Do people really fall for it? - A laboratory study on sharing passwords with strangers

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Abstract

Descriptive prospect theory posits that individuals in uncertain situations act based on their expected utility, which is, however, influenced by specific perceptual biases. This paper empirically tests the application of this theoretical framework to social engineering, a widespread and highly damaging fraudulent-manipulative technique on the Internet. The experiment investigates the circumstances under which individuals respond to offers from third-party social engineers who propose solutions to their assigned tasks in exchange for their social media passwords. The objective is to identify the conditions that prompt individuals to engage with such offers. Subsequent to the experiment, follow-up interviews were conducted to elucidate the underlying evaluative processes employed in determining whether or not to share the password. This approach seeks to explain social engineering behavior by analyzing subjects' individual utility evaluations and risk perception concerning the potential consequences of password sharing, within the theoretical framework of prospect theory.

Theory and Methodology

According to prospect theory, people are more likely to share their passwords when they perceive the potential gains of sharing as outweighing the potential losses (Tversky & Kahneman, 1992; Kahneman et al., 1982; Kahneman & Tversky, 2013). To empirically investigate and validate this theoretical principle for social engineering, a controlled laboratory experiment was conducted. The experiment was designed to test how people's decisions to share their passwords are influenced by their perception of different factors, including the perceived trustworthiness of the person requesting the password, the potential benefits of password sharing as promised by the requestor, as well as their risk perception and risk aversion.
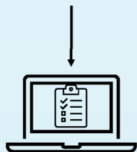

Experiment

A laboratory experiment was conducted with a sample of 82 people from Germany. Participants were asked to work on tasks when they were approached by a third-party social engineer who offered to help them complete the task in exchange for their social media password.

Distraction task for which a search is to be carried out, payment will be made for each correct answer at the end
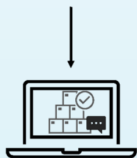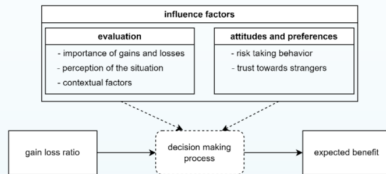
Social engineering attempt including an offer to double the participant's money in exchange for their social media password

Post-experiment survey of the participant including demographic characteristics, internet usage, risk tolerance and aversion, assessment of the situation, and thoughts and assumptions about the stranger

Conclusion

This empirical-experimental study followed by a questionnaire survey investigated the password sharing decisions of 82 participants by analyzing their password sharing behavior as well as evaluating their answers on 38 questionnaire items covering general online behavior, as well as perceptions and assumptions about the situation and the stranger. Of the participants, 15 chose to share their passwords, and even validated strangers via multi-factor authentication when applicable.

The empirical evidence demonstrated a strong statistical significance between the perception of the trade as profitable ($p = .001$, Cramer's V = 0.47) and the expectation that the trusted person will not disappoint the given trust ($p = .001$, Cramer's V = 0.46) on the decision to (not) pass on the password in the experiment. Also, the assessment of whether the stranger and the situation were perceived as trustworthy showed not only highly significant effects ($p < 0.001$) but also remarkable effect sizes (Cramer's V = 0.68 and 0.48). These findings suggest that descriptive prospect theory offers a promising framework for understanding social engineering behavior. While a complete integration of the personal cost-benefit trade-off between the risk of password loss and the potential gain in trust proved challenging, this may be attributed to the inherent complexity of trust-related decision-making. In summary, the experiment has shown that the general expectation about the stranger's intentions, the presumed trustworthiness of the stranger and the perception of the situation are of similar importance while the null hypothesis for the influence of the perception of risk, general risk behavior and fear of cybercrime could not be rejected.

References

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