Using Anchoring Vignette to Correct for Differential Response Scale Usage across Cultures

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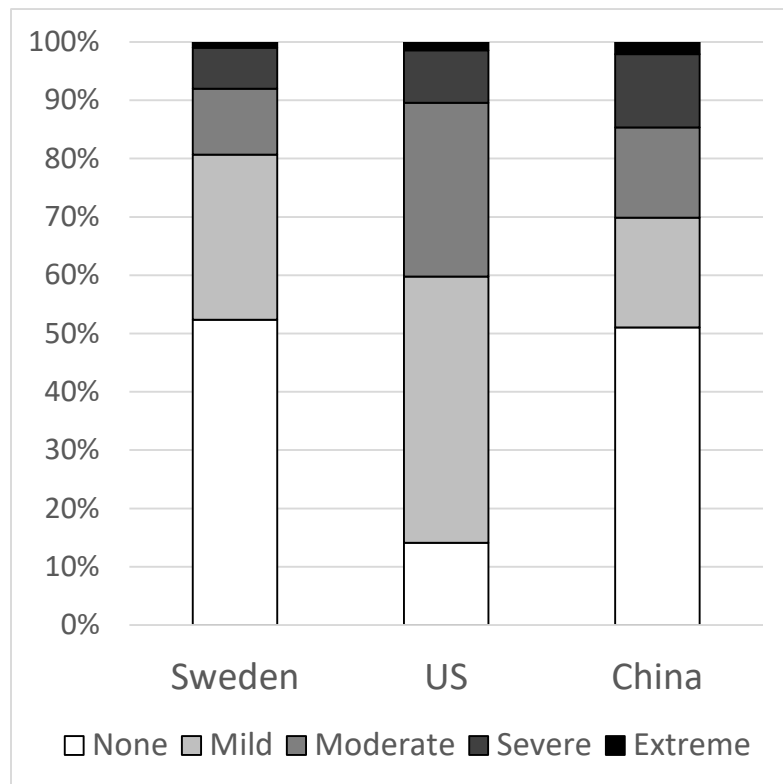
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Cross-National Comparison of Pain

Q: Overall, in the last 30 days, how much pain or bodily aches did you have?
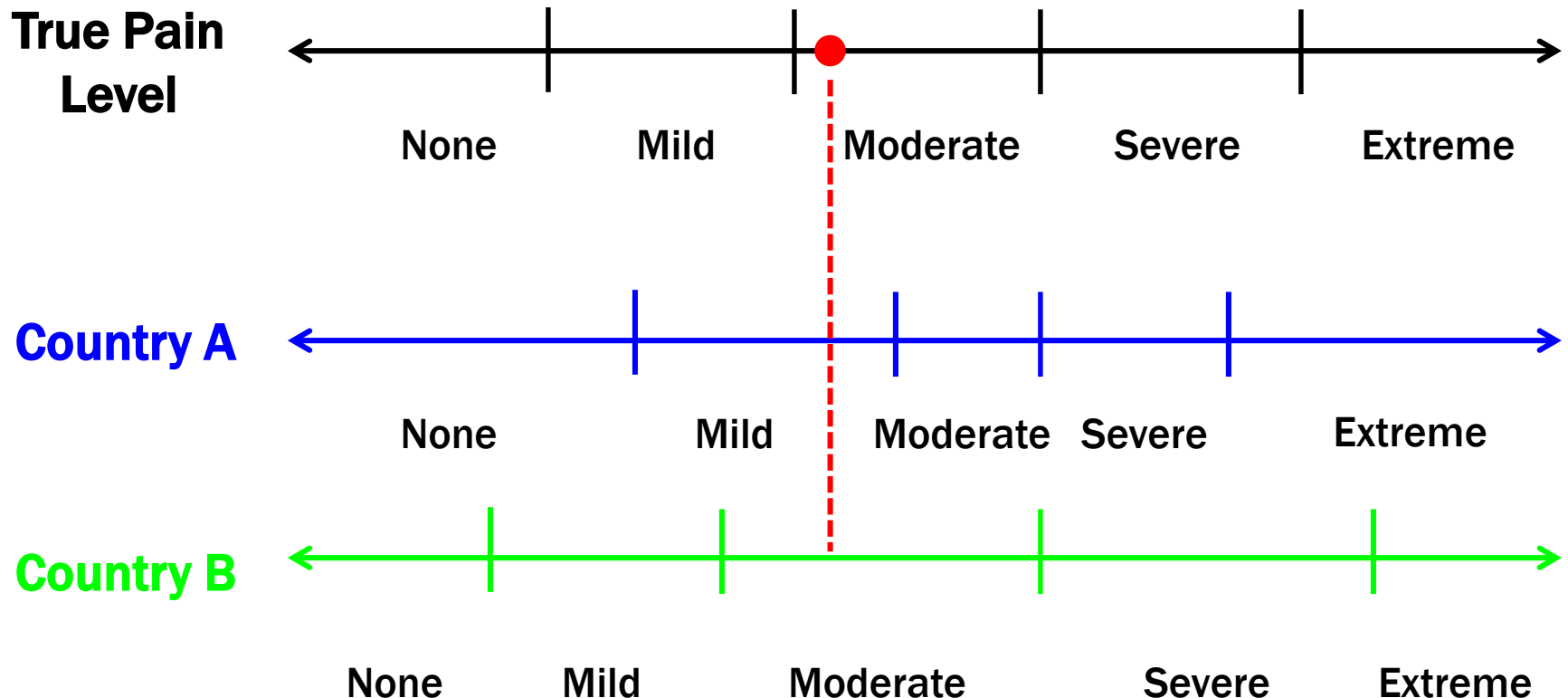
1. Simple comparison

2. Adjustment for age, gender, and education differences through multivariate models (e.g., ordered probit)

	Coeff.
Sweden vs. China	-0.11
US vs. China	0.71***

Is the comparison valid?

Ordinal Response Scale Use

Q: Overall, in the last 30 days, how much pain or bodily aches did you have?

True Pain Level

None   Mild   Moderate   Severe   Extreme

Country A

None   Mild   Moderate   Severe   Extreme

Country B

None   Mild   Moderate   Severe   Extreme

Anchoring Vignettes – 1

- Adjustment method for reporting heterogeneity

- Data requirement
  - Self-report item (e.g., Pain level)
  - Vignette items (typically more than one)
    - Hypothetical scenarios describing different pain levels
    - Identical items given to the comparison groups
    - Help reveal where respondents' response anchoring points lie on the continuum of the true state, which, therefore, enables correction for differential response scale usage.

Anchoring Vignette Example

- Self-report: Overall, in the last 30 days, how much pain or bodily aches did you have?

- Vignette 1: Paul has a headache once a month that is relieved after taking a pill. During the headache he can carry on with his day-to-day affairs. Overall, in the last 30 days, how much pain or bodily aches did Paul have?

- Vignette 2: Henry has pain that radiates down his right arm and wrist during his day at work. This is slightly relieved in the evenings when he is no longer working on his computer. Overall, in the last 30 days, how much pain or bodily aches did Henry have?

- Vignette 3: Charles has pain in his knees, elbows, wrists and fingers, and the pain is present almost all the time. Although medication helps, he feels uncomfortable when moving around, holding and lifting things. Overall, in the last 30 days, how much pain or bodily aches did Charles have?

Anchoring Vignette Example

- Vignette 1: Paul has a headache once a month that is relieved after taking a pill. During the headache he can carry on with his day-to-day affairs. Overall, in the last 30 days, how much of a problem did Paul have with bodily aches or pains?

- Vignette 2: Henry has pain that radiates down his right arm and wrist during his day at work. This is slightly relieved in the evenings when he is no longer working on his computer. Overall, in the last 30 days, how much of bodily aches or pains did Henry have?

- Vignette 3: Charles has pain in his knees, elbows, wrists and fingers, and the pain is present almost all the time. Although medication helps, he feels uncomfortable when moving around, holding and lifting things. Overall, in the last 30 days, how much of bodily aches or pains did Charles have?

Anchoring Vignettes – 1

- Adjustment method for reporting heterogeneity
- Data requirement
  - Self-report item (e.g., Pain level)
  - Vignette items (typically more than one)
    - Hypothetical scenarios describing different pain levels
    - Identical items given to the comparison groups
    - Serve as response "anchoring" points
- Assumptions
  - Vignette equivalence
  - Reporting consistency

Anchoring Vignettes – 2

- Nonparametric analysis
- Model-based parametric analysis
  - Hierarchical Ordered Probit (HOPIT)

Empirical Demonstration
of
Anchoring Vignette Method

Research Questions

- Whether people from different cultural background use same response scales differently

- How anchoring vignette can be used to correct for response scale usage differences among cultures

Data

- Using anchoring vignette data from
  - Health and Retirement Study (HRS)
  - Survey of Health, Ageing, and Retirement in Europe (SHARE)
  - China Health and Retirement Study (CHARLS)
- Countries:
  - Sweden, US, and China
- Domains:
  - Pain
- Methods:
  - Simple comparisons
  - Multivariate comparisons without and with anchoring vignettes (Ordered probit vs. HOPIT)

Analysis Results

Pain Comparison

- **Simple comparison:
  No adjustment**

- **Multivariate comparisons:
  Age, gender, educ adjustment**
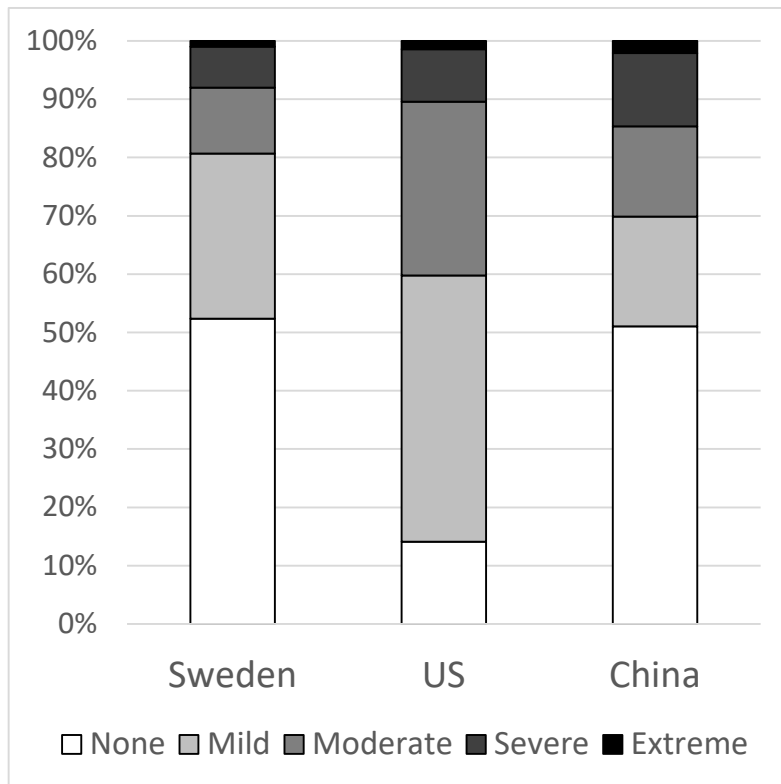
	O Probit (wo vigs) Coeff.	HOPIT (w vigs) Coeff.
Sweden vs. China	-0.11	-1.78***
US vs. China	0.71***	0.21***

Number of Vignette Items and Intensity in Vignette Items

Research Objectives

- To evaluate whether the method is sensitive to the number of vignettes
  - ➢It is of general interest to cross-cultural survey researchers to know whether similar results can be achieved when using a smaller number of vignettes

- To evaluate whether the method is sensitive to the imposed intensity levels in vignettes
  - ➢Important to researchers who use this method to know that whether the use of different vignette items can properly control for reporting heterogeneity across cultures

Methods

Design of the Sensitivity Analysis using SHARE and HRS data

	Vignette Items Included in the Model
No Vignette Used	
Model 0	No Vignettes Used
One Vignette	
Model 1	Low Intensity Vignette (L)
Model 2	Medium Intensity Vignette (M)
Model 3	High Intensity Vignette (H)
Two Vignettes Per Trait	
Model 4	Low Intensity Vignette + Medium Intensity Vignette
Model 5	Low Intensity Vignette + High Intensity Vignette
Model 6	Medium Intensity Vignette + High Intensity Vignette
Three Vignettes Per Trait	
Model 7	Low Intensity Vignette + Medium Intensity Vignette + High Intensity Vignette

Results

HOPIT model result and the Self-assessment component of the HOPIT models predicting true health: comparison results between models with different number and choices of vignettes

Model	0 (Probit)	One Vignette			Two Vignettes			Three Vignettes
		1 (L)	2 (M)	3 (H)	4 (L+M)	5 (L+H)	6 (M+H)	7 (L+M+H)
Age	0.000	-0.004*	0.006*	0.003	-0.000	-0.000	0.005*	0.000
Male	-0.10*	-0.22*	-0.05	-0.03	-0.14*	-0.15*	-0.04	-0.12*
Education								
High School	-0.20*	0.01	-0.33*	-0.38*	-0.14*	-0.11*	-0.36*	-0.18*
College and Above	-0.45*	-0.13*	-0.78*	-0.79*	-0.38*	-0.31*	-0.81*	-0.43*
Sweden vs. U.S.	-0.94*	-1.67*	-1.15*	-1.34*	-1.53*	-1.66*	-1.25*	-1.55*

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Conclusions

- Important to control reporting heterogeneity.

- Using anchoring vignettes helps to control for differences in the use of response scales across different population groups.

- The method is sensitive to the intensity in vignette items.

- If carefully designed and selected, fewer numbers of vignette items can achieve similar controlling effects as using more vignette item.

Unexplored Dimensions

- Cognitive difficulty of these vignette questions
- The design of vignettes
  - Difficult to make the vignette descriptions as comprehensive as respondents' knowledge about their own condition (Kapteyn et al., 2010)
- Questionnaire translation in cross-cultural surveys
- Violation of assumptions
  - Simulation studies can be done to evaluate the validity of this method under different assumption violation conditions
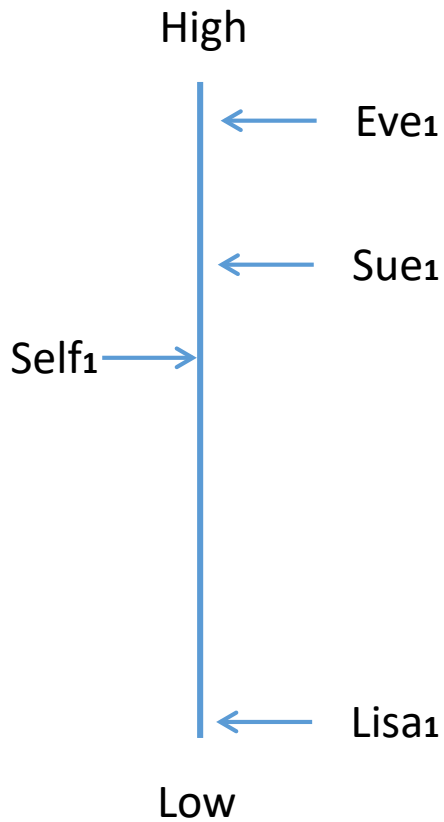- Other parametric analysis

Thank you!

maggiehu@umich.edu
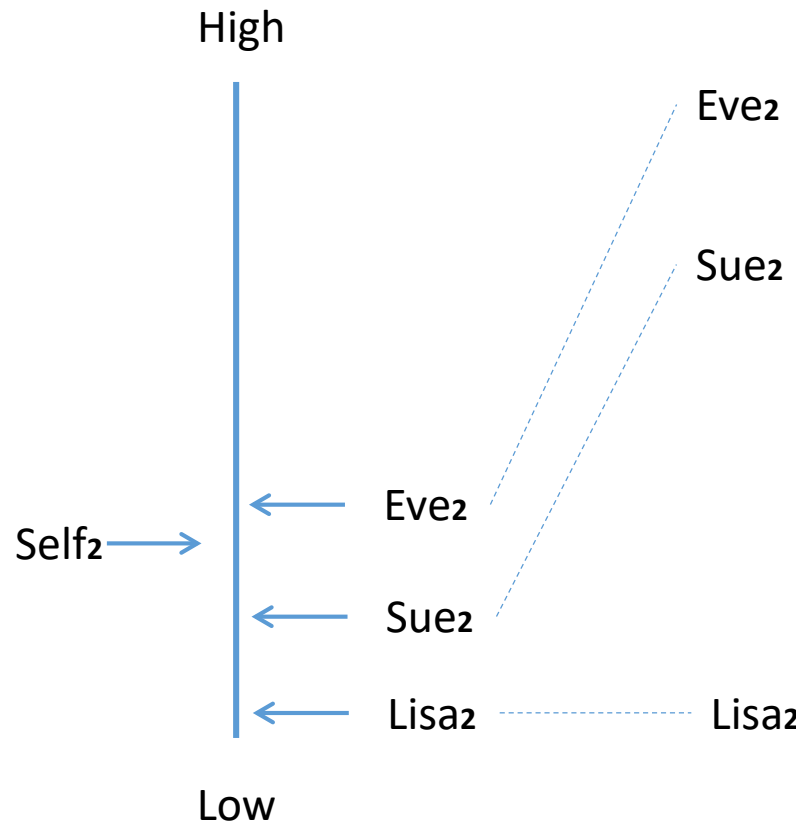
Practical Issues

- Cognitive difficulty of these vignette questions
- The design of vignettes
- Questionnaire translation in cross-cultural surveys

Using Vignette Variables

Unadjusted R1	Unadjusted R2	Adjusted R2

Unadjusted R1

High

← Eve$_1$

← Sue$_1$

Self$_1$ →

← Lisa$_1$

Low

Unadjusted R2

High

Self$_2$ →

← Eve$_2$

← Sue$_2$

← Lisa$_2$

Low

Adjusted R2

High

Eve$_2$ →

← Self$_2$

Sue$_2$ →

Lisa$_2$ →

Low