Cross-Cultural Comparability of Response Patterns of Subjective Probability Questions

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Take Home Message

Uncertain measurement comparability

- Subjective probability questions:

e.g. "What is the percent chance you will live to be [TARGET AGE]?"

- Responses are sensitive to "culture"
  – Nationality, Race, Ethnicity, Language
  – Why?
  – Sense of control as a mechanism

Outline

- Take Home Message
- Subjective Probability Questions
  - Historical background
  - Cognitive difficulties
  - Association with cultural backgrounds
- Data and Methods
- Results
- Implications
- Discussion

Subjective Probability Questions – 1

- Solicit respondents to estimate probabilities of future events on a numeric scale of 0-100

"What is the percent chance [FUTURE EVENT]?"

- Product purchase intention
- Financial outlook: Employment, Income, Investment, Inflation, Asset values, Inheritance
- Health outlook: Life expectancy, Care coverage
- Living condition: Moving, Crime, Victimization, Schooling, Retirement
- Voting intention

https://sites.google.com/a/umich.edu/subjective-expectation-questions/3MC_CH24/App1

Subjective Probability Questions – 2

- First proposed by Juster (1964, 1966)
  - Experiment on the Survey of Consumer Buying Expectations
  - 11-pt scale (0: "absolutely no chance" to
    10: "absolutely certain chance")
- Now popular among economists backed by empirical evidence coming from Survey of Consumers (SCA) and the Health and Retirement Study (HRS)
- Policy relevance

Subjective Probability Questions – 3

- Debate over probabilistic reasoning in psychology

Normative reasoning (coherent, well-calibrated)
    vs. every-day reasoning
        (heuristics → biased)

Numeric probabilities (neutral)
    vs. Verbal probabilities
        (intuitive)

- Survey methodology

→ What do respondents do?
– Partial information
– Not well calibrated
– Difficult

→ What does this mean for measurement?
– Response scale
– Response scale usage

Subjective Probability Questions – 4

- On subjective probability questions, respondents…
  - Experience (unusual) cognitive difficulties
  - Difficulty manifested through
    - I don't know (item nonresponse)
    - Heaping: Use of 10's and 25's
    - Expression of uncertainty
      - Item nonresponse
      - Response of 50

# Subjective Probability Questions – 5

- In a cross-cultural setting, varying cognitive difficulties
  - Considered attributes for the question topic
  - Calibration of attributes
  - Understanding of probability

  - Sense of control

Subjective Probability Questions – 6

- Sense of control
  - A personal belief: "I can behave in a way to control my life and future outcomes"
  - Related to various behaviors and outcomes
  - Socio-demographic correlates: Race, ethnicity, education
  - Cultural trait related to
    - Individualism (vs. Collectivism)
    - Future time orientation (vs. Past or Present orientation)
  - Affect subjective probability question difficulty

Subjective Probability Questions – 7

Nationality, Race,
Ethnicity, Language

Culture

Sense of
control

Question
difficulty
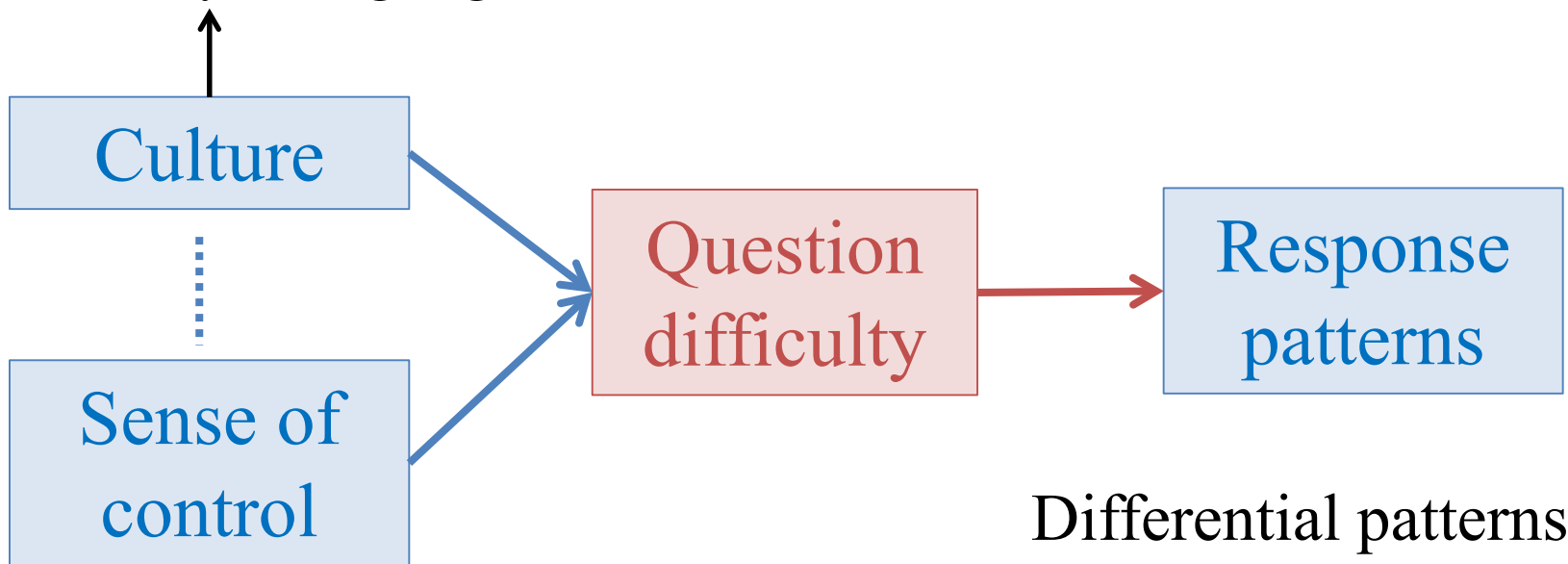
Response
patterns

Differential patterns

1. Item nonresponse

2. Response heaping

2. Uncertain response

Data and Methods – 1

- Health and Retirement Study (HRS) 2006
- English Longitudinal Study of Ageing (ELSA) Wave 1
- Survey of Health, Ageing, and Retirement in Europe (SHARE) Wave 1

    – Longitudinal survey of the elderly
    – Designed to be comparable
    – A designated section on expectation with subjective probability questions
    – HRS: Response 50 probed about certainty; A rich set of psycho-social measures related to sense of control

Data and Methods – 2

- Dependent variables:
  - Subjective life expectancy:

    "What is the percent chance that you will live to be [TARGET AGE]?"

  - Item nonresponse
  - Response heaping patterns
  - Uncertain response (Item nonresponse + Unsure 50)

Data and Methods – 3

- Independent Variables
  - Culture: nationality, race, ethnicity, interview language
  - Sense of control
    - Time orientation
    - Perceived constraints
    - Hopelessness
    - Religiosity
- Control Variables
  - Age, sex, education, marital status
  - Responsibility

Data and Methods – 4

Group level analysis

- Comparison of item nonresponse using HRS, SHARE and ELSA

- Relationship between item nonresponse and future time orientation from Ashkanasy et al. (2004) using HRS, SHARE and ELSA
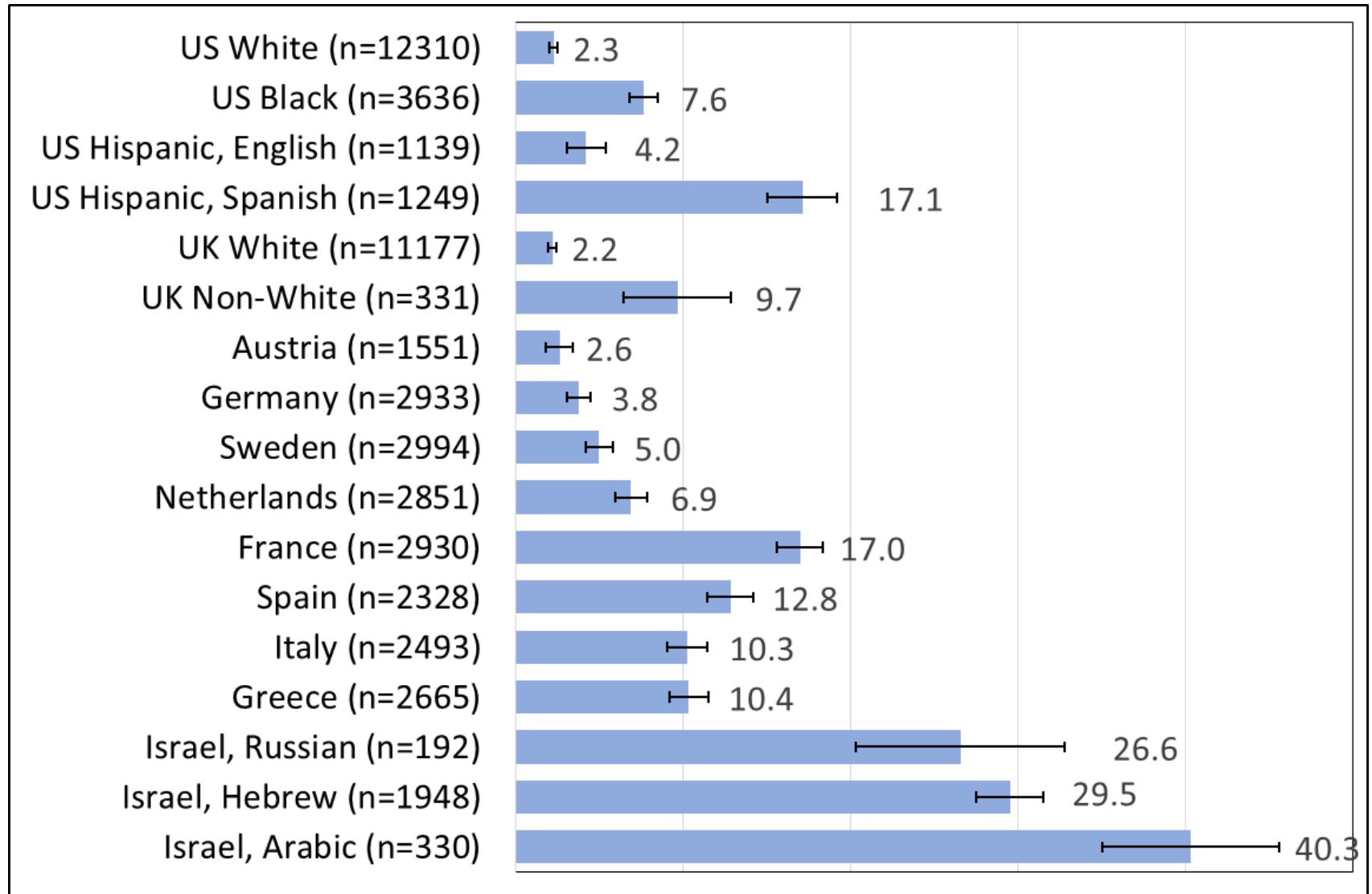
- Comparison of heaping patterns using HRS

Individual level analysis

- Structural equation model (SEM) with to accommodate measurement of psycho-social measures on sense of control using HRS
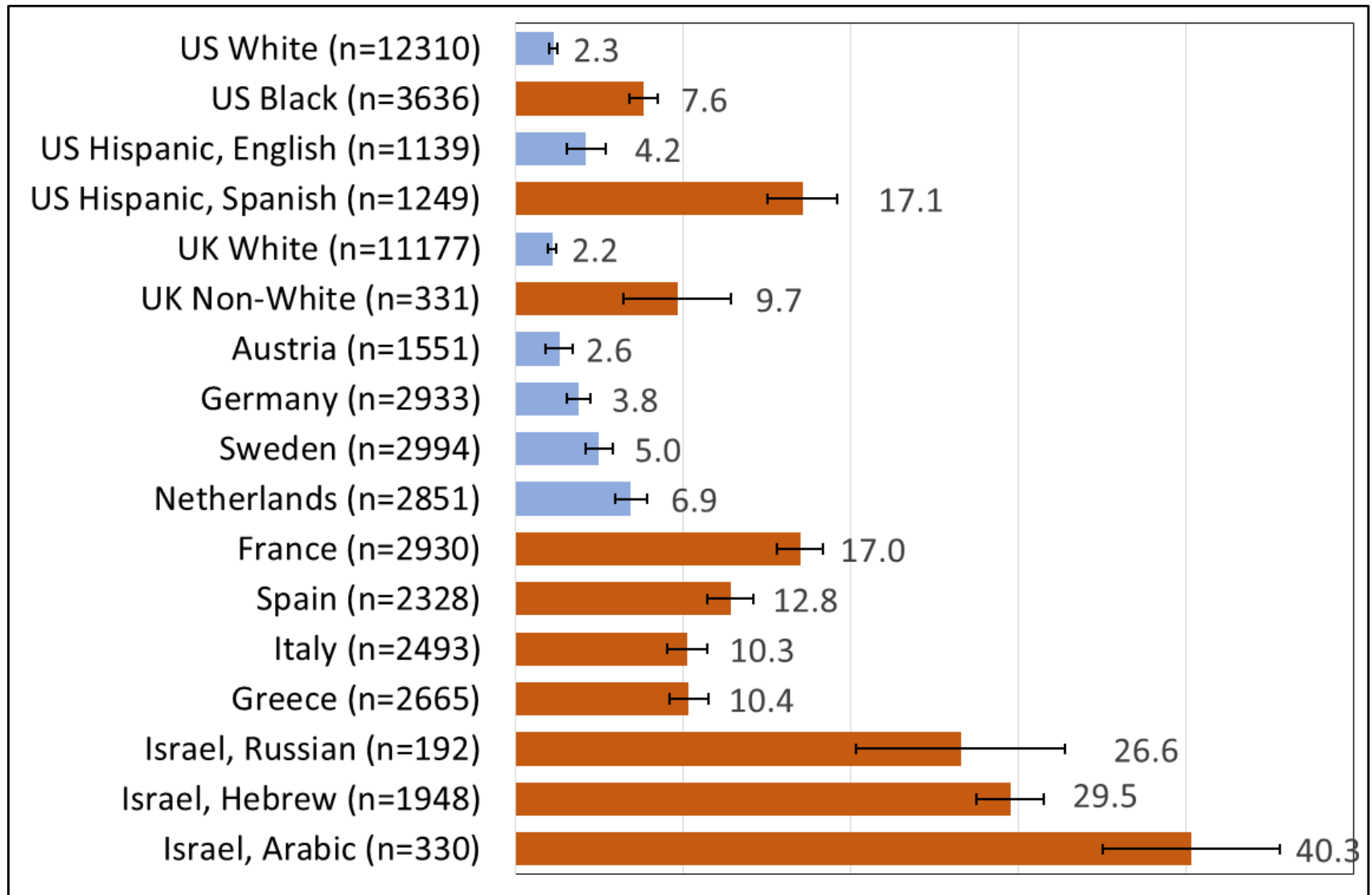
Data and Methods – 5. SEM

*For simplicity, correlation across traits and paths from demographics to personality are included in the model but not presented in the figure.
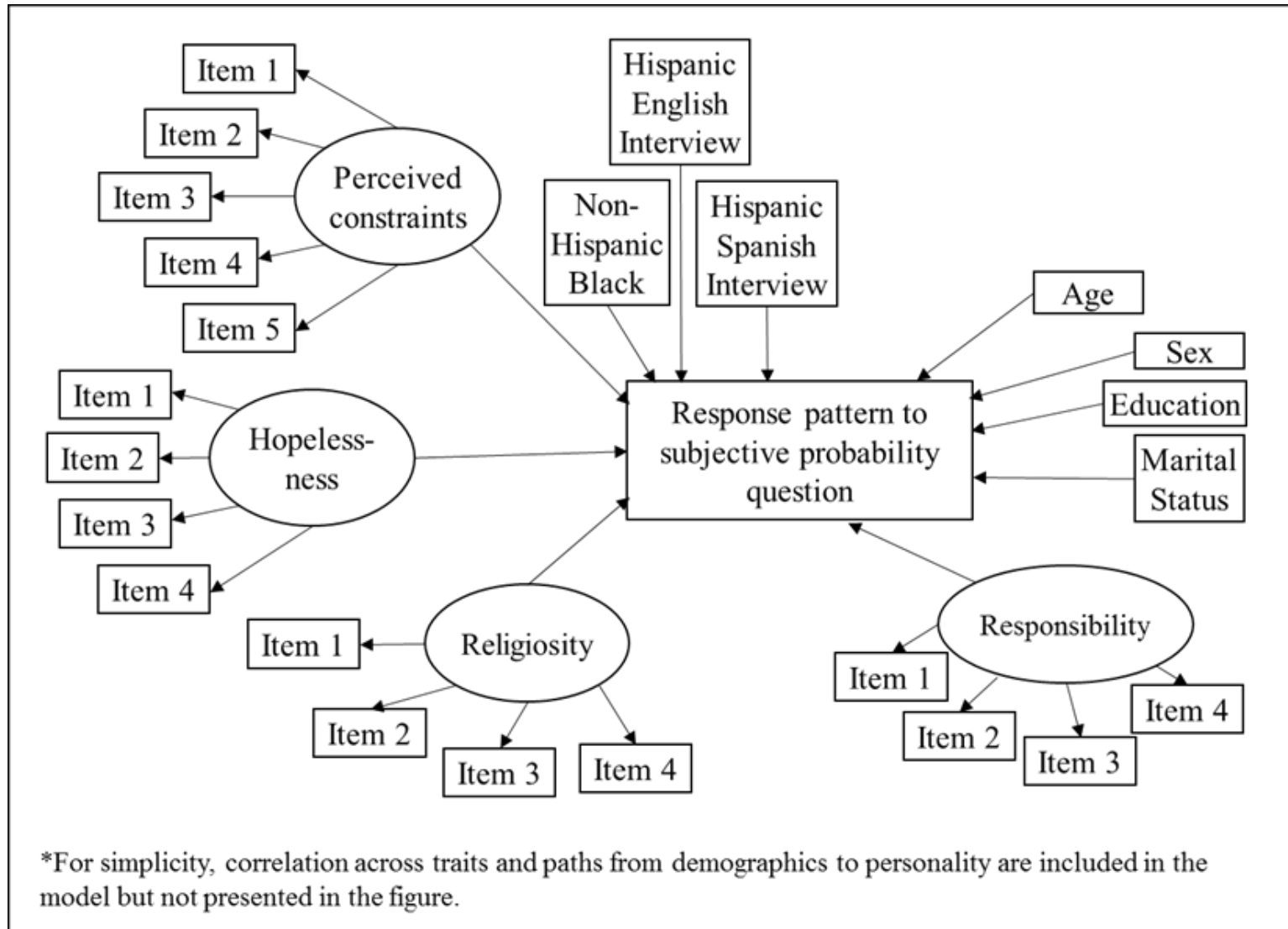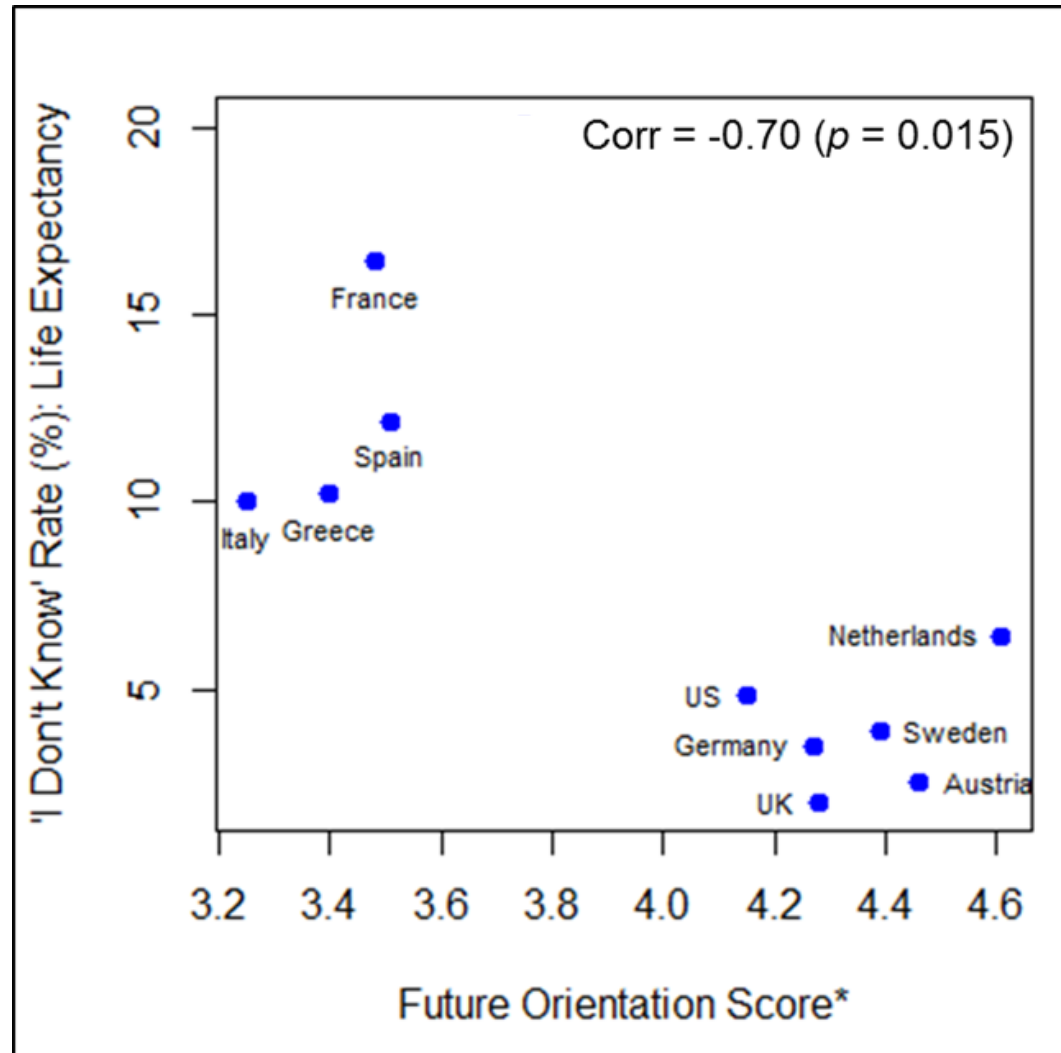
Results – 1. % Nonresponse

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Implications – 1

- High item nonresponse
- Higher among
  - Minorities in US and UK
  - Romance language speaking countries in Europe
  - Israeli respondents
- Very high among Arabic speakers in Israel

Results – 2. Future Time Orientation

* Country-level future orientation scores from Table 13.5 of Ashkanasy, Gupta, Mayfield and Trevor-Roberts (2004); the higher the score, the more future oriented the society practices.
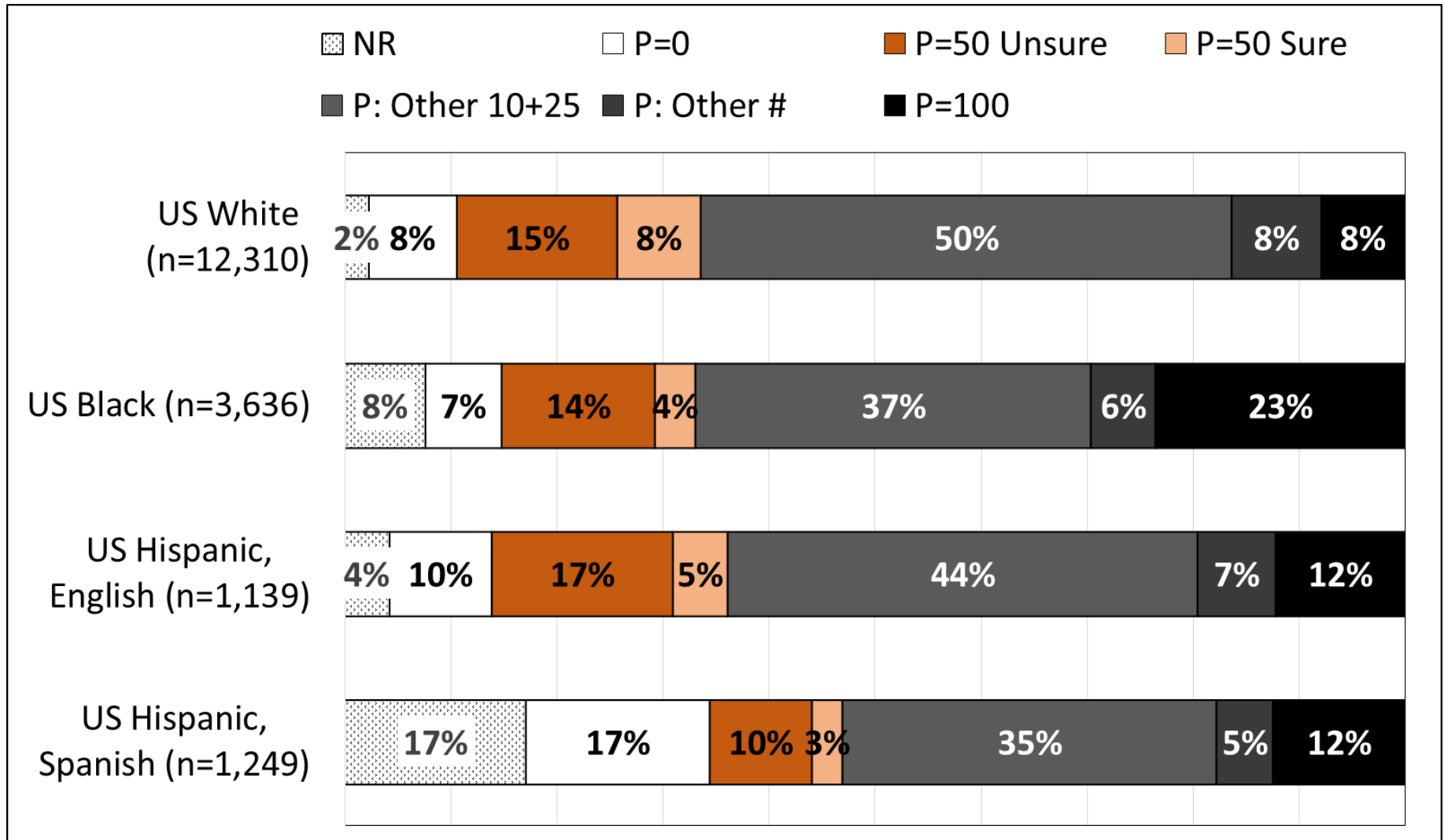
Implications – 2

- Significant relationship between item nonresponse and time orientation
  - Lower nonresponse rates with higher future time orientation score
  - Future time orientation related to higher sense of control
  - → Higher sense of control; lower item nonresponse

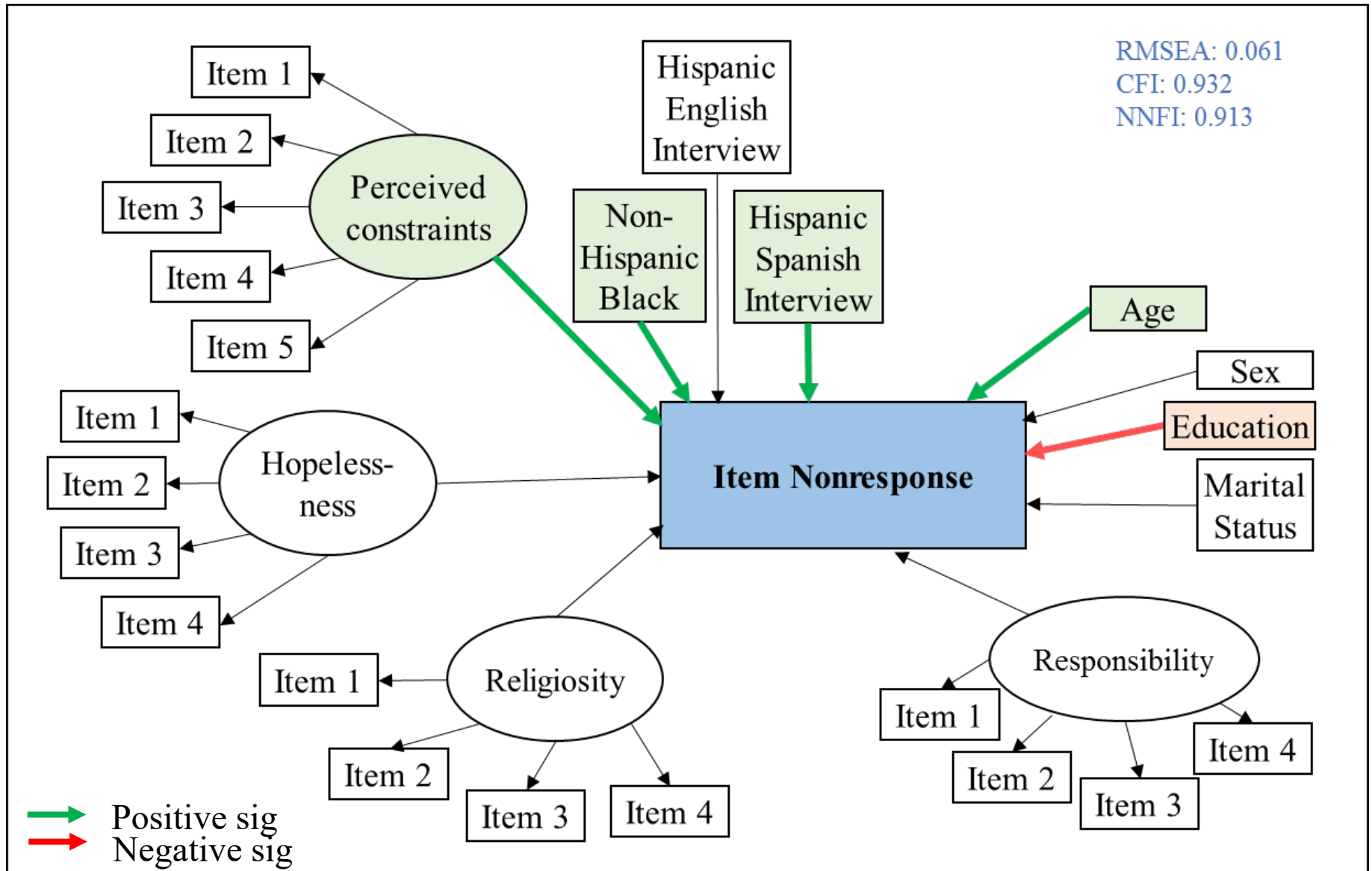# Results – 3. Heaping Patterns, US
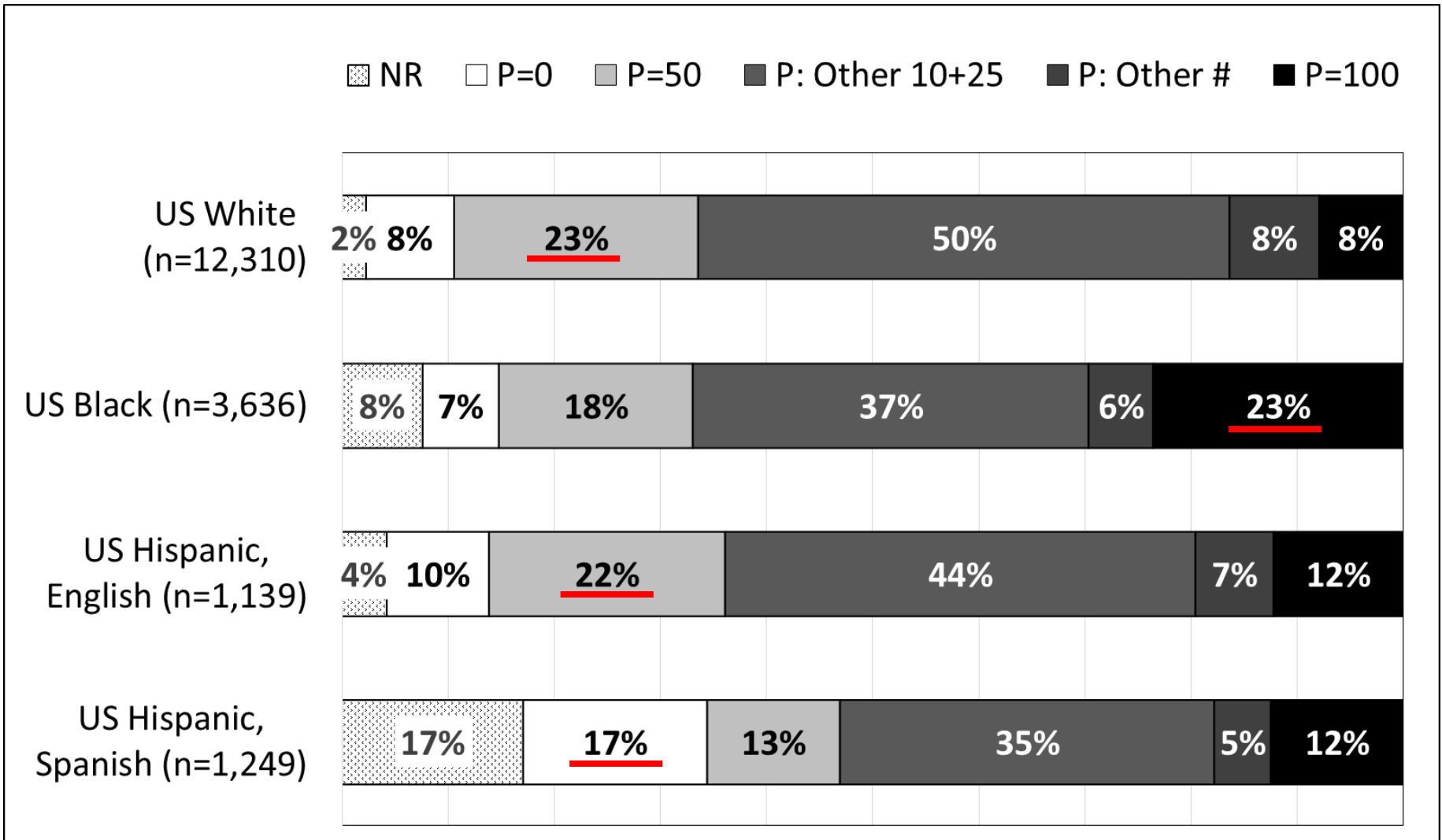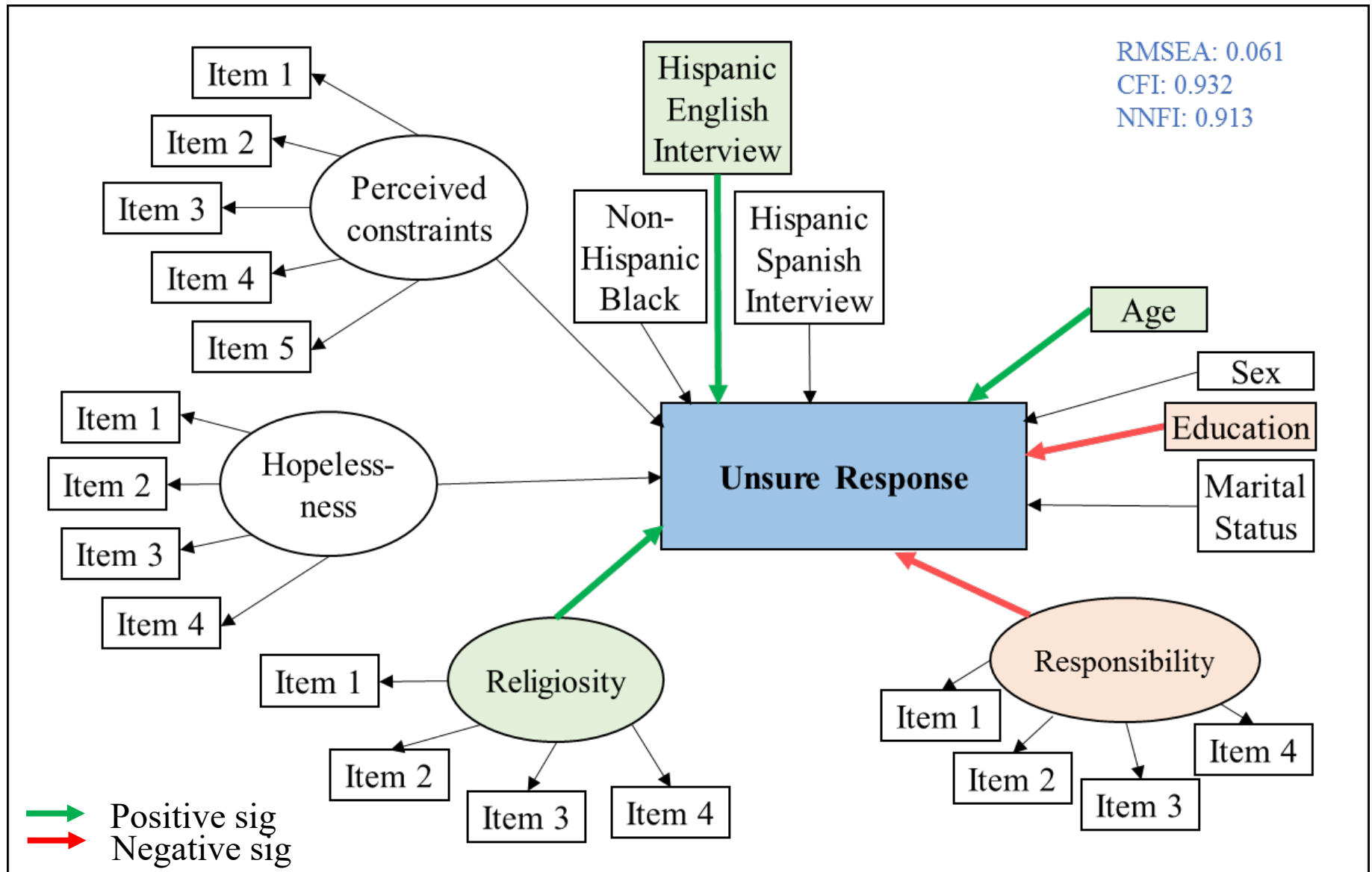
Results – 3. Response 50, US

Implications – 3

- Response heaping
  - Non-heaping response: <10%
  - 50 by Whites and English-speaking Hispanics
  - 0 by Spanish-speaking Hispanics
  - 100 by Blacks

- Response 50 due to uncertainty

Results – 4. SEM of NR, US

RMSEA: 0.061
CFI: 0.932
NNFI: 0.913

Positive sig
Negative sig

Results – 4. SEM of Unsure R, US

Implications – 4

- Role of sense of control
  - Higher nonresponse ← Higher perceived constraints
  - Higher unsure response ← Higher religiosity
- Role of race/ethnicity/language
  - Higher nonresponse ← Spanish-speaking Hispanics and Blacks (vs. Whites)
  - Higher unsure response ← English-speaking Hispanics (vs. Whites)

  - Non-comparable expression of uncertainty?

Discussion – 1

1. Subjective probability questions are difficult: Item NR; Heaping

Culture

Sense of control

Question difficulty

Response patterns
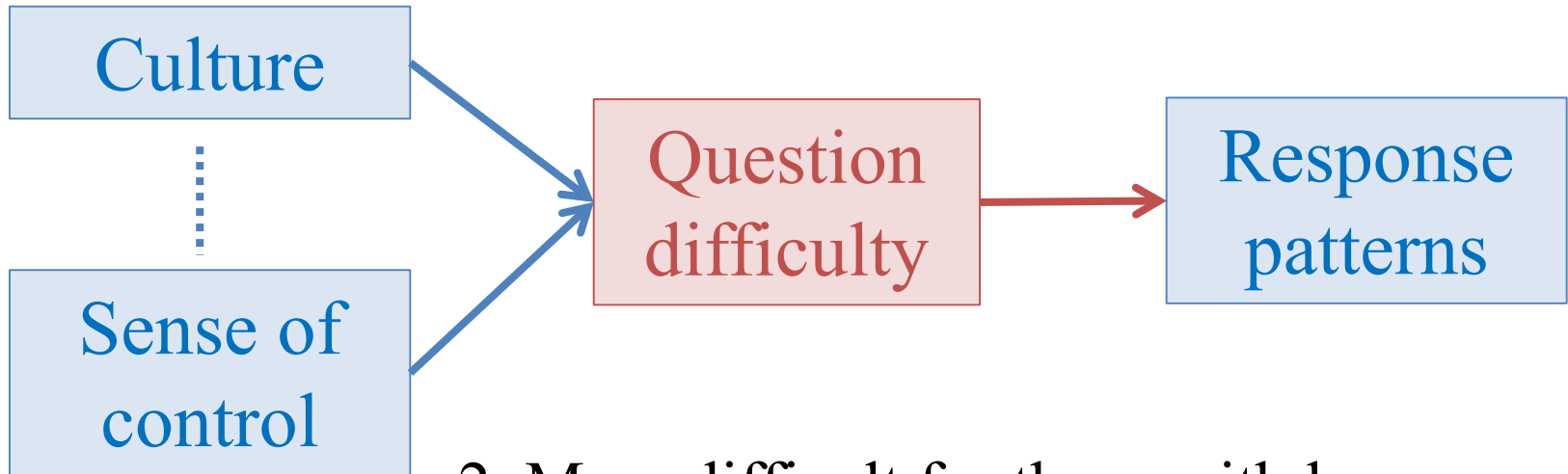
2. More difficult for those with lower sense of control at the individual level and the cultural group level

3. Different expression of uncertainty

Discussion – 2

- Systematic item nonresponse
  - Higher mortality among subjective life expectancy item nonresponders (Lee and Smith, 2016)
- Culturally sensitive item nonresponse pattern applicable for other subjective probability questions

Thanks!

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