

Title: Naturalistic observations of login attempts: Do security implementations and demands affect employee job behaviors and perceptions?

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Extended Abstract

Throughout the working world, data breaches and data integrity compromises have increased greatly, and naturally, this has led to an increase in cybersecurity control implementations across organizations (e.g., LastPass databreach;). Given that employees will be at the forefront of experiencing the heightened security implementations, our proposal is designed to investigate the implications of increased security demands. The implications of increased security demands will be explored through the human experiences during failed login attempts, and information will be extracted with an event-contingent diary protocol. It is predicted that login failures will impact short term levels of frustration and negative appraisals of security-related technology, and that these experiences will drive engagement in counterproductive workplace behavior (CWBs), emotional labor, lower levels of organizational commitment, reduced perceptions of organizational justice, lower levels of perceived organizational support, as well as loss of productive time during the work day (Fox & Spector, 1999; Fox et al., 2001; Paul & Dykstra, 2022;). Given the relationships of constructs in this proposal, this approach follows the Jobs Characteristics model framework and the Stressor-Strain-Outcome model.

Design & Methodology

This study will employ a three-phase design with a sample of 60 university employees, at a university in which heightened authentication protocols exist. In the first phase of the study design, participants will complete pre-observational surveys. The pre-observational surveys are measures of general self-efficacy, security-related self-efficacy, security complexity, security overload, security uncertainty, computer self-efficacy, and the Human Aspects of Information Security Questionnaire. Additionally, trait affect will be measured through the short Positive Affect Negative Affect Scale, and will be used as a control for emotional reactivity. Lastly, we will collect a short self-report list of password management techniques used by the participant.

The second phase will be the naturalistic observations of our study participants, using a diary protocol. Each time a participant experiences a failed login attempt (accessing university resources for work), they will complete an event within the diary (event-contingent). The diary consists of a momentary measure of frustration, a momentary measure of cognitive appraisal of the failed login, an estimate of time lost due to the failed login, and a final checkmark to indicate no failed logins for a given day. The diary will be completed at least once per day, for 30 days, or until the maximum number of login failures has occurred (15).

The third phase will consist of the participants completing a final series of survey measures, and returning diaries. The protocol will re-assess general self-efficacy, computer self-efficacy, as well as the security constructs (self-efficacy, complexity, overload, and uncertainty). Finally, outcome measures of CWBs, emotional labor, organizational justice perceptions, organizational support, job engagement, and organizational commitment will be completed.

Practical Implications

Consistent experiences of frustration and negative thoughts surrounding the technological space at work have the potential to relate with, or lead to workers perceiving their organization as less supportive and just (Jacobs et al., 2014). Along with less perceived support and justice, workers may be more likely to engage in counterproductive workplace behaviors that lessen productivity, performance, and engagement both within the job and the broader organizational environment (Cochran, 2014; Colquitt et al., 2013). Additionally, workers are less likely to be committed to an organization that is seen as less fair and supportive (important turnover implications), and lastly workers experiencing momentary levels of moderate or high frustration and negative thoughts surrounding their work environment are more likely to engage in unhelpful patterns of emotional labor (burnout implications) (Jacobs et al., 2014;).

Contributions

This project will contribute to literature in cybersecurity and organizational psychology in multiple ways. First, the ability to use daily login failures as a source of predicting important workplace outcomes is a novel approach, and this study aims to explore the nature of authentication failures' relationship with human experience and employee outcomes. To the knowledge of the author, little work has been done to understand the direct link between daily authentication failures (an event characterized by cybersecurity implementation, methodology, and demand) and the subsequent impact on human behavior, cognition, and emotions which potentially lead to outcomes of importance to organizations. Second, we aim to explore the economic impact of increased security demands placed upon employees, and ultimately, if the way in which security protocols are adopted influences the economic bottom line of worker productivity. Third, we aim to explore patterns of cybersecurity performance across individuals and develop categories of users depending on their cybersecurity behaviors.

References

- Cochran, Megan, "Counterproductive Work Behaviors, Justice, and Affect: A Meta-Analysis" (2014). Electronic Theses and Dissertations, 2004-2019. 4517. <https://stars.library.ucf.edu/etd/4517>
- Colquitt, J. A., Scott, B. A., Rodell, J. B., Long, D. M., Zapata, C. P., Conlon, D. E., & Wesson, M. J. (2013). Justice at the millennium, a decade later: A meta-analytic test of social exchange and affect-based perspectives. *Journal of Applied Psychology*, 98(2), 199–236. <https://doi.org/10.1037/a0031757>
- Fox, S., & Spector, P. E. (1999). A model of work frustration-aggression. *Journal of Organizational Behavior*, 20(6), 915–931. [https://doi.org/10.1002/\(sici\)1099-1379\(199911\)20:6<915::aid-job918>3.0.co;2-6](https://doi.org/10.1002/(sici)1099-1379(199911)20:6<915::aid-job918>3.0.co;2-6)
- Fox, S., Spector, P. E., & Miles, D. (2001). Counterproductive work behavior (CWB) in response to job stressors and organizational justice: Some mediator and moderator tests for autonomy and emotions. *Journal of Vocational Behavior*, 59(3), 291–309. <https://doi.org/10.1006/jvbe.2001.1803>
- Jacobs, G., Belschak, F.D. & Den Hartog, D.N. (Un)Ethical Behavior and Performance Appraisal: The Role of Affect, Support, and Organizational Justice. *J Bus Ethics* 121, 63–76 (2014). <https://doi.org/10.1007/s10551-013-1687-1>
- Paul, C. L., & Dykstra, J. (n.d.). Understanding Operator Fatigue, Frustration, and Cognitive Workload in Tactical Cybersecurity Operations. *Journal of Information Warfare*, 16(2) (2022), 1–11.
- Pham, Hiep & Brennan, Linda & Richardson, Joan. (2017). Review Of Behavioural Theories In Security Compliance And Research Challenges. 10.28945/3722.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality & Social Psychology*, 54(6), 1063–1070.