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BOOK REVIEW

Mary Blair-Loy and Erin A. Cech: Misconceiving Merit: Paradoxes in Excellence and Devotion in Academic Science and Engineering

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How can we understand the commitment of STEM (science, technology, engineering, & mathematics) to meritocracy when these fields continue to be marked by unequal representation and outcomes? This seeming paradox is the central question that Mary Blair-Loy and Erin A. Cech interrogate in *Misconceiving Merit* (University of Chicago Press, 2022). Universities and departments typically try to improve diversity, equity, and inclusion by forming taskforces, addressing the so-called pipeline problem, and by offering sensitivity workshops and implicit bias training. However, Blair-Loy and Cech's work urges a much deeper examination into how excellence and merit are defined and adjudicated in STEM. These notions, they argue, are not the objective, neutral, and universally applied ideals that proponents of meritocracy believe them to be. Instead, they encode and reproduce the conditions under which certain demographics flourish and under which others, namely people of color, LGBTQ + individuals, and women, remain underrepresented and face disproportionate difficulty. Blair-Loy and Cech's work identifies the particular cultural schemas (that is, constructed frameworks of meaning that emerge out of shared cultural processes (Blair-Loy, 2003), that transmit these notions of excellence and merit. While their research pertains to STEM fields and is in some ways particular to STEM, I suggest that many of the problems and patterns they observe, as well as the schemas they develop in *Misconceiving Merit,* are relevant to other academic fields with competitive and avowedly merit-based professional cultures.

In their book, Blair-Loy and Cech examine the beliefs that STEM professors hold about excellence and merit, and how these beliefs shape academic institutions and cultures in STEM fields. To do this, they study STEM professors (tenured or tenure track) at a top (R1) research university in the United States. Both authors are sociologists with extensive experience researching gender, education, and career building

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in STEM(M—medicine) fields in the U.S. They draw on their past work, especially Cech's STEM inclusion study (Cech & Waidzunas, 2021), which supplements the data from their case university. Blair-Loy's scholarship on women in STEMM making tradeoffs between family and career and Cech's work on depoliticization in engineering and passion in vocation provide theoretical context and framing for the research conducted and presented in *Misconceiving Merit*.

This is a short but compact book of six chapters and a detailed appendix. In the first chapter, the authors introduce the paradox of meritocracy in STEM that the book unravels. STEM professionals believe they can recognize talent when they see it, and that talent is duly and systemically rewarded through promotion, grant acquisition, and professional reputation. But in these fields, inequalities persist. A growing literature shows that "equally devoted and productive scientists encounter strikingly different treatment depending on their race/ethnicity, gender, sexual identity, and family responsibilities" (p. 2), and despite efforts to increase diversity in recent decades, STEM fields remain overwhelmingly white and male. Blair-Loy and Cech then introduce their main argument: hegemonic, venerated, anchoring beliefs about merit and excellence contribute to inequality in academic STEM fields. These form two constructive cultural schemas they identify: the *work devotion schema* and the *schema of scientific excellence*.

The work of the book is in describing and developing these schemas on the basis of the quantitative and qualitative data Blair-Loy and Cech marshal. They use personnel data supplied by their case study university on the 506 STEM professors working there, detailed survey data from this cohort (n = 266), and in-depth interview data with a smaller subset (n = 85). For all members of this cohort, Blair-Loy and Cech additionally compiled standardized SCOPUS-based bibliographic data (articles published, citations, h-index, and average journal impact factors) and data on awarded grants to construct their own scholarly productivity index. They generalize their case university data using nationwide survey data of more than 7000 STEM professionals from Cech's previous STEM inclusion study (Cech & Waidzunas, 2021). Comparisons to this dataset help to substantiate the claim that their case university, while in some ways institutionally specific, is representative of STEM cultures at public, elite research universities in the U.S.[1]

Before turning to these data, however, the authors provide the theoretical background for this research in chapter two, situating their schemas in existing sociological and STS literature. They offer an account of the historical and cultural foundations for merit and ideas of excellence in science in the west and set their focus on professional cultures as the medium through which cultural schemas propagate. Professional cultures are the systems of meanings, values, and symbols shared by groups linked by profession and conveyed through and reproduced by their

[1] Demographically, their case university is generally representative of STEM in the U.S. Their case institution is 73.8% white, 20.4% Asian, and 5.8% underrepresented racial/ethnic minority (URM) as compared to U.S. STEM averages: 71.5% white, 20.7% Asian, and 7.7% URM. I include these figures to provide background information for comparison, especially outside of the U.S. context. Women represent only 16% of the STEM professors of all ranks at their case university, and 2/3 of these women are mothers (p. 131).

characteristic tasks, practices, and interactions. They are maintained in large part through the extensive training and acculturation required to gain access to, in this case, STEM professions, through processes of credentialing and socialization. Nevertheless, Blair-Loy and Cech note that professional cultures have been overlooked as "a mechanism of intraprofessional inequality" (p. 28) in research on inequality in STEM.

In chapters three and four respectively, the authors discuss their two cultural schemas, *work devotion* and *scientific excellence*, with the help of the data they have collected. These schemas consist of fundamental operative beliefs, hegemonic in that they are shared across all demographic groups in STEM. The work devotion schema is the set of beliefs regarding academic STEM work as a "calling deserving of undivided allegiance" (p. 31). In reality, and as demonstrated effectively through the survey and interview data, for professors this means regularly working far beyond contracted hours—on nights and weekends—a demandingness such that other responsibilities, like childcare and other care tasks, are seen as undermining devotion to one's work. Professors' survey responses about their personal dedication to their work were combined with data from the compiled scholarly productivity index and with hours spent working and providing childcare per week. To explore how competing responsibilities (like childcare) are understood, their survey also asked professors what the perception is in their department of professors who have childcare responsibilities or make use of work-life balance policies (e.g., temporary parental leave). This is an example of the kind of question needed throughout this research to home in on beliefs and perceptions of prevailing attitudes. It pays off: Blair-Loy's and Cech's constructive analysis of perception-type responses offers novel insights and measures, in this case, of what they term 'flexibility stigma.' Blair-Loy and Cech's regressive analysis shows that flexibility stigma is most likely experienced by women and parents with children under three, and is predictive of likelihood to leave one's position. However, the data also show that despite being more likely to face flexibility stigma and despite earning less, women with children are no less devoted to their work, and "are just as productive as their colleagues or even more so" (p. 50). This analysis demonstrates one of the main harmful consequences of the work devotion schema: competing responsibilities, though they do not compromise professors' commitment to their profession or productivity, are nonetheless perceived this way, and professors with those responsibilities are stigmatized and viewed as less devoted scientists.

Chapter four examines the schema of scientific excellence, the shared "cultural yardstick" (p. 32) for measuring professional competence in STEM, in detail. With their survey and interview data, Blair-Loy and Cech demonstrate four strands comprising scientific excellence in academic STEM: creative brilliance, assertive leadership, relational qualities, and commitment to advancing diversity.[2] However, these

[2] Blair-Loy and Cech's survey asked STEM professors to rate specific traits (e.g., competitive, good mentor) as "typical of a successful person in my discipline" (p. 172). They also ask professors to assess their own achievement of these traits, as well as to indicate to what extent: "In my department, my research is respected" (p. 198, note 21).

strands do not all contribute evenly to scientific excellence, nor does everyone benefit equally by achieving these traits. Strikingly, "most respondents *disagreed* that caring about diversity is a marker of excellence in their field," (p. 74, emphasis added) whereas the other three strands were widely accepted as marking excellence in STEM. That commitment to advancing diversity is commonly viewed as at odds with scientific excellence demonstrates ideas of depoliticization, according to Cech (Cech, 2014). Many STEM professors understand and aim to maintain scientific communities as apolitical, neutral spheres that become compromised when social considerations, like diversity of scientists, enter. This idea explains why, as the data show, "faculty who express commitments to diversity [overwhelmingly people of color] feel like they encounter additional hurdles in proving their excellence" (p. 91).

Disadvantage for people of color shows up again when other markers of scientific excellence in STEM are examined. Developing traits for assertive leadership, for instance, isn't a strategy that will pay off equally for everyone, despite agreement from all demographic groups that this trait marks excellence in their discipline. According to Blair-Loy and Cech's analysis, white and Asian men and white women benefit from being more assertive, but assertiveness by members of other groups is penalized. Black and Latina women who self-report as assertive receive less respect for their research than white, low-assertive reporting women. Again using their scholarly productivity index, Blair-Loy and Cech ask whether these markers of excellence really predict for productivity and conclude, again, they do not: assumed and accepted markers of excellence in STEM are not predictive of productivity or visibility in one's field. Nevertheless, professors who self-report as more assertive are, on average, paid higher salaries, and, if white, report receiving more respect for their research than their peers report. Blair-Loy and Cech conclude: "The seemingly straight and true yardstick of the scientific excellence schema is warped by gender, racial, and heteronormative biases built into the very idea of excellence" (p. 94).

The book's main strength lies in how Blair-Loy and Cech enlist both qualitative and quantitative data to invalidate the two cultural schemas; by the fifth chapter, the schemas have been critically undermined. In this chapter, Blair-Loy and Cech demonstrate why they nevertheless receive enduring support amongst STEM professors and are seen as explaining career outcomes, even when faced with evidence that plainly calls them into question. They present two data-based, factual scenarios to professors in interviews: first, asking professors how they would explain the underrepresentation of women and people of color at their university if STEM is indeed meritocratic; and second, asking them to explain the results of a 2011 study published in *Science* showing that Black scientists were less likely to win National Institutes of Health grants than their equally productive white peers. This chapter reveals how many of these professors "double down on the schema of scientific excellence" (p. 95), rejecting the confronting evidence by largely relying on personal experiences or anecdotes to preserve the idea of STEM's meritocracy. Blair-Loy and Cech summarize the findings of their interviews:

> Because the cultural schema of scientific excellence is so deeply taken for granted and widely accepted, they cannot see how it might be subtly defining some faculty candidates as less excellent than others. These pipeline and

> pedigree explanations are powerful cultural frames that excuse the faculty and their departments from taking significant action to rectify underrepresentation. (p. 106)

In effect, this chapter presents the most direct demonstration of the way these cultural schemas, particularly the schema of scientific excellence, continue to hold sway and operate through the beliefs and meaning making around merit and excellence in academic STEM.

In the final chapter, Blair-Loy and Cech broaden their arguments about the harms of these schemas. Minoritized groups are most affected, but the authors argue that the schemas pose harm to all scientists, and even science itself. The insistence that the pursuit of science be unrivaled by other responsibilities particularly harms those with caregiving responsibilities. Yet it also creates environments of chronic overwork and stress burdening all professors, which stifles creativity and innovation in science. The current conceptualizations of merit in STEM, as Blair-Loy and Cech have effectively shown, devalue the contributions of underrepresented minorities, but so too are these conceptualizations out of touch with the realities of collaborative, interdependent processes of scientific inquiry. Impact skewed by metrics of publications and citations neglect other critical aspects of academic work, namely teaching, mentoring, and public outreach. Blair-Loy and Cech follow up these and other related consequences with attendant suggestions for positive change. While they align well with the problems elaborated over the previous chapters, their suggestions are brief, general, and somewhat underwhelming, given the scale of their conclusion by the book's end that prevailing practices of academic science need to be rethought.

In the spirit of this project, aiming to push its questioning more deeply and extend its scope more broadly, I briefly raise two critical points. First, there are questions to be asked about the standard performance metrics—their scholarly productivity index—on which Blair-Loy and Cech rely to make key comparisons and ground significant claims. Should raising critical questions about how excellence and scientific merit are conceptualized, practiced, recognized, and rewarded not also lead to critical scrutiny of the metrics by which success in these fields is determined? That is, why should we think that publications, citations, and grant awards remain a neutral measure for comparison? The authors concede in the book's final conclusions, as well as in an explanatory note in the appendix, that these indicators may also be skewed in ways that devalue the work of underrepresented groups. Unfortunately, they say little about how such an issue could properly be addressed, either methodologically, or—more broadly—in reconsidering how merit is recognized and rewarded in STEM.

Second, *Misconceiving Merit* was published at roughly the same time as record numbers of U.S. academics were striking for better wages, benefits, and improved working conditions, especially for contingent and adjunct faculty. Given the growing differences in working conditions that permanent faculty enjoy compared to graduate students, post-docs, adjuncts, and other non-permanent staff, the exclusive focus on tenure-track and tenured professors of Blair-Loy and Cech's research has two limiting consequences. First, the viewpoints and voices of non-permanent STEM

professionals are missing and their perspectives are not included in the conceptualization of excellence and merit the book provides. Second, by framing employment conditions only in terms of the process getting tenure or promotion and recognition beyond tenure, the book fails to ask how the precarity of non-permanent positions contributes to inequalities in STEM.

Nevertheless, this is an important book that deserves attention beyond the context of U.S.-based STEM academia it studies. It is especially impressive for the work it does to substantiate through its empirical research how biased ideas take hold and operate in professional cultures. As an investigation into inequality in STEM's professional cultures, *Misconceiving Merit* is robust and penetrating. Though the specific content of notions of excellence and merit will be culturally specific to the U.S. and to STEM fields, there is clear resonance with academic professional cultures beyond STEM, fields which would be well served by following the example Blair-Loy and Cech provide.

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