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Gender Disparity in STEM Across Cultures

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Miner et al. (2018) claim that focusing on individual factors to understand gender inequity in the fields of science, technology, engineering, and mathematics (STEM) provides an incomplete explanation of the phenomenon. They challenge the appropriateness of individual-level explanations that hold women responsible for the injustices they experience, suggesting that this perspective fails to consider larger social-contextual influences. Instead, to explain gender disparity in the STEM fields, Miner et al. offer a social-structural lens through which to view the situation that relies on commonly held beliefs about women in society. The inequality that characterizes these fields, however, is a worldwide phenomenon that spans societal boundaries.

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Therefore, understanding the social-contextual factors that contribute to gender inequality in the STEM fields requires a cross-cultural examination of norms and values. In this commentary, I first outline a program of research aimed at developing an empirically supported theoretical framework that explains gender inequity in the STEM fields from a cross-cultural perspective. Then, I review the ways in which cultural beliefs influence education and careers in the STEM fields. Finally, I provide some practical suggestions of ways to promote gender equality in STEM fields. As such, this commentary serves as a call to integrate concepts from vocational, educational, and cross-cultural psychology to address an issue of utmost importance: equal representation.

Research suggests that gender-based stereotypes are deeply ingrained globally; however, it is vital to consider the depth in which it varies across cultures. Williams and Best (1990), for example, conducted a study wherein they asked participants from 25 countries across Europe, Asia, Africa, and the America to rate adjectives in terms of their applicability to women and men. In general, dominance, autonomy, aggression, and achievement were perceived as being more applicable to men, whereas nurturance, relationship, and reverence were perceived as being more applicable to women. The magnitudes of these effects, however, varied across countries, with greater sex-based differences being observed in countries that were less economically developed. This implies that culture and economic development have a moderating effect on gender stereotypes and ideologies where these gaps are smaller in more economically developed countries. Hence, understanding societal norms can explain how men and women assume multiple roles in the society and the effect societal norms have on their decision to enter the STEM fields.

Living in certain cultures leads to exposure to different values and roles, which may affect an individual's perception of accepted behavior (Warr, 2007). Understanding the influence of societal values on beliefs of individuals can, thus, help us comprehend their attitude toward STEM field. Empirically supported theoretical frameworks have been developed to understand these differences in a systematic manner. For instance, Hofstede (1980) developed a masculinity/femininity cultural dimension of international culture, which refers to the extent to which social roles of men and women are determined by biological constraints. He suggested that the fundamental way to understand differences in society is to explore the extent to which they differ in prescribing roles for men and women. Masculine societies emphasize clear, distinct gender roles and expect men to be tough, assertive, and achievement-oriented, whereas women are expected to support the family and be nurturing. On the other hand, societies that score higher on femininity tend to have an overlap in gender roles and expect both

men and women to be tender, modest, and relationship-oriented. Gender disparity in STEM fields in masculine societies can be expected to be higher because women may face more challenges in these societies to work in male-dominated fields. Additionally, women may choose a career that aligns with the role expectations of the society. Hence, societal norms can explain the underlying reasons for the career paths chosen by its women, which can help design appropriate intervention to overcome disparity across cultures.

Similarly, the Global Leadership and Organizational Behavior Effectiveness Research Program (GLOBE) developed a cultural dimension, gender egalitarianism, that measures the extent to which biological sex of the members of a society determines the roles they play in workplaces, homes, and communities (Emrich, Denmark, & Den Hartog, 2004). Low gender egalitarian societies emphasize traditional gendered division of labor, where men are expected to be the breadwinners and women are viewed as caretakers. High egalitarian societies, on the other hand, emphasize more similarities in women's and men's involvement in work as well as non-work domains of life. GLOBE's conceptual model indicates that practices and values of a society affect their organizational practices and cultures (House & Javidan, 2004). Societal gender egalitarianism practices have a significant and positive relationship with organizational gender egalitarianism practices. Lyness and Judiesch (2014) found in their study that supervisor's rating of the subordinate work-life balance differed depending on the country context and the gender of the subordinate. Women in low egalitarian cultures had lower ratings compared to male subordinates. Further, the women in low egalitarian culture had lower ratings compared to females in high egalitarian culture. Overall, ratings of women but not men differed based on the country context. Hence, a woman's work is judged against a stricter standard in lower egalitarian societies, as gender stereotypes hinder the perception of their ability to balance work and family life. It can be challenging for women in low egalitarian societies to overcome these biases and succeed in male dominated STEM fields.

Furthermore, culture has an impact on education and career choices of individuals. Culture influences the gender disparity in such fields from an early stage of schooling. For instance, Han (2016) investigated the gender gaps in STEM occupations across countries based on secondary education systems in different countries. Some countries have stratified education systems where more school types with distinct curriculum, programs, or differentiated academic performance are available. On the other hand, some countries have similar types of schools with standardized education system throughout the societies. The analysis of the study revealed significant variation in the magnitude of gender disparity across countries in STEM occupational expectations. The number of school type available to 15-year-olds was

negatively correlated to girls opting for STEM-related occupations. There was a decrease in the probability of having a STEM-related occupation for girls more than boys when more school types were available.

Further, a national-level case study revealed that when the education system allows more freedom of choice in the curriculum, gender segregation tends to increase (Catsambis, 1994). Girls' low confidence in their ability to perform well in STEM fields may lead to the decision of not pursuing STEM-related courses when given the freedom of choice. The early onset of disparity across cultures demands a better theoretical understanding of this issue to overcome the barriers faced by women.

Future research focusing on the values of a society on expected behavior and attitudes toward women working in male-dominated fields can help understand the underrepresentation of women in such fields. Because factors like the structure of schooling affect gender segregation, these issues can be understood better using longitudinal studies that track how early life experience affects the decisions of individuals to pursue STEM fields. Understanding the issue from this perspective can help tackle the issue using a different approach in organizational practices.

With increased globalization, organizations are expanding operations in countries across the world. Multinational organizations that operate in different countries need to modify their operational models considering the culture of different countries. If the societal values of the home country and subsidiaries in foreign countries are different, the implementation of managerial practices to combat gender inequity can be challenging. The organization needs to respect and consider the culture of the society in which it is located to attract and retain more diverse employees.

Practical Implications

First, industrial and organizational (I-O) psychologists can understand the cultural norms of the society in which the organization is planning to establish its subsidiary. They can use this insight to increase gender parity by using job redesign and recruitment skills to attract more and women in STEM fields across cultures. Policies that can accommodate employees' needs can be developed considering the cultural differences. For instance, I-O psychologists develop gender neutral job descriptions to attract equal pools of men and women while recruiting and hiring in masculine societies.

Additionally, I-O psychologists can opt for targeted recruitment and visit universities to actively recruit female applicants in these societies where women do not pursue STEM careers after graduating to fulfill societal roles. Also, organizations can help with early interventions by sponsoring programs or events at universities and schools that encourage women to pursue STEM fields.

Further, organizations can develop culturally sensitive workplace practices and meet employees' needs based on their valued roles and behaviors. Organizations in highly masculine (or low egalitarianism) societies can introduce flexible work arrangements for women and hence alleviate the pressure of choosing between household responsibilities and workplace duties.

Moreover, introducing mentoring programs and providing source of visible female role models in the field can help attract and retain women. Finally, managers are the change agents of the organization and thus in a position to influence the norms and practices. Training the managers in the organization to help them understand how to achieve organizational goals considering the national culture can also be helpful. If the managers are sensitive to the impact of culture on expectations from men and women, they can introduce the accommodation that can help women succeed in STEM fields and at the same time ensure achievement of the organizational goals.

Hence, using a cultural lens to understand the underrepresentation of women in this field can help provide different and useful insight for organizations striving to increase diversity in their workforce.

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