Developing a Cookstove Usability Test

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What Is Usability?

- How well a product meets a user's needs
  - Effectiveness
  - Efficiency
  - Satisfaction
- Common in industry
  - Software
  - Consumer products

Cookstove Usability

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Why does it matter?

- Low usability leads to:
  - Low adoption/ sustained use
  - Stove-stacking

Why hasn't it transferred from other industries?

- Lack of resources
- Limited professional expertise

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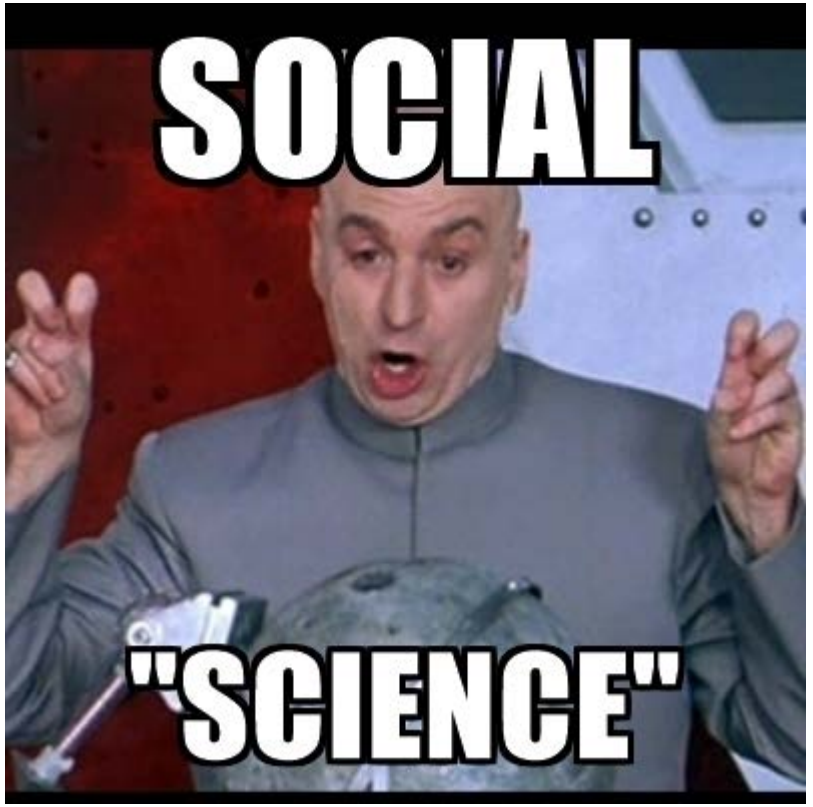
Adapting Usability to Stoves

- Existing standards and models serve as a foundation
  - ISO 9241: Ergonomics of Human System Interaction
  - Nielson's *Usability Engineering* Handbook
  - Quesenbery's "5E's of Usability"
- Some changes needed
  - Broad vs. narrow
  - Cross-cultural vs. within one culture

Integrating Social Science

- Anthropological methods
  - Broadly applicable
  - Cross-cultural
  - But, require more interpretation



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Usability Criteria

Six main usability criteria

1. Fuel cost and convenience
2. Cooking performance
3. Operability
4. Maintenance
5. Comfort
6. Location-specific needs

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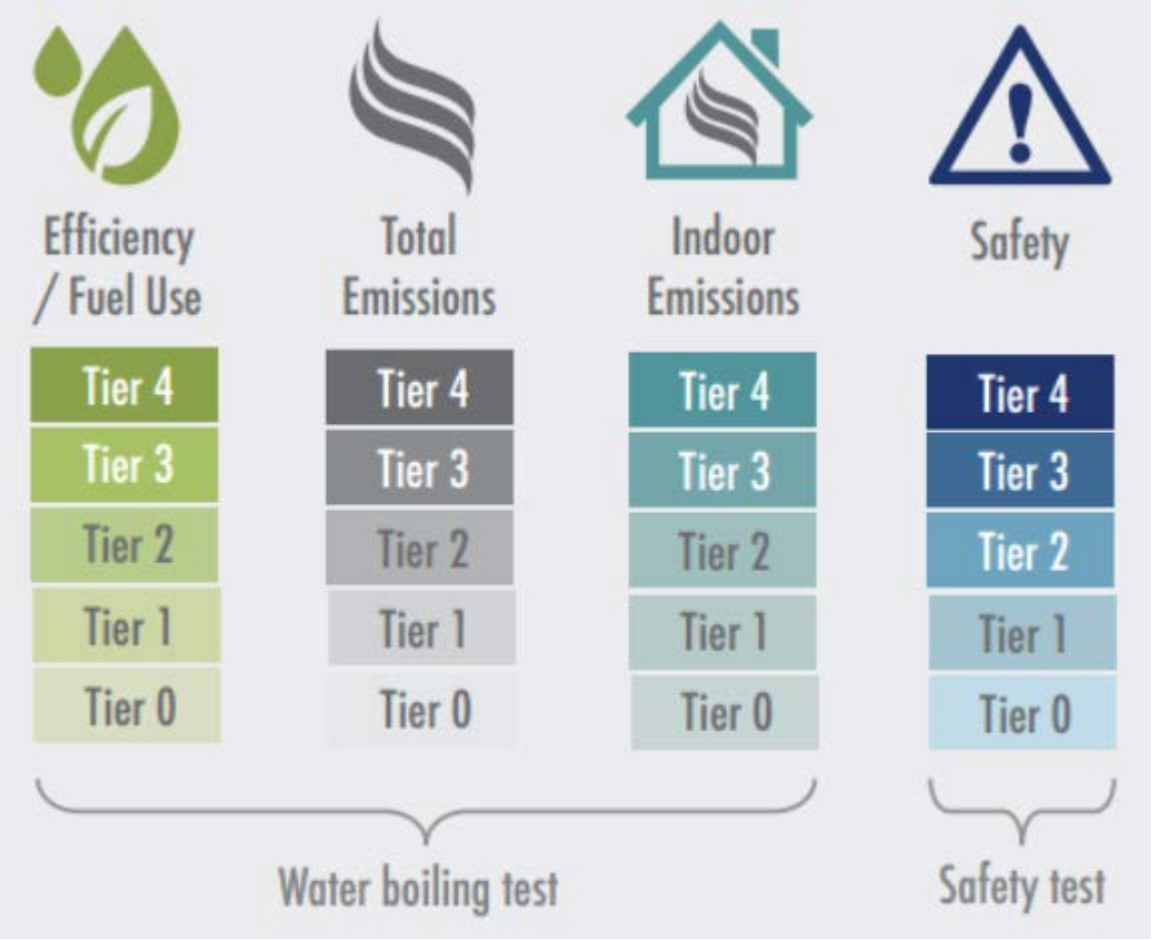
Using the Protocol

- Four test sections
  1. Quantitative measurements
  2. Observation
  3. Survey
  4. Interview

  ➔ Triangulation
- Field test
  - With provisions for lab testing
- Self-contained (hopefully)

Protocol Output

- Uses ISO/IWA tiers
  - With CoV's
- Limitations
  - Context specific
  - Potential for higher uncertainty than technical tests



http://cleancookstoves.org/technology-and-fuels/standards/iwa-tiers-of-performance.html

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What's in it for the tester?

- Understand user needs
  - Balance with technical goals

  ➔ Improve adoption and sustained use

- Impress your partners, funders, etc.

https://www.colourbox.com/image/successful-corporate-team-showing-ok-symbol-image-4494888

Field Trial

- Northern Uganda
  - In collaboration with ILF
  - Visited 12 kitchens
  - Tested 7 stove designs

- Positive feedback from ILF staff about protocol

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Distribution

- ISO cookstove testing standard (ISO/TC 285)
- Academic publications
- Public distribution
  - Beta testers wanted
  - Feedback is welcome

Protocol is available online at:
https://humanitarian.engineering.oregonstate.edu/project-page/usability-testing-protocol-cookstoves

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Questions?

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