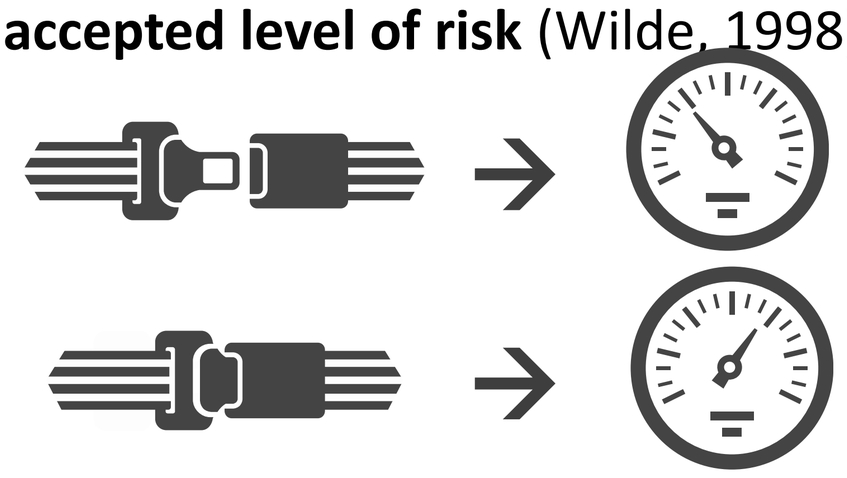
Risk Compensation in Home-User Computer Security Behavior: A Mixed-Methods Exploratory Study

Sarah Pearman, Arnab Kumar, Nicholas Munson, Charu Sharma, Leeyat Slyper, Jeremy Thomas, Lujo Bauer, Nicolas Christin (Carnegie Mellon University), Serge Egelman (ICSI / UC Berkeley)

Introduction

Risk homeostasis theory (often applied in safety & traffic science) hypothesizes that people adjust their behaviors to compensate for factors that change their risk levels, ultimately maintaining a **constant accepted level of risk** (Wilde, 1998)



Applicable to end-user security behavior?

Research Question

If antivirus software is installed, theoretically lowering the level of risk, do users engage in other behaviors that compensate for that lower risk, e.g., visiting unsafe sites or declining security updates?

Two-Part Methodology

Longitudinal *in-situ* observation

- Security Behavior Observatory (SBO) (Forget et al., 2014)
- >200 Windows users observed over >1 year

Survey data

- 114 SBO participants & 135 MTurk Workers
- 36 questions about general usage, attitudes regarding security and antivirus, security experiences

Preliminary Findings

Traits of users with AV installed	**Source**	**Statistically significant?**
More likely to have OS updates fully disabled	*In-situ*	No
More likely to delay or decline software updates	Survey	No
More likely to have had viruses in the past	Survey	Yes *(p = .001)*

Free text responses implied risk compensation behavior

- *Since I work online and have to go to many different websites that I do not 100% trust I feel this is required.* –Participant M190
- *I like to poke around on the Internet, and need something to clean up the stuff I get that I do not want on my PC.* –Participant M90

Future Work

- Larger sample sizes
- How many users have antivirus installed but not functioning correctly?
- Effects of past experience with viruses?
- Separate investigation of novel reasons given for avoiding updates

Carnegie Mellon University CyLab Security and Privacy Institute

References

A. Forget, S. Komanduri, A. Acquisti, N. Christin, L.F. Cranor, and R. Telang. 2014. Security Behavior Observatory: Infrastructure for Long-Term Monitoring of Client Machines. Technical Report. Carnegie Mellon University CyLab.

G.J.S. Wilde. 1998. "Risk Homeostasis Theory: An Overview." *Injury Prevention* 4, 89-91.