

CSCI 331:
Introduction to Computer Security

Lecture 17: Undefined behavior

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Williams

Topics

Undefined behavior

Social engineering

Your to-dos

1. Project part 2, **due Sunday 11/14.**
2. Reading response (Blaze), **due Wed 11/17.**
3. Lab 7, **due Sunday 11/21.**

Paper discussion (Wang)

Social engineering attacks

“You can’t trust the system, man!”

<https://www.youtube.com/watch?v=gAYL5H46QnQ>

Social Engineering

Social engineering, in the context of information security, is the **psychological manipulation of people** into **performing actions** or **divulging confidential information**.

- Cognitive biases
- Social/cultural pressures

Category: Cognitive Bias

A **cognitive bias** is a **systematic pattern of deviation** from **rationality** in judgment.

Heuristics

Heuristics are simple strategies or mental processes that we use to **quickly form judgments**. Heuristic processes are **used to find solutions** that are approximately correct; however, **they are not foolproof**.

Attack: People do not think logically about risk. E.g., hackers reading your emails are far less likely (and possibly less consequential) than your spouse reading your emails.

Consistency

Consistency refers to a person's **strong psychological need to be consistent with prior acts** and statements. To remain consistent, people will sometimes change their **attitudes, beliefs, actions** and **perceptions** (!!!).

Attack: People can be coerced into doing things if it can be demonstrated that those actions are consistent with their self-image.

Consistency

The Psychological Roots of Anti-Vaccination Attitudes:
A 24-Nation Investigation

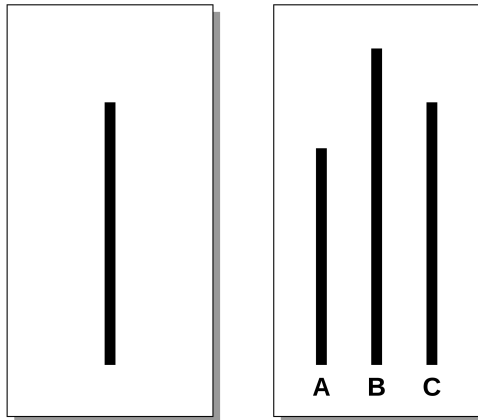
Matthew J. Hornsey, Emily A. Harris, and Kelly S. Fielding
University of Queensland

Category: Social/cultural pressure

Social pressure is the direct influence on an individual who is encouraged to follow their peers by **changing** their **attitudes, values** or **behaviors** to **conform** to those of the influencing group or individual.

Attack: People are often thoughtlessly bound by convention. E.g., holding the door open for a stranger.

Conformity



Asch conformity experiment (1951).

Conformity

- 74% of the participants conformed on at least one trial.
- On average people conformed one third of the time.

Attack: People feel pressure to go with the group. If multiple attackers subtly coerce a person, there is a higher probability of success.

Obedience to Authority



Milgram obedience experiments (1964).

Obedience to Authority

BEHAVIORAL STUDY OF OBEDIENCE¹

STANLEY MILGRAM²

Yale University

This article describes a procedure for the study of destructive obedience in the laboratory. It consists of ordering a naive S to administer increasingly more severe punishment to a victim in the context of a learning experiment. Punishment is administered by means of a shock generator with 30 graded switches ranging from Slight Shock to Danger: Severe Shock. The victim is a confederate of the E. The primary dependent variable is the maximum shock the S is willing to administer before he refuses to continue further. 26 Ss obeyed the experimental commands fully, and administered the highest shock on the generator. 14 Ss broke off the experiment at some point after the victim protested and refused to provide further answers. The procedure created extreme levels of nervous tension in some Ss. Profuse sweating, trembling, and stuttering were typical expressions of this emotional disturbance. One unexpected sign of tension—yet to be explained—was the regular occurrence of nervous laughter, which in some Ss developed into uncontrollable seizures. The variety of interesting behavioral dynamics observed in the experiment, the reality of the situation for the S, and the possibility of parametric variation within the framework of the procedure, point to the fruitfulness of further study.

- 65% of experiment participants administered the experiment's final massive 450-volt shock.
- All administered shocks of at least 300 volts

Attack: People listen to authority figures, e.g., professors!

Reciprocity

In cultural anthropology, **reciprocity** refers to the non-market exchange of goods or labor where **a return is eventually expected** as in the exchange of birthday gifts.

Attack: People can be tricked into giving away valuable things. E.g., romance scams, phishing.

Human Vulnerabilities

This list is not exhaustive!

- Cognitive bias
 - Heuristics
 - Consistency
- Social/cultural pressures
 - Conformity
 - Authority
 - Reciprocity

Recap & Next Class

Today we learned:

Undefined behavior

Next class:

Physical security