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Being a First-Year Undergrad in Human-Centered Research

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Offering research experience to undergraduates is a well-known path to broadening participation in research fields [1]. We are a team of four undergraduate students, with experience working in areas ranging from environmental policy to tax filing and human-centered design projects. We spent the summer of 2024 working in the CACTI Lab at Harvey Mudd College. This piece articulates our expectations as early-career researchers, and the things that surprised us.

At various points during the experience, we had lapses in confidence. This imposter syndrome was constantly in the back of our minds, resulting in the questioning of our qualifications and the quality of our work. Often, it was difficult to see our contributions as valuable when all we could notice were the potential shortcomings. This fear of inadequacy makes the labels "researcher" and "academic" feel ill-fitting. Our perception of human-centered computing research compounded that feeling. While our peers analyzed mathematical and computational models, coded drones to deactivate nukes, and developed ways to integrate AI into computer science curricula, we were focused on a people-first agenda. The program we joined was in its early stages, and our task was to write a survey paper that would serve as the foundation for future research. It required sitting and reading for hours and learning about lived experiences reported in literature that were scattered across multiple domains and venues. This difference between our tasks and our peers' work made us feel like we were not conducting proper research.

More specifically, our project involved understanding environmental justice, focusing on disability through a systematic review of academic journals, government reports, activist spaces, and more. The breadth of sources was

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intentional, as academic research is sometimes criticized for presenting novel findings from nonacademic practitioners. Using computers and coding never came up. At this stage in our research, our "codes" were key terms used to analyze data—not the Python scripts we were used to. Despite the fancy CS hacking research narrative that Hollywood sells, however, the research we conducted is still valuable.

After reviewing information that the previous research team curated, we compiled the lived experiences that speak to the human in HCI. One cannot develop a technological solution without knowing the problem. Throughout our research, we saw the same complaints

and recommendations show up repeatedly, yet nothing seemed to have been done to address them. As such, our team hoped to address this gap and provide direction.

Beyond our research topic, our team learned much about academia. Going into this project, we anticipated working with or collecting large amounts of data—a process that we romanticized as groundbreaking. Instead, we reviewed a large number of sources. The sheer volume was intimidating and mildly concerning, given that every source claimed this topic lacked research. We read at least 24 literature reviews and 100 academic sources, as well as numerous nonacademic ones. As our work continued, the themes and findings that make literature review a foundational step in research began to emerge.

One of the benefits of doing this type of review is that we were immersed in people's writing. We found it interesting to see how many sources a paper would eliminate. Some started with several thousand sources but ran a content analysis on fewer than 12 relevant ones. We noticed a surprising trend with some literature reviews that had scanned titles and abstracts rather than examining entire papers to determine relevance. Perhaps the most shocking thing was the exclusion of certain perspectives. Most literature reviews were peer-reviewed journals and other scholarly sources. This, however, had consequences: It neglected the knowledge of disabled individuals and activists, who were primarily published in nonacademic venues.

Overall, this process was fascinating. We got a level of individualized tasks and trust that we had not experienced in our work before. We learned a lot about this research and how to actively contribute to the academic community.

Beyond that, our research was also about personal enjoyment and achievement. Being an undergraduate researcher means we are doing this work because we are interested in it. Without the intense publishing pressure that surrounds academia [2], we had the privilege of learning about the process. Fundamentally, our research is about sustainably uncovering new information about environmental justice. We hope to share our learnings with others and further contribute to expanding accessibility.

ENDNOTES
1. Sunshine, J. and Velez-Ginorio, J. Research experiences for undergraduates are necessary for an equitable research community. *Communications of the ACM 67*, 8 (2024), 26−28.
2. Mhaidli, A. and Roemmich, K. Overworking in HCI: A reflection on why we are burned out, stressed, and out of control; and what we can do about it. *Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems.* ACM, New York, 2024, Article 561, 1−10.

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