# 20221021152856-research\_questions\_CPS\_security\_concerns

#hcps #research-questions #security #cyber-physical-systems

This is an outline / brainstorming space for research questions related to what will influence or be influenced by people’s security concerns around cyber physical systems (CPS). We are developing a scale to measure people’s security concerns around CPS (see [[20221020144236-security\_concern\_scale\_cyber\_physical\_systems.md]]), and we want to simultaneously develop research questions that we can design experiments around once this scale is ready to use.

## Unstructured brainstorming space

* Can we look at how differences in people’s mental models of CPS influence their security concerns?
* How might the sophistication of technology influence people’s security concerns?
  + Thinking about Rick’s example of how hackers exploited the wifi system of a goldfish tank to infiltrate a casino.
  + Do people assume that trivial technology is safe because it’s not a worthy target?

… your ideas here!

## Some important constructs

**Some constructs**

These are other constructs that seem highly related to security concerns. I’m guessing we can generate hypotheses about the relationships between these constructs and security concerns.

* Consequences
  + What are the perceived consequences of a security breach?
* Agency
  + In what ways does the individual perceive that their actions will influence the likelihood of a security breach?
* Responsibility
  + Perceived responsibility of a security breach.
  + Same thing as blame?
* Likelihood of security breach
  + Perceived likelihood that CPS security will be breached generally.
  + Perceived likelihood that CPS security will be breached personally.
    - ie, that it will happen to “me”.

**Interesting independent variables**

* Individual / collective
  + Does security concern vary in interesting ways depending on whether the risk is characterized more at an individual level (eg, a personal smart car) vs. a collective level (eg, a communal smart train).
* Familiarity
  + Does the extent to which one has familiarity with a type of system or technology predict their level of concern?
  + For example, might people have different intuitions about security risks for smart cars vs. the electric grid because of greater familiarity with cars generally than with the mechanisms of smart grid operation?
* Priming
  + Will people’s security concerns differ depending on which aspects of the CPS are highlighted or primed?
  + For example, when soliciting security concerns about smart cars, people could first be cued with information either about computers (to make salient the technology component of the smart car) or about cars generally (to make salient the automobile component of the smart car).

**Possible covariates**

What are important characteristics of individuals that we’d want to understand or control for when thinking about people’s intuitions about CPS security concerns? Possibilities include:

* Current security practices
  + Is the individual vigilant in their security practices generally? Will security intuitions in one domain (eg, cyber security) be more likely to transfer to CPS than other domains (eg, general physical safety)?
  + See [[20220919144842-mental\_model\_analogies\_cyber\_security.md]] for a discussion of possible analogies that people use to understand risks around cyber systems.
* Usage of the technology
  + Does the extent to which a person uses the CPS influence their intuitions of its security?
  + Related to familiarity. All those who use the technology should be familiar with it, but not necessarily vice versa.