MODELLING ENERGY USE BEHAVIOUR OF BRITISH ASIAN HOUSEHOLDS

Dr. Satish B. K

29 June 2017

Plymouth University

"There is enough for everybody's need, but not enough for anybody's greed”

M K Gandhi

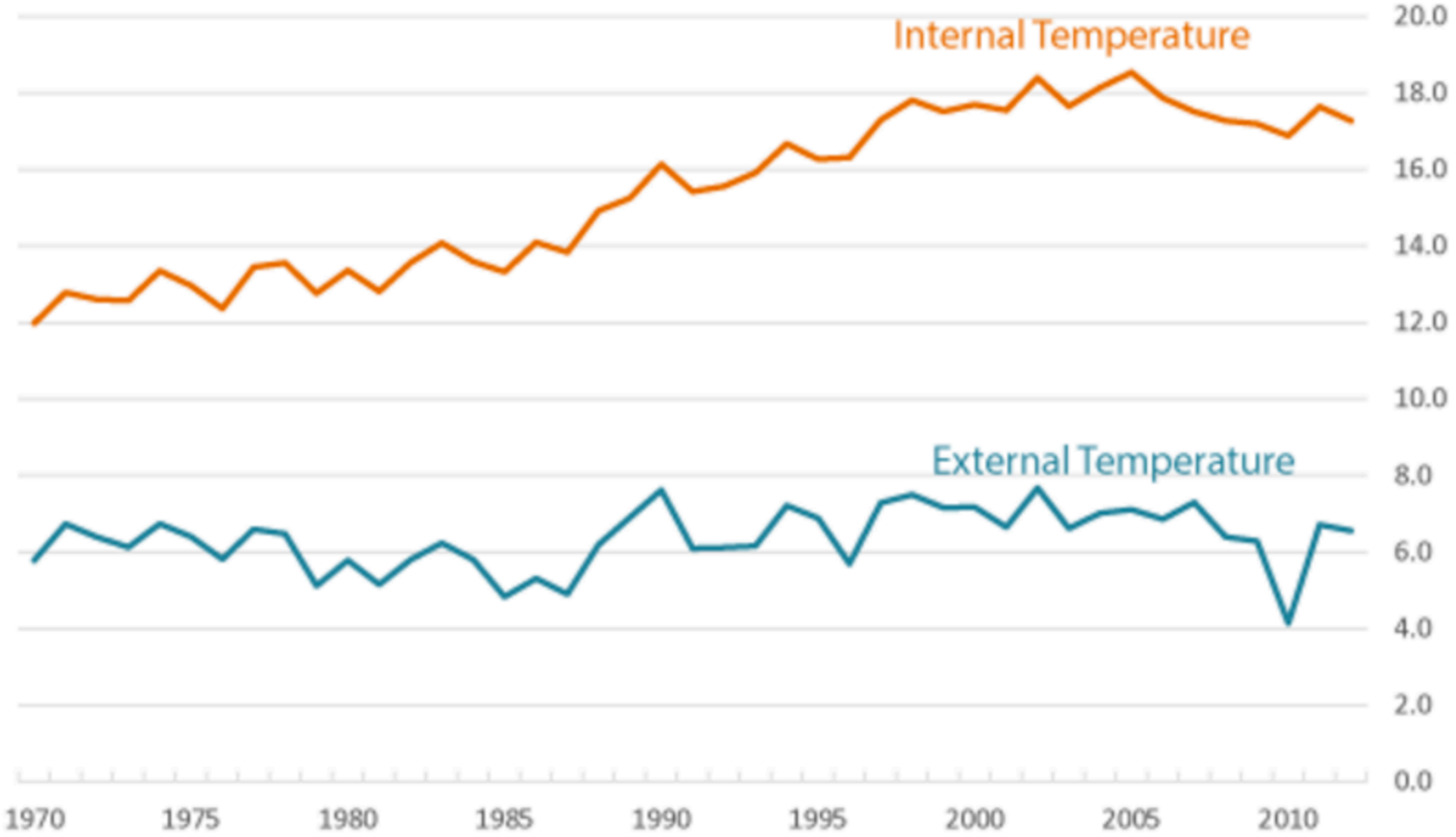
How warm is your home?

How warm is your home?

The average room temperature in a UK home during the winter season is roughly **18°C**

Average internal and external winter temperature (°C)

Figures based on the average modelled temperatur from October to March



Source: Energy Consumption in the UK (ECUK), 2015 data tables

What is a healthy room temperature?

The basic level of warmth required for a healthy and well-dressed person is **18°C**.
[Ref. World Health Organization and Min std in the latest UK cold weather plan].

Basic benchmarks for indoor temperatures:

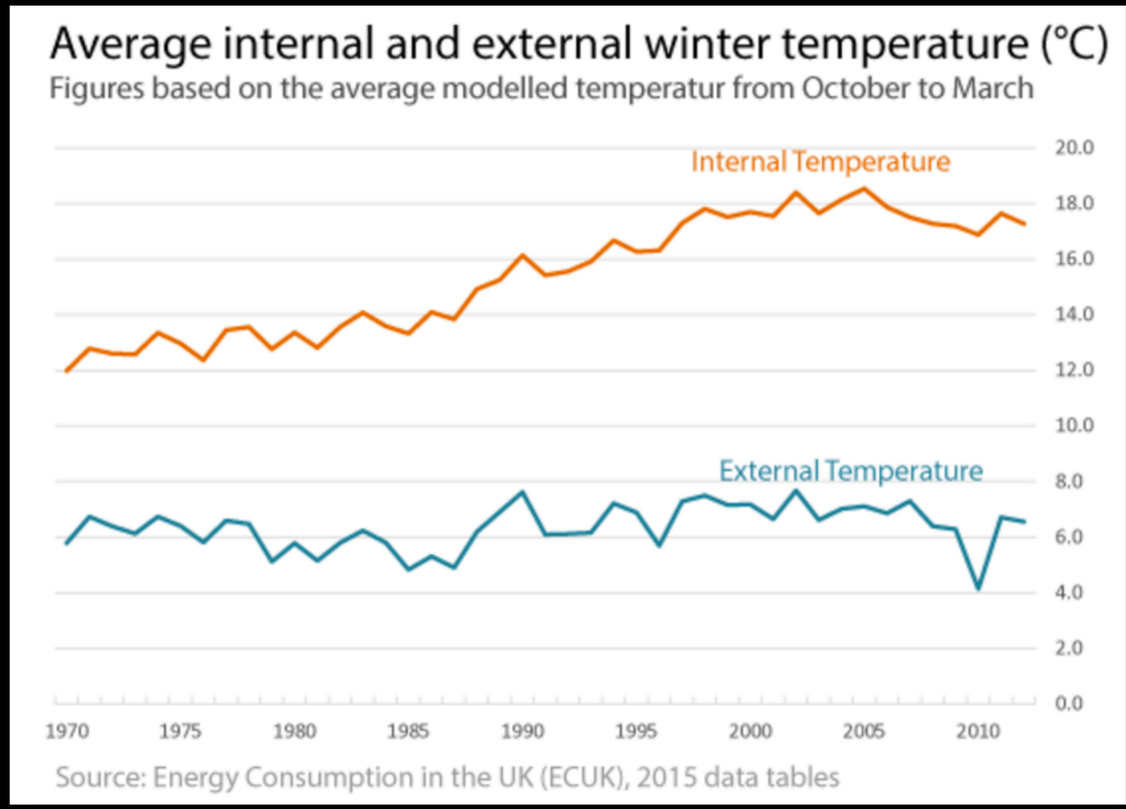
> 24°C - cardiovascular risk

18-21°C - comfortable temperature

18°C - minimum for comfort

12-16°C - respiratory risk

<12°C - cardiovascular risk



What is a healthy room temperature?

The basic level of warmth required for a healthy and well-dressed person is **18°C**.
[Ref. World Health Organization and Min std in the latest UK cold weather plan].

Basic benchmarks for indoor temperatures:

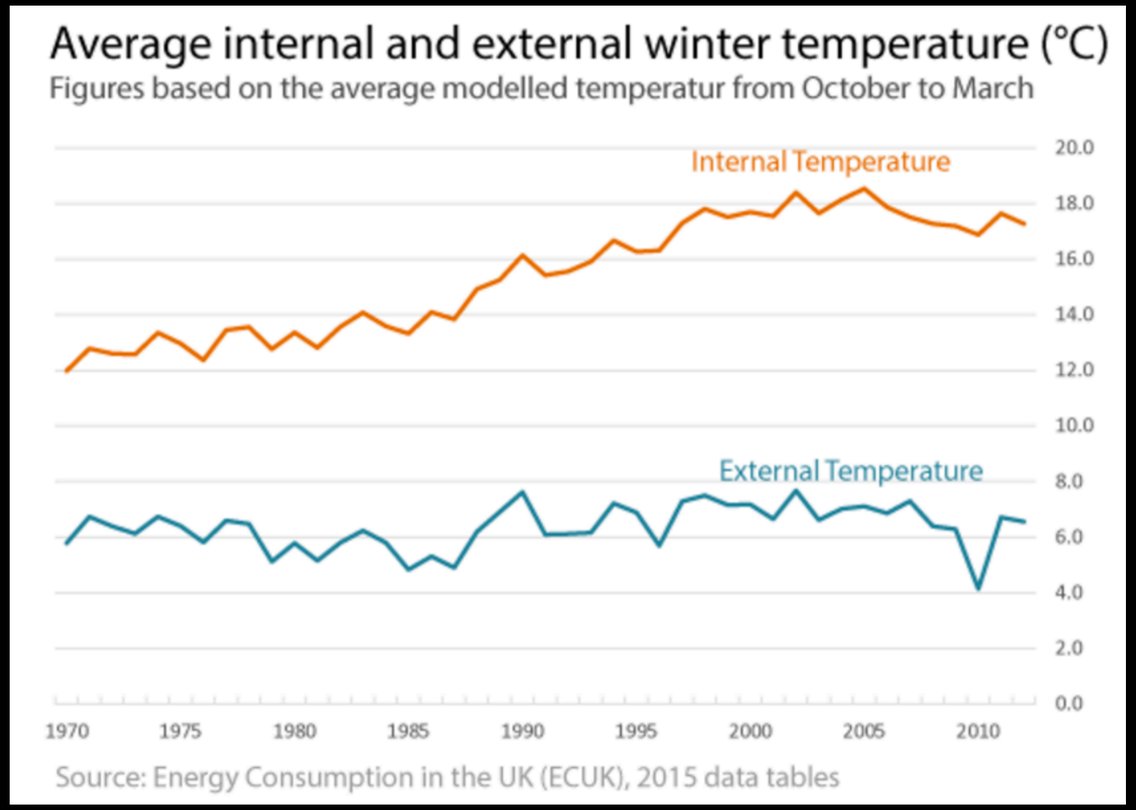
> 24°C - cardiovascular risk

18-21°C - comfortable temperature

18°C - minimum for comfort

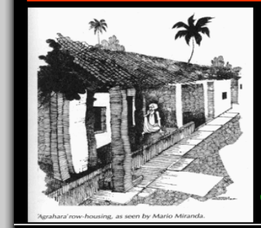
12-16°C - respiratory risk

<12°C - cardiovascular risk



Average Temperature setting in a British Asian Home 21.4°C
[survey conducted in Plymouth- June 2017]

Lifestyle adaptation and its implication on sustainable housing: contextual study of Mysore, India


'Aprahara' now-housing, as seen by Mario Miranda.

Satish B. K
Edinburgh School of Architecture and Landscape Architecture
The University of Edinburgh

Programme Leader, ATE
Lecturer, School of Architecture,
Plymouth University

'Innovative Engagement for Sustainable Development: the Edinburgh-India Story'

"There is enough for everybody's need, but not enough for anybody's greed" M K Gandhi

EnerGAware

Energy Game for Awareness of energy efficiency in social housing communities

UNIVERSITAT POLITÈCNICA DE CATALUNYA

CISTER - Research Center in Real-Time & Embedded Computing Systems

advanticsys

RESEARCH WITH PLYMOUTH UNIVERSITY

dch

eDF ENERGY

fremencorp

Dr. Satish BK

Plymouth University:
Dr. Alba Fuertes
Dr. Rory Jones

‘SUSTAINABLE BUILT ENVIRONMENT’

The cause of and responsibility for climate change and mitigation strategies

the Brundtland Report - predominantly empiric framework

Sustainable society
(Skea 2008)

Developed Nations

“inventing low carbon technology and reducing carbon dioxide emission by the middle of 20th century”

Developing Nations

achievement of Sustainable communities must go hand in hand with achieving wider development goals

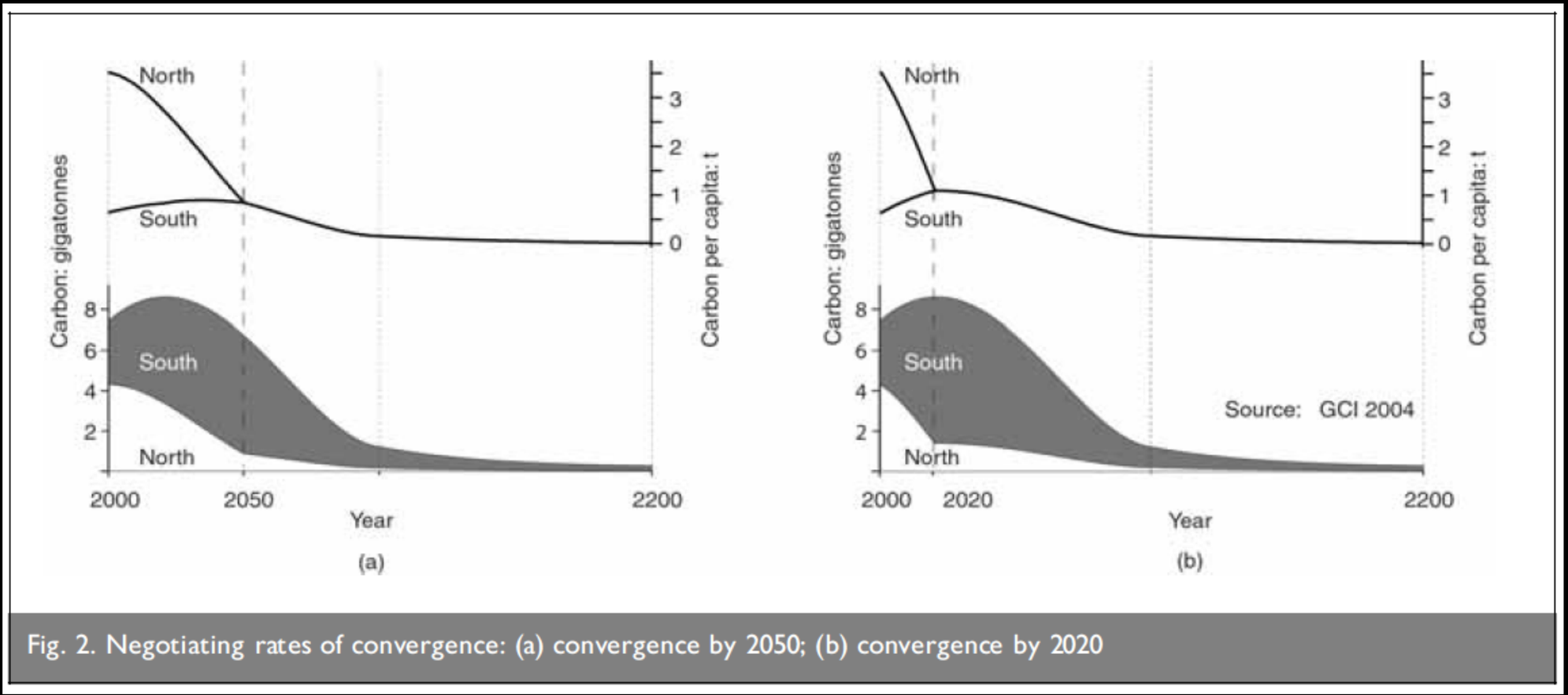
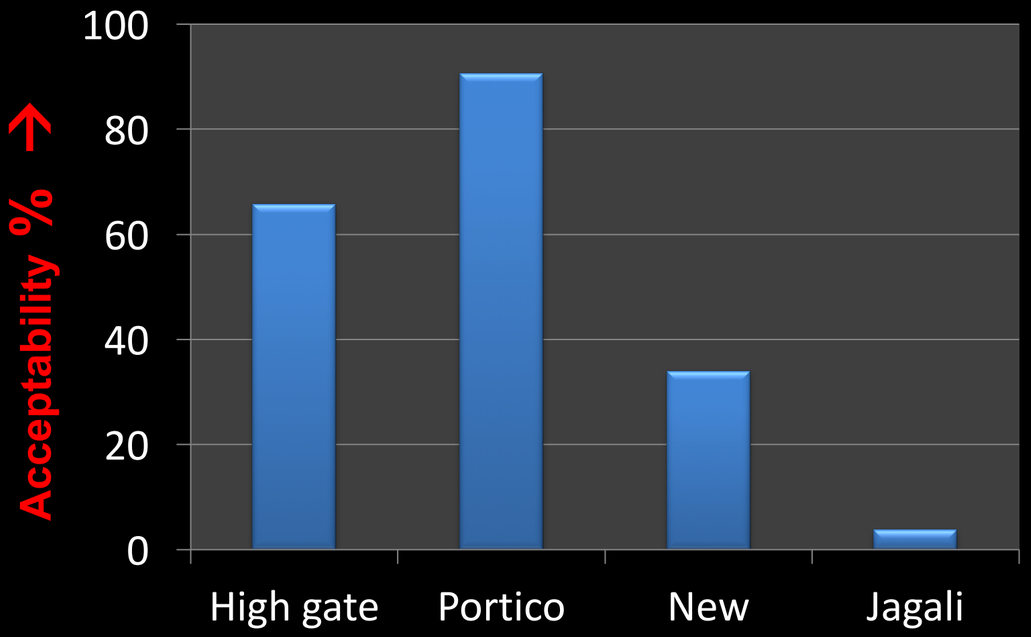


Fig. 2. Negotiating rates of convergence: (a) convergence by 2050; (b) convergence by 2020

Contraction and convergence (A Meyer 2004)

ANALYSIS

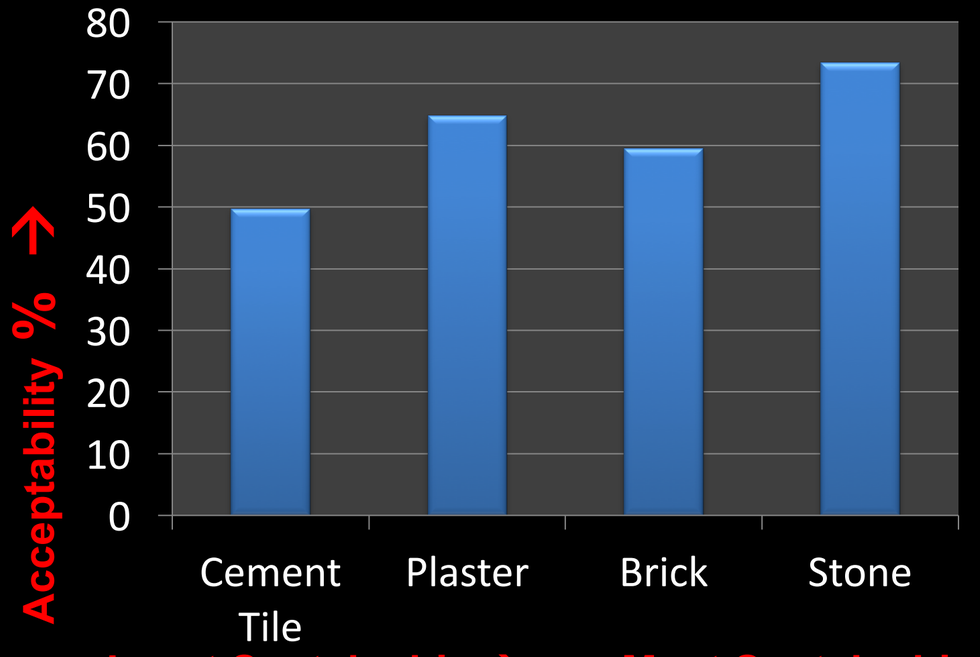
FIELD WORK _ ANALYSIS



Entrance Sequence

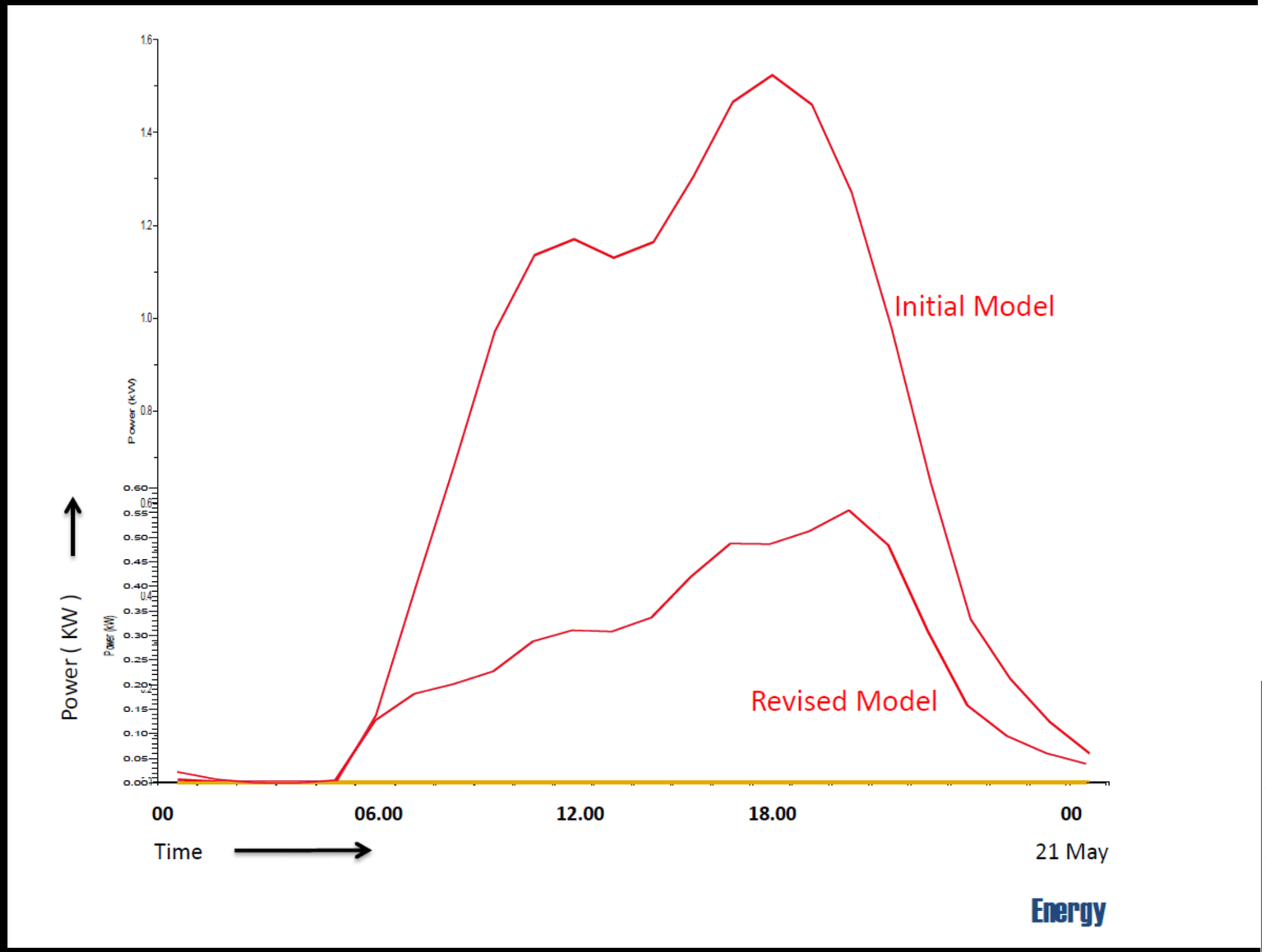
Field Work Reflections

	level of acceptance of sustainable models	Probability of aligning towards Sustainable Housing
Volume	Least	Negative
Entrance	Least	Negative
Openings	Most	Positive
Interaction	Moderate	Perhaps
Security	Least	Negative
Skin	Most	Positive



Building Skin

RESEARCH_ REFLECTIONS



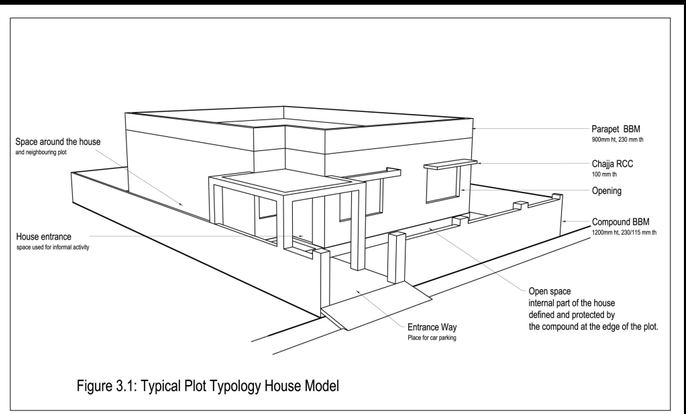
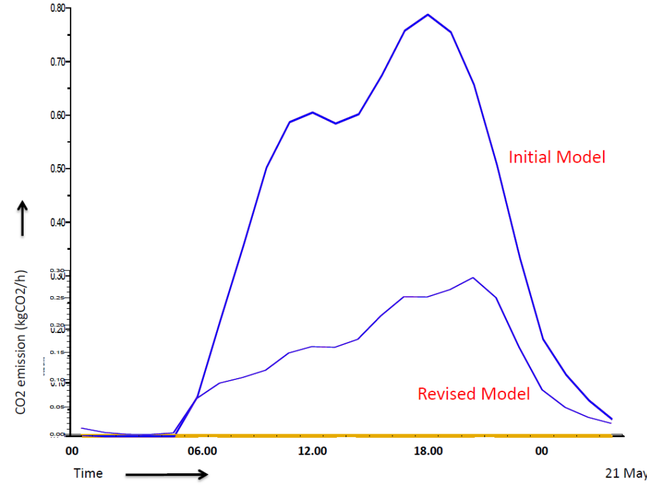
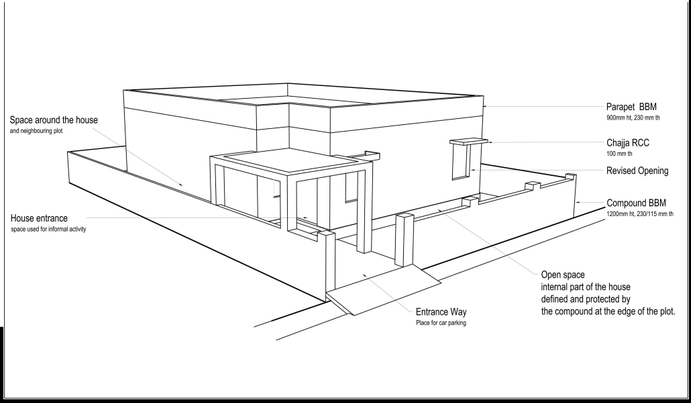


Figure 3.1: Typical Plot Typology House Model



Carbon emission



Post field work simulation

QUESTIONNAIRE SURVEY:

1. HOUSEHOLD –

PREFERENCES

2. VENTILATION

COMFORT AND ODORS

COOKING

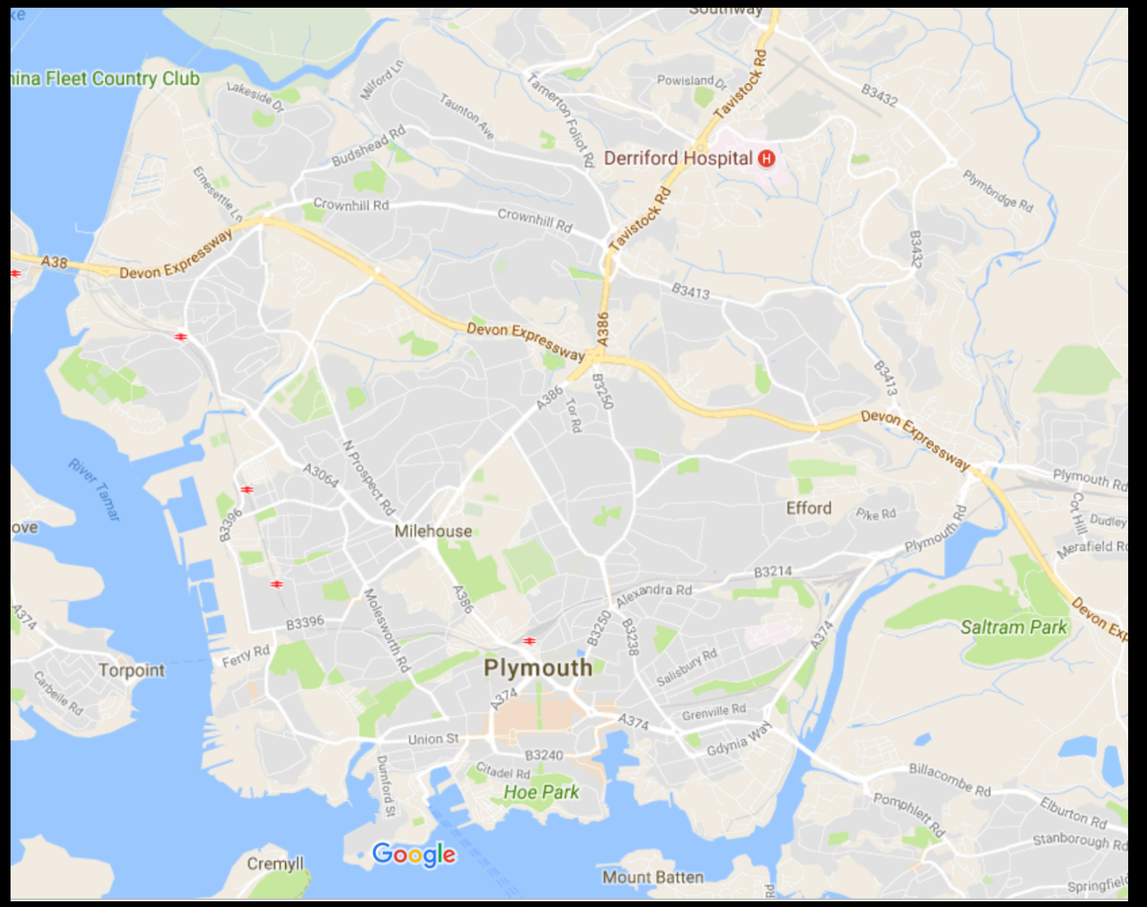
ADDITIONAL HOUSE CHARACTERISTICS

3. YOUR HOME

COMFORT AND CONDENSATION

4. YOUR HOME – ENERGY

5. YOU AND YOUR HOUSEHOLD



QUESTIONNAIRE SURVEY:

1. HOUSEHOLD –
    - PREFERENCES
2. VENTILATION
    - COMFORT AND ODORS
    - COOKING
    - ADDITIONAL HOUSE CHARACTERISTICS
3. YOUR HOME
    - COMFORT AND CONDENSATION
4. YOUR HOME – ENERGY
5. YOU AND YOUR HOUSEHOLD

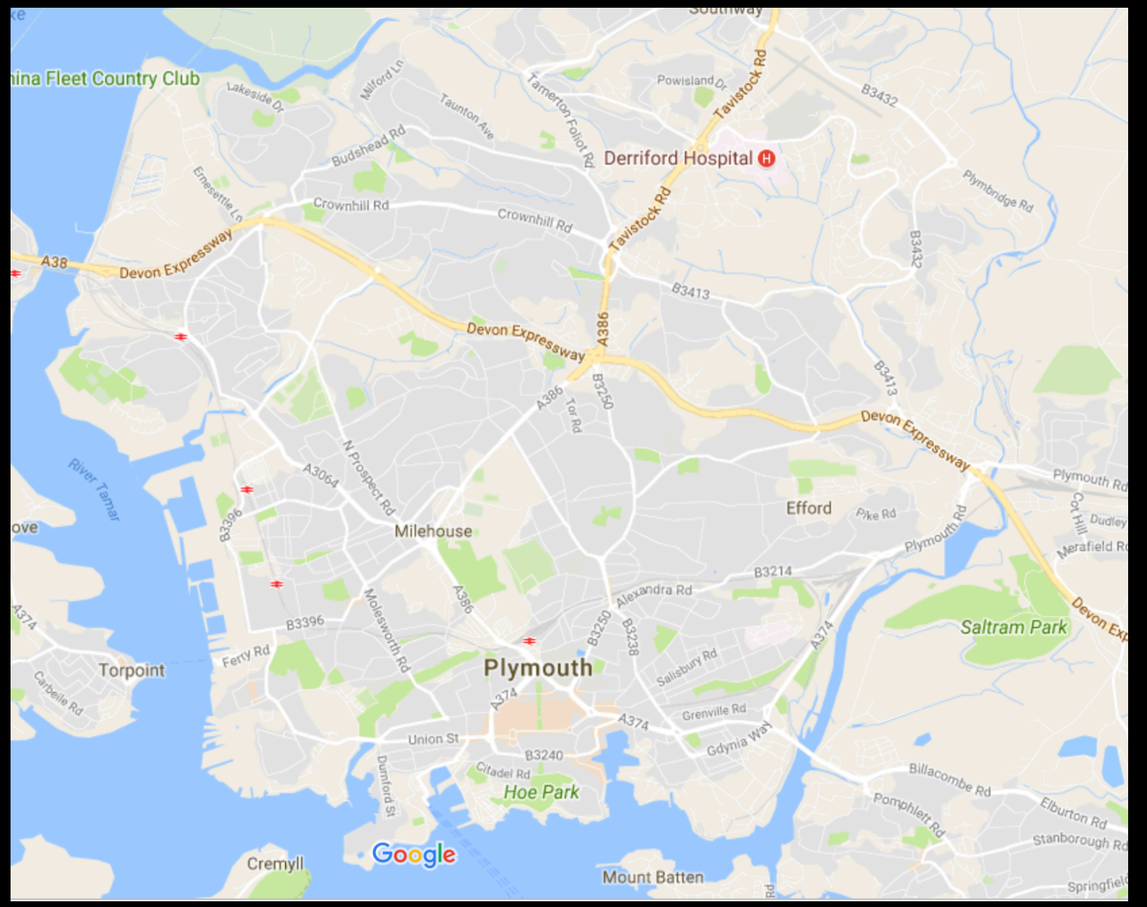
ETHNICITY

OCCUPATION

GEOGRAPHICAL LOCATION

DOMICILITY

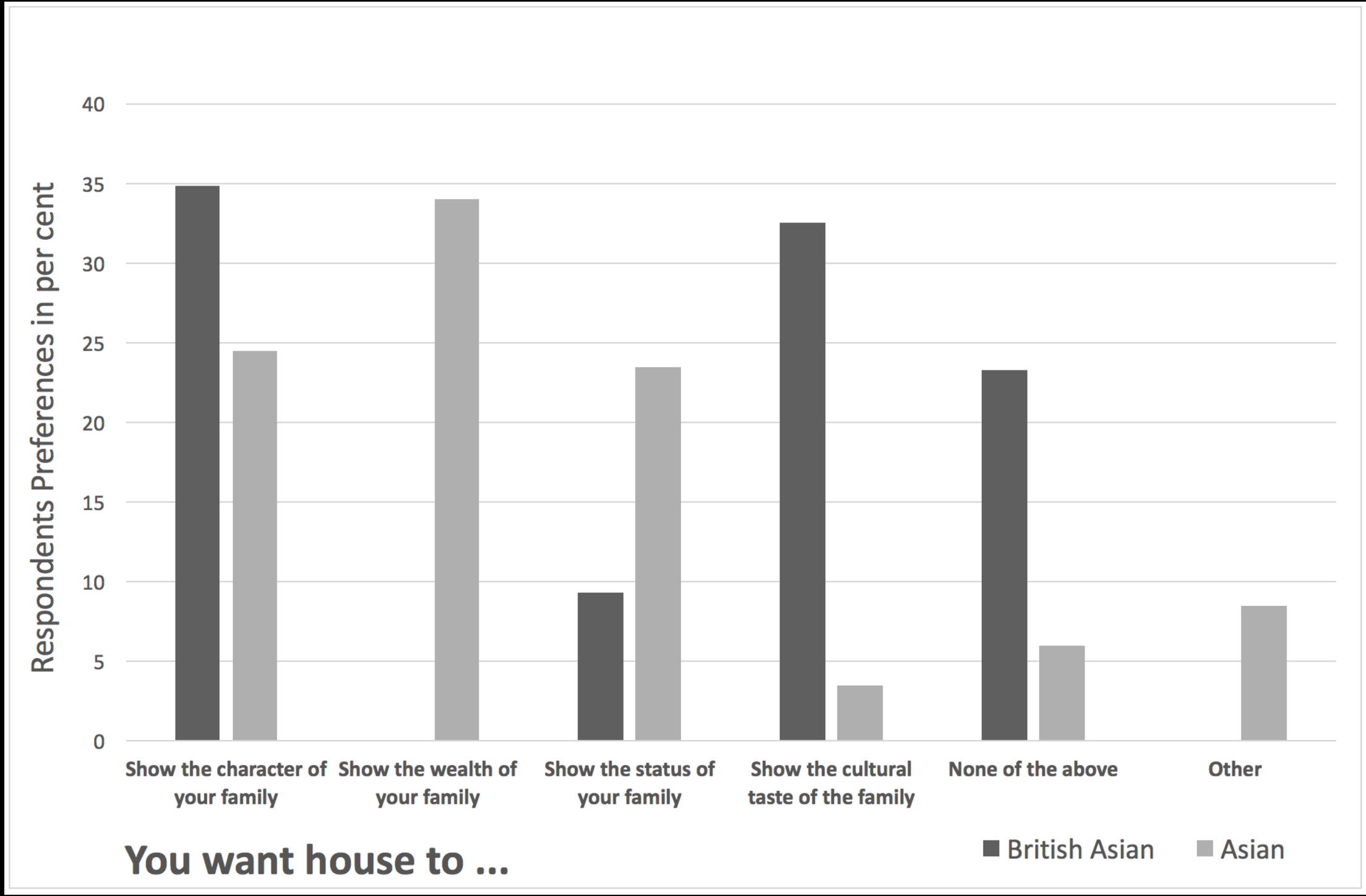
AGE GROUP



PLYMOUTH

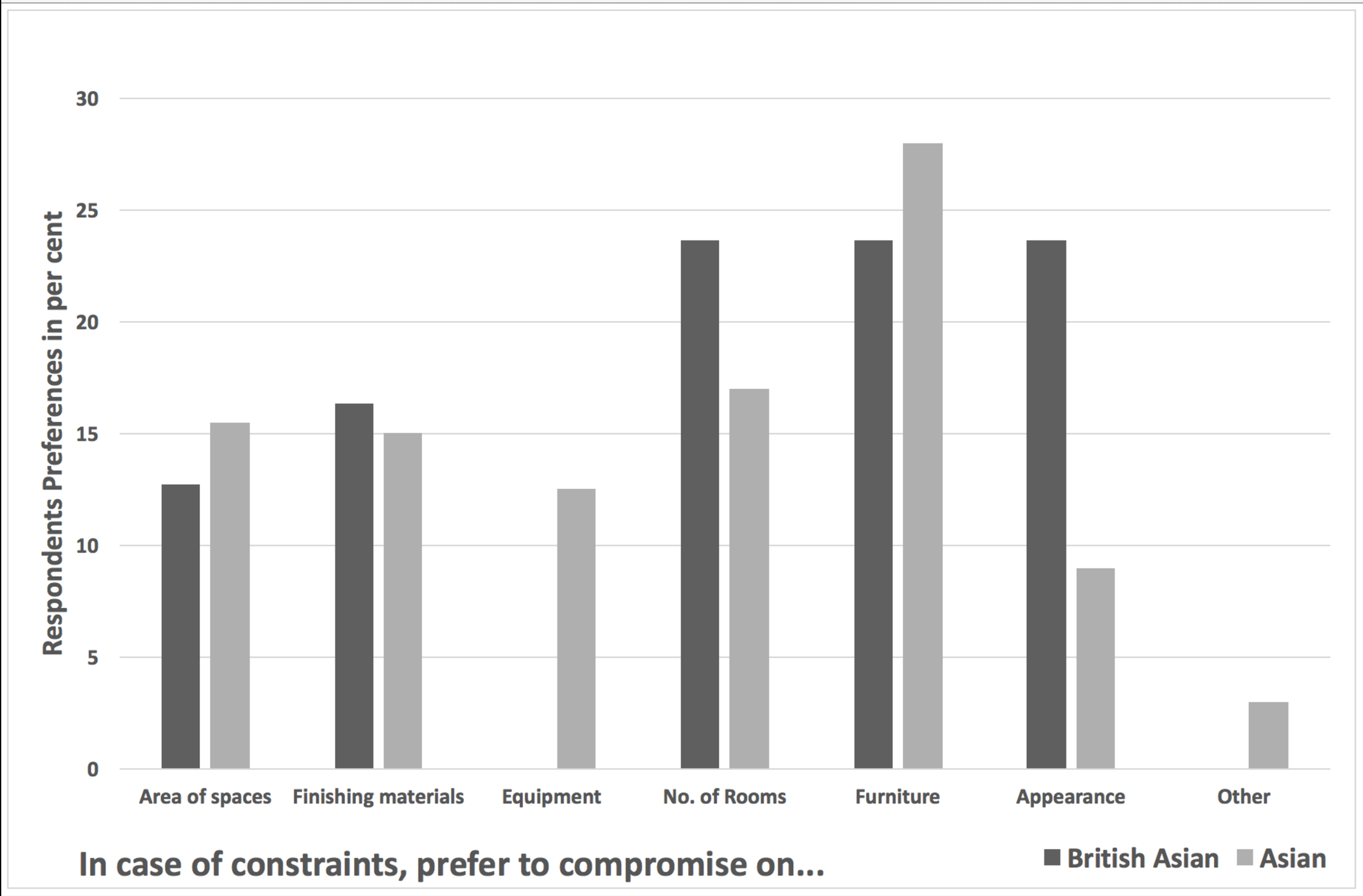
ANALYSIS

FIELD WORK _ ANALYSIS



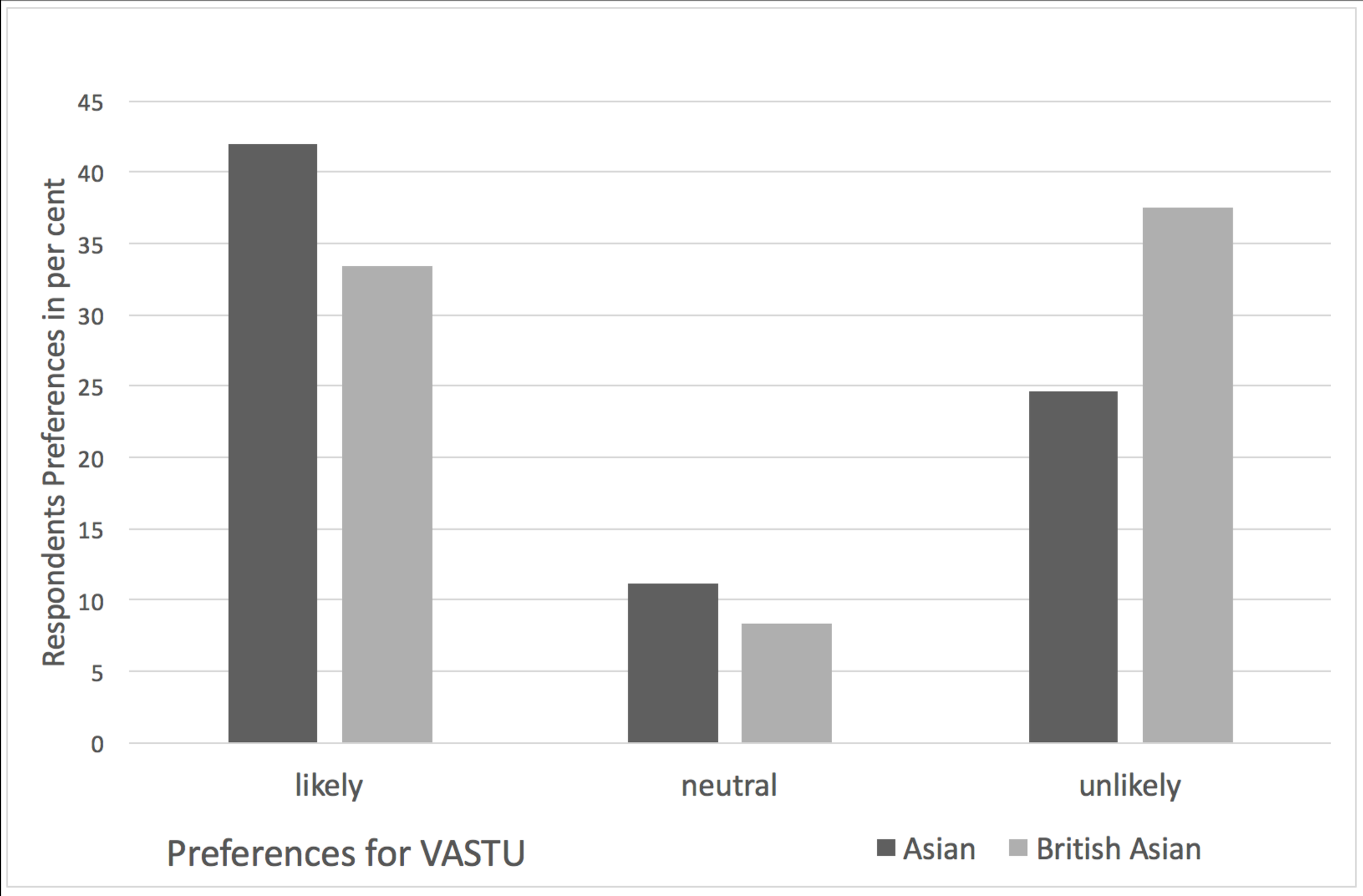
ANALYSIS

FIELD WORK _ ANALYSIS



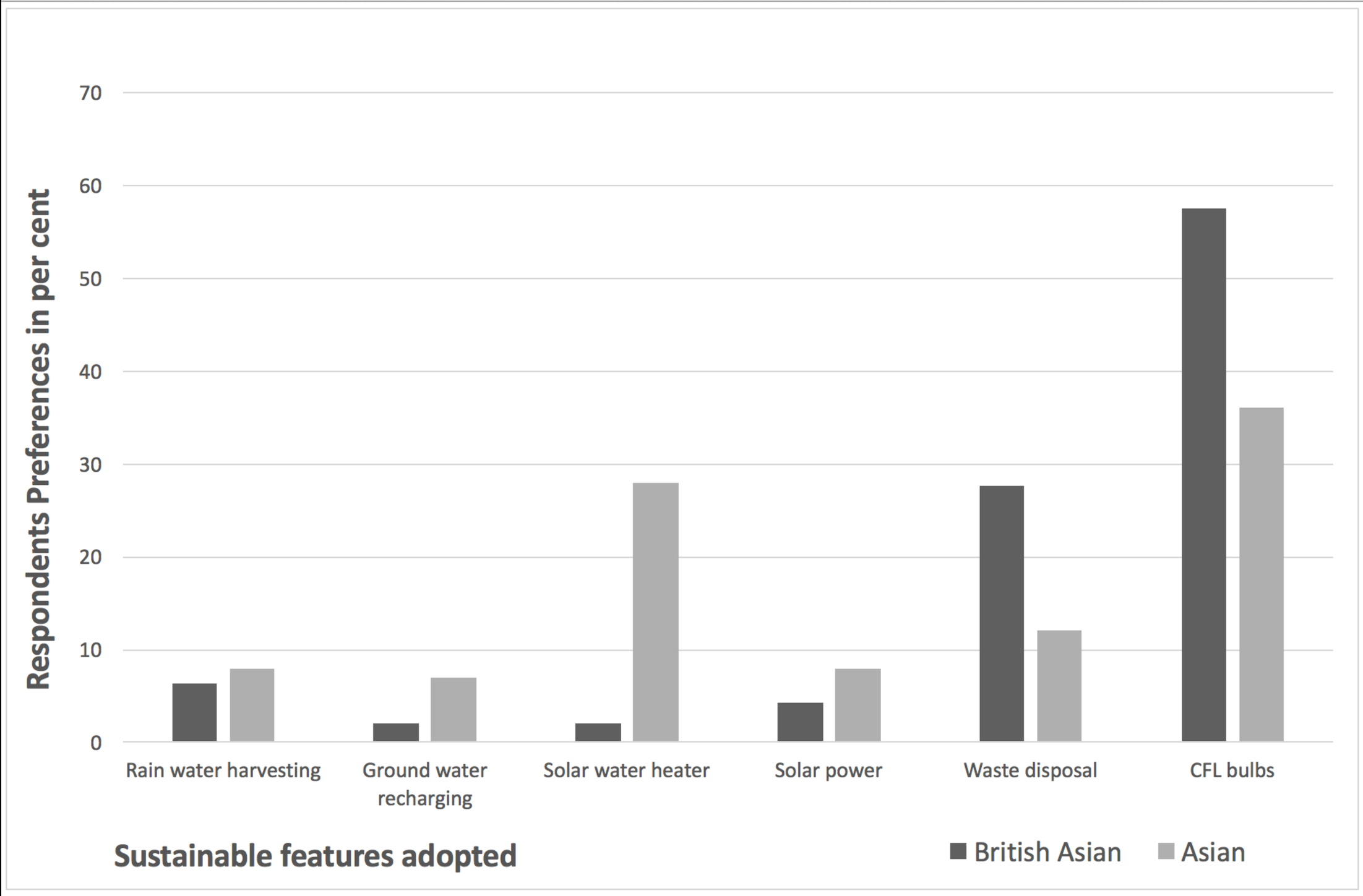
ANALYSIS

FIELD WORK _ ANALYSIS



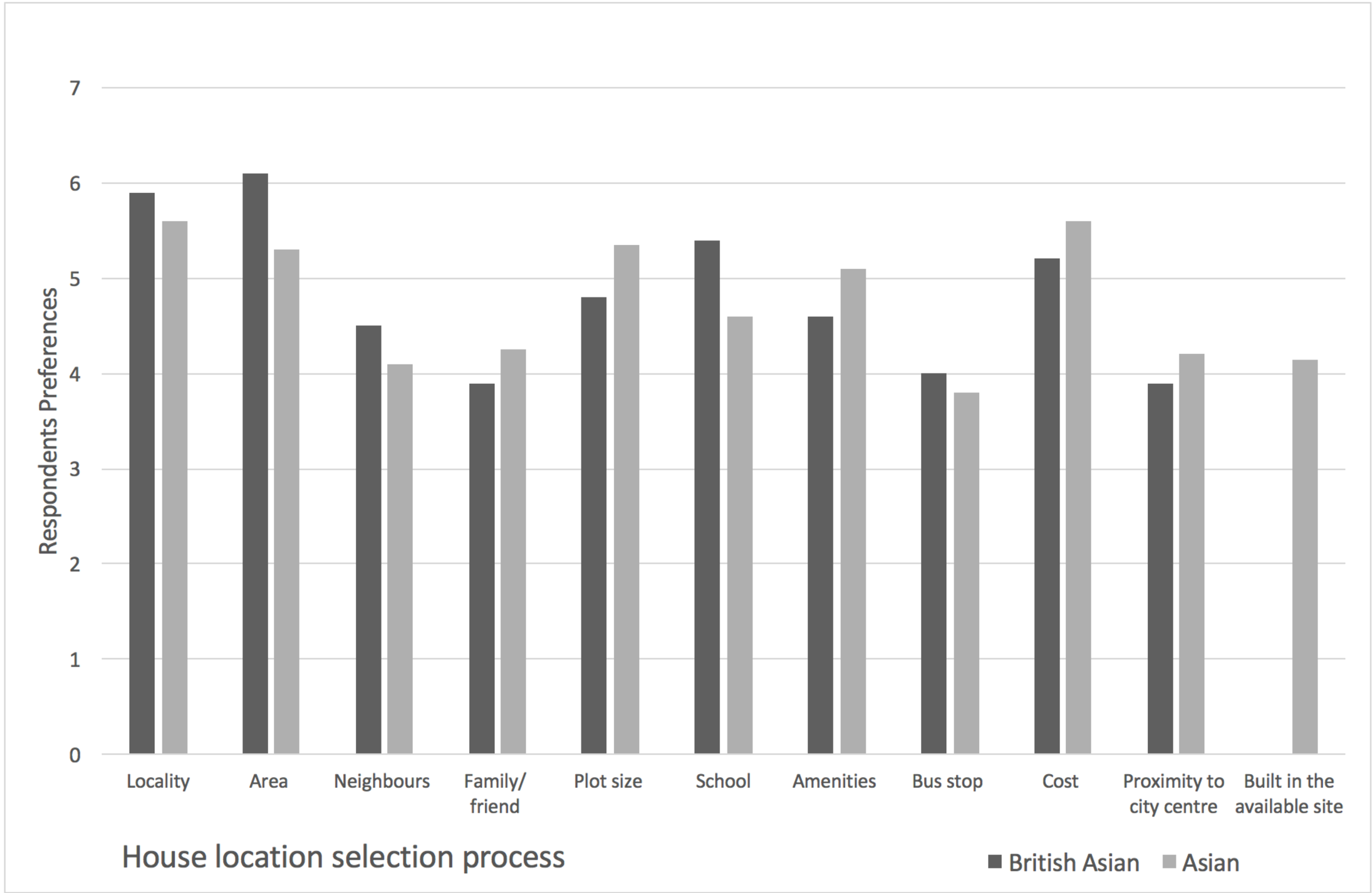
ANALYSIS

FIELD WORK _ ANALYSIS



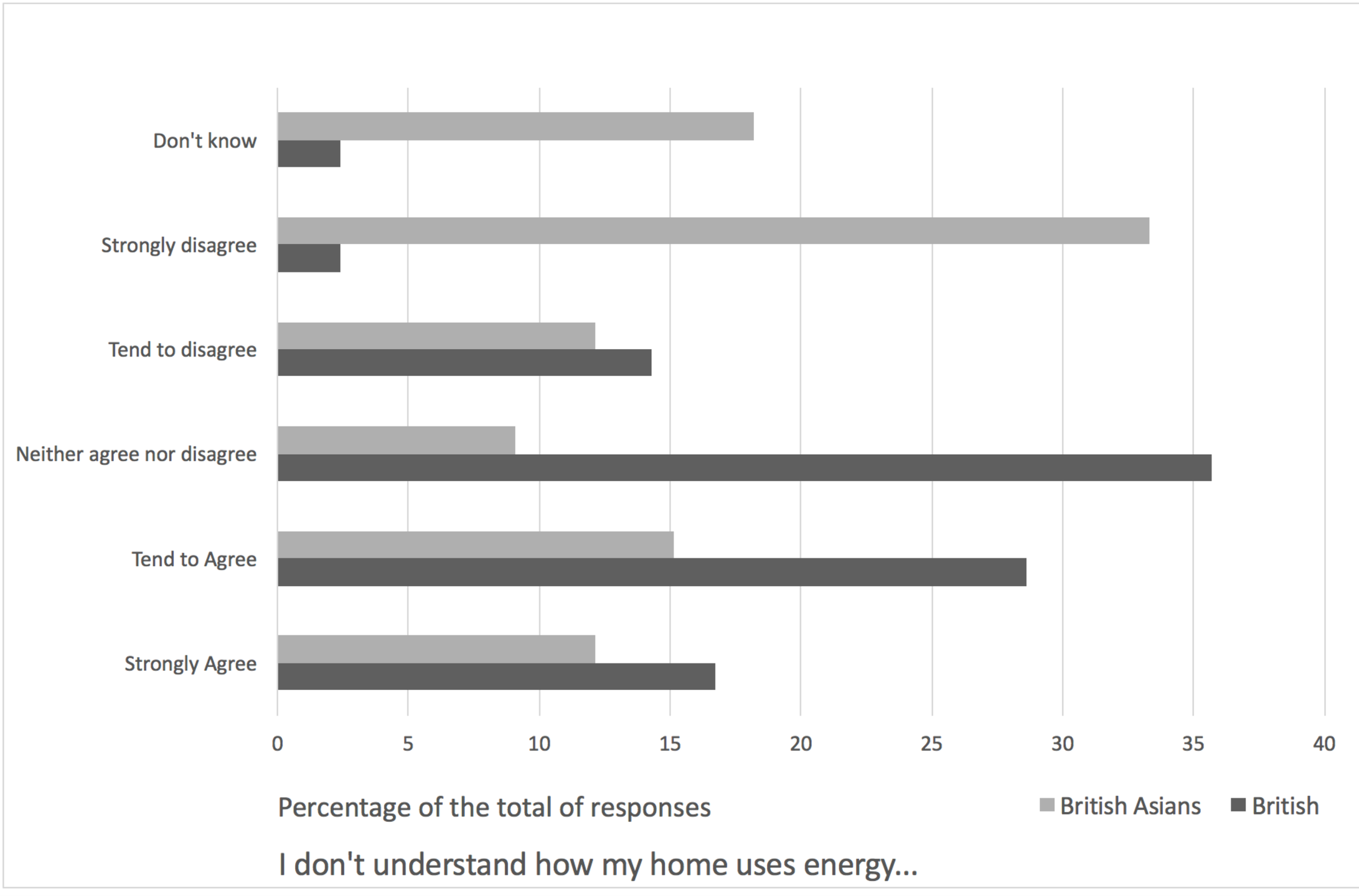
ANALYSIS

FIELD WORK _ ANALYSIS



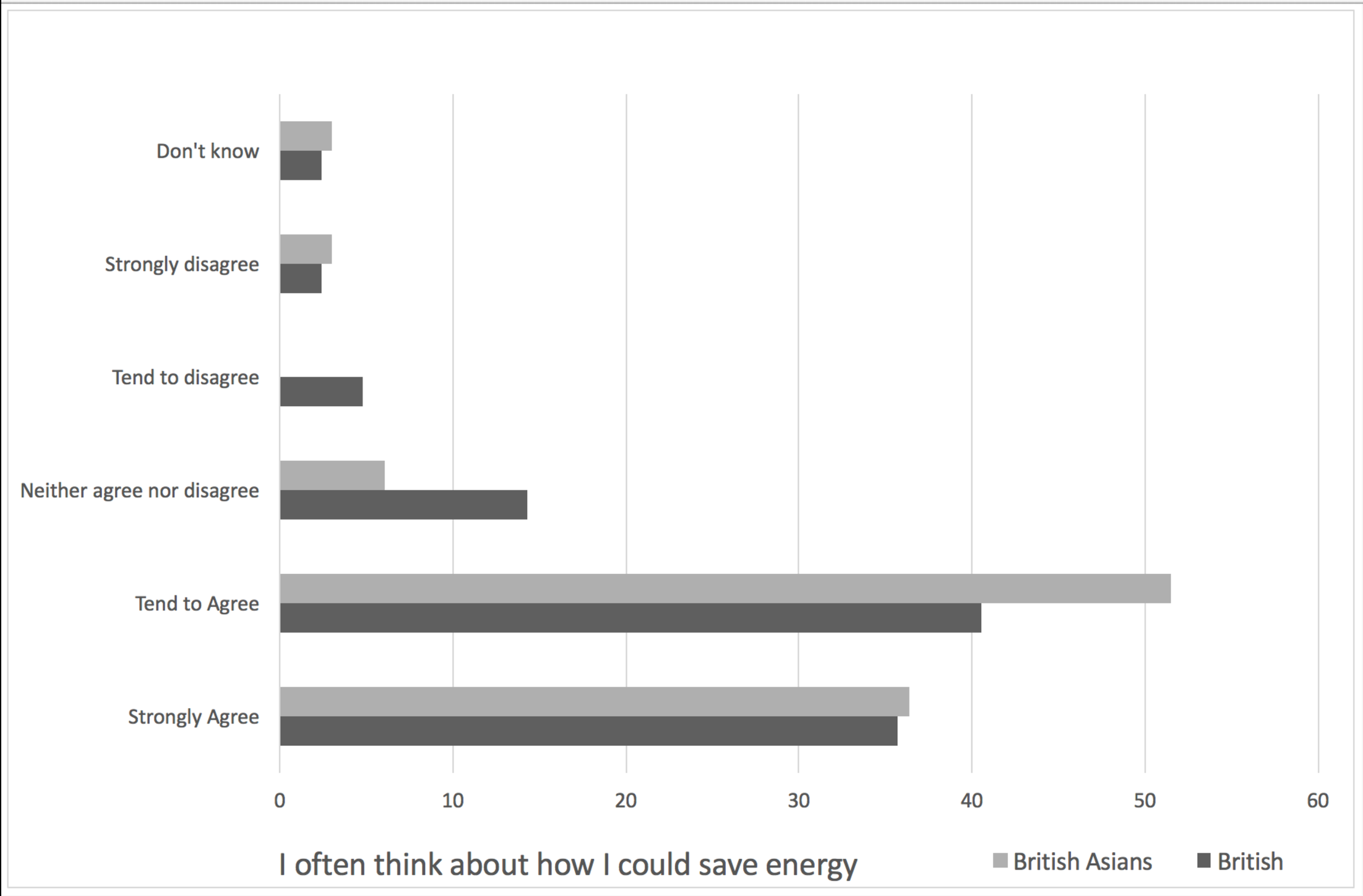
ANALYSIS

FIELD WORK _ ANALYSIS



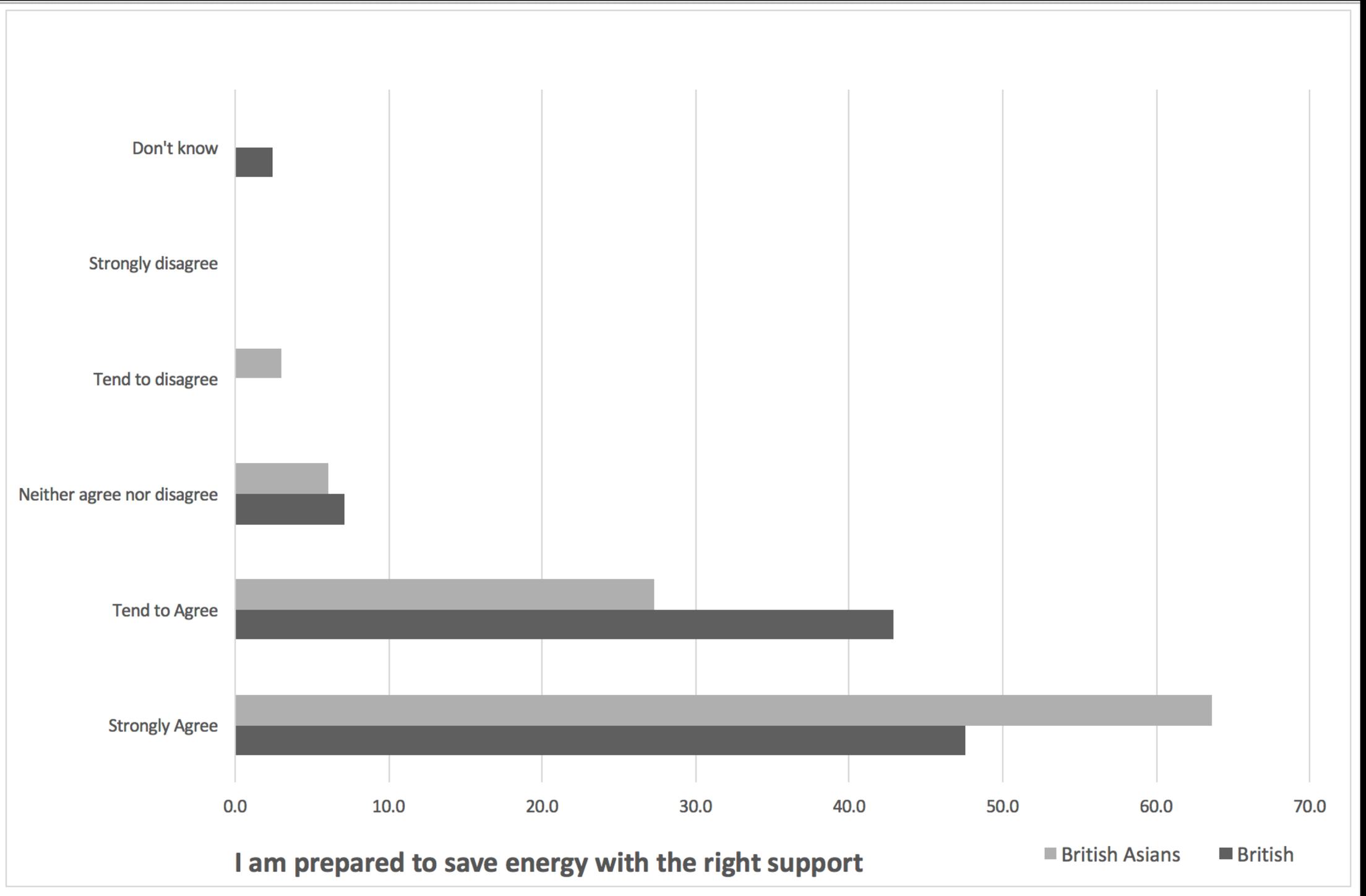
ANALYSIS

FIELD WORK _ ANALYSIS



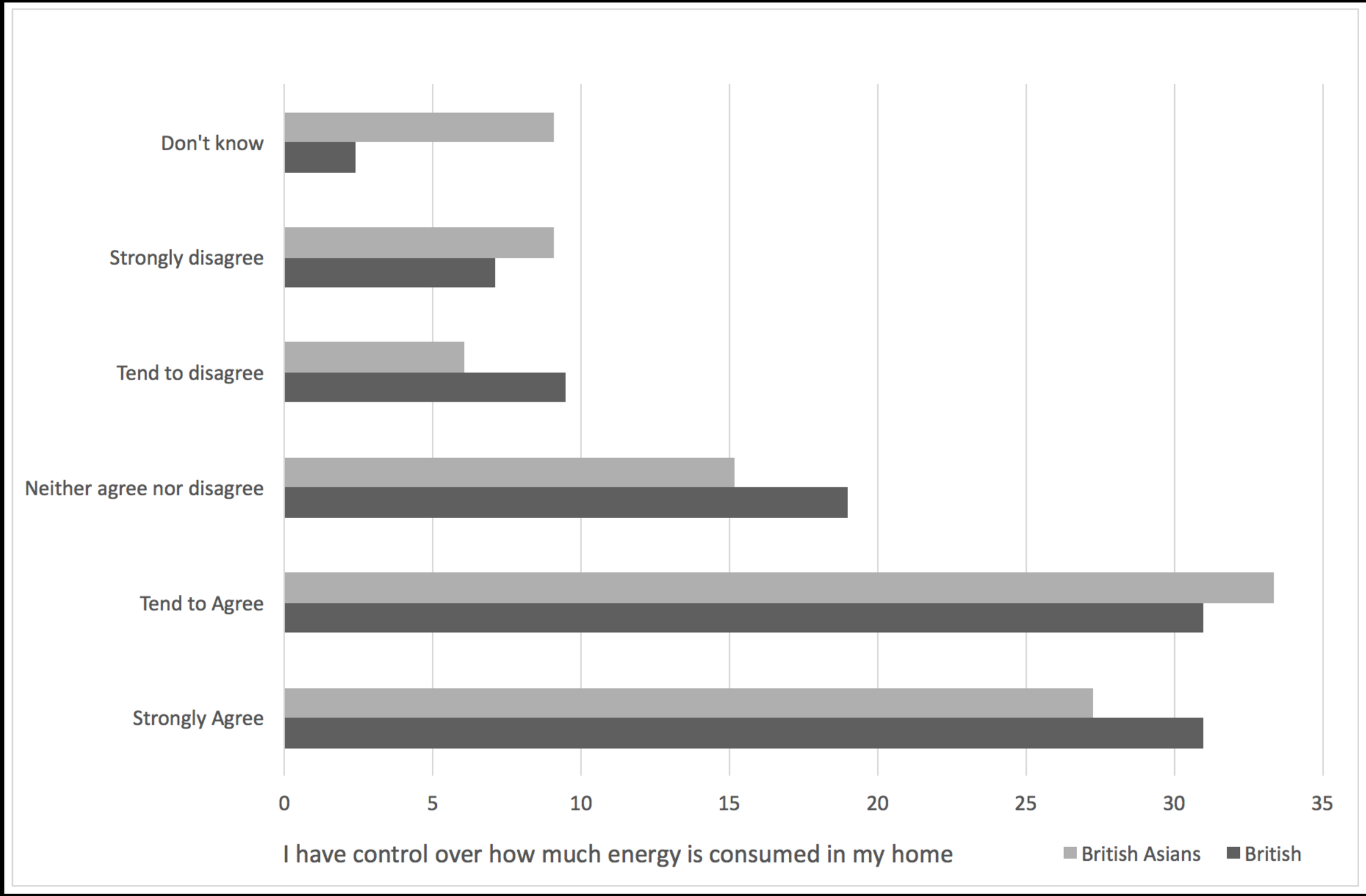
ANALYSIS

FIELD WORK _ ANALYSIS



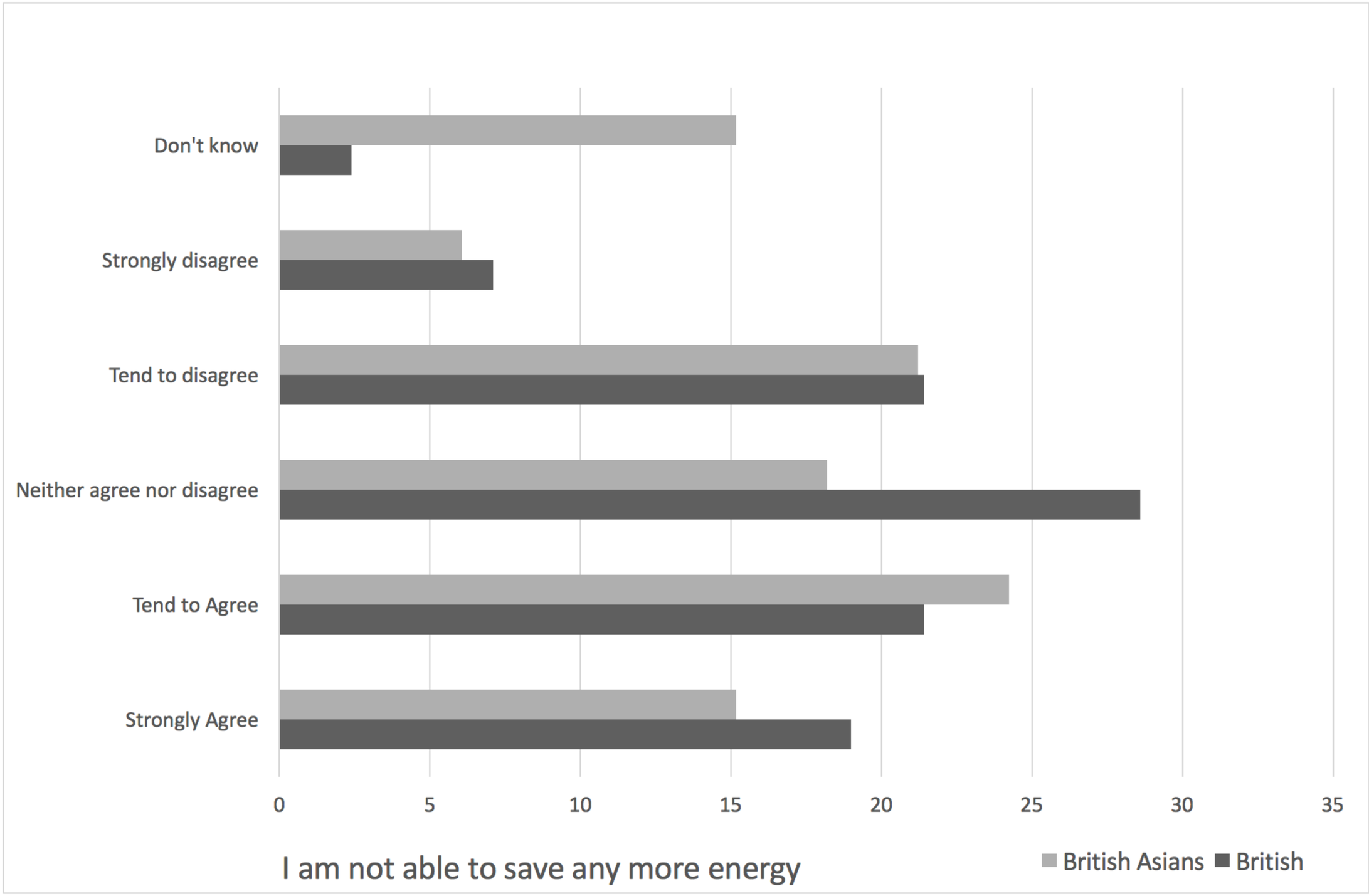
ANALYSIS

FIELD WORK _ ANALYSIS



ANALYSIS

FIELD WORK _ ANALYSIS



WORKING SUMMARY

PILOT SURVEY:

1. **Social perception and economic aspirations limit the acceptability of sustainable design and construction strategies.**
2. **Difference in behaviour pattern in regulated and unregulated economy**
3. **Some consistence in the preferences for cultural values –**

(eg. Vastu)

Mysore during the night

satish.bk@plymouth.ac.uk