

**BACKGROUND**

- Lack of diversity in computing, field dominated by White and Asian students [1]
- Often attributed to student-centered, deficit-based factors
- Racial "othering" in courses/departments negatively impacts students [2]-[4]
- **Goal: Understand computing undergraduates' perceptions of race and the factors influencing them**

**METHODS**

- Survey distributed to undergraduate computing departments in North America and China
- Quantitative survey: 35 items (closed + 1 open-ended)
  - 8 latent concepts (EFA):
    - Factors 1 & 3: Group advantages in computing
    - Factor 2: Race neutrality in computing
    - Factors 4 & 5: Reasons for underrepresentation
    - Factors 6 & 8: Comfortability discussing and knowledge of race
    - Factor 7: Race-based pressures/advantages
- Tested using Chi-square tests ( $\alpha = 0.05$ )

**DATA**

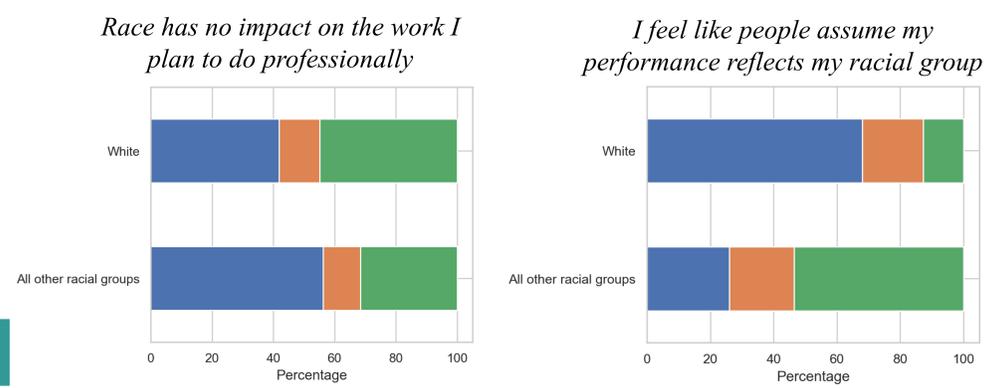
N = 552

Race	n (%)
White	203 (36.78)
Asian	201 (36.41)
Two or more races	71 (12.86)
Black or from the African Diaspora	39 (7.07)
Latinx/Hispanic	26 (4.71)
Middle Eastern of Northern African	8 (1.45)
Native American or American Indian	4 (0.72)

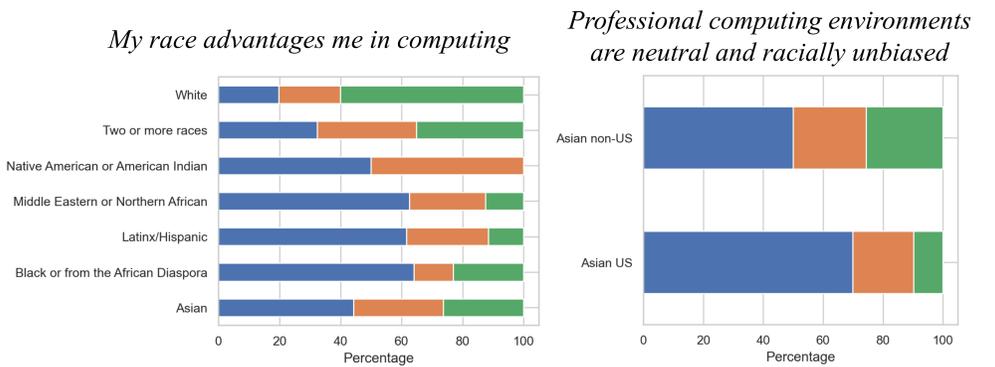
  

Gender	n (%)
Woman	257 (46.56)
Man	254 (46.01)
Non-binary & gender non-conforming	41 (7.43)

**RESULTS**



**Figures 1 & 2.** White students feel their racial identity impacts them less in computing



**Figure 3.** Asian students align with minoritized students on racial pressures

**Figure 4.** Formative country greatly shapes students' perceptions

*Minoritized races are underrepresented in computing because they...*

	have faced a lack of opportunities in the U.S. due to systemic issues of oppression	were not exposed to computing early as a K-12 student	did not have the financial resources to pursue computing courses
Agree	78.6%	72.8%	66.7%
Neither agree nor disagree	11.6%	15.2%	23.4%
Disagree	9.8%	12.0%	10.0%

**Table 1.** Most computing students blame structural inequities for the underrepresentation of minoritized races

	are not interested in computing	are not as strong in computing	experienced isolation and/or exclusion in computing courses	experienced internal bias in computing programs
Man	21.65%	10.24%	42.91%	40.55%
Woman	8.95%	4.67%	67.32%	92.68%
Non-binary/gender non-conforming	4.88%	2.44%	75.61%	64.20%

**Table 2.** Gender greatly shapes students' perceptions about the underrepresentation of minoritized races

**CONCLUSIONS**

- White students feel less impacts based on their race
- Asian students align with minoritized students on racial pressures in computing
- Dominant groups perceive themselves as having less advantage in computing compared to other groups' perceptions of them
- Most computing students blame structural inequities for the underrepresentation of minoritized races
- Formative country and gender greatly shape students' perceptions
- Results support and extend previous literature [5]-[8]

**REFERENCES**

[1] S. Zweben and B. Bizot, "2020 Taulbee Survey," 2020. [Online]. Available: <https://cra.org/wp-content/uploads/2021/05/2020-CRA-Taulbee-Survey.pdf>

[2] E. W. Huff et al., "Going Through a Process of Whiting: Student Experiences Within Computer Science Education," in *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education*, New York, NY, USA, Mar. 2021, p. 1348. doi: 10.1145/3408877.3432497.

[3] S. Erete, Y. A. Rankin, and J. O. Thomas, "A method to the madness: Applying an intersectional analysis of structural oppression and power in HCI and design," *ACM Transactions on Computer-Human Interaction*, 2022.

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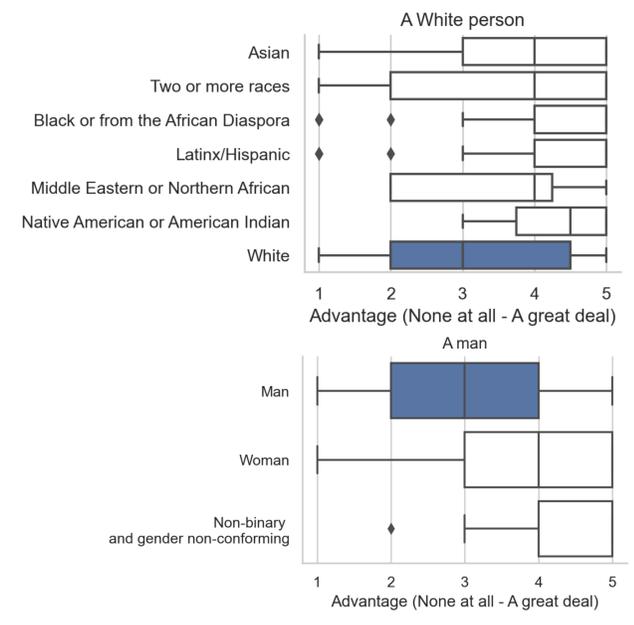
[5] Race and gender differences in how sense of belonging influences decisions to major in STEM (2018), Katherine Rainey, Melissa Dancy, Roslyn Mickelson, Elizabeth Stearns, and Stephanie Moller

[6] M. Dancy, K. Rainey, E. Stearns, R. Mickelson, and S. Moller, "Undergraduates' awareness of White and male privilege in STEM," *International Journal of STEM Education*, vol. 7, no. 1, p. 52, Oct. 2020, doi: 10.1186/s40594-020-00250-3.

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[8] E. McGee, "'Black Genius, Asian Fail': The Detriment of Stereotype Lift and Stereotype Threat in High-Achieving Asian and Black STEM Students," *AERA Open*, vol. 4, no. 4, p. 2332858418816658, Oct. 2018, doi: 10.1177/2332858418816658.

*How much advantage do you think the following identity/group has in computing:*



**Figures 5 (top) & 6 (bottom).** Dominant groups perceive they have less advantage in computing compared to minoritized groups' perceptions of them