Lewis & Clark College

REHEARSING DISASTER

Understanding Earthquake Preparedness Behavior in an Interactive Environment

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Motivation

- Regional lack of first-hand experience with earthquakes and long intervals between megathrust events means:
  - We lack an "earthquake culture"
  - Individual and community resilience is especially important while infrastructure catches up
- Young adults (ages 18-29) are an overlooked and hard-to-reach group with significant…
  - Capabilities: physical well-being, language abilities, level of education, facility with digital tools
  - Vulnerabilities: lack of financial security or control over living situation, fewer community connections due to high mobility
- We use video games as research tools to understand what motivates young adults to prepare for earthquakes
- Two-way communication with emergency managers: feedback on game design, results of experiments

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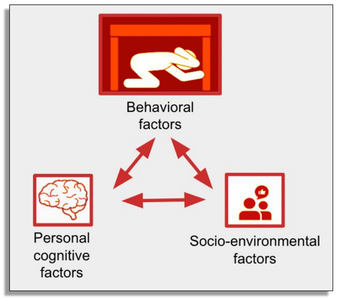


Theoretical Foundations

- Social cognitive theory (SCT) suggests that personal cognitive and socio-environmental factors influence the adoption of health-promoting behaviors, including disaster preparedness
- Vicarious experiences and observational learning emphasized by SCT especially important in the Cascadia context
- Measures of key dependent variables assessed via surveys before, after, and three months after the experimental task

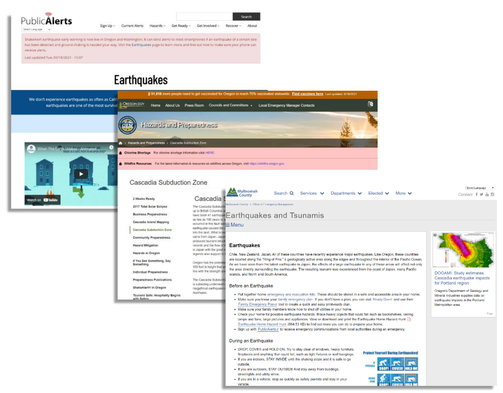
→ Learning
→ Risk perception
→ Emotional arousal
→ Self-efficacy (SE)
→ Collective efficacy
→ Outcome expectations
→ Intent to act (ITA)
→ Preparedness behavior

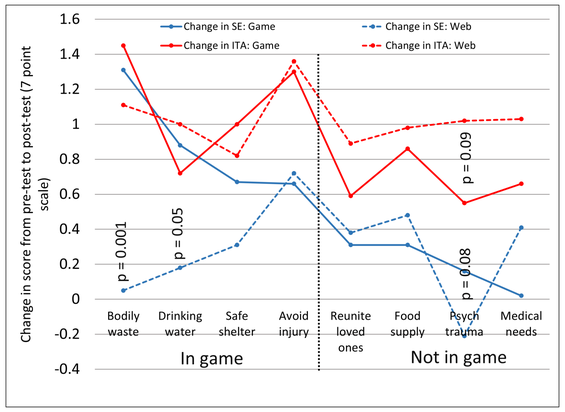
CASCADIA 9.0

- Game complete; available at Cascadia9game.org
- Experiment complete
- 125 participants
- 5-45 minutes of task (web search or game play)
- Game included 3 ways of solving 4 problems
- Web searchers offered 3 curated sites but invited to search freely

Avoid Injury	Get Clean Water	Find Shelter	Manage Human Waste
Drop, cover, hold on	Store water beforehand and treat with bleach	Vehicle	Two-bucket system
Shut off gas valve	Tap water heater and treat with chlorine dioxide	Tent	Pit latrine
Attach bookcase to wall	Collect rainwater and boil (shown)	Public shelter	Composting toilet

How does playing a custom video game vs. searching the web impact learning and outcomes related to earthquake preparedness and response?

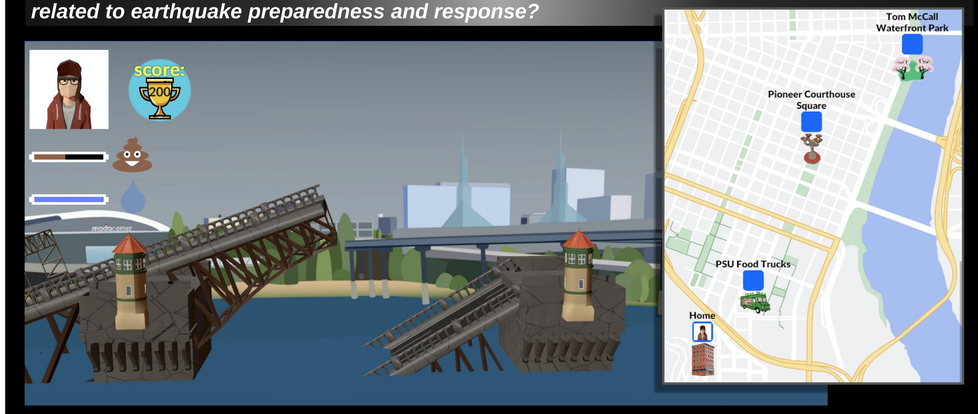




- **Short-term impacts: Game > Web**
- Significantly longer time spent on task, more information downloads, greater enjoyment, equal source trust
- **Long-term impacts: Game = Web** or Game < (?) Web
- **Self-efficacy ↑ and stayed ↑** for 5 out of 8 general categories of action
- For game condition, those were tied to **in-game activities**
- **Intent to act ↑ and then ↓** after 3 months
- Both media stimulate action
- Games CAN promote preparedness

CASCADIA 9.1

How does a player's match to living situation or home city shown in game impact outcomes related to earthquake preparedness and response?

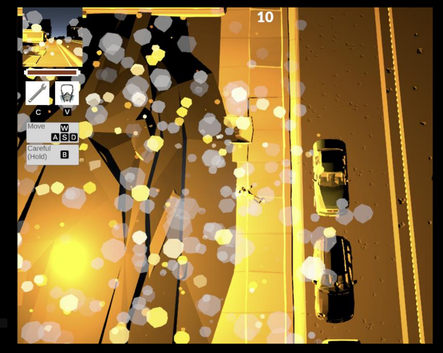


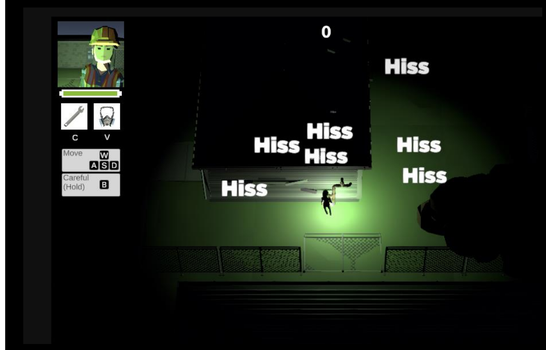
- Game complete; fully online, unmoderated experiment ongoing
- Game is set in Portland; players recruited from Portland and Seattle metro areas
- Experiment uses a two (geographic location match) x two (dwelling type depicted) x two (participant's dwelling type) factorial model design
- Social trading game to satisfy player's hydration and sanitation requirements while helping community members meet their own needs
- Water and sanitation solutions depend on dwelling type depicted in game (e.g., pit latrine for house vs. 2-bucket toilet for apartment)

CASCADIA 9.2

How does cooperating with another player vs. solo efforts to solve post-earthquake problems impact outcomes related to earthquake preparedness and response?

- Game under construction; in-person experiment to launch next month
- Takes place on Halloween night!
- Focus on dealing with or avoiding environmental hazards: gas leaks, downed power lines, fire, smoke
- All problems can be solved by a single player, but two players are more powerful (e.g., can push debris)
- Players will be playing in "couch co-op" mode





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