

Continuous and binary responses are not the same: Evidence from the field

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April 2021

1 Extended abstract

This paper conducts a pre-registered study aimed to compare binary vs. continuous set of responses in a questionnaire. Binary responses consist of two responses with opposed directions (Yes or No). Continuous responses are numerical, where respondents can indicate a response in a 0 to 10 horizontal line, marking precise numbers which express the exact level of agreement for an issue with respect to a maximum number.

We study whether binary and continuous sets yield to the same outcome (distribution) and the same cost (duration in minutes). Specifically, we analyze whether the probability of agreement is similar using both methods. We collect data from 360 households in Honduras who were randomly assigned to Yes/No questions or were given a slider (visual scaling) to mark their responses (interval [0,10]). The slider only includes labels at the extremes, where 0 indicates “not at all sure that it is going to happen” and 10 stands for “absolutely sure it is going to happen”. To compare replies from both treatments, we discretize continuous answers, assigning answers below 5 to their binary equivalent “No” category, and above 5 to the “Yes” category. Those answering 5 are randomly assigned to “Yes” or “No”.

We find that respondents are more likely to say “Yes” in the binary setting than using continuous responses. More specifically, respondents at the binary questionnaire answer on average 2.3 times (21%) less “No” answers than their peers in the continuous questionnaire. This can be due to acquiescence bias, which refers to the tendency for a respondent to agree with a statement without considering the content of the item or in order to please the researcher ([4]). This is one of the disadvantages of binary questions. As a neutral response is

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not provided, respondents tend to choose the positive "Yes" answer ([2, 3, 1]). Our data show that significant differences between binary and continuous answers arises on certain contexts, particularly in questions which include negative wording and when personal information might be potentially revealed. If questions include negative wording such as "anything", "no", "any", or sentences such as "do not allow to do...", "do not have access to...", "do not receive any information...", differences between binary and continuous responses are statistically significant. Specifically, the probability of agreeing jumps to 41% in binary sets compared to continuous sets of responses. Another type of questions in our survey include prescriptive wording, those that imply what we should do, what is right or wrong, or what is good or bad. Examples of this questions are "act as...", "take care of...", "limit activities...". Although differences are not statistically significant, we find that the probability of agreeing in the binary set is reduced by 9%. In less context-specific questions, no differences are found. Additionally, we also measure the difference in terms of survey length when running the questionnaire using one or the other set of responses. In our case, opting for Yes/No responses reduced the average length of the survey in 2.1 minutes (from 6.23 to 4.07), which implies a reduction of 35%. Hence, knowing the exact degree of agreement of the respondents comes at a cost, both in time and money. Finally, we replicate our results only considering the sample composed of women, which represents 86% of the total sample, and controlling for cognitive abilities in the understanding of expected probabilities using an extension of Delavande test (see [5]). In both cases, results remain equal. Our results contribute to survey design, both in the type of the question and the potential costs.

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