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Centering Criticality in Critical Technology Assessment: AI and Equity

Research Issue: There are many important questions to ask about AI, equity, and labor. AI-powered technologies may not affect all communities in the same way; in particular, racial and immigration status disparities in paid work may be exacerbated with AI and automation. The U.S. is leaving huge amounts of STEM & AI talent behind (e.g., Black, Indigenous, Latinx, rural communities, and women of all races) and evidence suggests that these underinvested and underrepresented segments of the U.S. population are susceptible to targeted national security threats.[1] Furthermore, increased representation by diverse intersectional identities (i.e., race, gender, etc.) in STEM is necessary to mitigate harms perpetuated by biased AI systems. Therefore, we especially want to consider questions related to who is developing AI, and for whom. In order to understand how inequalities relate to AI-powered technology, we need to know more about who is likely to be producing the knowledge, and in what kinds of organizations. We showcase 1) a national survey (Monroe-White & McGee) detailing the ways in which racialized experiences of underrepresented and minoritized STEM students shape career aspirations, and 2) a call for further research (Hoffman et al.) looking critically at the social institutional context of AI.

1) The Role of Race-Related Stress & Racial Activism on STEM Career Aspirations

Monroe-White & McGee's study finds racially minoritized students who are also underrepresented (URMs) in Science Technology, Engineering, and Mathematics (STEM) face distinct challenges, particularly when it comes to finding and advancing in their chosen career paths. This study aims to investigate the psychosocial differences and career aspirations of URMs pursuing degrees in STEM fields. Specifically, it explores how race-related stress shapes their career goals, as well as how experiences of marginalization and racial activism impact their career aspirations.

Methods/Data: National survey of 552 U.S.-based URM graduate students between 2018-2022, including 330 (60%) Black and/or African American, 197 (40%) Latinx/Hispanic, and 25 (5%) Native American/Indigenous students, pursuing graduate degrees in STEM fields. Over half, 327 (59%) identified as female, and 223 (40%) identified as male. Approximately twenty-five percent (138 respondents) were pursuing degrees in fields related to AI including computer science, human-centered computing, machine learning, artificial intelligence, and data science. **Research Question:** How do race-related stress and racial activism influence career interests in academia, industry, entrepreneurship, and other sectors among URM students in STEM?

- Finding 1: **Activism**. Racial activism emerges as the strongest predictor of academic career interests among underrepresented and racially minoritized graduate students (URMs) in STEM. Racial activism and race-based stress emerge as the most influential predictors of entrepreneurship. These findings underscore the importance of fostering an inclusive and supportive environment that encourages

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[1] Committee on Intelligence, United States Senate. (116th Congress, 1st Session). Report 116-XX: RUSSIAN ACTIVE MEASURES CAMPAIGNS AND INTERFERENCE IN THE 2016 U.S. ELECTION - Volume 2: Russia's Use of Social Media with Additional Views. Accessed: https://www.intelligence.senate.gov/sites/default/files/documents/Report_Volume2.pdf

and recognizes the contributions of URMs engaged in racial activism, highlighting the intersection of racial justice advocacy and career aspirations.

- Finding 2: **Gender**. When accounting for all other variables in the model, gender stands out as the sole factor influencing career interest in an industry position, with women displaying a significantly lower likelihood of being interested in such a career compared to men. Among URM graduate students in STEM fields, women experience significantly higher levels of race-based stress and report poorer mental health outcomes compared to men. However, levels of racial activism are similar across genders. These findings underscore the presence of gender disparities in terms of race-based stress and mental health, highlighting the need for targeted support and interventions specifically tailored to address these challenges faced by women within this population.

- Finding 3: **Race**. Black or African American STEM students demonstrate higher engagement in racial activism, experience greater levels of race-based stress, and report poorer mental health outcomes compared to their Latinx/Hispanic and Native American counterparts. These findings imply that the unique challenges faced by Black students within the STEM field may heighten their awareness of systemic inequities and motivate their active involvement in advocating for racial justice.

- Finding 4: **Stress**. Race-based Stress ($\beta=.39$, $p<.01$) is the strongest predictor of Racial Activism. This finding suggests that higher levels of race-based stress are associated with increased engagement in racial activism. These results emphasize the significance of considering the impact of race-based stress on the motivation for social advocacy among URMs in STEM fields. Race-based stress partially mediates the relationship between race (Black=1 and Hispanic/Latinx and Native American=0) and engagement in racial activism. This finding challenges the notion that racial activism is solely determined by one's racial identity. Instead, it suggests that the burden of racialized stress may leave Black students with a profound urgency to actively engage in advocating for racial justice. Together, this emphasizes the critical role of contextual factors in shaping the commitment and involvement of URM students in addressing systemic inequities through activism.

2) Other critical questions to ask: Five Big Ideas about AI

Hoffman, Joyce, Alegria, Bell, Cruz, Noble, Shestakofsky, and Smith-Doerr (2022) argue for five critical questions to ask about equity and AI, in understanding the contexts in which AI is developed and used.

- Idea 1: **What do data mean**? Problems occur when AI system designers and users fail to see that data purportedly about something neutral (e.g., criminal record, ZIP codes, location of hospitals) are also data about socially significant inequalities (e.g., class, gender, race, segregation, racist policing practices).

- Idea 2: **What myths are being used about AI**? If a myth is perpetuated that AI accomplishes human-level tasks without human intervention, the problem is that the myth itself can make it more difficult to observe how social actors are shaping where, why, and by what means AI is used in actual practice.

- Idea 3: **How are interlocking structures of inequality underlying AI systems**? Intersectional analyses can show which human actors and values drive AI development while identifying uneven harm from AI systems across age, race, ethnicity, gender, sexuality, and class. An intersectional approach can also help us imagine new futures in which the benefits and harms are distributed more equally.

- Idea 4: **Where is labor exploitation to support AI going unnoticed**? Firms that provide seemingly futuristic AI capabilities often outsource or offshore the necessary work of contract laborers who engage in a range of small tasks that help ensure automated systems' accuracy and efficiency, labor hidden behind platform interfaces.
- Idea 5: **Can we imagine more just AI futures**? Current problems in AI development are not inevitable, we must use research to create more equitable knowledge production contexts for this critical technology.

Next Steps: Additional data collection to better understand what AI automation means to developers and users via qualitative, quantitative and computation methodologies.