Exploring the Lack of Diversity in Cybersecurity

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Abstract

As public and private organizations continue to integrate information technologies into their business processes, the need to protect the data processed, transmitted, and stored by these technologies becomes increasingly important. For example, among private sector organizations, 37% of all companies in the U.S. were targets of ransomware attacks paying more than $170,000 in ransom on average. Even more astonishing is that only 8% of companies retrieved their data after paying the ransom (Sophos , 2022). Furthermore, as technology advances, so are criminals. A recent study found that while the tactics cybercriminals use are relatively similar, they are quick to adapt to changes in technology and leverage it to their advantage (Thinnes, 2021).

To accomplish this, cybersecurity professionals are required to plan and implement the organizational initiatives designed to identify and remedy vulnerabilities before cybercriminals can exploit them. Cybersecurity professionals enjoy high salaries (the average salary for a cybersecurity professional was $94,984 in 2019) and there is an expected growth rate of 30% for these roles through 2029 (Bishoff, 2021). In fact, employers cannot hire cybersecurity professionals quickly enough with the number of vacant cybersecurity positions increasing by 5.64% from 2019 to 2021 (Bishoff, 2021).

Despite the attractiveness of cybersecurity as a profession, it suffers from an alarming lack of diversity. In fact, a recent report on the lack of diversity in the field by the Aspen Institute states "The field remains remarkably homogeneous, both among technical practitioners and policy thinkers, and there are few model programs or initiatives that have demonstrated real progress in building diverse and inclusive teams" (Aspen Institute, 2021, p. 4). The field is dominated by males, and predominately white males. An examination of some of the employment numbers in the report obtained from (ISC)2 and Frost & Sullivan, show that men made up 74% of the cybersecurity workforce although they make up 49% of the U.S. population. Racially, whites made up 76% of the cybersecurity workforce with other races combining to comprise the other 24% (Aspen Institute, 2021; Reed & Acosta-Rubio, 2018).

We aim to examine the lack of diversity in cybersecurity careers by focusing on the factors leading to student's interest and eventual intention to major in a cybersecurity-related field during their university studies. To this end, we present a model based on social cognitive career theory (Lent, et al., 1994) to investigate the antecedents to the goal of majoring in a cybersecurity-related field. The model is presented along with the plan for data collection and analysis.

References

Aspen Institute. (2021). *Diversity, Equity, and Inclusion in Cybersecurity.* Washington, D.C.: Aspen Institute.

Bishoff, P. (2021, April 5). *2021 U.S. Cybersecurity Salary & Employment Study – which state has the best prospects?* Retrieved from Comparitech.com: https://www.comparitech.com/blog/vpn-privacy/cybersecurity-employment-study/

Cobb, S. (2016). Mind this gap: criminal hacking and the global cybersecurity skills shortage, a critical analysis. *Virus Bulletin*, (pp. 1-8).

Haney, J., & Lutters, W. (2019). Motivating Cybersecurity Advocates: Implications for Recruitment and Retention. *ACM SIGMIS-CPR* (pp. 109-117). Nashville: ACM.

Lambert, J. (2021, October 25). *Microsoft Digital Defense Report shares new insights on nation-state attacks*. Retrieved from Microsoft Security: https://www.microsoft.com/security/blog/2021/10/25/microsoft-digital-defense-report-shares-new-insights-on-nation-state-attacks/

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Social cognitive career theory. In D. Career Counselling (3rd ed., pp. 78-149). Brooks/Cole.

Nobles, C. (2018). The Cyber Talent Gap and Cybersecurity Professionalizing. *nternational Journal of Hyperconnectivity and the Internet of Things (IJHIoT), 2*(1), 42-51.

Reed, J., & Acosta-Rubio, J. (2018). *Innovation Through Inclusion: The Multicultural Cybersecurity Workforce.* Santa Clara: Frost and Sullivan.

Sophos . (2022). *Sophos 2022 Threat Report.* Sophos.