



# How Many is Too Many? Outcome Questions In Conjoint Survey Experiments



Simon Hoellerbauer

University of North Carolina at Chapel Hill

## Research Objectives

- Researchers often ask a large number of outcome questions – either forced choice or rating – for each conjoint profile-pair to maximize data
- How does the number and format of outcome questions impact data quality?

## Experimental Design

- Conjoint based on [1], with 12 randomly ordered attributes, 10 conjoint tasks per respondent
- Experimental interventions:
  - Outcome Question Type: 1) forced choice; 2) rating
  - Outcome Question Number: 1) 3; 2) 6; 3) 12

Forced Choice, 6 Outcome Questions Example:

Which candidate would you be more likely to vote for? If you are not eligible to vote in the United States, please still select the candidate you would vote for if you could.

Candidate 1  Candidate 2

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Which candidate do you think is more likely to:

	Candidate 1	Candidate 2
Be a good conversational partner	<input type="radio"/>	<input type="radio"/>
Be respected abroad	<input type="radio"/>	<input type="radio"/>
Know the price of a gallon of milk	<input type="radio"/>	<input type="radio"/>
Be implicated in a scandal	<input type="radio"/>	<input type="radio"/>
Support mask mandates	<input type="radio"/>	<input type="radio"/>

Rating, 3 Outcome Questions Example:

How likely would you be to vote for candidate 1? If you are not eligible to vote in the United States, please still indicate how likely you would be to vote for candidate 1 if you could.

Extremely unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Extremely likely

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How likely do you think it is that candidate 1 would:

	Extremely unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Extremely likely
Be a good conversational partner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be respected abroad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

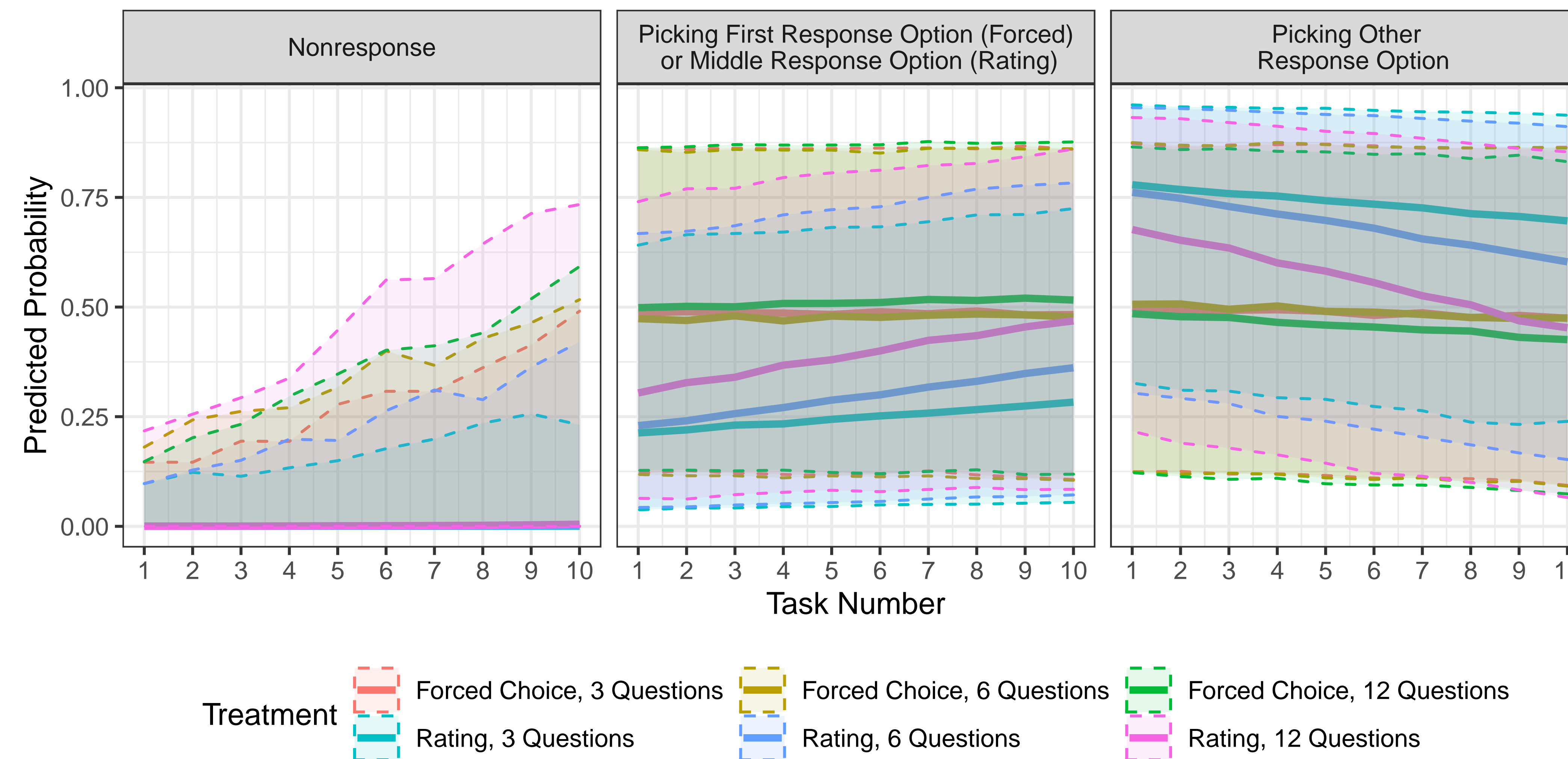
## Sample

- 659 students in Political Science Subject Pool at UNC - Chapel Hill
- Enrolled in introductory political science courses, required to complete studies to earn credit

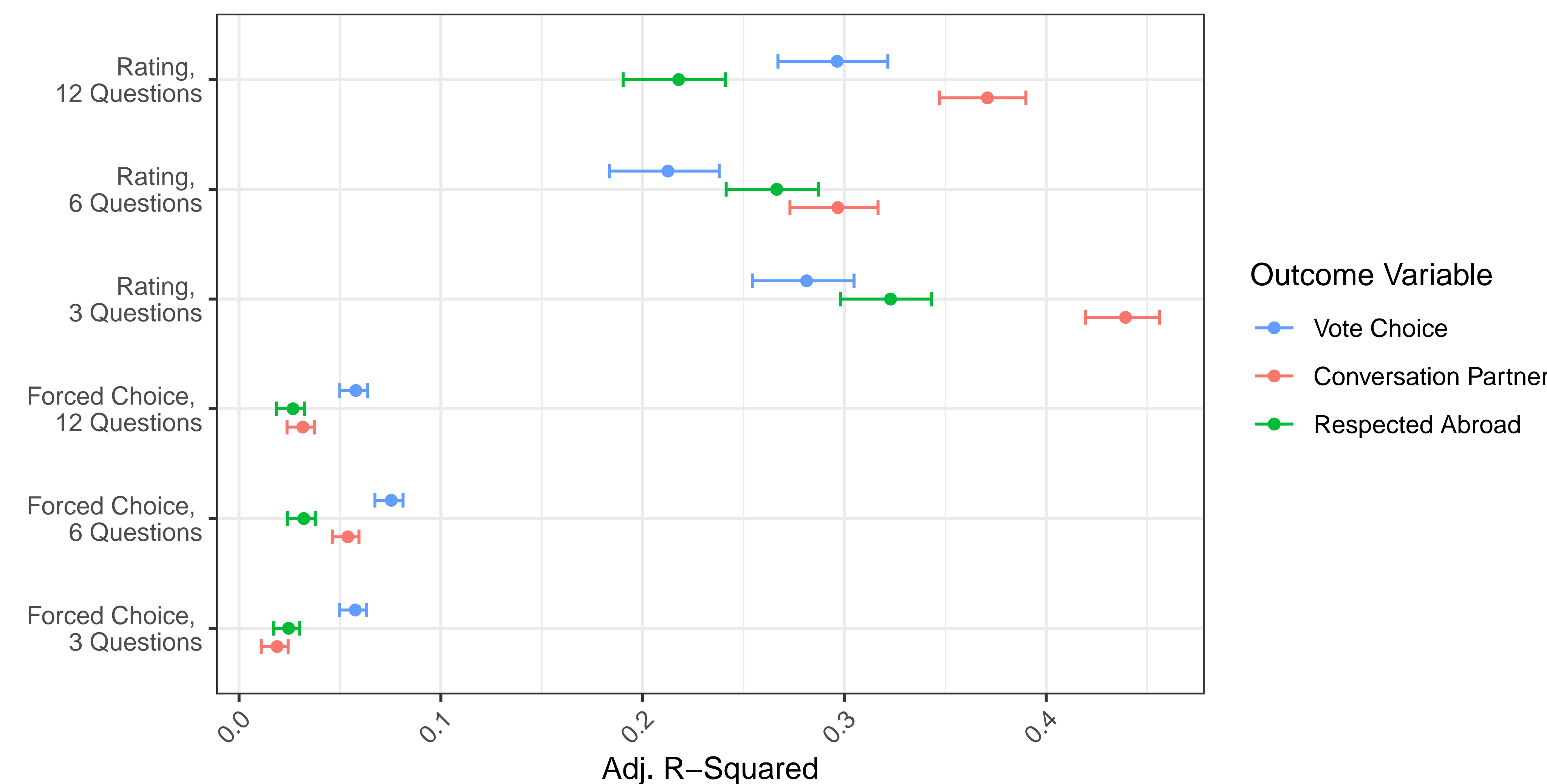
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## Impacts on Data Quality

Satisficing 1 - Predicted Probability of Nonresponse and Selecting “Quick” Answers, with 95% Cred. Int.



Satisficing 2 - How Well Attribute-Levels Explain Choices for Three Common Outcomes, with 95% Cred. Int.



## Model Specifications

- Satisficing 1: Multinomial logit
 
$$Y_{il} \sim Multi(m_{t_i}, \pi_{il})$$

$$\pi_{ilk} = \frac{\exp(\eta_{ilk})}{1 + \sum_{k=2}^K \exp(\eta_{ilk})}, k = 2, 3$$

$$\pi_{il1} = \frac{1}{1 + \sum_{k=2}^K \exp(\eta_{ilk})}$$

$$\eta_{ilk} = \alpha_{ik} + \gamma \times l + \nu_k^\top \mathbf{t}_i$$

$$\begin{bmatrix} \alpha_{i2} \\ \alpha_{i3} \end{bmatrix} \sim \mathcal{N} \left( \begin{bmatrix} \beta_2^\top \mathbf{t}_i \\ \beta_3^\top \mathbf{t}_i \end{bmatrix}, \Sigma \right)$$
 where  $i$  indexes individuals,  $l$  conjoint task,  $k \in \{1, 2, 3\}$  indexes response category,  $\mathbf{t}_i$  encodes treatment status of individual  $i$ , and  $\mathbf{t}_i$  encodes treatment status-task number interaction.
- Satisficing 2: Standard conjoint model fit for each outcome, treatment combination  
Models were fit using CmdStan's R interface `cmdstanr`.

## Conclusion

- No statistical difference between treatments when it comes to selecting “quick” answers
- Satisficing behavior does seem to increase with the conjoint task number
- No clear pattern for satisficing when comparing model-fit
- Difficult to compare some data quality outcomes for rating and forced choice questions

## Next Steps

- Improve design: Larger sample, randomize order of questions, decrease number of attributes, add number of conjoint tasks as treatment

Email: [hoellerbauers@gmail.com](mailto:hoellerbauers@gmail.com)  
Website: <https://hoellers.github.io>

## References

- [1] Kirk Bansak, Jens Hainmueller, Daniel J. Hopkins, and Teppei Yamamoto. Beyond the breaking point? Survey satisficing in conjoint experiments. *Political Science Research and Methods*, 9:53–71, 2021.