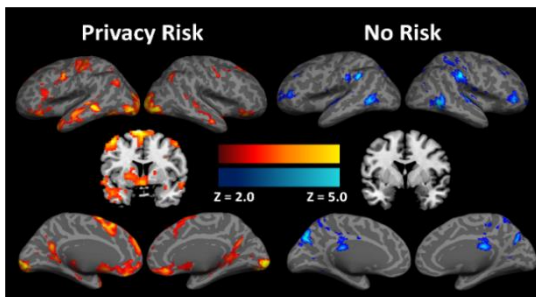# Neurobiological Basis of Decision Making in Online Environments

Challenge:

- *Affect* (emotion) plays little or no role in the existing mathematical models of decision processes
- Need mathematical models that "realistically" describe privacy behaviors, and rigorous test and evaluation
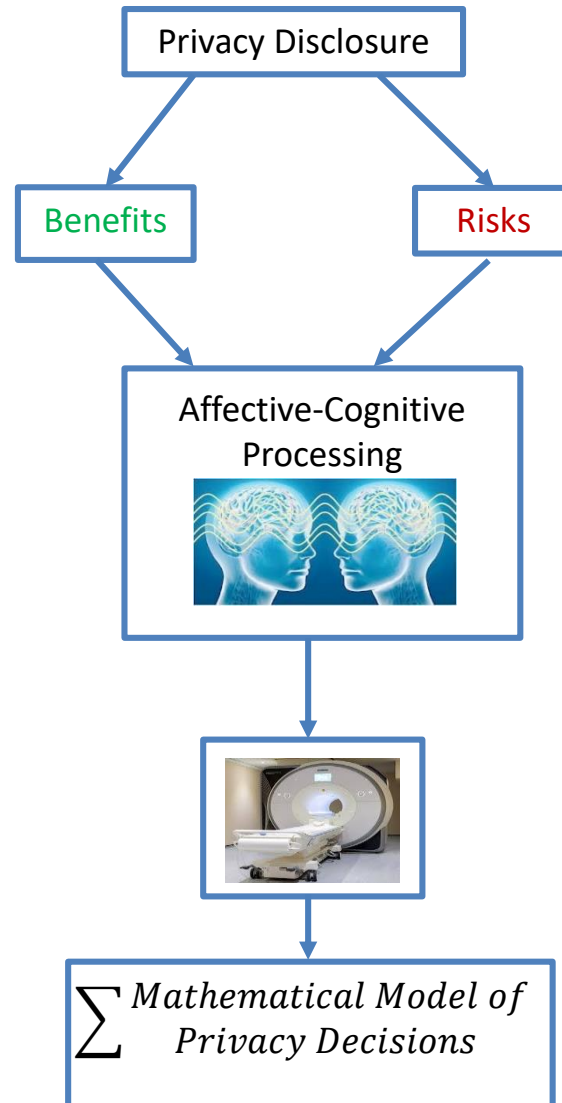
Solution:

- Brain imaging techniques to track changes in brain of humans, as they make decisions
- Whole-brain correlation analysis of parametric responses to privacy risk and no-risk activities and rigorous mathematical models--higher z score means more likely activation). (Farahmand & Farahmand 2019)

Privacy Disclosure

Benefits

Risks

Affective-Cognitive Processing

$$\sum \textit{Mathematical Model of Privacy Decisions}$$

Scientific Impact:

- Develop the first neurobiological (hard) evidence of privacy in human brain, and the new discipline of *neuroprivacy*
- Translate the findings of neuroscience (e.g., brain function) and social science (emotional memory) in privacy into mathematical models of choice and decision making

Broader Impact:

- *Cyber security and privacy*: Address the gap between mental models of security and privacy and the existing tools
- *Artificial intelligence*: Integration of affect and cognition in neurophysiological models of human behavior
- *Education and outreach*: How to nudge for "experienced" utility (likability) in policy development and risk communication