Notes on "Addressing Non-sincere Responses in Rank-Order Survey Questions" (Atsusaka & Kim, 2023) AU WiP

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Big Picture

Connections

Anchor Questions

Suggestions

Big Picture

Framing the Paper, Big Questions

Atsusaka and Kim (2023)

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(Some of this for §1, some for §9, some for body)

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- Clarify "what patterns?"
- Other question types (battery of Likerts, Approve/Disapproves, . . .)

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Connections

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$$\pi_{i,s} \perp\!\!\!\perp z_i \quad \text{such that} \quad \mathbb{P}(\pi_{i,s}|z_i = 1) = \mathbb{P}(\pi_{i,s}) \tag{6}$$

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- assume the typical, realistic MAR or NI, and need more
  (multiple imputation)

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- (What is and is not *pre-processing*?)

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- Why don't conjoints randomize attribute order?
  - Cognitive load

Connection 4: Doubly-Robust Models

$$\pi_i \equiv \pi_{i,s} z_i + \pi_{i,n}(1 - z_i) \tag{2}$$

$$\mathbb{P}(\pi_{i,s}|z_i = 1) = \frac{\mathbb{P}(\pi_i) - (1 - Pr(z_i = 1))\mathbb{P}(\pi_{i,n}|z_i = 0)}{Pr(z_i = 1)} \tag{4}$$

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Beyond non-parametrics:

Model for response/ranking + Model for sincerity

- Glynn and Quinn (2010)
- Tyler, Grimmer, and Westwood (2022)

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- King et al. (2004)
- Hopkins and King (2010)

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- How does this differ from an objective "attention check" like "president is state-level office-holder"?

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  - (Must I double survey length?)

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(Under assumptions, nice correction for "some get it right by chance" using item-order-randomization. But assumptions preclude anyone getting it wrong for any other reason.)

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  - **yes**, if worse than that. E.g., everyone is wrong:

$$\left(\frac{0}{120} - \frac{1}{6} \right) \left(1 - \frac{1}{6} \right)^{-1} = -0.2$$

Suggestions

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- §5
  - Validate that nominal bootstrap coverage is correct
  - Bootstrap vs. inverting the RI-permutation test?
- §8
  - What do I want to see? Not just with/without correction, but also examination of quality of correction (test multiple anchors, other assumptions)

Small Suggestions

- §1
  - "Indeed, our survey data show that non-sincere responses are prevalent in rank-order questions regardless of their contexts" (p. 1)
  - If this refers to contextless response practice, it does not follow. "regardless" $\neq$ "in absence of".
- §4.3 ☺
  - Add "No difference between sincere/insincere distributions"
- §5
  - Can you test anchor questions to estimate how easy they are? (E.g., in a big class, with incentives for correctness to set an upper bound)
  - "and re-designing": what do you have in mind?

Small Suggestions

- §6
  - Show us table of three χ^2 tests
- §7
  - If replicate this, add "Option 1" to reflect real task
  - "we may expect respondents to uniformly choose a ranking pattern available in the $J!$ permutation space". Well, clearly not. Phrase as null hypothesis.
  - Add respondent count
    (E.g., if $n = 100$, $J = 3$, then $p = 0.32$!)

References I

Atsusaka, Yuki, and Seo-young Silvia Kim. 2023. "Addressing Non-Sincere Responses in Rank-Order Survey Questions." *Working Paper*.

Glynn, Adam N., and Kevin M. Quinn. 2010. "An Introduction to the Augmented Inverse Propensity Weighted Estimator." *Political Analysis* 18 (1): 36–56.

Hopkins, Daniel J., and Gary King. 2010. "Improving Anchoring Vignettes: Designing Surveys to Correct Interpersonal Incomparability." *Public Opinion Quarterly* 74 (2): 201–22. https://doi.org/10.1093/poq/nfq011.

King, Gary, Christopher J. L. Murray, Joshua A. Salomon, and Ajay Tandon. 2004. "Enhancing the Validity and Cross-Cultural Comparability of Measurement in Survey Research." *American Political Science Review* 98 (1): 191–207.

Tyler, Matthew, Justin Grimmer, and Sean J. Westwood. 2022. "A Statistical Framework to Engage the Problem of Disengaged Survey Respondents." *Working Paper*.