



# Testing the Measurement Error of Dependent Interviewing in a Self-Administered Mode

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*Disclaimer: The views expressed in this document are those of the authors and do not necessarily reflect the views of the National Center for Science and Engineering Statistics within the National Science Foundation.*



# Introduction

- Goal: Reduce respondent burden in longitudinal surveys
- Is dependent interviewing a possible solution?
- However, what about measurement error?

# Introduction

- Traditionally, dependent interviewing (DI) is done in interviewer-based settings
  - Face-to-face, CAPI, or CASI methods
- Rarely done in self-administered modes
- Measurement error can be reduced due to DI
  - Forward Telescoping
  - Seam Effects
  - Underreports
- However, DI may also increase measurement error
  - Satisficing (Acquiescent response behavior)
  - Or is Non-change occurring?

# Research Questions

1. Does DI implementation in a self-administered mode affect consistency in responses between waves?
2. If so, are those changes meaningful and at what rate are they meaningful between conditions?
  - Or is it measurement error?
3. Does a different implementation of DI affect the number of changes made?

# Data

- 2020 Pilot Study of the Survey of Doctoral Recipients (SDR) conducted by NCSES
- Respondents selected from the 2015, 2017, and 2019 SDR
  - Mostly from 2019
  - Only those with mostly complete information
- Self-administered web survey
- Three conditions in total
  - 2,574 respondents in total
  - DI1 (1 Screen) | DI2 (2 Screen) | and the Control condition
  - 830 in DI1 | 861 in DI2 | 878 in the Control Group
  - AAPOR RR1 of 61.7%

# Experimental Conditions – DI1 Open-Ended

## Principal Job

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In your responses to the 2019 SDR, you reported the title of the principal job you held, as shown below.

Please update the information to indicate your job title during the week of September 1, 2020. If the answer shown below was still correct during the week of September 1, 2020, please select the box “Information has not changed since 2019.”

*Example: Physics professor*

Biochemistry instructor

Information has not changed since 2019

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# Experimental Conditions – DI1 Closed-Ended

## Principal Employer

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In your responses to the 2019 SDR, you reported the number of people who worked for your employer, as selected below.

Please update the information to indicate how many people worked for your principal employer during the week of September 1, 2020, counting all locations where this employer operates.

If the answer selected below was still correct during the week of September 1, 2020, please select the box “Information has not changed since 2019.”

- 10 or fewer employees
- 11 – 24 employees
- 25 – 99 employees
- 100 – 499 employees
- 500 – 999 employees
- 1,000 – 4,999 employees
- 5,000 – 24,999 employees
- 25,000 or more employees
  
- Information has not changed since 2019

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# Experimental Conditions – DI2 Open-Ended

## Principal Job

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In your responses to the 2017 SDR, you reported the title of the principal job you held, as shown below.

Job Title: Biochemistry instructor

Was this information still correct as of the week of September 1, 2020?

- Yes  
 No

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# Experimental Conditions – DI2 Open-Ended

## Principal Job

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What was the title of the principal job you held during the week of September 1, 2020?

*Example: Physics professor*

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# Experimental Conditions – DI2 Closed-Ended

## Principal Employer

In your responses to the 2019 SDR, you reported the number of people who worked for your employer, counting all locations where this employer operated, as selected below.

- 10 or fewer employees
- 11-24 employees
- 25-99 employees
- 100-499 employees
- 500-999 employees**
- 1,000-4,999 employees
- 5,000-24,999 employees
- 25,000 or more employees

Was this information still correct as of the week of September 1, 2020?

- Yes
- No

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# Experimental Conditions – DI2 Closed-Ended

## Principal Employer

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Counting all locations where this employer operates, how many people work for your principal employer? Your best estimate is fine.

- 10 or fewer employees
- 11 – 24 employees
- 25 – 99 employees
- 100 – 499 employees
- 500 – 999 employees
- 1,000 – 4,999 employees
- 5,000 – 24,999 employees
- 25,000 or more employees

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# Experimental Condition - Control Open-Ended

## Principal Job

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What was the title of the principal job you held during the week of September 1, 2020?

*Example: Physics professor*

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# Experimental Condition-Control Closed-Ended

## Principal Employer

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Counting all locations where this employer operates, how many people work for your principal employer? Your best estimate is fine.

- 10 or fewer employees
- 11 – 24 employees
- 25 – 99 employees
- 100 – 499 employees
- 500 – 999 employees
- 1,000 – 4,999 employees
- 5,000 – 24,999 employees
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# Data

- Questions about job title, job type, employer information, and employer type
- Mix of open and closed-ended questions
  - 28 Closed-ended and 3 Open-ended questions analyzed
- Code open-ended questions for meaningful changes
  - e.g “University of Michigan” -> “University of Michigan – Ann Arbor” not meaningful
- Additional respondent experience questions (REQ)

# Data

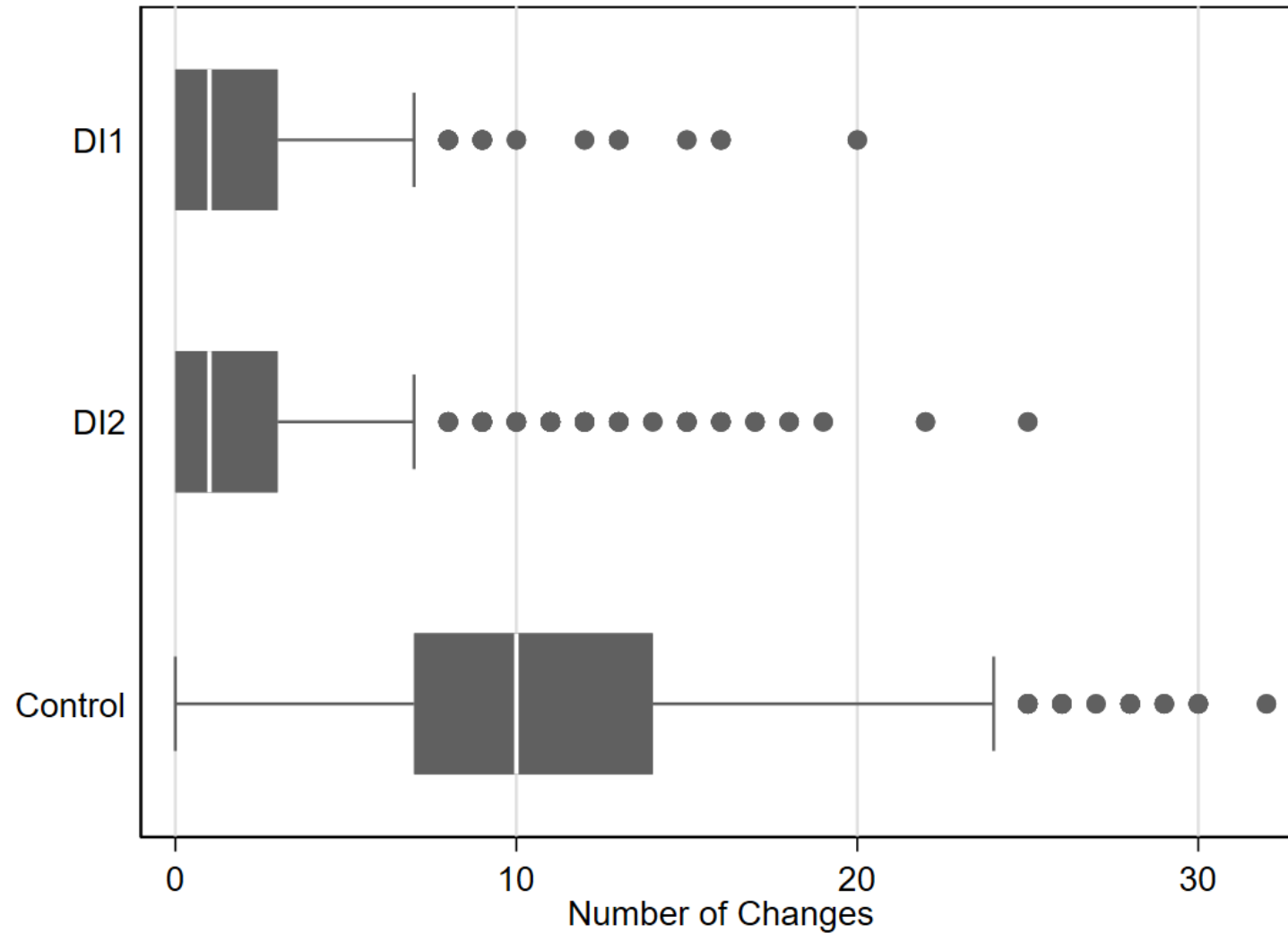
- REQ 1: Were there any questions where you felt answer was accurate enough although you could have updated it with potentially more accurate information?
  - Yes, for 1 question
  - Yes, for 2 or more questions
  - No
- REQ 2: Were there any questions where the answer displayed was no longer true, and you decided to leave it as-is rather than updating it with potentially more accurate information?
  - Yes, for 1 question
  - Yes, for 2 or more questions
  - No



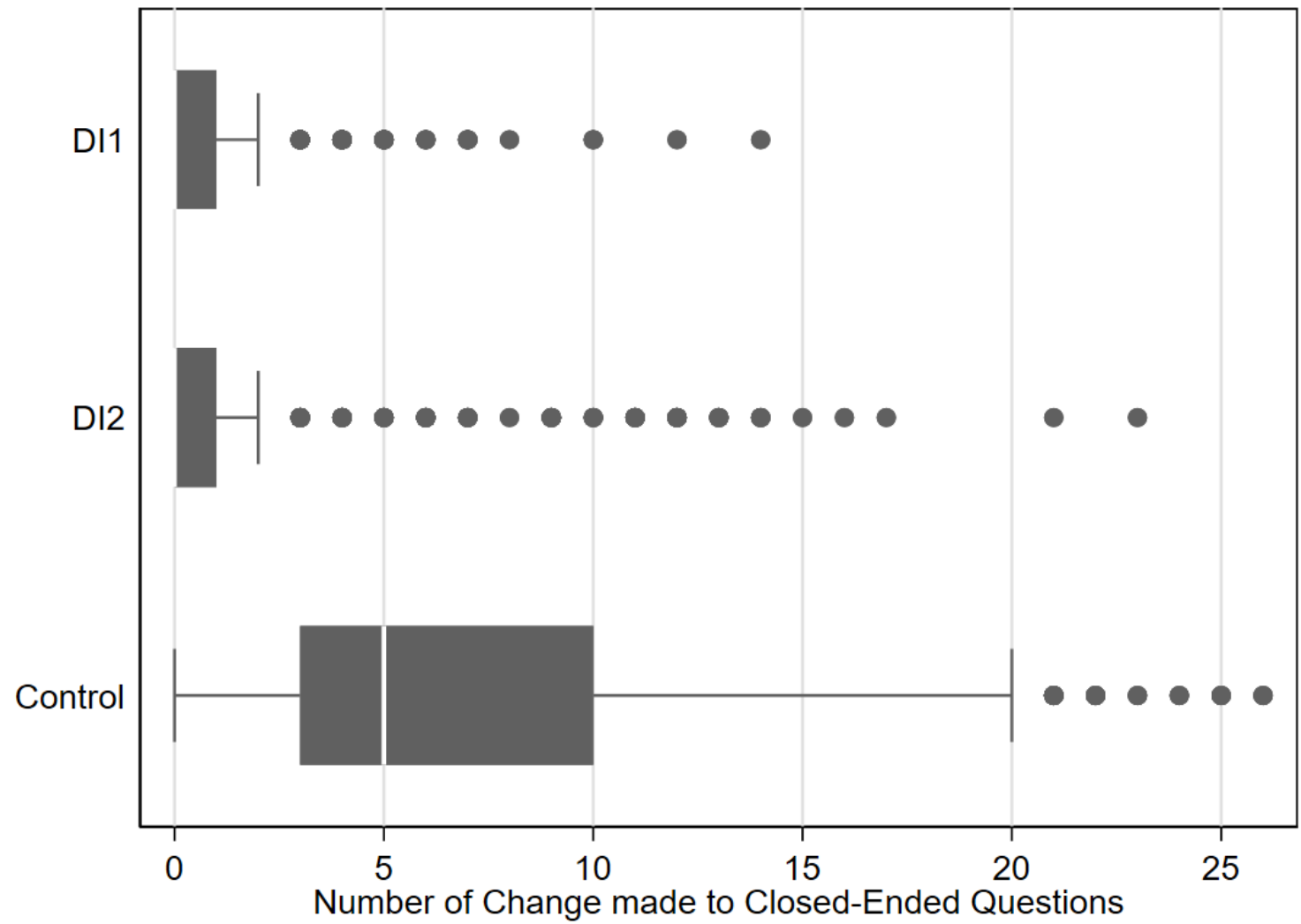
# Analytic Methods

- PMLE Negative binomial regression to model count of changes made
- Collapsed distribution of meaningful open-ended changes for proportion of meaningful changes by experimental group
- Marginal model to predict number of closed-ended changes by open-ended changes interacted with experimental condition
- Distribution of REQ
  - Reasons not changing responses
  - Based on two questions
- Design-based estimates

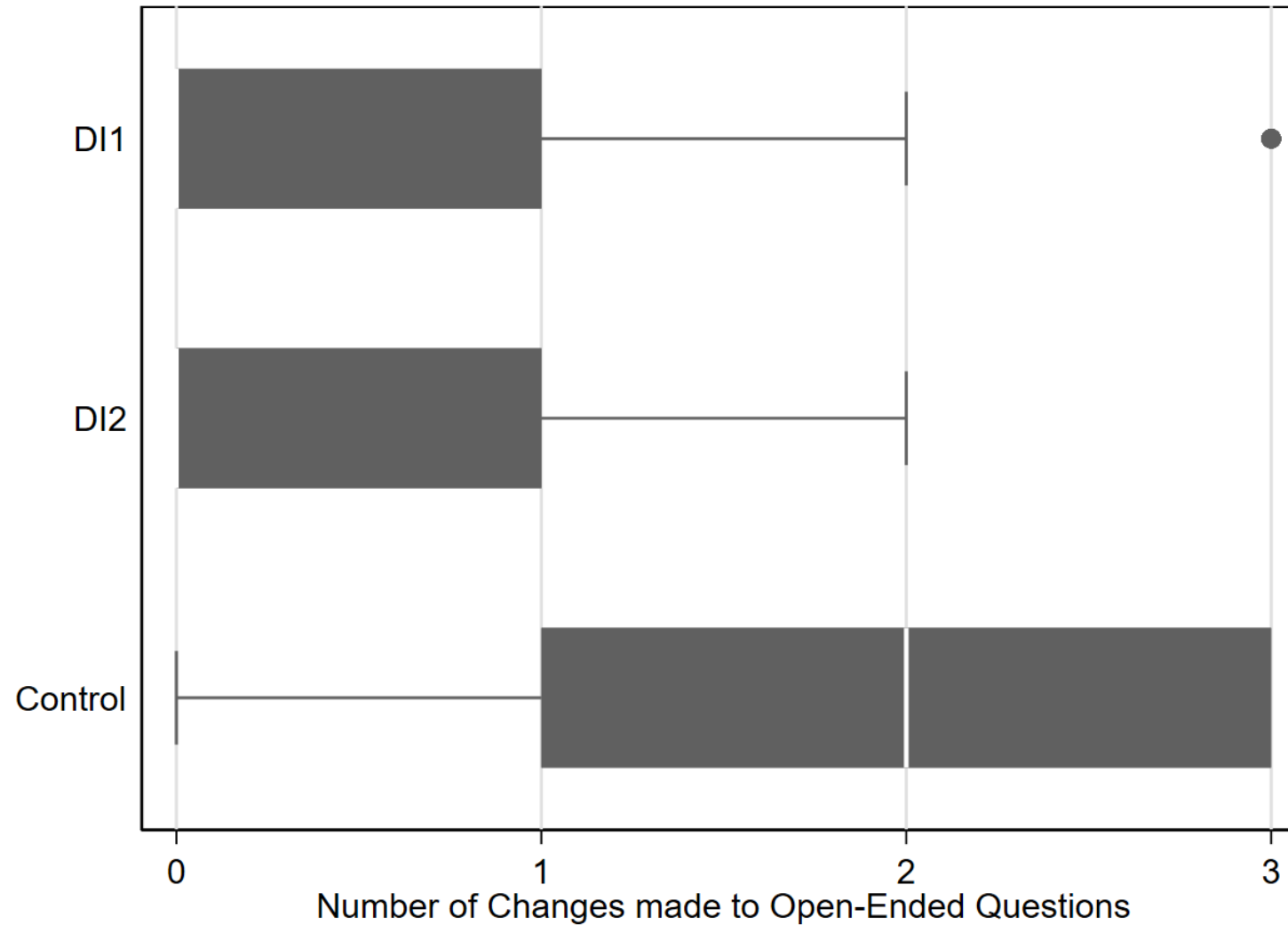
# Overall Number of Changes



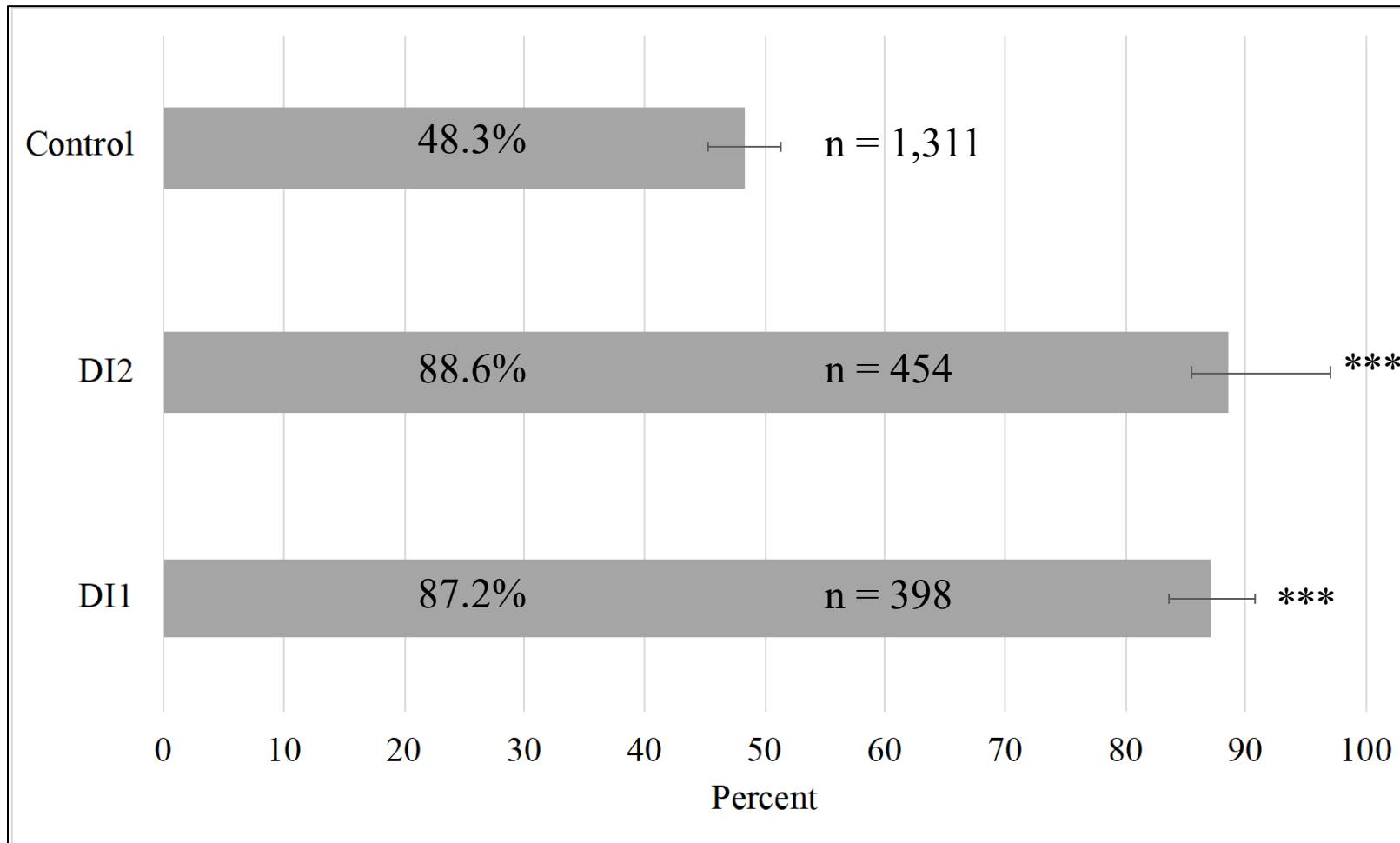
# Number of Changes - Closed



# Number of Changes – Open

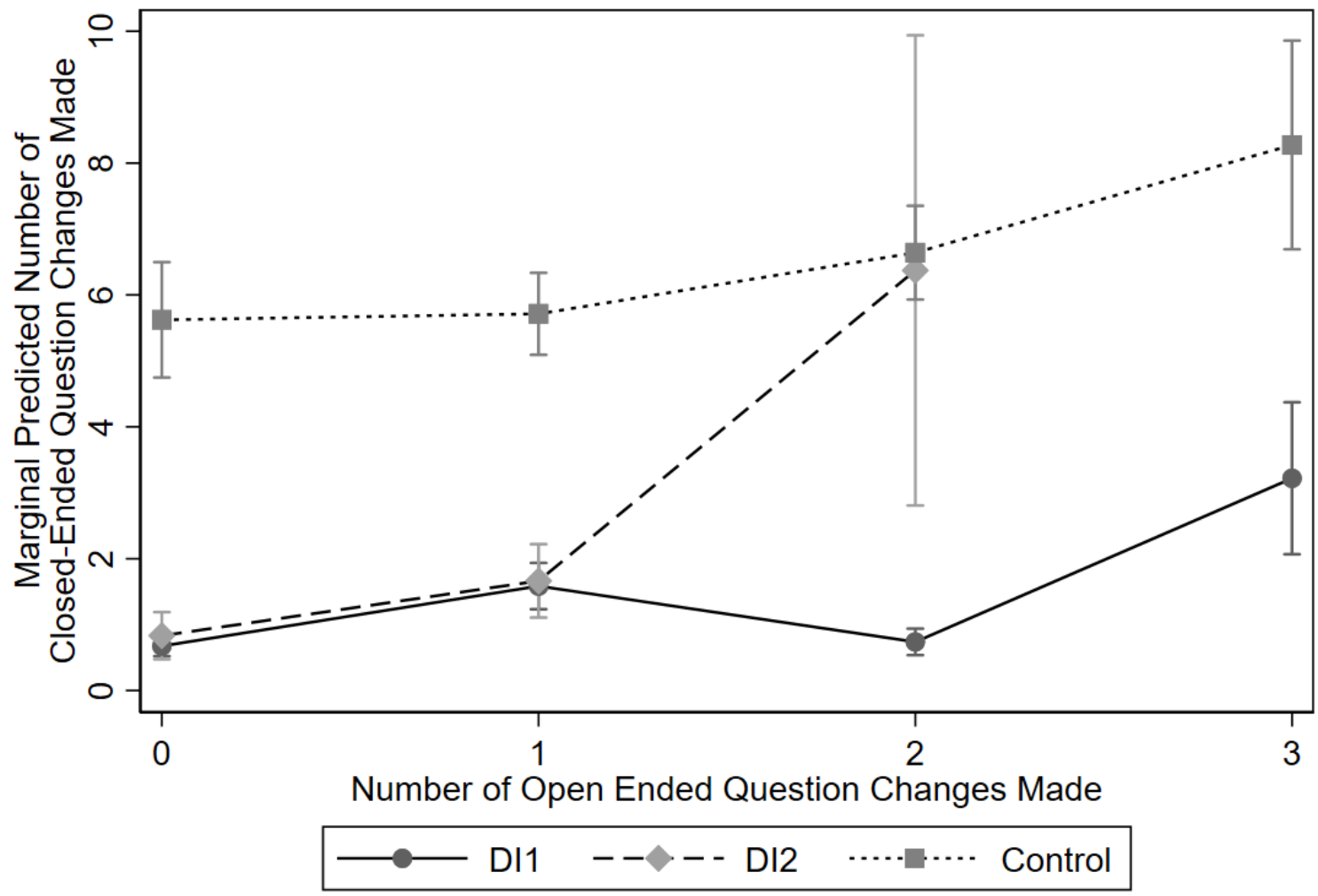


# Percent of Meaningful Open-Ended Changes



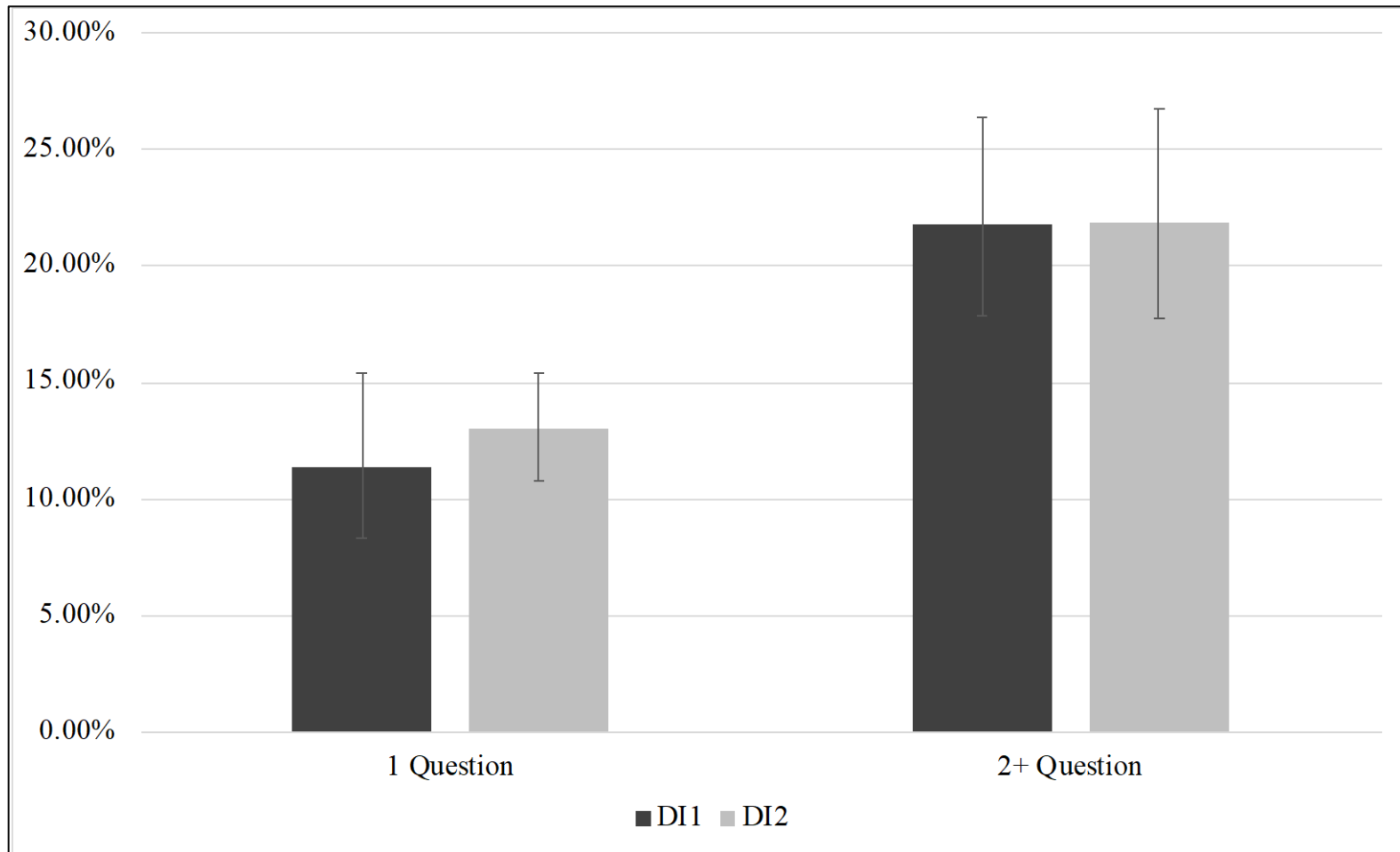
Note: \*\*\*<0.001 (Control is REF). N's are total number of open-ended changes. No difference between DI1 and DI2

# Predicted # of Closed Changes by Open



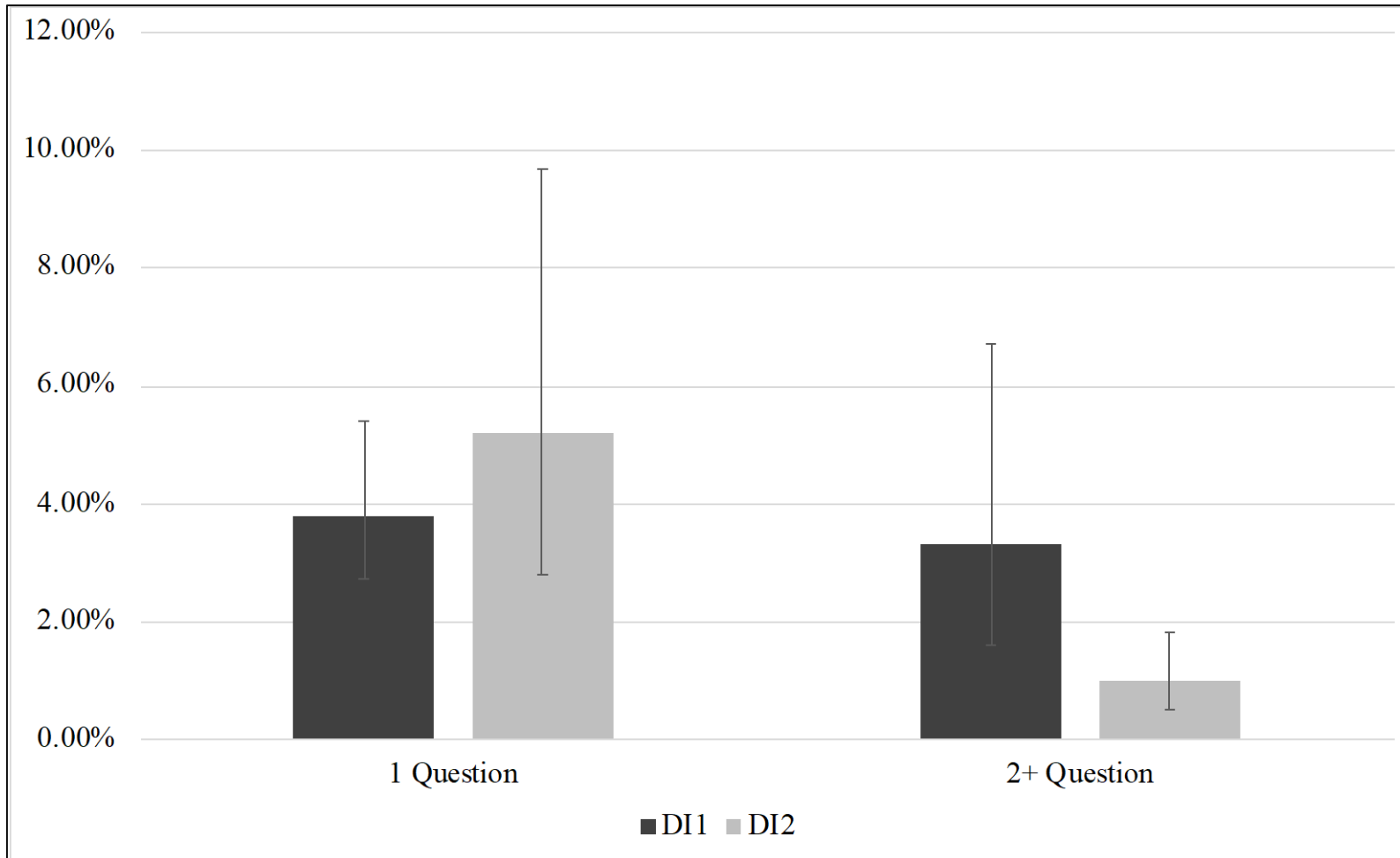
Note: No DI2 respondents made 3 Open-ended changes

# % Respondents report No Change in Previous Response as Past Response was Accurate Enough



Note: No significant difference between DI1 and DI2

# % Respondents report No Change in Previous Response Though Past Response is no Longer True



*Note: No significant difference between DI1 and DI2 in 1 Question, Marginal ( $P < 0.1$ ) in 2+ Questions*





# Summary

- DI respondents generally report fewer changes than Control
- Most changes made by DI respondents were meaningful
  - DI removes the added “noise” found in the Control

# Summary

- DI respondents generally report fewer changes than Control
- Most changes made by DI respondents were meaningful
  - DI removes the added “noise” found in the Control
- DI2 respondents made more closed-ended changes than DI1
- DI1 respondents were less likely to correct inaccurate responses

# Conclusion

- DI reduces number of changes made between survey waves
  - Increases consistency of responses
  - Removes noise
- Some evidence to suggest low levels of measurement error in DI
  - Especially in multiple questions where respondent knows information is no longer accurate
  - However, lower prevalence in DI2 compared to DI1
- DI2 respondents more inclined to make changes compared to DI1
  - Especially when some changes are needed



**Thank You!**  
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