On The Systematic Development and Evaluation Of Password Security Awareness-Raising Materials*

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Problem
- Security breaches in companies can often be traced back to leaked or weak default passwords
- In particular SMEs are targeted by attacks while being most threatened by financial loss
- Prior materials demand impossible tasks of users, offer only little actionable advice, are not based on state of the art

Approach

Development of Awareness-Raising Material (Step 1, 2 & 3)
- Development of initial version
  - 11 attacks based on work by Bonneau et al. (2012)
  - Relevant defensive technologies
  - Addressing misconceptions about password security
  - Emphasis on important advice identified in the literature

Feedback from experts
- Sent material to 30 experts in academia and industry
- Received feedback from 13 experts

Visual elements and feedback from lay-users
- Lab sessions with lay-users from our university
- Asked to point out unclear or unappealing aspects

Evaluation with Lay-users and Final Refinements (Step 4 & 5)
- Evaluation of the materials in three German SMEs
- 90 participants overall, 30 in each SME, selected as lay-users by contact person in company
- One SME participated in a retention after 6 months
- Tasks: Assessing behaviour in scenarios as secure or insecure and rating the security of passwords
  - Insecure e.g.: lq2w3e4r$, @Q1w2e3r4#, tIG3R
  - Secure e.g.: EimerKnirpsGoldSchelmerrei

Method
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Results
- Significant improvement for scenarios (H$_{1a,c,d}$)
- Discrepancy for passwords (H$_{2a,b}$)
  - Overall Significant improvements for ratings
  - Participants more likely to rate insecure passwords as insecure than secure passwords as secure
  - Overall very positive feedback by participants
    "It was very helpful. I have learned a lot!" (P7)

Refinements and Future Improvements
- Improved wording
- More concrete examples of consequences
- More information on password managers and password creation strategies