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COMPARING TYPES OF ATTENTIVENESS MEASURES

SEBASTIAN LUNDMARK, HENNING SILBER, JOSS ROßMANN, & TOBIAS GUMMER

PREREGISTRATION AVAILABLE AT:
OSF.IO/HDBPS

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Why include attention checks?

- Survey research relies on respondents' cooperation during the interview
- Attention checks widely assumed to identify participants who pay insufficient attention to treatments/procedures (Mancosu et al. 2019; Oppenheimer et al. 2009)
- May increase experimental treatment effects
- May motivate respondents to answer other questions more thoroughly

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Example of an attention check

To ensure that this survey is not completed by an automated computer program, but by an attentive person, please answer 'Strongly disagree' to the following statement, regardless of whether this is your true opinion.

To what extent do you agree or disagree with this statement?

I am an attentive person.

Strongly agree, Agree, Rather agree, Neither agree nor disagree, Rather disagree, Disagree, Strongly disagree

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Potential problems with attention checks

- Attention checks appear to break the conversational norm:
  - Respondents are invited to answer questions
  - Attention checks are often presented as questions
    but instruct respondents to disregard the questions and report irrelevant things

- They seem to disregard one of the first advice survey researchers are taught:
  Never ask double-barreled questions!

- Annoyance of breaking the conversational norm may demotivate respondents
- Annoyance of being checked on may demotivate respondents

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Gaps in the literature

- Limited experimental evidence comparing types of checks regarding their pass and failure rates
- Limited experimental evidence on non-compliance (voluntary incorrect answers) (Curran & Hauser, 2019)
- What impact does the potential contradicting instructions have for failure rates?
- Does attention checks have negative effects on response behavior? (e.g., Huang et al. 2015; Gummer et al. 2018)
- Are different attention checks equally good for increasing data quality?

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Two studies

- **Study 1:** The German Internet Panel (GIP), a probability-based online panel, Attention checks administered within an omnibus style questionnaire (*N* = 2,900)

- **Study 2** (preregistered): The Swedish Citizen Panel (SCP), self-selected online panel, Attention checks administered within an omnibus style questionnaire (*N* = 3,800)

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Study 1: The German Internet Panel

Respondents randomly assigned to one of five groups

- Instructed response item / Instructional manipulation check
- Bogus item
- Numerical task (real effort task) – medium effort
- Numerical task (real effort task) – low effort
- Control – no attention check

IRI / IMC (contradicting instructions)

To ensure that this survey is not completed by an automated computer program, but by an attentive person, please answer 'Strongly disagree' to the following statement, regardless of whether this is your true opinion.

To what extent do you agree or disagree with this statement?

I am an attentive person.

Strongly agree, Agree, Rather agree, Neither agree nor disagree, Rather disagree, Disagree, Strongly disagree

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Bogus Item

To ensure that this survey is not being completed by an automated computer program but by an attentive person, please read the following statement carefully and indicate the extent to which you agree or disagree with it.

To what extent do you agree or disagree with this statement?

I am currently taking part in a survey.

Strongly agree, Agree, Rather agree, Neither agree nor disagree, Rather disagree, Disagree, Strongly disagree

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Numeric Task – Medium Effort

To make sure that this survey is not filled out by an automated computer program but by an attentive person, please count carefully how often the digit 0 appears in the table.

0	0	0	0	1
0	1	0	1	0
1	0	0	1	0
0	1	1	0	1
1	1	1	0	1

Response options: 1, 4, 5, 8, 10, 13, 15

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Numeric Task – Low Effort

To make sure that this survey is not completed by an automated computer program but by an attentive person, please calculate the following task carefully and indicate the correct solution.

Please indicate the result of equation "2 + 3".

Response options: 1, 4, 5, 8, 10, 13, 15

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Results

Study 1

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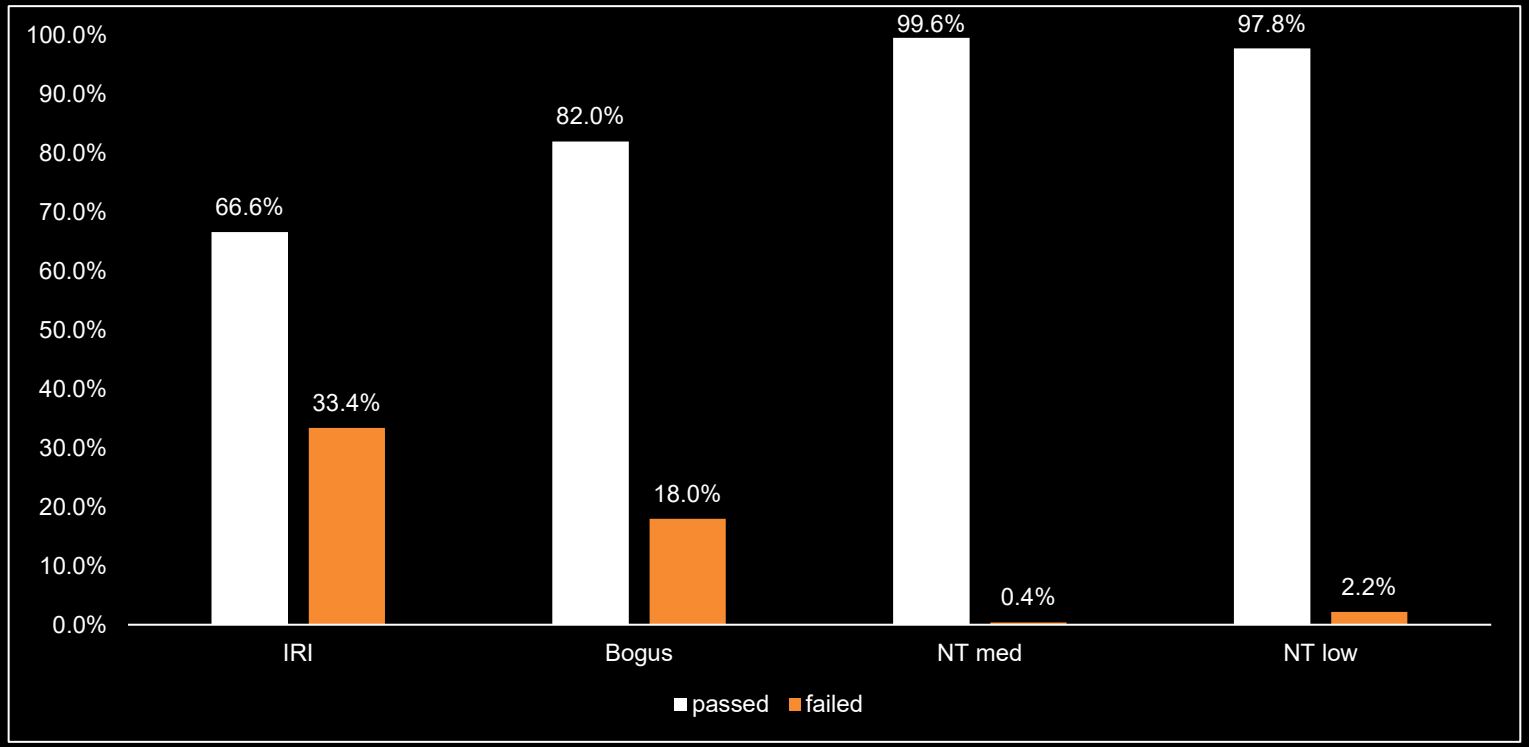
Failure Rates of Different Attention Checks



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Follow-up Question

To ensure that surveys are completed by attentive individuals rather than automated computer programs, we occasionally ask respondents to select very specific response options or to complete simple tasks.

Was there such a request on the previous page or not?

- Yes, there was, and I followed the instruction.
- Yes, there was, but I deliberately did not follow the instruction.
- No, there was not.

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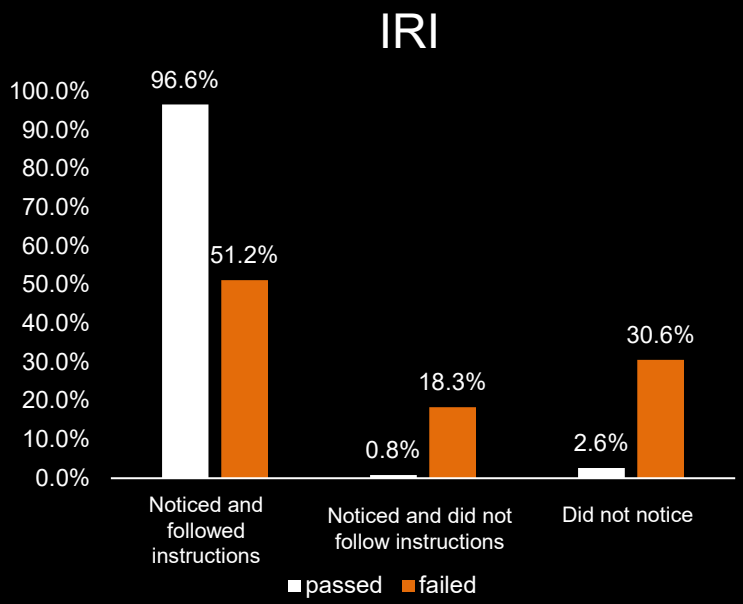
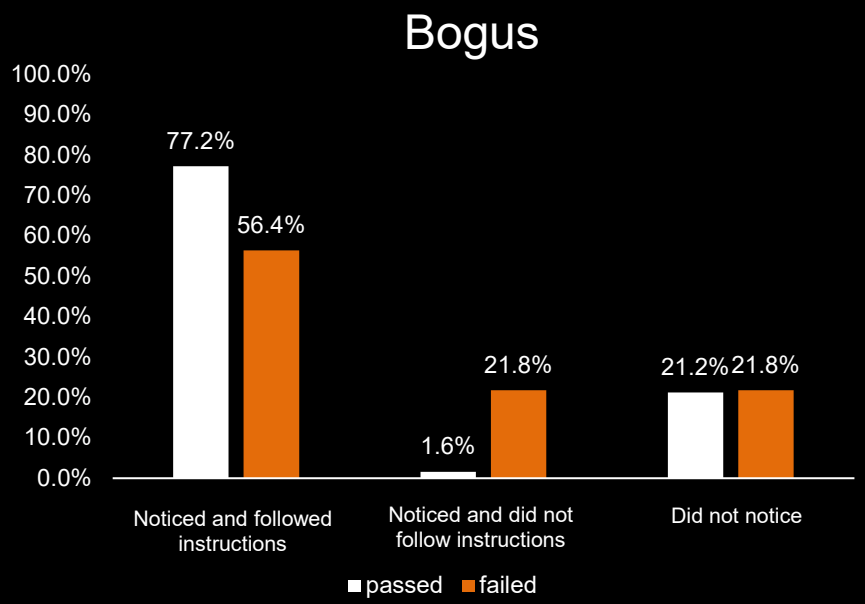
Follow-up Question





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Study 1: Summary of Results

- IRIs have a problem with non-compliance
- Bogus items are sometimes not seen as checks and have problems with non-compliance too
- Numerical tasks show that respondents were attentive
- Compliance self-reports have only about 70% correct predictions
- Survey evaluation is similar for different attention checks, but lower in the control group (only follow-up)

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Study 2: The Swedish Citizen Panel

1. Administered attention check experiment at the beginning of the questionnaire
   a) Follow-up question on whether instructions were followed
   b) Attitude toward attention checks
2. Administered social psychological experimental treatment
3. Administered procedures of other studies
4. Administered a second attention check (randomly assigned independent of attention check assigned at the beginning)
   a) Follow-up question on whether instructions were followed
   b) Attitude toward attention checks

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Study 2: The Swedish Citizen Panel

Nine groups

- IRI single answer (contradicting instructions)
- IRI single answer (no contradicting instructions)
- Bogus item
- Seriousness check
- Numerical task – medium effort
- Numerical task – low effort
- IRI several answers (contradicting instructions)
- IRI several answers (no contradicting instructions)
- Control

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Removing contradicting instructions

To ensure that this survey is not completed by an automated computer program, but by an attentive person, please answer 'Strongly disagree' to the following statement, regardless of whether this is your true opinion.

~~*To what extent do you agree or disagree with this statement?*~~

~~I am an attentive person.~~

Strongly agree, Agree, Rather agree, Neither agree nor disagree, Rather disagree, Disagree, Strongly disagree

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Added IRI/IMC (contradicting instructions)

When something important happens in the world, many people use online news services to find information about that topic quickly. We would like to know which news services you use when you want to get such information. We also want to find out if respondents read this question carefully. Therefore, please select "nyhetsbladet.se" and "kvallstidningen.se" as answers to this question in addition to the information you provided.

Which online news services do you visit during important political events?

- ○ Aftonbladet.se
- ○ Expressen.se
- ○ SvD.se
- ○ DI.se
- ○ nyhetsbladet.se
- ○ GP.se
- ○ DN.se
- ○ Nyheteridag.se
- ○ kvallstidningen.se
- ○ Nyheter24.se
- ○ Sydsvenskan.se
- ○ ETC.se
- ○ Friatider.se
- ○ GT.se
- ○ None of the above

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Added Seriousness Check

It would be very helpful if you could tell us at this point whether you have taken part seriously, so that we can use your answers for our scientific analysis, or whether you were just clicking through to take a look at the survey?

- ○ I have taken part seriously
- ○ I have just clicked through, please throw my data away

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Results

Study 2

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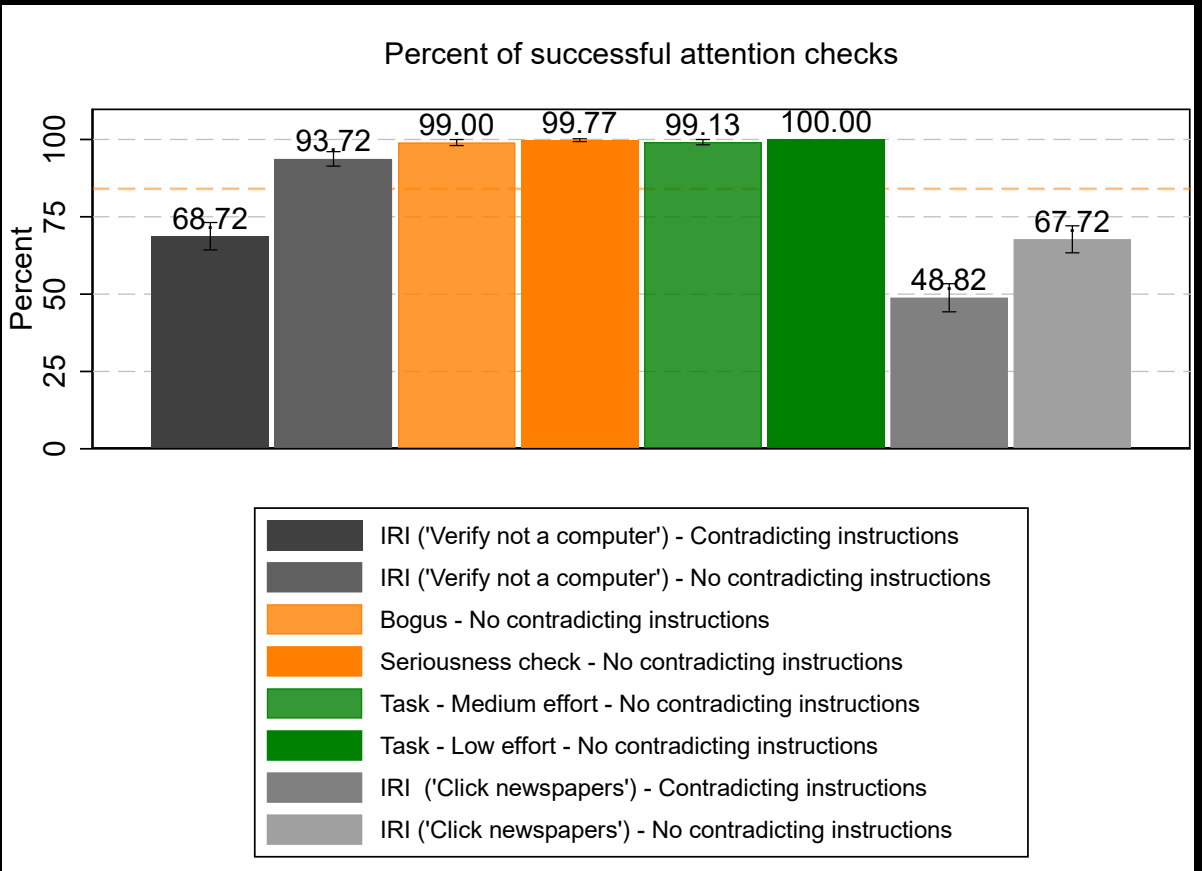
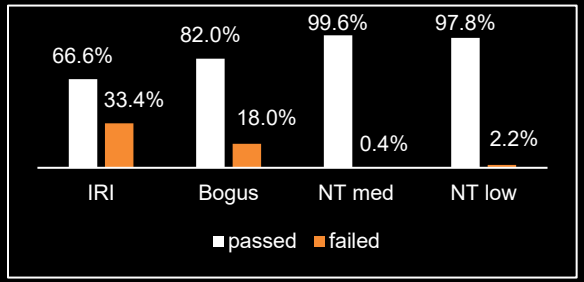
Study 2:



Study 1



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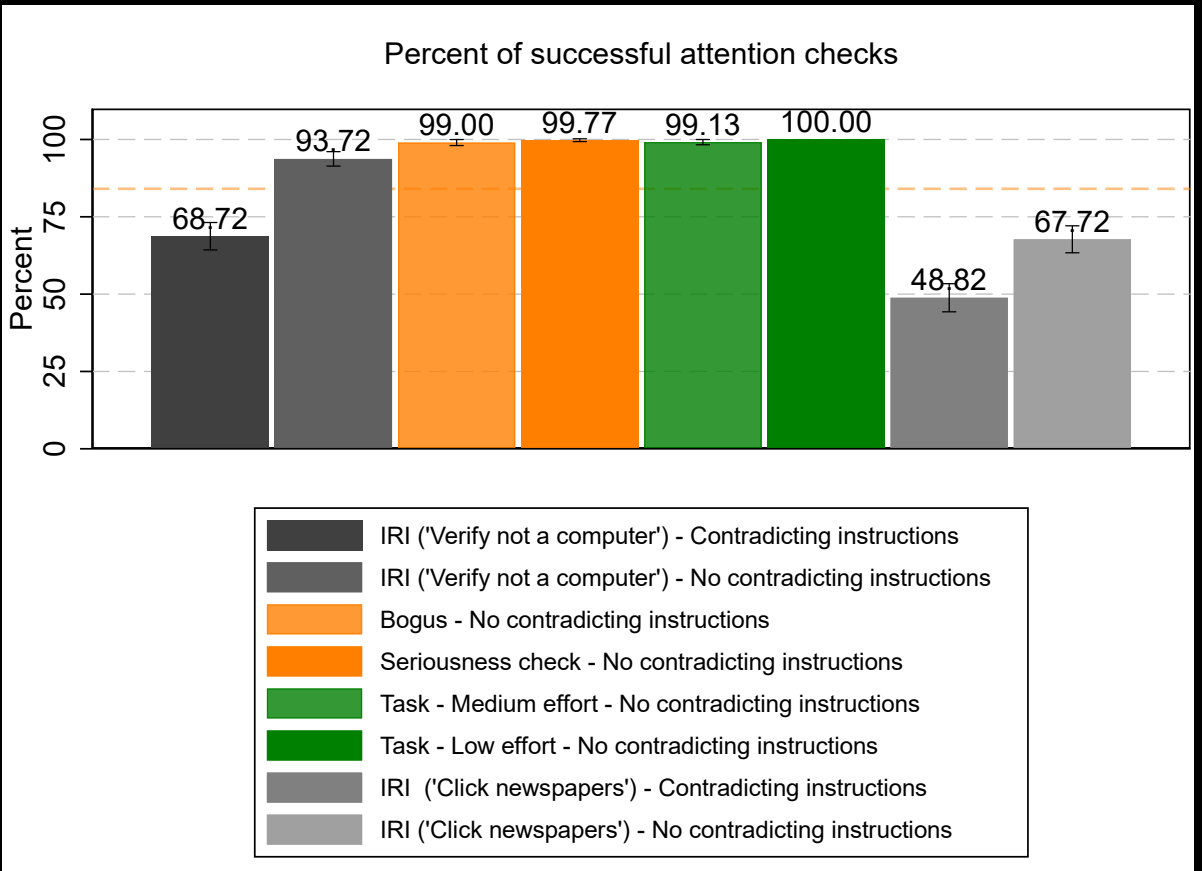
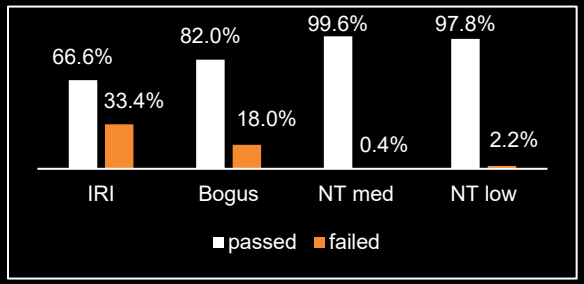
Study 2:



Study 1

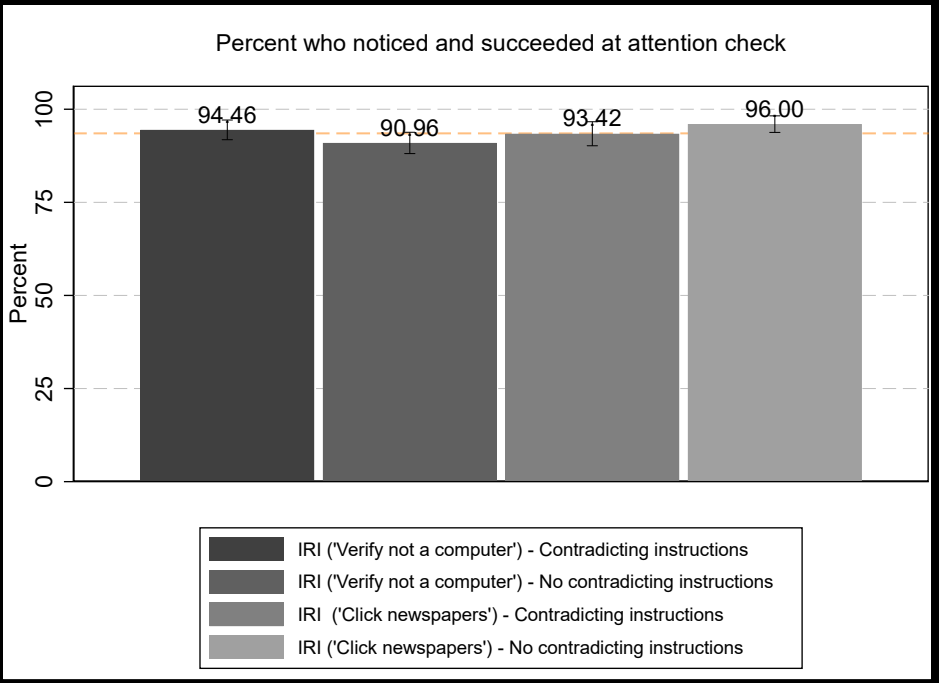


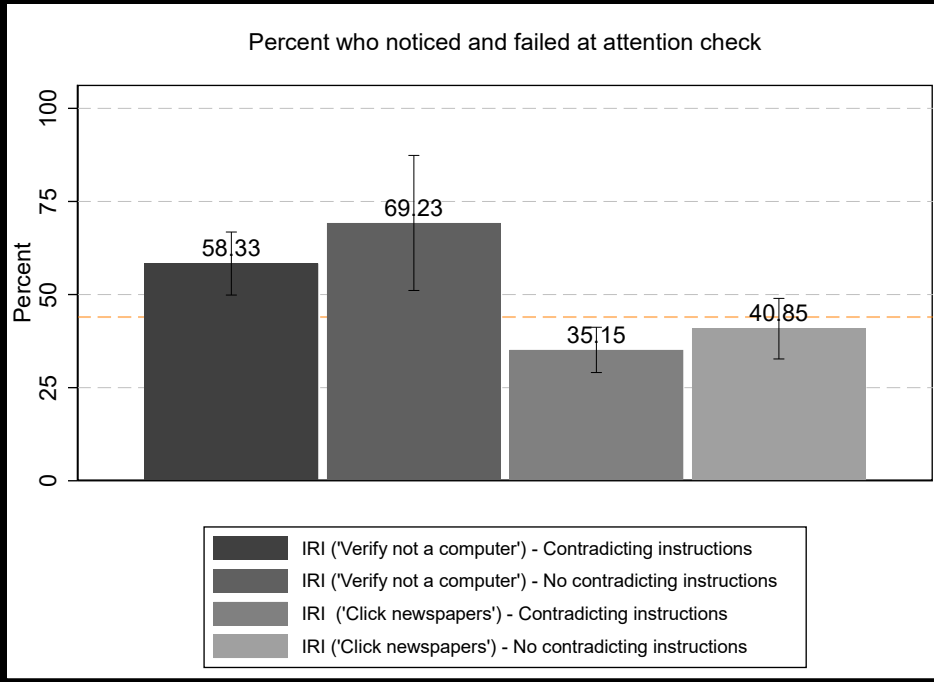
$b_{\text{contradicting instructions}} = -22.01$

$SE = 2.15$

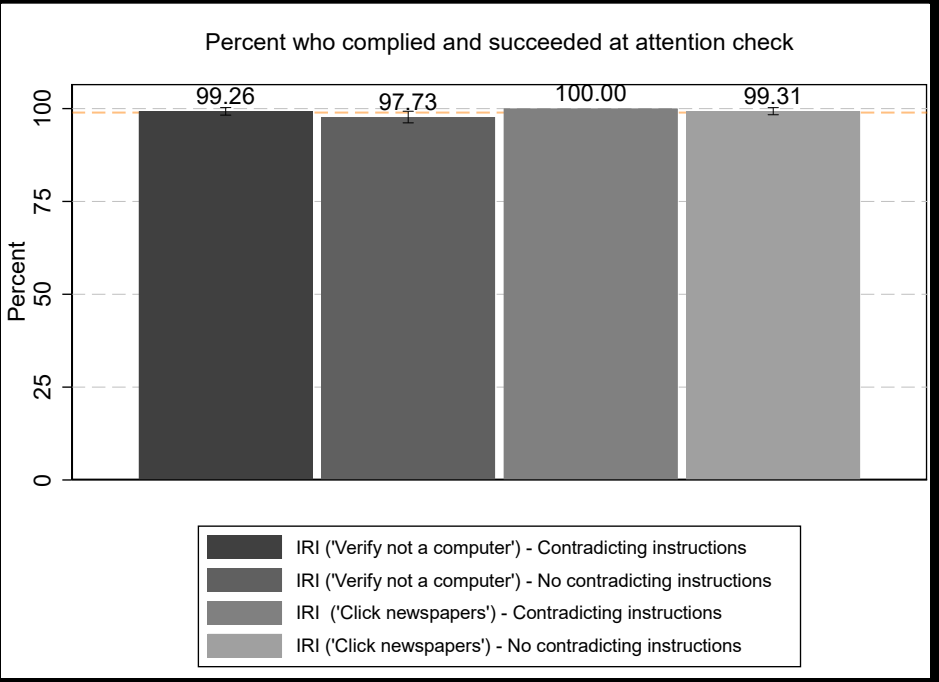
$p < .001$

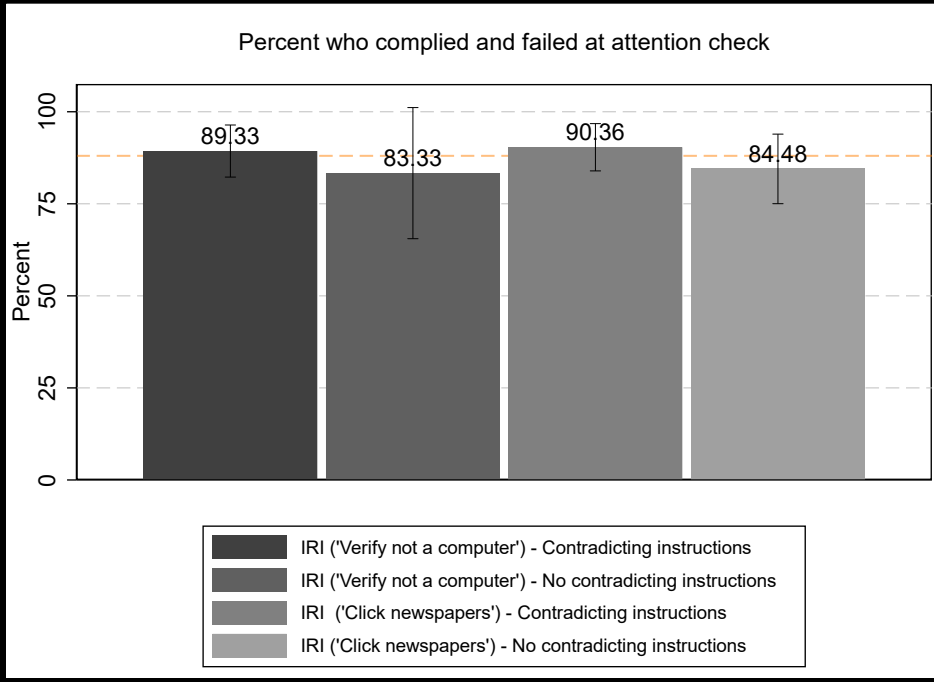
Study 2: Noticed the attention check



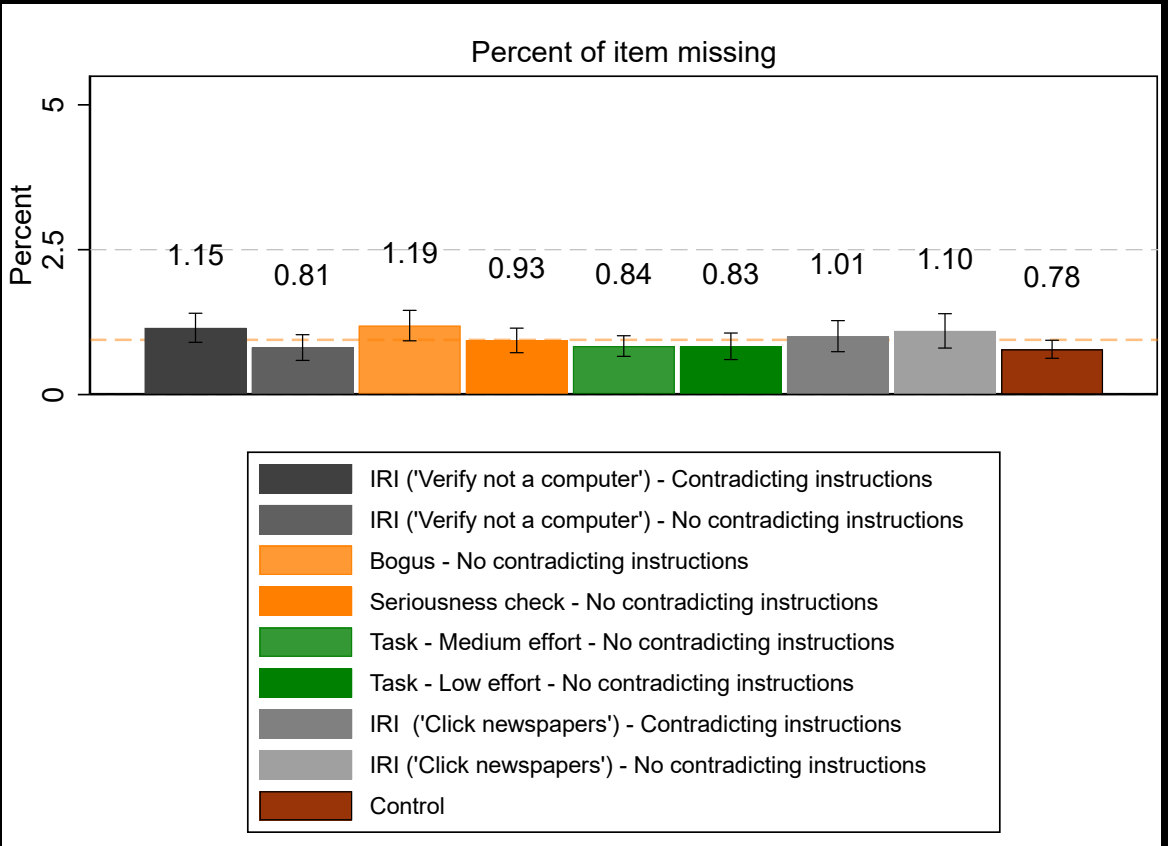


Study 2: Complied with the instructions & noticed instructions





Study 2: Percent item missing throughout questionnaire



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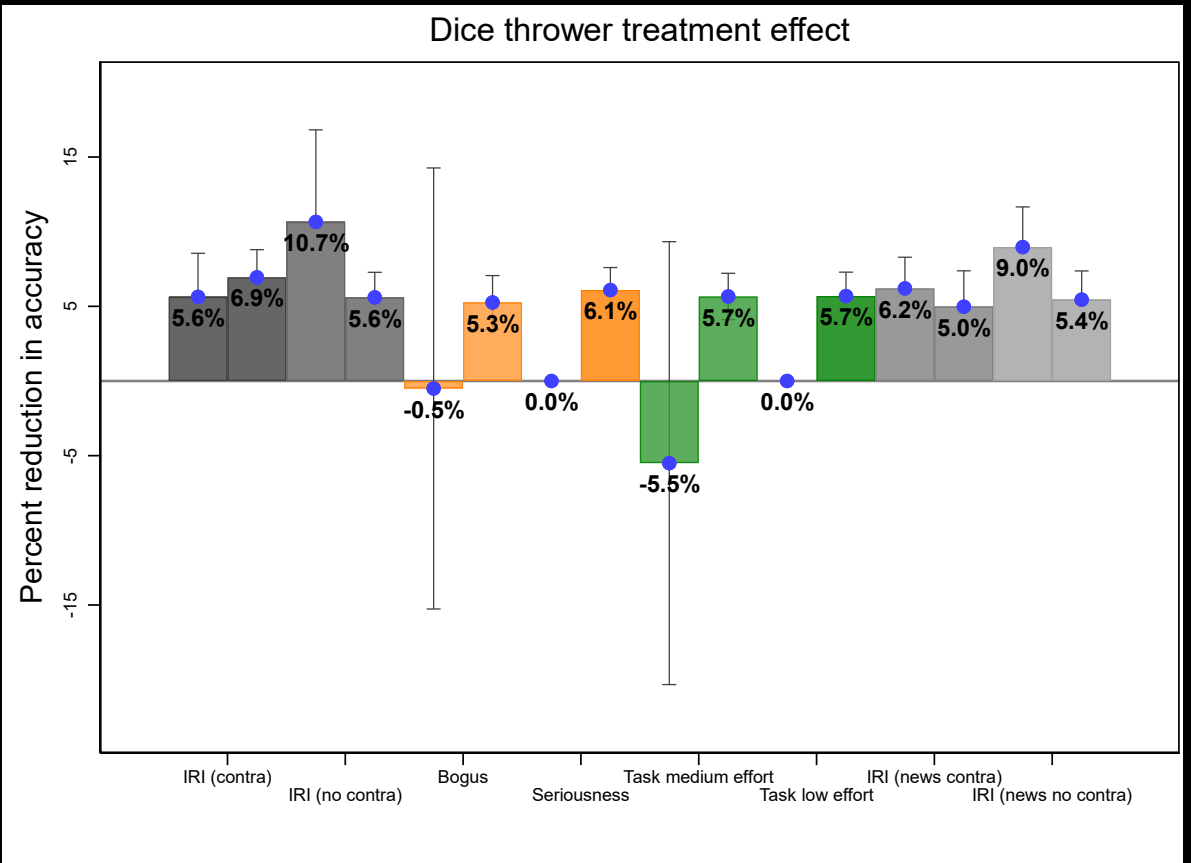
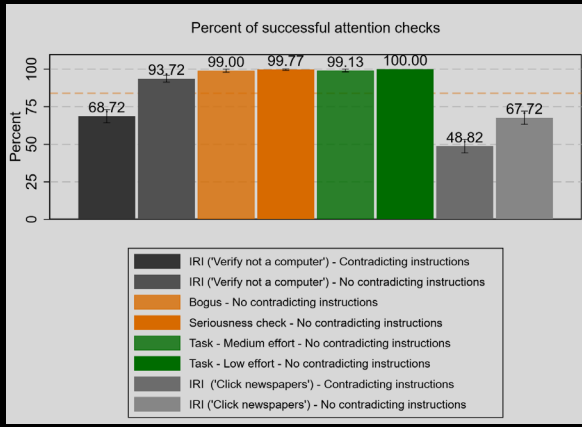
Study 2: Effects on experimental treatments





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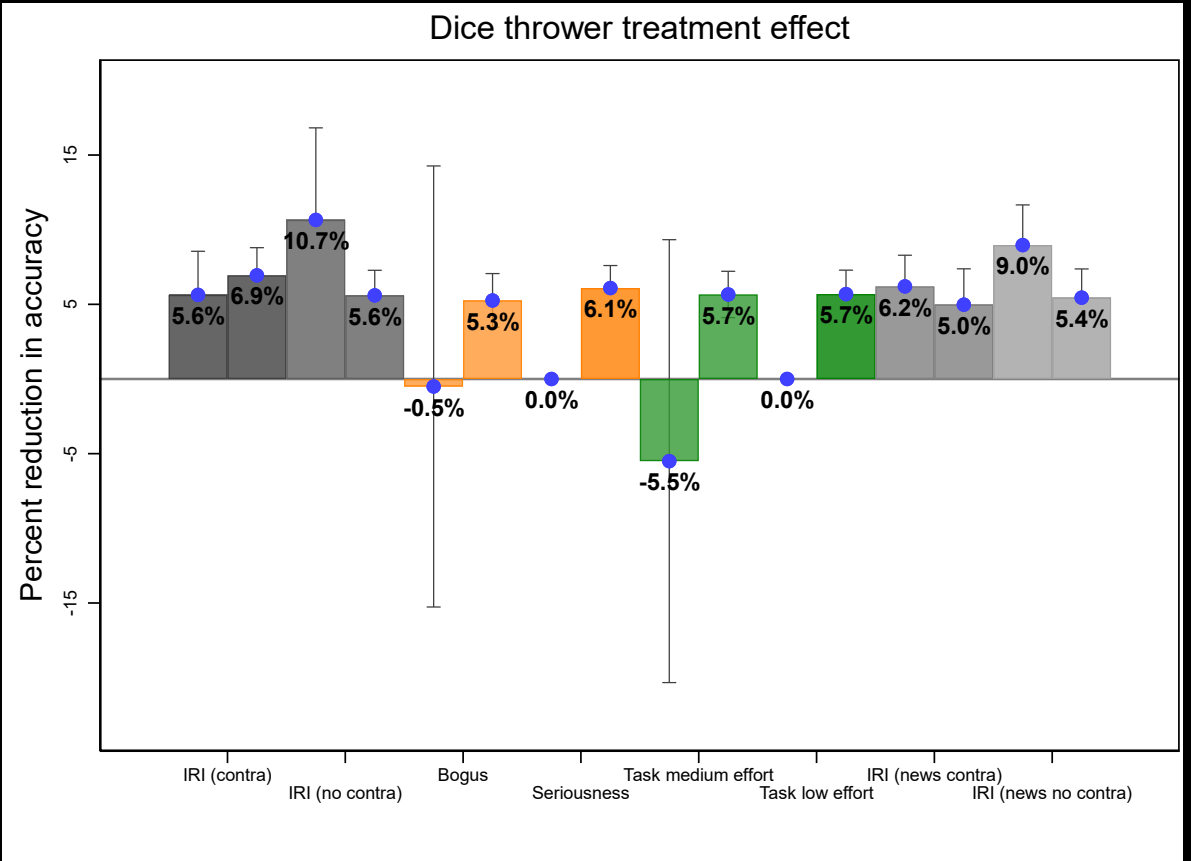
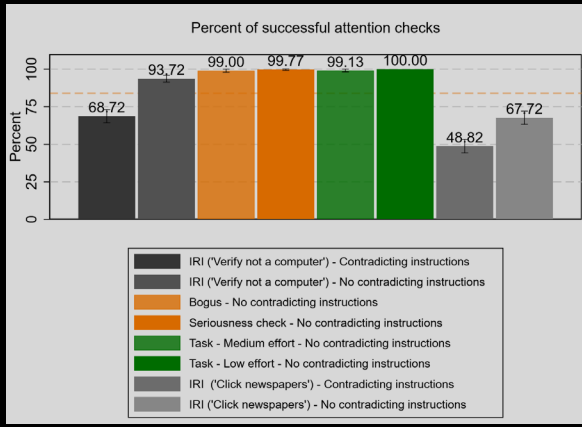
Study 2: Effects on experimental treatments





IRI News no contradiction

$b_{\text{treatment*succeeding}} = -3.52$

$SE = 1.69$

$p = .037$

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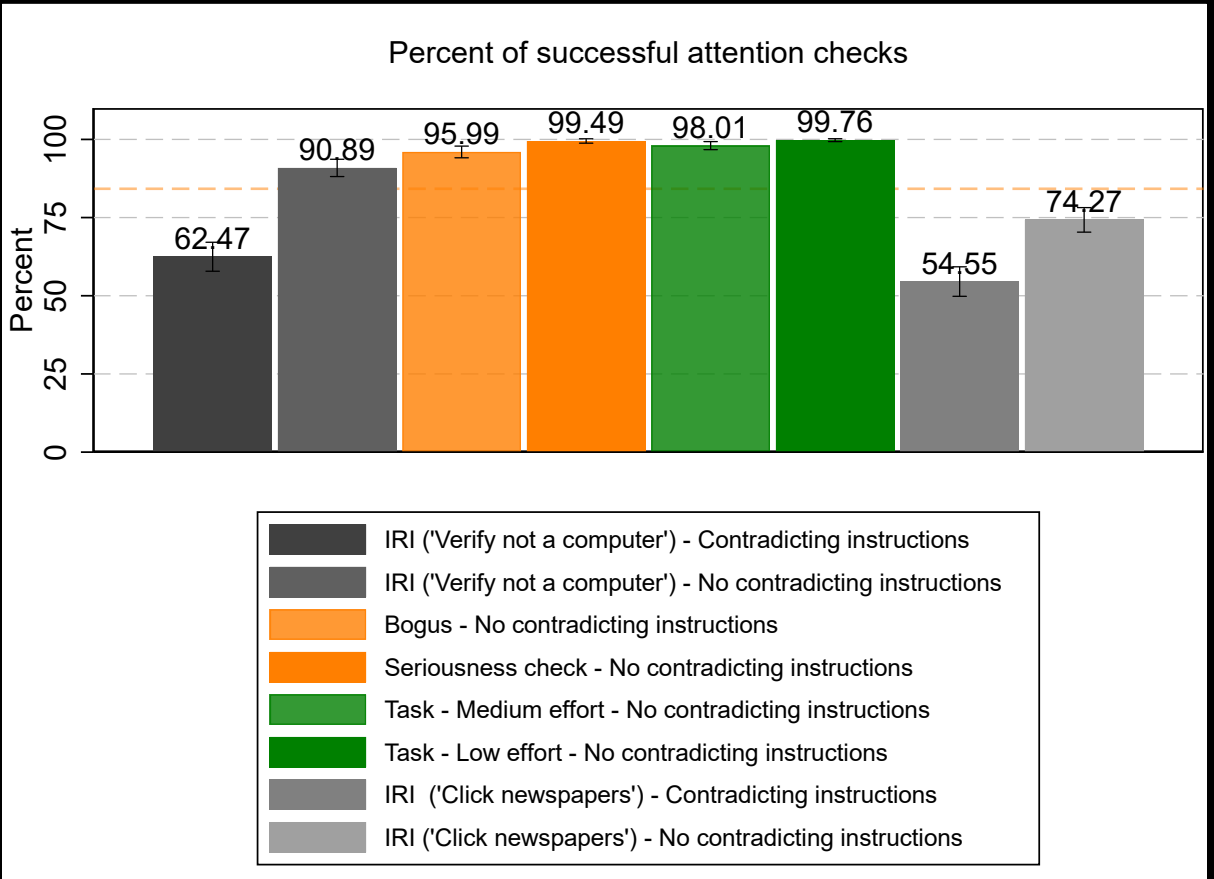
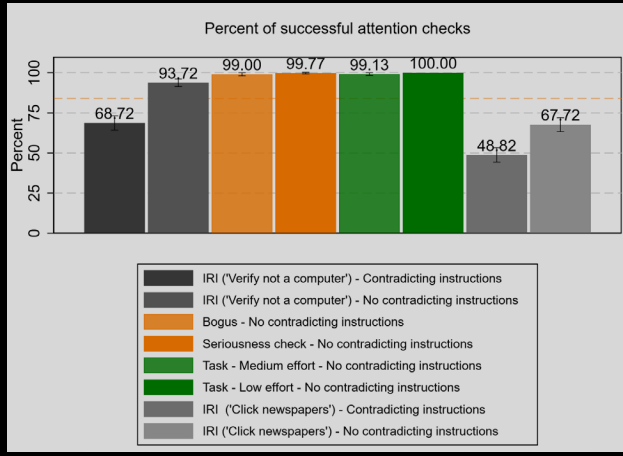
Second attention check



First attention check



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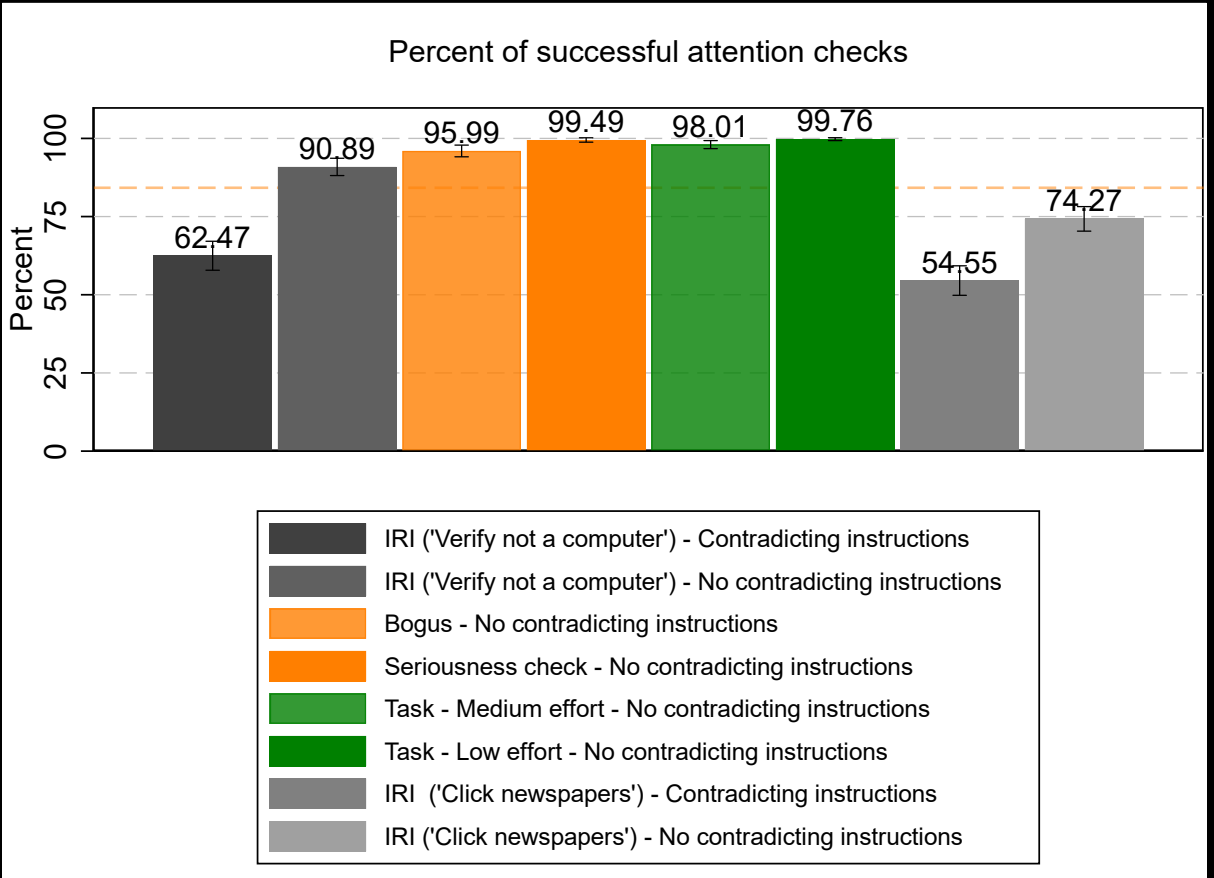
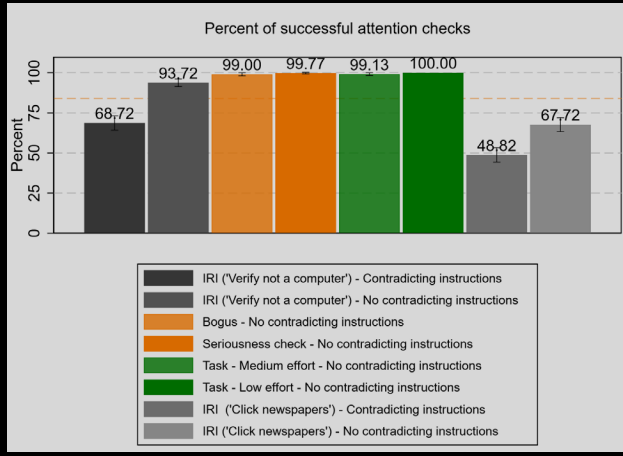
Second attention check



First attention check

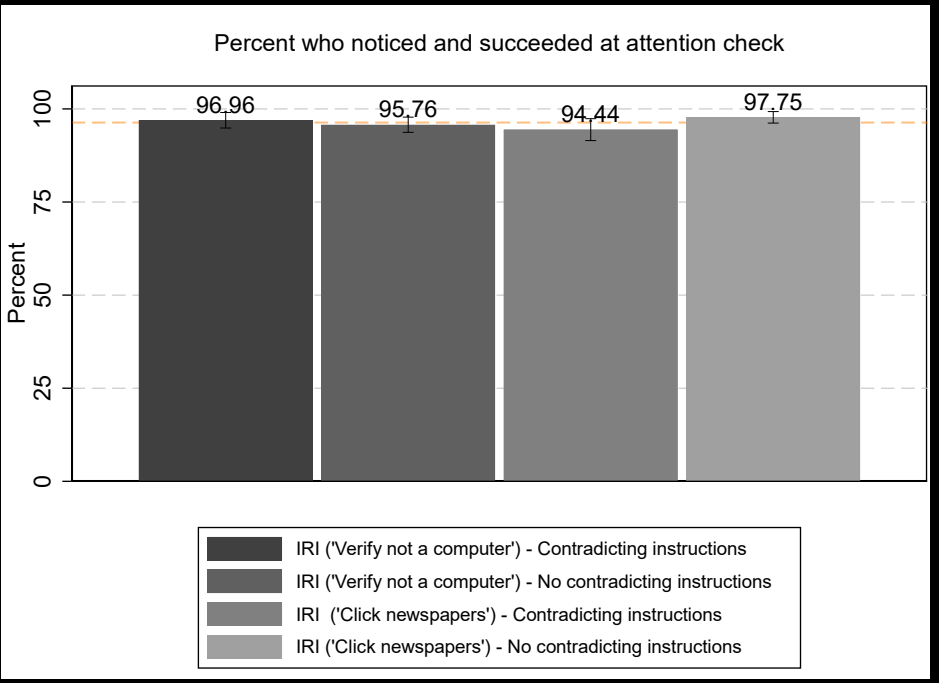


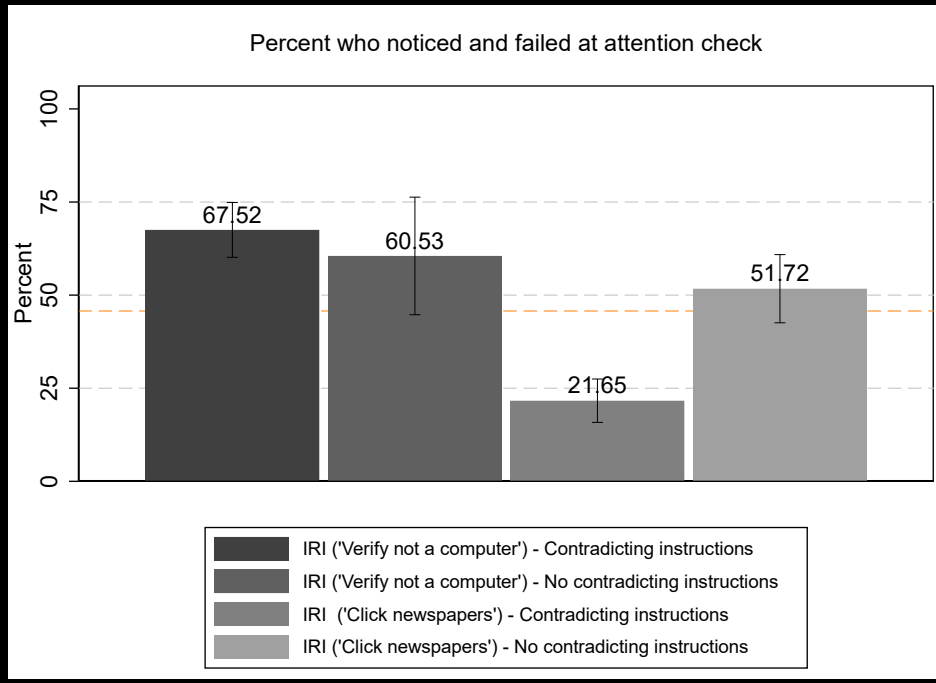
$b_{\text{contradicting instructions}} = -22.05$

$SE = 2.09$

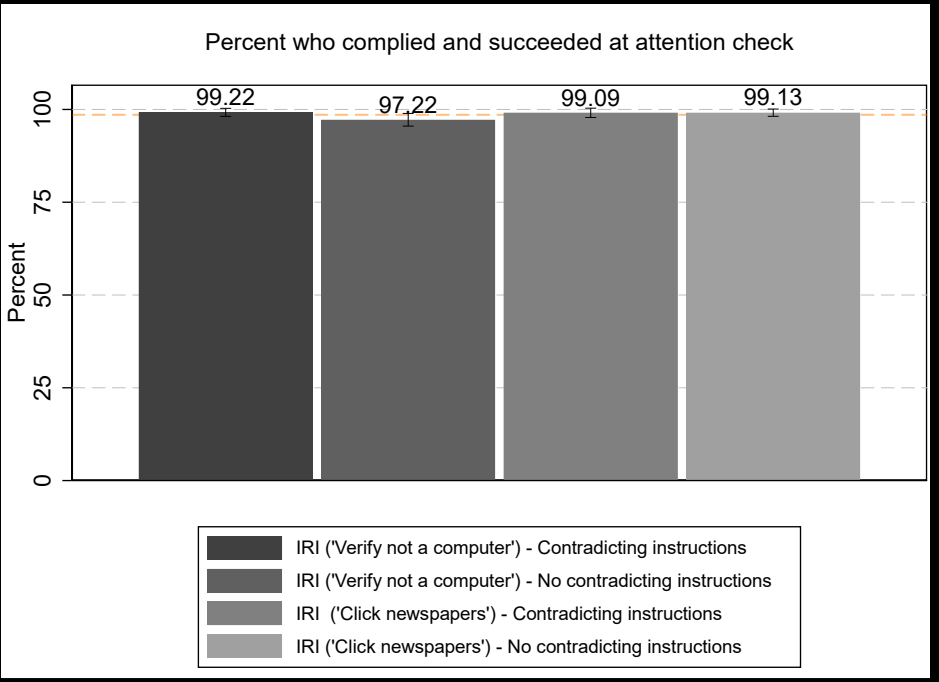
$p < .001$

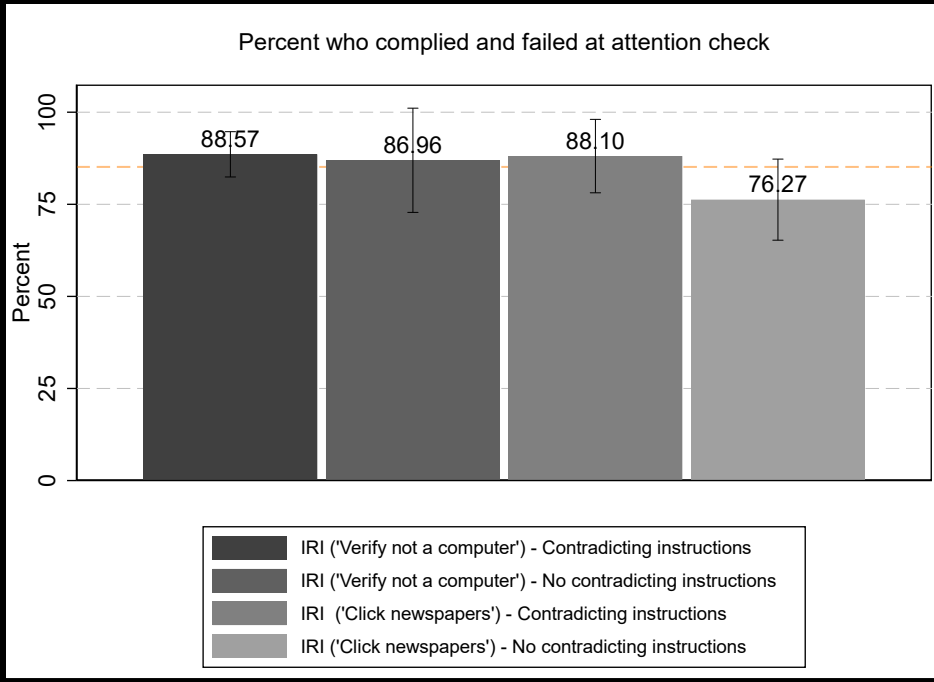
Study 2: Noticed the attention check



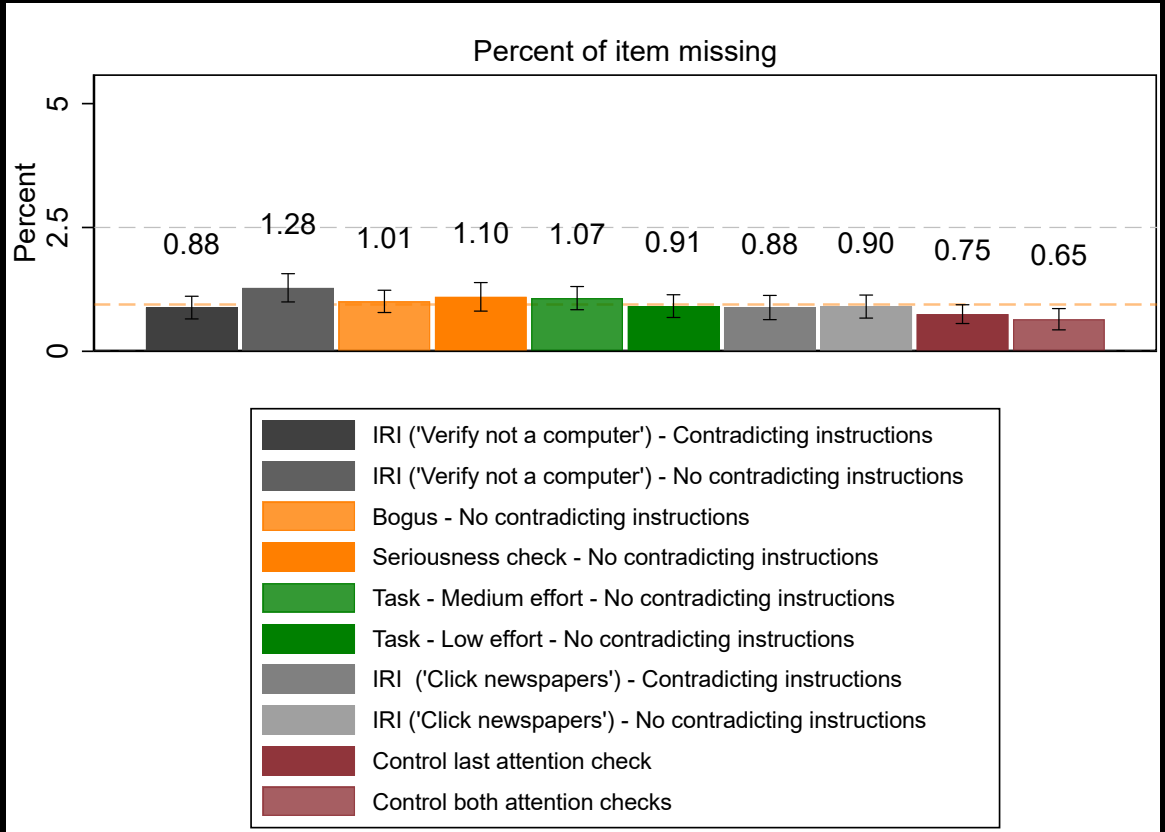


Study 2: Complied with the instructions & noticed instructions

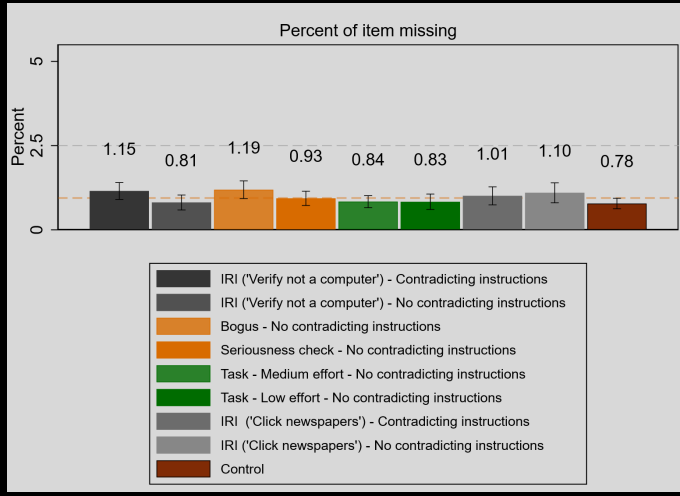




Second attention check percent item missing



First attention check



Did succeeding at the first attention check predict succeeding at the second?

	Failed at second	Succeeded at second
Failed at first	26%	74%
Succeeded at first	14%	86%

Yes, weakly: $b_{\text{first attention check}} = 12.42$, $SE_{\text{robust}} = 2.09$, $p < .001$, $R^2 = .02$

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Failing at both attention checks did not moderate experimental treatment effects

$b_{\text{treatment*succeeding on both}}$ = -0.62

SE = 0.68

p = .361

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Summary of Results

- Similar failure rates in both the German and Swedish panel
- Respondents succeeded on most types of attention checks
- Instructed Response Items / Instructional Manipulation Checks had higher failure rates than the other checks
  - A lot of those failures stemmed from contradicting instructions
  - Some of those failures stemmed from non-compliance
- **None of the attention checks worked for identifying respondents who produced poor data quality or weak experimental treatment effects**

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European Survey Research Association
July 17 – 21, Milan, Italy
2023

Comparing types of respondents' attentiveness measures: Experimental evidence from the German Internet Panel and the Swedish Citizen Panel

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