Are You Plugged In? Intergroup Competition Reduces Energy Consumption

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Background & Motivation

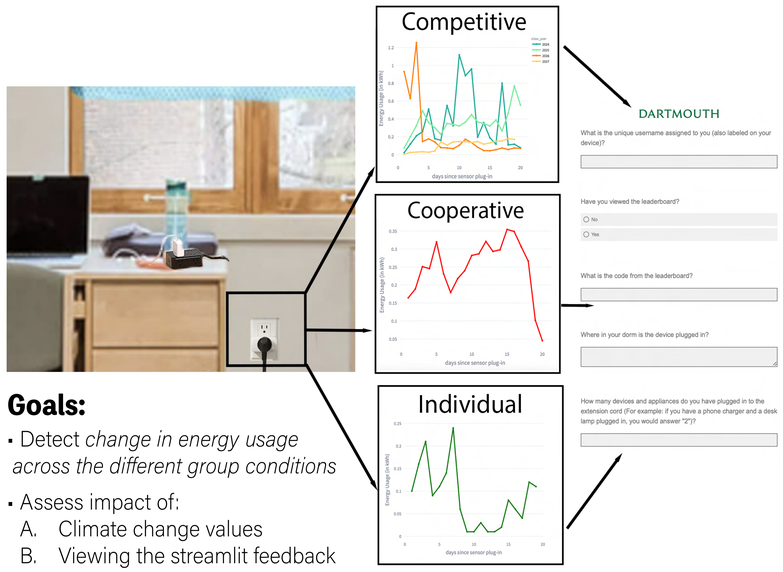
- Climate change can be directly attributed to human activities.
- The energy sector accounts for 35% of all global greenhouse gas emissions, the most of any sector
- Decreasing energy consumption is a collective action problem, where the group as a whole benefits from lower greenhouse gases, but individuals may prosper by increasing their personal energy use.
- Self-regulating systems require feedback loops of energy consumption behavior.

Research Questions

- What motivates individuals to change their behavior in ways that emit less greenhouse gas?
- Can group dynamics (i.e. cooperative, competitive conditions) influence individuals to reduce energy usage?

Experimental Paradigm

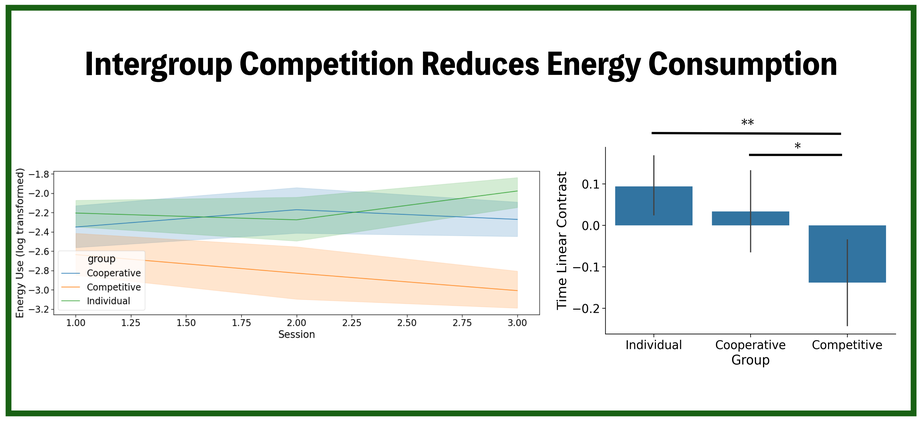
Switchbot Sensor in Dorm Room → Streamlit Web App Energy Data → Qualtrics Survey

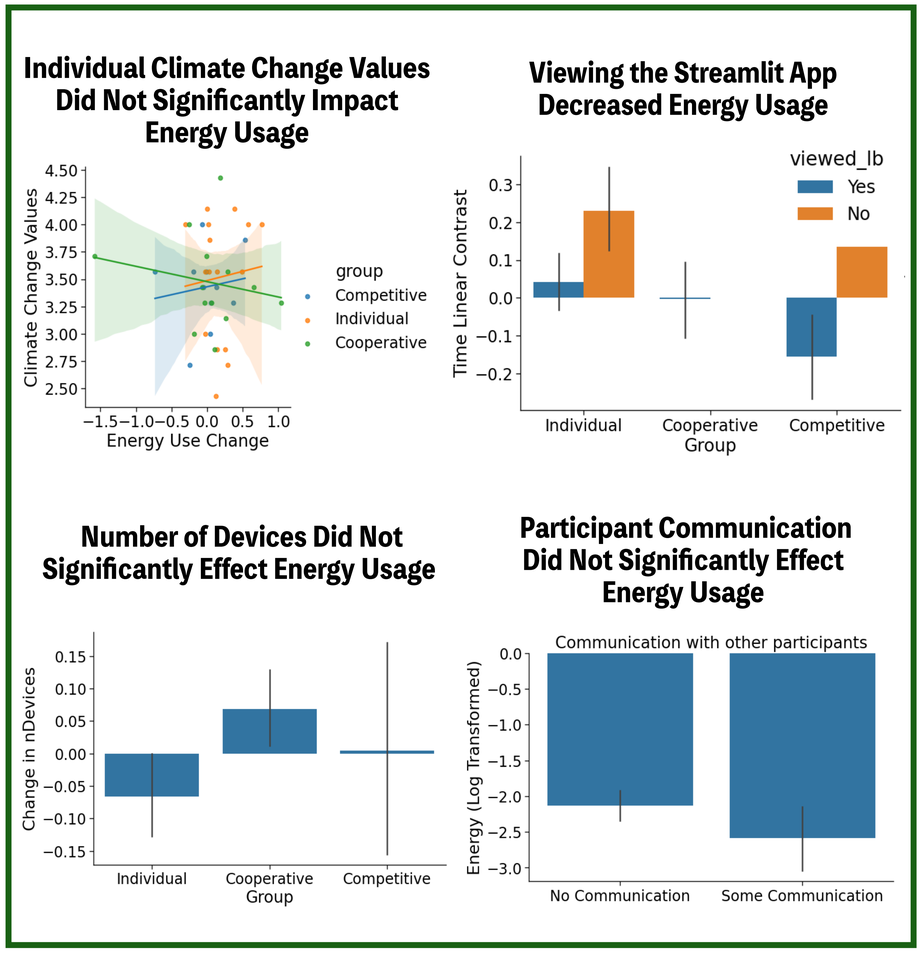


Goals:

- Detect *change in energy usage across the different group conditions*
- Assess impact of:
  A. Climate change values
  B. Viewing the streamlit feedback
  C. The number of devices plugged in
  D. Communicating with other participants has any significant effect on energy usage

Results





Discussion

- Social group dynamics, and intergroup competition in particular, can motivate individuals to lower their energy usage
- Our behaviors, especially in collective action scenarios like climate change, are shaped by social group dynamics
- Providing (energy) feedback which allows for comparison with others is important in motivating individual behavior

Future Directions

- Use a *more nationally representative sample* (more subjects, greater age range, people other than just undergraduate students living in Hanover, NH)
- Determine if the lower energy usage effect would *change if all participants were shown their individual energy usage*
- Run the experiment for a *longer period of time*
- Provide *immediate energy feedback* to participants
- Track the *amount of times that participants logged in* to view their feedback

Implications

- In many energy use feedback mechanisms, such as monthly utility bill reports, the individual or household is only compared to their performance in previous years
- Including comparisons of "your group" (i.e. your neighborhood or office building) to other groups could prove to be more effective in lowering individual household energy consumption
- The findings of this study create a framework for future scalable low-cost interventions where intergroup competition can be used to lower energy usage, and greenhouse gas emissions