” when referring to the kinds of problem solving competencies they believed were valued in industry. Biotechnology employers also valued problem solving and analytical competencies, and saw them as an integral part of the scientific endeavor. Problem solving competencies were also highly valued by educators at 2-year colleges, especially those involved with manufacturing-related programs. While only one biology educator from a 4-year college mentioned problem solving as an important competency, a number of other 4-year educators in biology highlighted the importance of analytical thinking, a recognized component of problem solving. Categorized specifically as a cognitive skill by the NRC (Pellegrino & Hilton, 2012), several employers and educators stressed the importance of teaching students and employees routinized problem solving techniques that they could, after practice, transfer as habits to a number of other social fields after their learning.

Communication. Communication was the sixth most salient term for all employers (.130) and educators (.183) and the fifth most valued form of cultural capital across all respondents. Indeed, while technically-oriented abilities and knowledge were important to the students’ future careers, employers and educators believed that communication skills, as much or more so than dexterity with specific tools or theories, served to distinguish valuable workers in industry fields. Employers spoke to the importance of speaking and written communication in multiple aspects of manufacturing and biotechnology businesses, including working with colleagues, giving presentations, and dealing with large volumes of emails efficiently and professionally. Communication competencies were significant, several manufacturing employers pointed out, in more technically-oriented positions as well. Many educators in 2-year institutions, for their part, spoke of communication as an important workplace competency, even in occupations traditionally associated with technical expertise. “We heard loud and clear from our industries,” one 2-year manufacturing educator told us, referring to members of his institution’s industry advisory board, “that they need more interpersonal skills and communication ability.” A number of educators at 4-year institutions also stressed the value of communication in a variety of

different contexts, scientific and pedestrian, as well as its importance to analytical and intellectual competencies.

Lifelong learning. Terms related to lifelong learning, which were listed fourth by employers (.171) and tenth by educators (.103), included cultural capital related to the willingness and curiosity to continue learning new things. This competency was valued by employers in both manufacturing and biotechnology fields, many of whom told us that rapid changes in technology made continual learning a necessity in the workplace. “Getting out of your comfort zone,” one biotechnology employer in southern Wisconsin said. “Being able to learn … is pretty important for anyone going into biotech.” A manufacturer in northern Wisconsin concluded that finding those who were “trainable” and eager to learn was of critical importance to her business. “That’s our business plan, that’s how we work,” she declared. “Is to get that willing, able … sponge up here.” Educators found obvious value in lifelong learning, though the term’s comparatively low salience score indicates that, as a group, they did not think the competency was as highly valued in workplace social fields as other forms of cultural capital. One manufacturing educator in a 2-year institution, for instance, saw lifelong learning as a competency that would continue to accrue value over the course of a student’s career, though not necessarily in the short term. “The long-term skill level is the attitude of continuous inquiry, inquire about this, inquire about that,” he said. “You gotta be curious about everything.” Another respondent, an engineering educator from a 4-year institution, related lifelong learning to this own background, pointing out that it was just the kind of skill universities were meant to instill in students. “I’m a product of the liberal arts,” he told us. “So I look at this whole idea of lifelong learning and broad backgrounds … try things that you do know, and if that doesn’t work, then go off and teach yourself or go find the resources that will help you.” Like others respondents, he spoke of lifelong learning as a competency that needed to be deeply rooted in the individual and learned over the course of years.

Following the field theoretical frame, we envision each of these competencies as socialized knowledge, traits, skills, abilities, or dispositions—or cultural capital—that are learned, instilled in the habitus, and differentially valued from social field to social field (Bourdieu, 1998). None of these competencies, it is important to point out, was discussed in isolation or as a standalone attribute. Instead, respondents linked terms to one another in ways both subtle and conspicuous, describing interlocking competencies that could activate one another depending on the individual or situation. One manufacturer, for instance, said workplace success was as dependent on attitude as it was on mental ability. “With mediocre intellectual capabilities,” he argued, “passion for something can take you a long way.” Devotion was indispensable, he seemed to be saying, *if* one could also apply a modicum of cognitive effort.

With these comparisons and connections in mind, we move on to exploring what contexts—envisioned as varied fields and field characteristics—employers and educators told us influenced the value and prevalence of competencies in Wisconsin.

Research Question 2: Contextual Factors Shaping Skill Valuation and Prevalence

After prompting free-list responses, researchers asked educator and employer respondents a number of questions about valued competencies. Our thematic analysis of these and other skill-related interview data elicited a number of societal, organizational, positional, and individual factors that respondents told us affected what competencies (or combination of competencies) they considered valuable, as well as whether students and employees possessed these competencies. Table 3 lists and defines the various contextual factors and specifies which particular competencies respondents most commonly associated with each.

Table 3. Contextual Factors Influencing Valued Skills

| Contextual Factor | Description of Factor | Associated Competencies (in alphabetical order) |
|--------------------------|--|--|
| Perceptions of industry | Perceptions of the kind, quality, or status of work in manufacturing field, as seen by general public and/or those from other fields | Communication, Teamwork, Technical ability |
| Education policy | Federal or state public education policies or political debates involving curricular, instructional, or budgetary matters in public and private institutions at all levels | Communication, Self motivated, Teamwork, Technical ability, Technical knowledge |
| Geographic location | Specific geographic locale of education or employment field, whether rural, urban, regional or statewide, that is seen to require certain competencies or values, instill (or not) competencies or values, or draw (or not) skilled students or job applicants to area | Interpersonal, Teamwork, Technical ability, Work ethic |
| Organizational “culture” | Values, norms, and customs of employment environment and colleagues usually shaped by a company’s unique management style, size, location, products, services, and history | Adaptable, Communication, Interpersonal, Lifelong learning, Teamwork, Work ethic |
| Compensation | Pay rate within a particular company, occupation, or position | Teamwork, Technical ability, Work ethic |
| Occupational category | Differences in job requirements and work activities between industries, companies, and/or one position and another | Teamwork, Technical ability, Technical knowledge, Work ethic |
| Generational status | Student or employee’s age, with age seen to reflect the common values and norms of the time period within which one was raised and educated | Adaptable, Communication, Interpersonal, Lifelong learning, Self motivated, Teamwork, Work ethic |
| Family background | Style of parenting and role-modeling the student or employee received from the parents and/or in the family growing up | Communication, Creative, Interpersonal, Lifelong learning, Teamwork, Work ethic |
| K–12 background | Influence on student or employee of elementary, middle, and secondary schooling/education | Teamwork, Work ethic |
| Personal history | Instructor or employer perspective—on what competencies they possess, what competencies are or are not important in students or new hires, or what competencies are present or lacking in a student or applicant—based on personal experiences | Adaptable, Communication, Critical thinking, Interpersonal, Self motivated, Teamwork |

Though space does not allow us to examine all these factors, we focus on a few that respondents most commonly reported as influencing the types of noncognitive competencies we have discussed, including communication, lifelong learning, and work ethic. As we show, as these factors represent respondent-generated conditionalities regarding the value and prevalence of certain important competencies, they are quite similar to the kinds of unique characteristics across social spheres that field theorists envision influencing a person's ability to harness cultural capital to gain prestige, status, or other resources in particular fields (Bourdieu, 1986).

Perceptions of industry. A number of respondents reported that they believed a popular but negative image of employment in the manufacturing field influenced a decline in the number of young people interested in manufacturing careers in Wisconsin. Based on widely reported layoffs, notions of the repetitive and gloomy nature of factory labor, and cultural stereotypes of those employed in the industry, many thought these perceptions ultimately led to lower skilled workers entering the field. “[When] you think ‘manufacturing,’ I bet you a majority of people who aren’t familiar with it would think dirty, dusty, nasty, low skills,” one human resources manager from an eastern Wisconsin manufacturing company reported. “And then parents say, ‘Well, I don’t want my kid going into manufacturing because they’re not going to make anything of themselves.’”

This “perception problem,” as a few educators and employers put it, was wrapped up in complex yet tacit assumptions about the prestige and status of 2-year vocational versus 4-year academic education and, more broadly, blue collar versus white collar labor (see, for instance, Mullen, 2010). These intricacies, in turn, influenced cultural capital across education and industry fields in two seemingly contradictory ways. First, according to some employers, the negative image of manufacturing led to an under-emphasis on the training of technical competencies in middle, secondary, and postsecondary institutions. “That’s something that’s really lacking, you know, is that general ability to put things together,” one manufacturing employer told us. He seemed to suggest, like some other employers, that this was the result of publicly sanctioned forms of elitism among educators. “Now I don’t know if the schools don’t want to bother to do that or don’t have the time to do that or [if] it’s beneath them,” he said. At the same time, however, educators and employers said the negative image of manufacturing had also led to widespread obliviousness to the fact that *noncognitive* competencies were significantly valued in the industry. Communication stood out in this regard. “If [students are] coming into the manufacturing area, many times they question why they need the communication,” one educator at a 2-year technical college told us. “We can teach them some of the technical or the trade skills,” he said, “but it’s those soft skills that they really need.” A manufacturing employer in southern Wisconsin seemed to agree. “The assumption is, well, ‘They’re just on a line, etcetera, they’re just doing their same repetitive position day in and day out,’” he argued, so “that whole communication piece gets missed.”

In effect, employers and educators believed that values and norms across a large, macro-level societal field, referred to above as the Popular Culture Field (Figure 1, p. 11), do not confer status or prestige on those working in manufacturing. Instead, many respondents thought popular

perceptions of manufacturing did quite the opposite, influencing how often students are exposed to technical skills education, whether students choose to enter the field, and what competencies those who do enter will possess. While there exists no empirical research on widely-held stereotypes of manufacturing labor, respondents' perceptions in this regard may very well reflect an underlying reality in Wisconsin, especially considering studies showing that culturally-embedded biases on television (e.g., Furham & Mak, 1999) and in printed media (e.g., Massoni, 2004) have been shown to have a negative influence on recruitment into certain occupations (for instance, see Master, Cheryan, & Meltzoff, 2016).

Geographic location. The diversity of certain areas, the depth or lack thereof of local worker pools, the demands of nearby businesses, and the other characteristics attributed to Wisconsinites from different regions of the state also affected what competencies educators and employers valued or thought were necessary in educational or employment contexts. Local demographics, for example, whether considered heterogeneous (usually in and around the Milwaukee and Madison metropolitan areas) or homogeneous (in more rural parts of the state, including central and northern Wisconsin), were mentioned as necessitating teamwork and communication skills for those who would be working with colleagues of different ethnicities. Other participants indicated that the shallowness of the local worker pool forced them to either bring on people lacking work experience, technical abilities, and the capacity to learn quickly, or hire from other parts of the state. "We just had a technician accept an offer and he's got a great background but he's from Madison," one central Wisconsin biotechnology employer told us. Madison is in the southern part of the state. "The ones we interviewed in the area just didn't have the skills and, to be honest, we didn't think they'd pick up quickly enough to get going." Still other respondents noted the heightened importance of particular competencies because of the area's proximity to certain types of companies. One manufacturing human resources director in northern Wisconsin, for instance, said that "precision metal working skills" were more prevalent *and* more valued locally because of local businesses. "We've been a region ..., because of that core metal manufacturing, machining, metal fabrication skill set, [where] work has come here from companies that require those ... skills," he said. He went on to note that the local technical college, which had a number of programs designed to educate students in these competencies, was well attended by students who, he reported, "already had all the technical skills coming in."

Similarly, while other participants told us of the "can-do attitude" of locals across different state regions, several educators and employers also believed workers across the entire state more often than not had a strong work ethic. It was a reputation, they reported, that helped Wisconsinites find employment more easily when they left the state. "I think a lot of the history of people who've lived in Wisconsin have tended to have good work habits, whatever those are," one engineering professor explained. "I don't know if that's the history of heavy manufacturing in Wisconsin or just they grew up on the farm or whatever." One human resource director at a manufacturer in the northeast part of the state agreed. "I really think it's 'Wisconsin work ethic,' you know, that hey, 'You're going to pay me a good wage, I'm going to give you my all, and I'm committed.'"

In contrast to the unenthusiastic perception of certain industries among large portions of the public mentioned above, the kinds of regional contrasts in valued (and prevalent) competencies referred to here indicate the ways cultural capital, usually conceived as a resource based in *social* space, can also vary according to *geographic space* (see, for instance, Holt, 2008; Patterson, 2008; Walker & Clark, 2010). Taking our cue from cultural geographers and ecological economists who have shown how complex social, economic, and environmental realities are often intertwined (e.g., Berkes, Folke, & Colding, 1998), we can conceptualize how various social fields—based as they are in locations in which manufacturing companies have supported a good proportion of the local populace for generations—may bestow prestige on an individual with the kinds of “precision metal working” cultural capital pointed to above, even if this status is not conferred within the wider field of popular culture (Lareau & Weininger, 2003).

Organizational “culture.” Employers and educators also spoke to the importance of an employee matching, as many respondents put it, an organization’s “culture,” or the collective values, norms, and working style of a specific employment environment and its employees. According to interviewees, this organizational culture, which we interpret as shared, often taken-for-granted assumptions of individuals within each organization (e.g., DiMaggio & Powell, 1991), was usually shaped by a company’s products and services, size, years in business, management style, and history. The concept as respondents described it closely tracks not only to organizational scholarship (e.g., Rivera, 2012; Sheridan, 1992), but also to field theory, which envisions individual attributes rooted in the habitus accruing value differently based on the social field’s unique history, rules, and customs (e.g., Emirbayer & Johnson, 2008).

“Cultural fit,” participants told us, pertained to an individual’s interpersonal and communication competencies and overall ability to get along with other institutional actors. One employer, for example, called the last phase of employment vetting the “cultural phase,” and told us his hiring team consistently asked, “Do we feel as if they’ll interact well with the people that they’ll be asked to interact with?” A number of participants indicated that they specifically tried to avoid hiring workers who were “cowboys” or “show dogs,” in the words of one employer, as they perceived their company cultures as more focused on the “we” instead of the “me.” Besides collaborative competencies, the employee’s connection to the company itself—through their dedication and commitment to the organization’s mission, product, and goals—was also reported as an important measure of this cultural fit. “We produce castings here,” one manufacturing employer reported. “And we want someone [who is] passionate about making good castings.” Wrapped up closely with this kind of dedication, many educators and employers also indicated, was employee work ethic. Several employers, for example, told us they depended on an employee’s ability to be disciplined, stay on task, and act independently for the good of the business. “We’re pretty much making [products] to order … just flying by the seat of our pants,” one manufacturing employer said. “If people decide to call in Monday ‘cause they had a long day on Sunday fishing and they had a few too many beers … if that’s a key employee, that really puts us in a bind.” This was a competency especially prized by smaller organizations and custom shops in both biotechnology and manufacturing fields, where workers are usually required to consistently train and acclimate quickly to changing duties, work flows, and technologies.

Family background. Though respondents mentioned other macro- and meso-level field characteristics, they also reported individual-level contexts they perceived as influencing competency prevalence and valuation, including the occupational category in which one is working or for which one is educated, an individual's K–12 education background, and the instructor or employer's personal history as it relates to the student or employee (Table 3, p. 22). One's unique family background, in particular, was the most often mentioned context perceived to weigh on competency valuation and incidence. Similarly to field theorists, who argue that parents impress durable and long lasting abilities, tastes, and outlooks into an individual's habitus from an early age (Bourdieu, 1984; Bourdieu & Passeron, 1977), many respondents spoke of early family experiences instilling certain kinds of tendencies an individual would carry with them into educational and career fields later in life. Such tendencies or habits, of course, allow one to accrue (or not accrue) cultural capital in given social fields. These included interpersonal competencies, the ability to continue learning, and "general educational" habits, as one biology instructor at a 2-year college in central Wisconsin described it. "If you go into somebody's house and there [are] no books ... and pop culture takes center stage, then our students are coming in with a perception that education is valued, but not education the way that educators and maybe potential employers are thinking." As he said, "thinking skills, the people skills, communication skills, the curiosity, the work ethic" were important competencies coming from parents and the family.

Work ethic in particular was significant in this regard. For many educators and employers, the dependability, quality, and dedication of an individual's work or studies directly mirrored her or his home environment. Some parenting techniques, participants argued, instilled patience, diligence, or discipline, while others did not. "I think parents play a big role in it as kids are growing up," one manufacturing employer reported of work ethic, concluding, "I see more and more younger kids getting handed things without having to work.... It's, 'I want it, I'm gonna get it.'" A university-level biology educator agreed. "I think [work ethic] just comes from life, it comes from family, it comes from opportunities that you had in the past. I feel bad for kids that didn't have to work in high school and college.... [T]o me that's the wrong message." Others pointed out that challenges in one's family background, whether it came in educational attainment or simply making ends meet, made some more inclined to succeed. "A significant portion of the students that come to this university are first-generation college," one professor told us, "so they come from families that have worked hard for everything that they've gotten, they have really no sense of privilege." The attitude, she seemed to be saying, was deeply rooted. "The students that we have come into this program are very hard workers, we don't have to teach that," she said. "If I did have to teach it, I wouldn't have a clue how to do it." Perhaps because respondents saw work ethic as such a firmly entrenched facet of an individual's character, it was an open question among many whether an instructor or employer could properly instill the attitude in an adult. One biology instructor in southern Wisconsin, when asked whether work ethic could be taught, answered, "Yeah, by parents.... I can help but by the time they get to me, that's pretty engrained, they've already learned a lot." As another manufacturer said, such competency comes from "deeper relationships."

Discussion

While the influential and far-reaching “skills-gap” narrative assumes that postsecondary programs should align curriculum and teaching more closely with employer needs—ostensibly to foster macro-economic strength and assist graduates in the workforce—the goal in this paper has been to explore insider perceptions of value and context linking important skills across higher education and career settings. Through the lens of field theory, we outlined which competencies or cultural capital educators and employers believe are important in the workplace as well as the different social and cultural contexts educators and employers perceive as influencing the value and prevalence of these skills in Wisconsin. Our findings, which speak to the status of learned competencies in postsecondary and employment settings, help move debates regarding postsecondary education, competencies, and the “skills gap” forward in a number of ways. Let us consider our two research questions in turn.

The Broad Appeal of Technical and Noncognitive “Habits of Mind”

Though the kinds of technical competencies that have been the focus of much postsecondary policy reform in Wisconsin—those listed as “technical ability” and “technical knowledge” in our free-list analysis—were considered valuable by both sets of respondents, *noncognitive* skills such as work ethic, communication, teamwork, and lifelong learning were also recognized as important competencies across educator and employer cultural domains alike. Employers *and* educators largely agreed that technical, interpersonal, and intrapersonal proficiencies were all important forms of cultural capital in the workforce. These results indicate that Wisconsin postsecondary educators, who have been targeted for their supposed disengagement with the employment sector, seem to have a better idea of what kinds of skills are valued in workplace settings than their critics have claimed.

In addition, the findings are also consistent with a wide body of research on the personal, academic, workplace, and health-related value of noncognitive competencies (Farrington et al., 2012; Heckman & Kautz, 2012; Heckman & Rubenstein, 2001; Pellegrino & Hilton, 2012) as well as prior studies on the competencies employers desire (e.g., Career Builder, 2015; Carnevale et al., 1990). Some of these competencies, furthermore, clearly implicate learned social and cultural values that may be difficult to cultivate in the kinds of short, technically-oriented interventions recently passed by education policy makers in Wisconsin.

That said, the employers and educators we spoke to usually did not discuss learned competencies as discrete, isolated traits or abilities. Importantly, after responding to our free-list question, participants often described competencies as interconnected, multifaceted, and indelibly tied to the student or employee’s character and frame of reference, much as the *habitus* has been conceptualized as the physiological embodiment of various “layers” of behavior and dispositions learned in different social fields over the course of one’s life (Lizardo, 2004). Many participants noted, for instance, that the ability to continually learn facilitated the acquisition of a number of other technical and noncognitive competencies, so much so that it was difficult to separate one competency or practicable domain of knowledge from another. Other respondents

linked critical thinking and problem solving competencies to the ability to analyze scientific data and communicate one's argument to others. "Being able to think through and then communicate what they are thinking and what their questions are, in a really clear way, is just part of that," one 4-year biology instructor noted in reference to an all-inclusive set of competencies she called "thinking skills." Another educator, a materials instructor at a 2-year technical college, channeled this concept of development in much the same way as Bourdieu, who, in describing how the habitus can be "inscribed" with traits that accrue cultural capital in various fields, wrote of the intense investment in time and energy that mastery demands (Bourdieu, 1986). "You practice, and you practice, and you practice," the instructor told us. "And you develop those fine motor skills as well as the attitude."

At once encompassing an individual's physicality, cognitive and noncognitive capacities, and state of being in the world, this concept of intertwined and contextualized competencies, which we term *habits of mind*, links an individual's past experiences and contemporary environments (Bateson, 1972). One employer, a blunt manufacturer in northern Wisconsin, explained the amalgamation well when asked what learned competencies he looked for in employees. "If I had to pick, I'd pick a person that worked on a farm," he told us. "The reason that I say that is that a person [who] works on their family farm every day is probably confronted with something that needs to get done, and they don't really know how to get it done, but they know they have to get it done." Like many Wisconsin employers, he believed a job applicant who grew up on a farm would be a hard and inventive worker because that is what years of farm work had taught them to be. "That little description right there," he said, referring to his summation of farm work, "probably describes the combination of attitude, problem-solving, work ethic, imagination, and innovation better than anything that you could put into categories and test."

Work ethic, an individual competency rooted in cultural, social, and dispositional factors that was the most salient term for all employers (.350) and the second most salient term for educators (.257), is a prime example of such a habit of mind. While most of our respondents used the term to refer to the responsibility, dependability, and positivity with which one approached her company and job, the term has a long cultural history in Northern European Protestantism speaking to the belief that hard work and material success are signs of salvation (Furnham, 1990b; Weber, 2002). As we noted above, the term "work ethic" also has cache among Wisconsinites stemming from the state's rural, agricultural traditions that defies easy categorization (Hora et al., in press). Past research has backed up work ethic's multidimensionality, as well. Though the concept of "Protestant work ethic" was assessed on questionnaires through the 1960s and 1970s using a unidimensional score, recent factor analyses of the Protestant work ethic have shown the survey item measured an array of factors related to attitudinal and intrapersonal skills including self-reliance, morality, hard work, and the ability to delay gratification (e.g., Furnham, 1990a; Miller, Woehr, & Hudspeth, 2002). The closely related idea of "conscientiousness," studies suggest, also encompasses a variety of similar concepts (e.g., Costa & McCrae, 1992) as well as competencies like grit, impulse control, and striving (e.g., Heckman & Kautz, 2012). Indeed, some have argued that work ethic may not even be a fixed attribute, but instead a trait that evolves over time and changes with the individual and

situation (Wentworth & Chell, 1997). Communication and lifelong learning are similarly complex habits of mind as unworthy of the simple, almost mechanical term “skills” as they are deserving of careful, nuanced, and contextualized analysis.

Ultimately, the prominence in this analysis of such culturally-embedded competencies, each with its own widely divergent connotation from era to era and field to field, raises at least two questions. First, how, exactly, should one be taught habits of mind? Second, who is responsible for cultivating certain habits of mind in students? One leader of a manufacturing company in northern Wisconsin answering these questions, for instance, told us such competencies were more appropriately taught in other social spheres. “School can only typically teach skill sets, they can’t teach culture,” he said. “How do you teach the ability to listen? Or the ability to question? Or the desire to learn?” he asked. These competencies were either there or not, he concluded. “I don’t know that you can [teach these things] by the time that someone gets to higher education.” Such questions force us to further consider what other social and cultural fields, including one’s family, K–12 education, or local community, may be important to inculcating competencies in students that help them accrue cultural capital, as well as the wisdom of policy and rhetoric expecting those in the higher education field to tailor their instruction and curricula so closely to the needs of one field in particular (employers).

Field Theory, Neoliberalism, and Power in Wisconsin

The findings above referring to contexts influencing skill valuation and prevalence are instructive in this regard. From the perspective of those most closely implicated in debates about skills and the so-called “alignment” of higher education institutions and employers, concepts regarding which competencies are valuable and which are not, as well as how one learns important habits of mind, cannot ultimately be separated from social, cultural, or economic contexts. Rather, they represent one of many parts in a much larger constellation of factors specific to individual actors, organizations, industries, states, and, of course, society. Field theory, we have argued, is helpful in conceptualizing these issues with specificity and with attention to individual agency and social structure. Some contextual factors influencing competency valuation and prevalence, like the occupational category in which competencies would be utilized, are *positional*, and often influence an individual’s perspective or the different expectations others have of that individual whether she or he is an assembly line worker, lab technician, or a chemical engineer (Martin, 2003). Some contextual factors, such as the student or employee’s family and educational background or the employer’s personal history, relate more closely to life experiences and the durable yet evolving habitus that individuals carry from social field to social field throughout their lives (Bourdieu & Wacquant, 1992; Lizardo, 2004). Others, we can postulate, relate to meso- and macro-level social field factors (Fligstein & McAdam, 2012). In this regard, while we have outlined how public perceptions of industry, geography, and organizational climates influence what competencies were important as well as what competencies might be missing in students or job applicants, other macro-level contexts touch on these issues as well.

One such dynamic influencing the value and prevalence of habits of mind in Wisconsin during our field work came in the form of a market- and economic-driven political philosophy, discourse, and set of policy prescriptions ushered in by conservative movements in the United States, Germany, and Britain in the late 1970s and early 1980s. Founded on ideals of deregulation, free-market solutions to public problems, and the supposed inefficiency of the welfare state, “neoliberalism,” as the ideology is called, has come to influence fields of public governance in the United States and around the world (Harvey, 2005; Saunders, 2010). The higher education field, as a key public investment closely connected to state fields, has not been immune from the growing political pressure to develop more economically oriented perspectives and forms of management (Slaughter & Rhoades, 2004). In the neoliberal frame, the primary goal of colleges and universities—whether 2-year technical colleges, 2-year community colleges, or 4-year research universities—is to prepare students with the knowledge and skills necessary to succeed in the world of work (e.g., Olssen & Peters, 2005, p. 328–330). The skills-gap narrative and its attendant postsecondary policy reforms, which, as we explained above, emerged most dramatically in Wisconsin with the Republican wave election of 2010, can be seen as a continuation of such trends. By dovetailing with ongoing efforts to shift private sector burdens to the public sector, as well as discourses and funding regimes tying national economic competitiveness to STEM education (e.g., Carter, 2008), the narrative has played an effective role in framing (and limiting) contemporary debates on the purposes of higher education (e.g., Apple, 2000; Giroux, 2002; Kleinman, Feinstein, & Downey, 2013). The question is no longer whether postsecondary institutions are adequately educating students for civic obligations, democratic citizenship, or other societal needs, but whether postsecondary institutions are adequately educating students for the workforce. Narratives that equate intricate habits of mind with mechanical “skills,” similarly, are a byproduct of this economic focus, and as such a product of distinctively contemporary social, cultural, and political contexts of their own.

As it represents a governing ideology that has had direct effects on relations and practice in the state government field (Hora et al., in press; McLendon et al., 2009; also see Wacquant, 2009, 2012), neoliberalism has influenced subfield dynamics in higher education and industry fields that necessarily depend on the state for regulatory and budgetary support (Fligstein & McAdam, 2012, p. 74–75). As one 4-year biology instructor explained, the classical idea that students should leave a 4-year institution with a *broad set* of competencies—the overriding purpose of university education from his perspective—had increasingly fallen out of favor among state policymakers. “The 4-year campus,” he argued, “is here in order to help people actually become a person who is capable of a wide range of accomplishment.” This preparatory “diversity,” as he put it, allowed individuals to gain an appreciation for multiple areas of achievement, from business and music to literature and chemistry, which accrued to their benefit later in life. “If you’ve got exposure across those fields, you’re gonna be much more ready to take your career in the direction that it can go in rather than stay focused in just on your little area.” Recent state government policies, however, emphasized different goals. He referred to recent proposals to tie public postsecondary funding to graduate employment metrics, in particular (e.g., Tandberg & Hillman, 2013). “At the state level,” he pointed out, “they’re not

interested in assessment of whether or not a person understands logic, they’re interested in employment.” Like a number of other educators, he told us such measures would have a negative impact on the mission of universities across the state. “That’s really not the goal of a 4-year campus,” he concluded. “The goal of the 4-year campus is the long term health of the society, not short-term economic impact.” Essentially, norms related to valued competencies in the higher education subfield, which once had focused more on the moral or civic purposes of colleges and universities (e.g., Dewey, 1916), had shifted in response to wider political movements, rhetoric, and skills gap-oriented policy changes.

Reconceptualizing Culture and Context for Teaching and Learning

With this macro-level field context in mind, we return to the question at hand: even if one were to submit to the disputable notion that postsecondary institutions should be responsible for cultivating work ethic, curiosity, or other competencies considered important in the workplace—which we describe as valued habits of mind embedded in particular social, cultural, historical, and individual contexts—how can such competencies be imparted? Though field theorists refer to processes such as “inscription” and “acquisition” through which individuals acquire cultural capital (Bourdieu, 1986), the theory has been criticized for its emphasis on the structural, reproductive functions of education to the detriment of a focus on the specific mechanisms by which students learn (e.g., Lizardo, 2004). Where field theory falls short, however, scholarship from the learning sciences may offer us guidance. Despite a high profile focus on the transformation of instructional practices in postsecondary STEM fields over the last decade (e.g., Anderson et al., 2011; President’s Council of Advisors on Science and Technology, 2012; Wieman, Perkins, & Gilbert, 2010), the links between pedagogical techniques and valued habits of mind have been relatively underexplored in recent skills-related debates.

Indeed, skills gap advocates hoping to more closely align postsecondary education with workforce needs have typically emphasized program-level reforms over instruction (Sullivan, 2012; Symonds, Schwartz, & Ferguson, 2011), paying little attention to work on “transfer”—defined as the ability of a student or trainee to apply competencies acquired in one setting to unique situations in other settings—that has been a focus in the learning sciences for years (e.g., Billing, 2007; Pellegrino & Hilton, 2012; Salomon & Perkins, 1989). Essentially, this work shows that facilitating the transfer of valued habits of mind from situation to situation demands a deliberate pedagogical approach that at once integrates technical knowhow, socialization, and disciplinary culture with inductive learning techniques (Hirschfeld & Gelman, 1994; Lave, 1977; Resnick, 1987). Studies indicate that over time, and in conjunction with instructor- and peer-support, students and trainees slowly internalize both discipline-specific skills and cultural values surrounding a particular skill set until they are given the space to work more independently and, eventually, on their own (Lave, 1977). This process, furthermore, is shown to be most effective when it is embedded in real-world, “authentic” situations outside the school walls (e.g., Brown, Collins & Duguid, 1989; Lave, 1988). Viewed from this perspective, the acquisition of knowledge and abilities is so grounded in particular social and cultural contexts, as Brown,

Collins, and Duguid (1989) wrote, that these contexts “might be said to co-produce knowledge through activity” (p. 32).

The idea that transfer depends on context-specific learning underlies many contemporary views of teaching and learning (e.g., Bransford, Brown & Cocking, 1999; Resnick, 1987), and has been connected to research on communication (Dannels, 2001; Miller, 1984), self-regulation (Pressley, 1995; Schraw, Crippen, & Hartley, 2006), and teamwork (Lingard, 2010; Van den Bossche, Gijselaers, Segers, & Kirschner, 2006), among other competencies. It also, importantly, directly corresponds with field theory’s fundamental argument: an individual’s ability to harness cultural capital to gain prestige in a field, which she carries from sphere to sphere in the habitus, depends on how well her learned acumen fits that particular field’s values and norms. Context, simply put, is key.

Conclusion

When coupled with previous research, our findings suggest that contemporary policies like Wisconsin Fast Forward favoring short-term, technically oriented training programs are misguided, not only because they perpetuate the drift away from the kinds of learning processes most associated with valued habits of mind, but also because they overlook the social and cultural value in noncognitive competencies from which all stakeholders can benefit. Furthermore, though workforce-oriented objectives fit the history and organizational contexts of 2-year technical college fields in Wisconsin—as well as targeted professional programs in 4-year institutions such as engineering—they may serve to undercut the immersive educational experiences that are most practicable in a university setting. Policymakers and other advocates looking to improve the transfer of valuable competencies and STEM knowledge from postsecondary classrooms into the work world would do better to collaborate with learning science scholars and discipline-based education researchers whose objectives are similar to their own (e.g., Handelsman, Miller, & Pfund, 2007; Singer & Schweingruber, 2012). This kind of collaboration, we believe, could translate research on the instructional practices necessary to help students succeed in life and work into real, serviceable public policy solutions—including perhaps an increased emphasis on teaching-focused professional development and more equitable partnerships between postsecondary educators and employers. Further studies seeking to explore educator, employer, and student perceptions of competency value and context across settings, in other national and even international locations, would buttress such efforts as well. Ultimately, qualitative, ethnographic methods and field theoretical analyses hold great promise in helping conceptualize and disentangle these issues.

They also, we believe, remind us of the stakes involved. One of the core ideas animating Bourdieu’s work on education is that schooling is a prominent venue for the reproduction of cultural, social, and economic inequality (Bourdieu & Passeron, 1977). Those who control the curriculum and thus the valued forms of cultural capital in a course of study, he noted, effectively manage the “logic of its transmission” to the next generation, usually in ways that favor those with power (Bourdieu, 1986, p. 249; Lareau & Weininger, 2003). In thinking about how different competencies are internalized by students via formal schooling and then

Cultural Nature of Valued Skills

transferred into employment fields, we believe it is useful—and deeply democratic—to think of competencies such as work ethic, communication, and lifelong learning not as unassailable measures of an individual's capability or merit, but as cultural resources necessarily defined and valued by particular groups, at particular times, for particular reasons. In so doing, we begin to utilize a language for talking about processes of student learning, socialization, and transfer that emphasize not only the role that culture plays in shaping valuation and success, but also the clear and essential capriciousness of the skills-gap narrative. Considering the narrative's profound influence on education policy as well as how we look at the goals of higher education, this, in and of itself, is a meaningful feat.

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This material is based upon work supported by the National Science Foundation (Award no. 1348648). Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation, WCER, or cooperating institutions.

The authors would like to express their sincere thanks to Amanda K. Oleson, who helped collect and analyze data on which this paper is based.