ENERGY JUSTICE IN POVERTY

POLICY MODELLING OF INVISIBLE DRIVERS OF ENERGY DEMAND IN SLUM REHABILITATION HOUSING IN THE GLOBAL SOUTH

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PROBLEM STATEMENT

Distributive **energy justice** entitles people to a **basic set of minimum energy services** which enable them to **enjoy an essential minimum of well-being**. However, the thresholds for a minimum energy services **remains unknown** in the literature (Sovacool and Dworkin, 2014)

PRIMARY RESEARCH QUESTION

How do you **indicate** a 'minimum of energy services' for energy justice in low-income population?
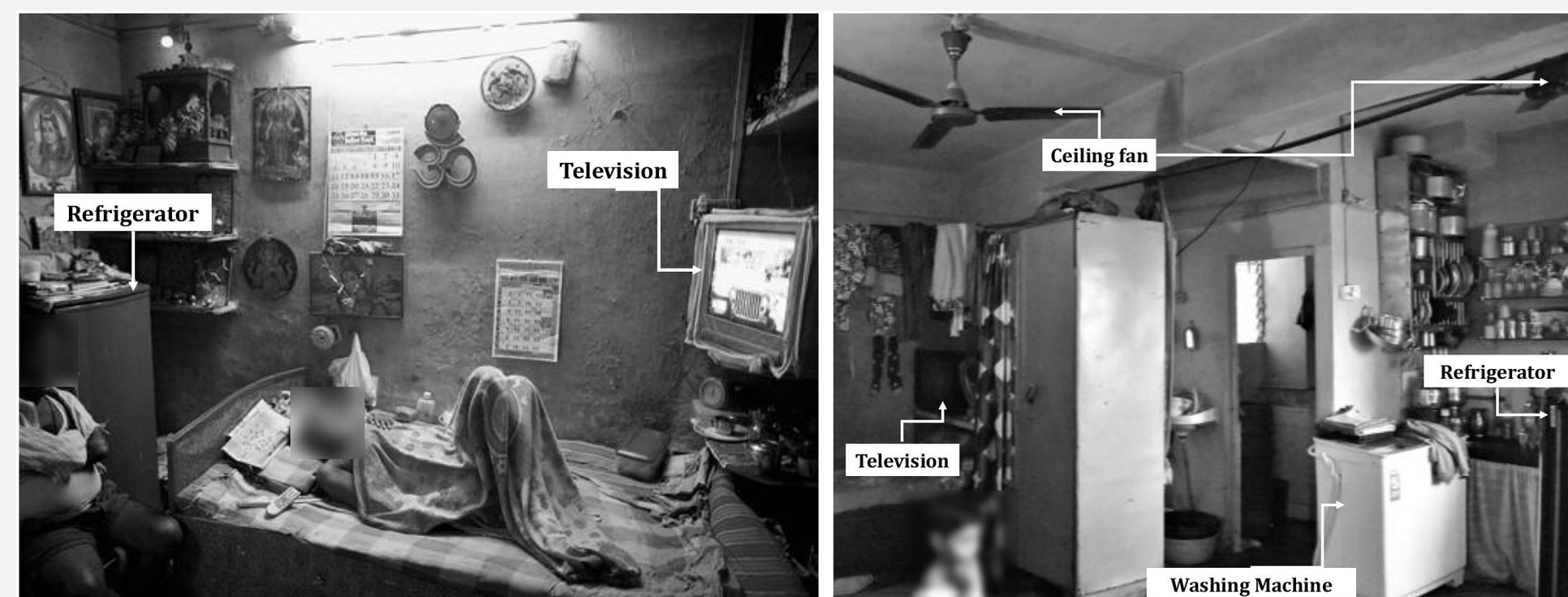
RESEARCH QUESTION 1

What are the non-income drivers of energy demand in poverty?
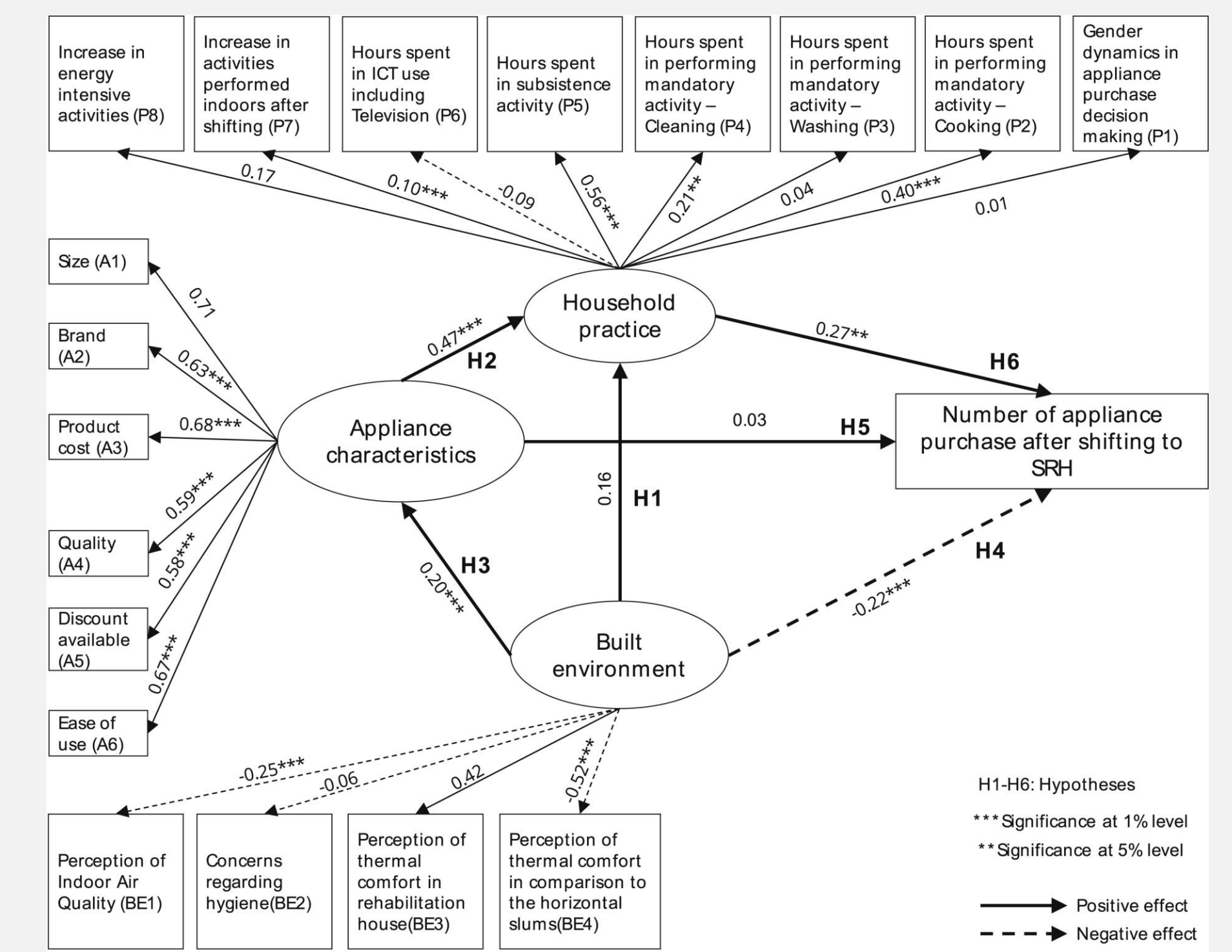
ANSWER

- Poor built environmental design
- Change of household practices
- Socio-cultural energy service needs
- Aspiration-driven appliance ownership
- Settled-status in slum rehabilitation houses

METHODOLOGY

Social Practice Theory and **Structural Equation Modelling** on 1224 slum rehabilitation household, Mumbai, India.

EMPIRICAL MODEL


RESEARCH QUESTION 2

How does social dimension of energy services influence energy justice?

ANSWER

- Typology of built environment influences cultural energy service demand
- Minimum of energy can be defined through comfort, cleanliness and convenience
- Environmental design – energy justice link

METHODOLOGY

Energy Culture Theory and **Structural Equation Modelling** on 200 slum rehabilitation household

Mumbai, India   João Pessoa, Brazil
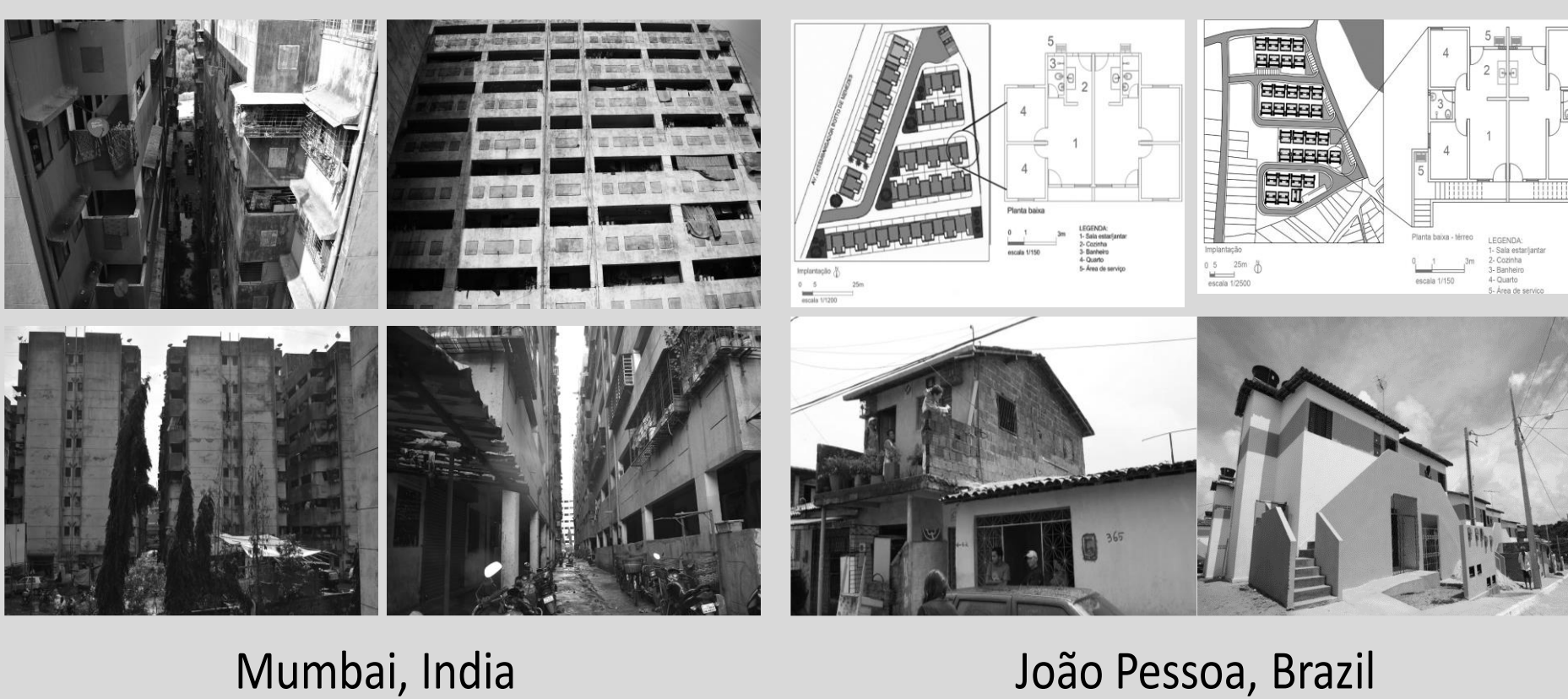
EMPIRICAL MODEL

$$f(total\ appliance\ ownership) = \alpha(comfort) + \beta(cleanliness) + \gamma\ (convenience) + \text{error}\ (\varepsilon)$$

$$f_{Brazil}(total\ appliance\ ownership) = 0.222(comfort) + 0.845\ (convenience) + \varepsilon$$

$$f_{India}(total\ appliance\ ownership) = -0.121(comfort) - 0.501\ (cleanliness) + 0.695\ (convenience) + \varepsilon$$

RESEARCH QUESTION 3

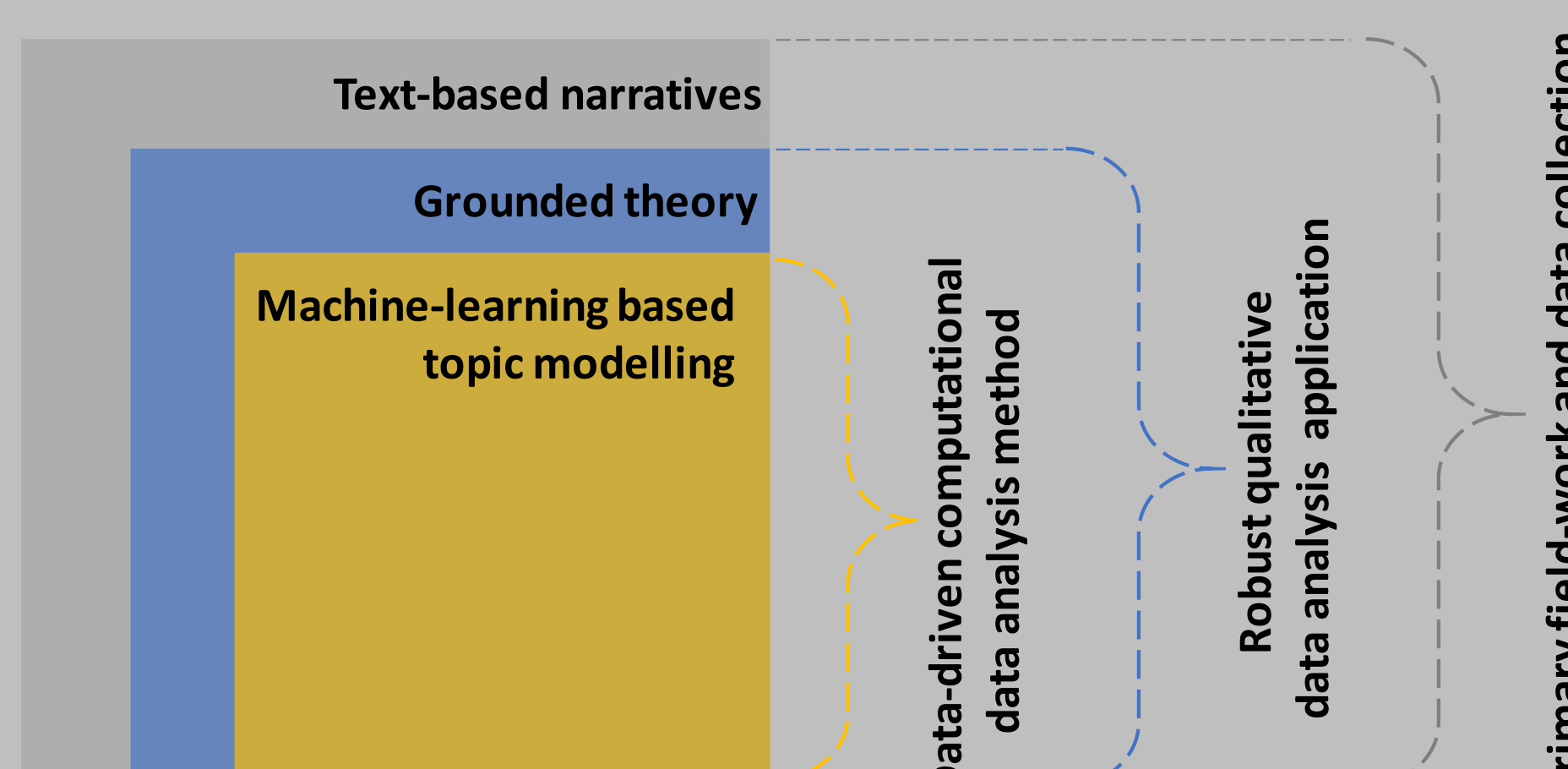**What are the energy externalities in poverty from a dynamic energy justice perspective?**

ANSWER

- Poverty demands energy services through the built environment and welfare component of children

METHODOLOGY

Nested deep-narrative analysis approach on Brazil, India and Nigeria field-based text data

EMPIRICAL RESULTS

PUBLICATIONS FROM RESEARCH:

- Debnath, R., Bardhan, R., & Sunikka-Blank, M. (2019b). *How does slum rehabilitation influence appliance ownership? A structural model of non-income drivers.* Energy Policy, 132(December 2018), 418–428. https://doi.org/10.1016/j.enpol.2019.06.005
- Ramit Debnath, Gianna Monteiro Farias Simoes, Solange Maria Leder, Ronita Bardhan, Minna Sunikka-Blank, Roberto Lamberts (2020): *A structural model of cultural energy services and appliance ownership for energy justice in slum rehabilitation: Case of Brazil and India,* Energy Policy, Elsevier (under review)
- Ramit Debnath, Ronita Bardhan Ana Villaca, Abdulrasheed Isha, Minna Sunikka-Blank (2020): *Energy justice and human scale energy services in poverty: A nested deep narrative analysis approach using topic modelling,* Applied Energy, Elsevier (working paper)

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