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**Is a Proxy Response Good Enough? Using Paired Cognitive Interviews  
to Assess the Accuracy of Proxy Responses**

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## Abstract

A number of government, university, and privately-sponsored surveys use within-household proxy reporting to collect information about multiple members of a household from a single household member. The benefits offered by within-household proxy reporting include reduced survey costs and effort (compared to self-response from each household member), making this type of response a potentially advantageous alternative to self response in some situations. However, there are open questions as to whether data collected from one household member answering on behalf of other household members is comparable to the data collected from each individual household member's self-report. In this research, we interviewed multiple participants from the same household to explore whether factors such as their relationship to each other and topic area (questions on volunteering, civic engagement, Internet and device usage) can inform comparability of responses. This paper discusses the design considerations necessary in planning and executing a research study using paired cognitive interviews in an approach similar to that of Blair, Menon, and Bickart (1991) to evaluate the use of within-household proxy interviewing in surveys conducted with related and unrelated household members. Data from two recent paired cognitive interview projects are used as case studies.

**Keywords:** proxy response, paired cognitive interviewing, household relationship

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## 1. INTRODUCTION

In many household surveys, respondents are asked to provide information about other members of their household as well as themselves (Bickart, Blair, Menon, & Sudman, 1990). This type of survey response, within-household proxy reporting, refers to the process by which one household member responds on behalf of all members of the household. A number of surveys conducted by universities, government agencies, and the private sector permit the collection of survey responses via within-household proxies if the sampled respondent is not available. This includes the decennial census, Current Population Survey (CPS), and the General Social Survey (GSS) (Krosnick, Presser, Fealing, & Ruggles, 2015).

Within-household proxy reporting offers a number of advantages relative to conducting a survey interview with each member of the household individually, including reduced costs due to fewer visits to the sampled household (Krosnick et al., 2015). Survey costs per person are also reduced as the number of people reported on by a single respondent increases (Mathiowetz & Groves, 1985). Additionally, proxy reporting is associated with faster data collection and increased cooperation rates (Krosnick et al., 2015).

However, there are also disadvantages associated with proxy response. For one, the motivation of a proxy respondent may differ from that of a target respondent, leading to differences in effort, and potential error in responses provided by the proxy respondent (Blair, Menon, & Bickart, 1991). Proxy respondents may also base their answer on their own behaviors and attitudes, and estimate their response more often instead of using a recall strategy (Bickart et al., 1990; Blair et al., 1991). Respondents' perspective also varies depending on whether they are providing a self versus proxy response, which can influence response quality and error. With proxy response, the respondent is answering not based on self-knowledge of the event, but on their perception of events that happened to someone else, which may be less accurate, detailed, or salient than characteristics of oneself or events that occur to oneself (Krosnick et al., 2015; Mathiowetz & Groves, 1985). Therefore, there may be a tradeoff between reduced costs and potential data quality.

Self response is thought to be more complete, accurate, and generally preferred over proxy response (Bickart et al., 1990). However, this finding - that self response is associated with better data quality - has been qualified by the caveat that many of the studies addressing this issue are flawed because of possible selection biases (e.g., by using proxies only when the target respondent is unavailable) (Bickart et al., 1990; Moore, 1988).

While it is generally assumed that for the reasons listed, self response leads to better data quality, Moore (1988) found evidence that, in some cases, for example income and health reporting, proxy reporting may be no different in data quality than self reports. Mathiowetz & Groves (1985) hypothesized that proxy reporting for health status and health events may actually be more accurate than self reports because of social desirability effects, yet their research did not offer any support for this hypothesis. The quality of proxy response may vary depending upon the subject matter. Some aspects of other household members might be relatively obvious and reportable with high accuracy, but other aspects may be less discernible.

Blair et al. (1991) discusses using a cognitive interviewing approach to evaluate survey questions by asking an identical set of questions to both members of a respondent pair and using concurrent and retrospective think aloud techniques to assess response strategies. This approach allows researchers to assess how the response strategies differed for self and proxy responding, if at all, and determine the match or convergence rates between self and proxy response for each question. While assessing rates of matching responses among pairs does not provide information about the accuracy of these responses, it does indicate how well or how poorly both members of the pair are able to provide the same response.

In recent years, this paired cognitive interviewing approach has become more popular as Holzberg, Ellis, Kaplan, Virgile, and Edgar (2019) and Zuckerbraun, Allen, and Flanigan (2020) used this method to examine the feasibility of collecting responses on certain topics from a proxy respondent.

The research presented in this paper uses this paired cognitive interviewing approach to evaluate the feasibility of proxy interviewing in two case study surveys, both supplements of the Current Population Survey (CPS), a large, national, government-sponsored survey. The reasons for conducting paired cognitive interviewing was CPS staff wanted to explore the feasibility of changing the study design from all household respondents providing a self-response to a single household respondent reporting for themselves and as a proxy for other household members. By collecting proxy response, they wanted to assess whether this would have an effect on data quality.

## **2. RESEARCH METHODS**

### **2.1 Questionnaires**

#### **2.1.1 Civic Engagement and Volunteerism Supplement**

The first study tested questions for a supplement on Civic Engagement and Volunteerism. Testing on this project commenced after the supplement was redesigned from two separate questionnaires (CNCS, 2016). The newly-combined supplement included 22 questions and addressed topics related to individuals' interactions with their friends, family, community, and neighborhood; political involvement in their community; group membership and activities; volunteering experience and frequency; and donations to political or charitable organizations, all with a reference period of the past 12 months. Two rounds of cognitive testing were conducted with 21 pairs of participants: 11 pairs of related participants, and 10 pairs of unrelated participants. These interviews were conducted in 2016 in the greater Washington, D.C. and Philadelphia metro areas.

#### **2.1.2 Computer and Internet Use Supplement**

The purpose of the second study was to determine the continued relevance of the types of technology addressed in the Computer and Internet Use supplement, a supplement conducted every three years in the CPS. Questions in this supplement focused on why, where, and how American households use the Internet within a six-month reference period, and included 54 questions on the types of internet-connected devices used, locations where internet is used, type of internet connections and providers, as well as privacy concerns and issues associated with internet use.

Two rounds of cognitive testing were conducted with 14 pairs of participants: seven pairs of related participants, and seven pairs of unrelated participants. These interviews were conducted in 2016 and 2017 in the greater Washington, D.C. and Philadelphia metro areas.

## **2.2 Recruitment and Scheduling Procedures**

The goal of this paired cognitive interview research study was to evaluate the extent to which participants and proxies from the same household provided the same responses to survey questions. Following the methodology of Blair, Menon, and Bickart (1991), we recruited pairs of participants ages 18 and older from the same household, where some pairs were related to each other and some were unrelated to evaluate whether this affects respondents' ability to provide consistent responses.

Individuals interested in participating were screened by telephone to determine if they met a series of study-specific and demographic criteria. The first participant of the pair who was screened chose the other member in their household as the second person of the pair, and also reported their relationship. Pairs of participants were classified as either related or unrelated household members. Pairs were considered "related" if individuals living together were related in some way (e.g., parent and child, spouses, cousins, in-laws etc.), or if they described themselves as non-married partners. Pairs of participants who described themselves as roommates, housemates, or friends were considered "unrelated."

Each individual in the pair was interviewed separately for this study. In the beginning of testing for Civic Engagement and Volunteerism supplement, both individuals in the pair were interviewed one after another, same day, with the same interviewer conducting both interviews. However, midway through testing, this study design was modified as it was decided that interviews did not have to be conducted one after another and both individuals of the pair could be interviewed on different days, typically within a couple business days. This decision was made to attract more interest from pairs to participate in the study. Both individuals of the pair were still interviewed by the same interviewer.

For testing of the Computer and Internet Use supplement, we allowed more flexibility with interviewing as each individual of the pair could be interviewed on separate days and also by two different interviewers. Each individual in the pair could also be interviewed one after another, same day, or simultaneously at the same time with different interviewers conducting each interview.

## **2.3 Interviewing Procedures**

At the outset of each individual interview, the participant was asked to complete a household roster. This provided the interviewer with the number of other individuals residing in the participant's household and their relationship to the participant. After the household roster was established, the interviewer administered the questionnaire with the participant, first collecting the participant's self responses. Then, the same questionnaire was administered to the participant in order to collect proxy responses for the other member of the cognitive interviewing pair. A

questionnaire was also administered to collect proxy responses for one additional member of the household, who was not interviewed, if necessary.

Once all self and proxy responses had been recorded, the interviewer conducted the retrospective probing portion of the interview. The goal of the protocol was twofold: first, to assess question clarity and participants' comprehension, and second, to assess participants' ability to provide proxy responses that matched self-responses provided by the pair member.

For each section of questions, participants were first probed on the answers they reported for themselves, by question. Probes were included for select questions in each survey, and were designed to assess participants' understanding of various terms and phrases and how participants came up with their answer.

Then within each section of questions, participants were probed on the proxy responses they provided for each additional household member. Participants were asked to explain how they came up with their proxy response for each question, by household member. Additionally, for each proxy response they provided, participants were asked to state their level of confidence in its accuracy and to say how easy or difficult it was for them to provide the response. In cognitive interviews where participants were providing proxy reports for more than one other household member, participants were also asked if each question was more challenging to answer on behalf of one household member than another, or if they were more confident in responding for one household member over the other.

This process where participants were probed on the answers they reported for themselves, by question, and then probed about proxy answers provided for additional household members, was repeated for each section of questions.

Cognitive interviewing procedures for the second member of each pair were identical to those used to interview the first member of each pair. Collecting the same data from each interviewed individual allowed researchers to compare self and proxy responses reported for each pair member. Further, proxy responses provided for additional household members not interviewed could also be compared for similarity.

## **2.4 Analyses**

Each cognitive interviewer was required to complete an interview summary containing detailed information on the survey questions as well as the feasibility of proxy reporting. The summary included responses for each question for the participant and every household member for whom they reported; the relationship between the participant pairs, as well as the other household members for whom participants reported; and information on how the participant came up with their answer for themselves and other members of their household, including their reported level of confidence in the proxy responses they reported for other members of their household, and whether they found that providing proxy responses for other household members was easy or difficult.

The scope of the information collected for each interview permitted us to analyze the data as described in the following section.

## **2.5 Matching Responses**

Methods of assessing whether two different respondents provide the “same” response to the same question is straightforward in some cases but more nuanced in others, depending on the format of the question. Across the two supplements, there were three different formats:

1. Yes/No
2. Closed-ended with six response options (e.g., frequency of volunteering: basically every day; a few times a week; a few times a month; once a month; less than once a month; not at all)
3. Open-ended numeric (e.g. number of hours volunteering)

Match rates can be calculated for questions with both open and closed response options. Matching responses are defined as those where both members of the pair provide “comparable” answers. In the Yes/No format, this was straightforward; if both participants said “yes” or both said “no” it was considered a match; if one said “yes” and the other “no” it was considered a non-match. If a participant said “don’t know” and the other said “no”, it was considered a non-match as well. For closed-ended questions with multiple response categories, we developed two metrics of matching – “exact” and “near match”. An exact match was when both participants answered the same category (see Figure 1); a near match was where participants did not choose the same response category, but was only one response category apart from each other (see Figure 2). A non-match was when the participants were two or more categories apart. For open-ended numeric questions, we used the two metrics of matching – “exact” and “near match”. An exact match was when both participants provided the same exact numeric answer or provided an answer in the same exact range category (we created multiple categories of numeric ranges for one question of Civic Engagement and Volunteerism after testing since there was a wide range of values one could report). A near match was defined as when participants provided numeric answers that were only one apart or had chosen categories that were only one apart from each other. A non-match was defined as when participants provided numeric answers that were two or more apart or had chosen categories that were two or more categories apart from each other.

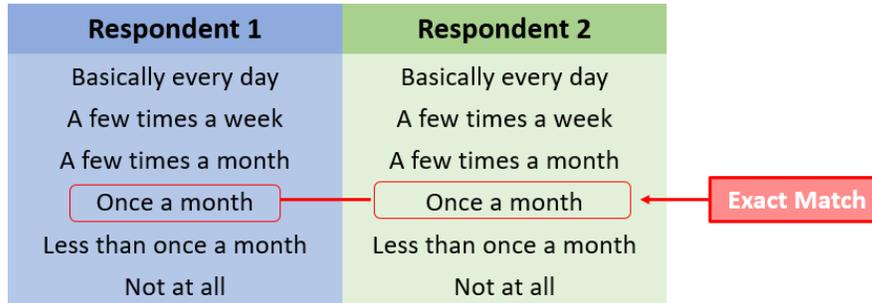
In order to assess overall match rates by survey question, response matches (or non-matches) for each participant must be coded. Individual match rates are calculated by comparing the paired participants’ answers for an individual household member. From the individual match rates, overall question match rates can be calculated by dividing the number of matching responses for a given question by the total number of responses for that question in the study. Match rates can be calculated among pairs of participants, as well as for other household members who did not provide a self-response but for whom a proxy response was provided by participants.

### **2.5.1 Example 1. Civic Engagement and Volunteerism**

In the Civic Engagement and Volunteerism survey supplement, there were two sets of closed-ended response options used in the survey; both sets offered six response options (see Appendix

A for the full questionnaire). See Figure 1 for an example of an exact match rate for a closed-ended question with six response options.

**Figure 1. Identifying Exact Matches**



Exact match rates were calculated for each question in the Civic Engagement & Volunteerism supplement, and compared among other questions with the same type of response options. See Table 1.

**Table 1. Civic Engagement and Volunteerism Exact Match Rates by Question Format (n = 56<sup>1</sup>)**

Question Response Format	Number of Questions	Average Exact Match Rate	Minimum Exact Match Rate	Maximum Exact Match Rate
All response formats	21 <sup>2</sup>	50%	21%	77%
Six-category, closed-ended	11	41%	23%	55%
Yes / No	8	69%	61%	77%
Open-ended numeric <sup>3</sup>	2	26%	21%	30%

<sup>1</sup> Twenty-one pairs were interviewed for this study so 42 participants answered questions for a proxy. Proxy responses were also collected for an additional 14 household members who lived in the same household as the pairs, but were not interviewed.

<sup>2</sup> Data from one question on giving money to charity, school, or religious organization was excluded from analysis because participants were randomized to respond to one of two versions of this question during the second round of testing.

<sup>3</sup> For one of the open-ended numeric questions, we created six categories of ranges and defined an exact match if participants' answers were within the same range. This question asked about the number of hours a household member volunteered so we thought there would be a low likelihood of an exact match. The other question asked about number of groups a household member is a part of which we thought would have a higher likelihood of an exact match.

Exact match rates from this project demonstrate that across all questions in the supplement, self and proxy responses matched slightly above half of the time, though this varied by response option format. In testing for this supplement, questions with yes / no response options elicited a higher exact match rate than questions with six-category, closed-ended response options, or open-ended numeric response options (69% vs 41% and 26%, respectively). Questions with open-ended numeric response options were associated with the lowest match rates. These findings do not come as a surprise as there is a better chance of matching on a yes/no question since there is fewer options to choose from than a six-category, closed-ended question or open-ended numeric question.

Among questions in this survey supplement, match rates varied by individual question. Across both rounds of testing, two questions in particular had match rates consistently and considerably higher than the other questions in the survey (see Table 2). Both questions, Q11 and Q13, used a yes / no response format. Additionally, the content of Q11 and Q13 may reflect more salient events which respondents may be more likely to discuss with household members. These questions ask about voting and engagement with government. It is also worth noting the timelines of this research overlapped with the 2016 presidential campaign and election, which may have made these topics even more salient.

**Table 2. Questions with the Highest Exact Match Rates, Civic Engagement and Volunteerism (n = 56)**

Question Number	Question Text	Response Options	Average Exact Match Rate
Q11	[In the past 12 months, <i>that is from [FILL CURRENT MONTH] of 2015 until today</i> ] Did [you / NAME] vote in the last local elections, such as for mayor or school board?	- Yes - No	77%
Q13	[In the past 12 months, <i>that is from [FILL CURRENT MONTH] of 2015 until today</i> ] Did [you / NAME] contact or visit a public official – at any level of government – to express [your / his / her] opinion?	- Yes - No	77%

Conversely, three questions in the Civic Engagement and Volunteerism supplement had consistently lower match rates compared to other questions included in cognitive testing (see Table 3). Among questions with the lowest match rates, none had yes / no response options. Two questions, Q15a which asked about the number of groups one belonged to and Q16b which asked about the number of hours one volunteered, both asked participants to provide an open-ended numeric response, which may have affected match rates. For Q3 which asked about providing assistance for friends or extended family members, the match rates may have been affected by participants' inability to clearly understand this question during testing. Participants struggled to understand Q3 and demonstrated a great deal of variability in their understanding of this question. For example, when participants were probed who they were thinking of when answering Q3, participants were thinking of spouses, parents, or children which is not technically considered "extended family". This variability in particular may have negatively impacted match rates.

**Table 3. Questions with the Lowest Exact Match Rates, Civic Engagement and Volunteerism (n = 56)**

Question Number	Question Text	Response Options	Average Exact Match Rates
Q3	[In the past 12 months, <i>that is from [FILL CURRENT MONTH] of 2015 until today</i> ] How often did [you / NAME] provide food, housing, money or help for friends or extended family other than [your / his / her] children, parents, and spouses, partners or significant others?	- Basically every day - A few times a week - A few times a month - Once a month - Less than once a month - Not at all	23%
Q15a	How many groups, organizations, or associations would you say [you / NAME] have belonged to over the past 12 months?	Open-ended numeric response	21%
Q16b	Approximately how many hours did [you / NAME] volunteer?	Open-ended numeric response	30%

Exact match rates were also compared for related and unrelated pairs of cognitive interviewing participants and by response option type. Related participants did not always serve as more accurate and reliable proxies than unrelated participants, based on our findings. The match rates

for the different question types in the Civic Engagement and Volunteerism supplement are presented in Table 4.

**Table 4. Civic Engagement and Volunteerism Exact Match Rates by Question Format for Household Type (n = 56)**

<b>Question Response Format</b>	<b>Number of Questions</b>	<b>Average Exact Match Rate</b>	<b>Related Participants Exact Match Rate</b>	<b>Unrelated Participants Exact Match Rate</b>
All response formats	21 <sup>4</sup>	50%	48%	52%
Six-category, close-ended	11	41%	36%	46%
Yes / No	8	69%	70%	68%
Open-ended numeric <sup>5</sup>	2	26%	29%	23%

### 2.5.2 Example 2. Computer and Internet Use

In the Computer and Internet Use survey supplement, there were only two question response formats: yes / no and closed-ended response options. See Appendix B for the Computer and Internet Use survey supplement. Exact match rates for the Computer and Internet Use supplement were calculated for only the yes/no questions using the same methods as the Civic Engagement and Volunteerism supplement. See Table 5 for more details.

**Table 5. Computer and Internet Use Exact Match Rates (n = 30<sup>6</sup>)**

<b>Question Response Format</b>	<b>Number of Questions</b>	<b>Average Exact Match Rate</b>	<b>Minimum Exact Match Rate</b>	<b>Maximum Exact Match Rate</b>
Yes / No	40	72%	36%	100%

It is important to keep in mind that the use of yes / no questions increased the chances of higher exact match rates for this supplement. There was a 72% match rate for all yes / no questions. Only four of 40 yes / no questions had an exact match rate that fell below 50%.

<sup>4</sup> Data from one question on giving money to charity, school, or religious organization was excluded from analysis because participants were randomized to respond to one of two versions of this question during the second round of testing.

<sup>5</sup> For one of the open-ended numeric questions, we created six categories of ranges and defined an exact match if participants' answers were within the same range. This question asked about the number of hours a household member volunteered so we thought there would be a low likelihood of an exact match. The other question asked about number of groups a household member is a part of which we thought would have a higher likelihood of an exact match.

<sup>6</sup> Fourteen pairs were interviewed for this study so 28 participants answered questions for a proxy. Proxy responses were also collected for an additional 2 household members who lived in the same household as the pairs, but were not interviewed.

Several questions performed well in terms of accuracy when comparing self and proxy responses. However, Q26 and Q27 about email and text messaging/instant messaging had the highest match rates (see Table 6). We speculate these questions had higher matches for two reasons. First, the qualitative data collected during testing suggested that using email, text, or instant messaging are more popular forms of technology and social interaction than some of the other forms of technology measured throughout the supplement. Additionally, if you reside in the same home as someone, you may also communicate with them through these technological platforms or have witnessed a household member use them.

**Table 6. Questions with the Highest Exact Match Rates, Computer and Internet Use (n = 30)**

Question Number	Question Text	Response Options	Exact Match Rates
Q26	[Do you/Does NAME] use email?	- Yes - No	100%
Q27	What about texting or instant messaging? [Do you/Does NAME] use text or instant messaging?	- Yes - No	97%

Alternatively, four questions in the Computer and Internet Use supplement had consistently lower match rates compared to other questions (see Table 7). The match rates for these questions fell below 50%.

For these four questions, qualitative data collected during the cognitive interviews shed some light into why participants may not have matched. Match rates were low for Q24 which asked about other cable or phone companies offering high-speed Internet service in your home, suggesting that participants recruited during testing were unsure if internet provider competition existed in the areas where they lived. The qualitative results suggest that for Q33 which ask about using the Internet to telecommute or work away from their usual workplace, people living in the same household view the ability to telework differently. For some people, it may be as simple as having to do a work assignment when they are home every once in a while, whereas other individuals believe that teleworking is something that you do on a planned, routine schedule. Self interpretations of teleworking seemed to contribute to the lower match rates for Q33. For Q44 which asked about accessing health records or health insurance records online, it was commonly reported during the cognitive interviews that medical questions are very difficult to answer on behalf of others with whom you have no familial relationship. Results from testing suggest that for Q64 which asked if anyone has subscribed to cable TV or satellite TV, participants were not considering their entire household when answering this question. They reported their answers based on their own memory of whether they had personally subscribed to cable or satellite TV in their lifetime.

**Table 7. Questions with the Lowest Exact Match Rates, Computer and Internet Use (n = 30)**

<b>Question Number</b>	<b>Question Text</b>	<b>Response Options</b>	<b>Exact Match Rates</b>
Q24	To the best of your knowledge, are there other cable or phone companies or organizations where you live that would offer high-speed Internet service installed in your home, such as cable, DSL, or fiber-optic service?	- Yes - No	36%
Q33	[Do you/Does NAME] use the Internet to telecommute or work while away from [your/his/her] usual workplace, such as working from home?	- Yes - No	37%
Q44	What about accessing health records or health insurance records online? (If needed) [Do you/Does NAME] access health records or health insurance records online?	- Yes - No	47%
Q64	[Have you/has anyone in this household] ever subscribed to cable TV or satellite TV? Do not include TV streaming subscriptions, such as Netflix, Sling TV, or Hulu.	- Yes - No	38% <sup>7</sup>

<sup>7</sup> One pair of participants did not answer this question as the interview for both participants had to be ended early.

Exact match rates compared for related and unrelated pairs of cognitive interviewing participants, and by response option type for the Computer and Internet Use supplement are presented below in Table 8.

**Table 8. Computer and Internet Use Exact Match Rates for Household Type (n = 30)**

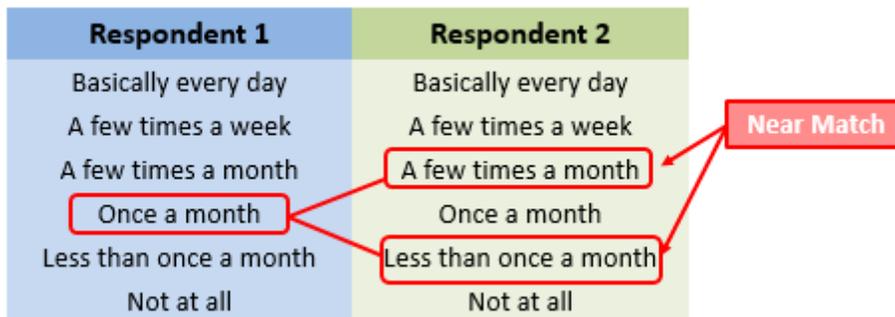
Question Response Format	Number of Questions	Average Exact Match Rate	Related Participants Exact Match Rate	Unrelated Participants Exact Match Rates
Yes/No	40	72%	69%	76%

Overall, exact match rates were higher for Computer and Internet Use questions compared to Civic Engagement and Volunteerism. The reasons may be that all of the questions for Computer and Internet Use studied were binary (yes/no) compared to Civic Engagement and Volunteerism which only had a few yes/no questions. In addition, the qualitative data suggested too that participants may have found it easier to answer questions on technology and internet use compared to questions on civic engagement and volunteerism.

## 2.6 Near Matching Responses

Near matches were calculated on all questions in the Civic Engagement and Volunteerism supplement with more than two response options (questions with yes / no response options were excluded). See Figure 2 for an example of what was considered a near match.

**Figure 2. Identifying Near Matches**



For comparison, exact match rates were also calculated for this subset of questions. The average near match rate across all questions was 27%, and the average exact match rate for the same group of questions was 39% (See Table 9). The average near match rate for questions that asked for an open-ended numeric response was lower than that of questions with six-category close-ended response options (17% vs 29%).

**Table 9. Civic Engagement and Volunteerism Near Match Rates by Question Format**

<b>Question Response Format</b>	<b>Number of Questions</b>	<b>Average Exact Match Rate</b>	<b>Average Near Match Rate</b>
Close- and open-ended questions	13	39%	27%
6-Category, close-ended	11	41%	29%
Open-ended numeric	2	26%	17%

As shown in Table 9, the percentage of comparable answers among pairs increases for all different types of questions when allowing for near matches as part of the match criteria. This potentially informs us that some participants may have knowledge of other person’s civic engagement and volunteerism behaviors but cannot exactly map it out to the correct frequency level. Calculating a near match is at the discretion of the researcher and should account for questionnaire design and goals of the research. This could especially be useful for researchers who are considering collapsing some response options prior to survey finalization / administration or during data analysis.

## **2.7 Additional Analyses**

In addition to looking at overall match rates of the survey questions, additional analyses to look at feasibility of proxy response included (1) whether perceived confidence or easiness in answering survey questions for the other household member contributed to match rates and (2) whether demographic characteristics including type of relationship between household members and education levels may be associated with both individuals within the pair being more or less likely to match. Katz and Luck (2020) found that perceived confidence or ease in answering questions for other household members may not necessarily be associated with match rates. They also found that the type of relationship and education was not really associated with whether both individuals in the pair were more likely to match on the survey questions. This will be discussed in more detail in a future paper.

## **3. CONCLUSIONS**

The success of a survey using proxy response depends heavily on the type of data being measured and the complexity of the response choices. Prior to fielding a survey instrument, it is common protocol to use pretesting such as cognitive interviews to inform researchers and other stakeholders of potential measurement concerns with survey questions. The qualitative and quantitative data collected during paired cognitive interviews can be of valuable use when proxy responses may be used in lieu of the intended respondent for a survey.

When comparing match rates between related and unrelated pairs, we found no difference. In fact, across all questions for both Civic Engagement and Volunteerism supplement and Computer and Internet Use supplement, the match rates were slightly higher for unrelated pairs. This may inform that the nature of the survey item may be more important than the relationship status in terms of data quality.

Match rates were higher for questions in the Computer and Internet Use supplement compared to the Civic Engagement and Volunteerism supplement. This may have been because the Computer and Internet Use questions analyzed were all binary (yes/no), compared to Civic Engagement and Volunteerism, where only a select few questions were binary (yes/no). Qualitative data collected during testing also suggested questions about computer and internet use may have been easier for participants to answer on behalf of the other member of the household because they were more familiar with other household member's technology use than their civic engagement and volunteerism behavior.

For a subset of Civic Engagement and Volunteerism questions that were six category and closed-ended or open-ended numeric, calculating a near match did increase the number of comparable answers among pairs and this method can be considered when determining the goals of the research and data analysis purposes.

Overall, the results from the two case studies showed that recruiting a minimum of two members from the same household, answering the same questions, can help compare the consistency of responses. The calculation of match rates and qualitative cognitive interview data help uncover which survey questions may be more challenging for proxies, and why proxies struggle with responses.

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## Appendix A. Civic Engagement and Volunteerism Supplement

**These next questions will help us understand how people in America interact with and relate to each other, as well as how we work together to make changes in our communities and country.**

1. **The first few questions focus on how you interact with family and friends in person, over the phone, or through the internet or social media.**

**In the past 12 months, that is from [FILL CURRENT MONTH] of 2015 until today, how often did you talk to or spend time with friends and family?**

[READ RESPONSE OPTIONS AS NEEDED]

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

2. [In the past 12 months,]

**How often did you discuss political, societal, or local issues with friends or family?**

[READ RESPONSE OPTIONS AS NEEDED]

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

3. [In the past 12 months,]

**How often did you provide food, housing, money or help for friends or extended family?**

[READ RESPONSE OPTIONS AS NEEDED]

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

**This next set of questions focuses on how you interact with your neighbors in person, over the phone, or through the internet or social media.**

**4. In the past 12 months, how often did you have a conversation or spend time with your neighbors?**

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

5. [In the past 12 months,]

**How often did you discuss political, societal, or local issues with your neighbors?**

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

6. [In the past 12 months,]

**How often did you and your neighbors do favors for each other?**

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

7. [In the past 12 months,]

**Did you get together with your neighbors to do something positive for your neighborhood?**

- (1) Yes
- (2) No

**8. In the past 12 months, how often did you talk to or spend time with people from a racial, ethnic or cultural background that is different than yours? This may have been in person, over the phone, or through the internet or social media.**

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

9. [In the past 12 months,]

**How often did you post your views about political, societal, or local issues on the internet or social media?**

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

10. [In the past 12 months,]

**How often did you read, watch or listen to news or information about political, societal, or local issues?**

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all

11. [In the past 12 months,]

**Did you vote in the last local elections, such as for mayor or school board?**

- (1) Yes
- (2) No

12. [In the past 12 months,]

**Did you attend a public meeting, such as a zoning or school board meeting, to discuss a local issue?**

- (1) Yes
- (2) No

13. [In the past 12 months,]

**Did you contact or visit a public official – at any level of government – to express your opinion?**

- (1) Yes
- (2) No

14. [In the past 12 months,]

**Did the social or political values of a company influence your decision of whether or not to buy products or services provided by that company?**

- (1) Yes
- (2) No

**This last set of questions focuses on local and national groups, organizations and associations that you may belong to. Examples include community groups; civic or service organizations; religious or spiritual communities; recreational groups; and political or advocacy groups.**

**Participation in these groups could be in-person, online, or both.**

**15. In the past 12 months, did you belong to any groups, organizations, or associations?**

- (1) Yes
- (2) No --- **SKIP to Q16**

**15a. How many groups, organizations, or associations would you say you have belonged to over the past 12 months?**

\_\_\_\_\_ Number of groups / organizations / associations

**[IF Q15a=0 SKIP TO Q16]**

**15a1. Thinking about the group, organization, or association with which you are most active, which best describes the proportion of your in-person activity to online activity?**

**READ ALL RESPONSE OPTIONS**

- (1) **All activity is in person**
- (2) **Activity is more in-person than online**
- (3) **Activity is evenly split between in-person and online**
- (4) **Activity is more online than in-person**
- (5) **All activity is online**
- (6) **I am a member but not active with any groups, organizations or associations.**

**16. In the past 12 months, did you volunteer for a group, organization, or association?**

- (1) Yes
- (2) No --- **SKIP TO Q17**

**16a. How often did you volunteer?**

- (1) Basically every day
- (2) A few times a week
- (3) A few times a month
- (4) Once a month
- (5) Less than once a month
- (6) Not at all --- **SKIP TO Q17**

**16b. Approximately how many hours did you volunteer?**

\_\_\_\_\_ Hours

17. [In the past 12 months,]

**Did you give money or possessions with a combined value of more than \$25 to a political organization, party, or campaign?**

- (1) Yes
- (2) No

**18. [CHOOSE EITHER VERSION 1 OR VERSION 2 FOR THE WHOLE QUESTIONNAIRE BEFORE READING.]**

[In the past 12 months,]

**[V1:] Did you give money or possessions with a combined value of more than \$25 to a non-political group or organization, such as a charity, school, or religious organization?**

**[V2:] Did you give money or possessions with a combined value of more than \$25 to any other group or organization?**

(1) Yes

(2) No

**[IF THERE ARE ADDITIONAL RESPONDENTS IN THE HOUSEHOLD GO TO THE NEXT PAGE]**

**[IF THERE ARE NO ADDITIONAL RESPONDENTS IN THE HOUSEHOLD] That brings us to the end of the survey. Thank you for participating in this survey.**

## Appendix B. Computer and Internet Use Supplement

1. This month we are asking some additional questions about the Internet, computers, mobile phones, tablets, and other Internet-connected devices. First, we will ask what types of computers and other devices [you/members of your household] currently use. Please focus on devices [you/members of your household] currently have access to, and have used at least occasionally during the past six months. We are interested in devices used at any location, whether at home, work, school, a library, or anywhere else.

2. [Do you/Does anyone in this household, including you,] use a desktop computer?  
(If needed) A desktop is a personal computer that is too large or heavy to be frequently moved from place to place.

(If yes & is multi-person household) Who is that?

1. Yes - If yes, Enter persons by line number (1-16)
2. No

3. What about a laptop or notebook? [Do you/Does anyone in this household] use a laptop or notebook computer?

(If yes & is multi-person household) Who is that?

1. Yes - If yes, Enter persons by line number (1-16)
2. No

4. What about a tablet or e-book reader, such as an iPad or Kindle? (If needed) [Do you/Does anyone in this household] use a tablet or e-book reader?

(If yes & is multi-person household) Who is that?

1. Yes - If yes, Enter persons by line number (1-16)
2. No

5. What about a smartphone, or a cell phone that connects to the Internet? (If needed) [Do you/Does anyone in this household] use a smartphone? (If yes & is multi-person household) Who is that?

1. Yes - If yes, Enter persons by line number (1-16)
2. No

6. [Do you/Does anyone in this household] use a wearable device that is connected to the Internet, such as a smart watch or fitness band? Examples include an Apple Watch or Fitbit.

(If yes & is multi-person household) Who is that?

1. Yes - If yes, Enter persons by line number (1-16)
2. No

7. [Do you/Does anyone in this household] use a smart TV, a game or video system, or another device that connects to the Internet and plays through a TV? Examples include an Xbox, Apple TV, PlayStation, Roku, or a Blu-Ray player that can access the Internet.

(If yes & is multi-person household) Who is that?

1. Yes - If yes, Enter persons by line number (1-16)
2. No

8. Next, we will ask where [you/members of your household] currently use the Internet. Please focus on places where [you/members of your household] have used the Internet at least occasionally during the past six months. People can use the Internet in many places, such as at work, school, or a library. Internet use includes a wide variety of activities, from checking email or browsing the Web to watching videos or using mobile apps. We are interested in all forms of Internet use on all devices, including the ones we just discussed.

9. [Do you/Does anyone in this household, including you,] use the Internet at home? This includes accessing the Internet with a cell phone, computer, tablet or other device. *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*

2. No

**If anyone in the household is employed, go to Q10. below  
Else go to Q11. on page 3**

10. What about at work? [Do you/Does anyone in this household] use the Internet at work? *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*

2. No

11. What about at school? [Do you/Does anyone in this household] use the Internet at school? Please count students only, and do not include online classes. *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*

2. No

12. What about at a coffee shop or other business that offers Internet access? *(If needed)* [Do you/Does anyone in this household] use the Internet while at a coffee shop or other business that offers Internet access? *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*

2. No

13. What about while going from one place to another? Examples include using the Internet while riding public transit, or using the GPS on your cell phone while driving. *(If needed)* [Do you/Does anyone in this household] use the Internet while going from one place to another? *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*

2. No

14. What about at a library, community center, park, or other public place? *(If needed)* [Do you/Does anyone in this household] use the Internet at a library, community center, park, or other public place? *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*

2. No

15. What about at someone else's home? *(If needed)* [Do you/Does anyone in this household] use the Internet at someone else's home? *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*
2. No

16. [Do you/Does anyone in this household] use the Internet at some other location we haven't covered? *(If yes & is multi-person household)* Who is that?

1. Yes - If yes, *Enter persons by line number (1-16)*
2. No

**If 1 or more persons does not use the Internet, go to Q17. below**

**If ALL persons go online anywhere, go to page 5**

**If no one uses the internet, go to Q53. on page 12**

17. Based on your responses, it sounds like *(list names where all IN\* != 1)* [does/do] not use the Internet. [Does/Do] [he/she/these people in your household] use the Internet from any location, and for any purpose? *(If additional users)* Who uses the Internet from any location, and for any purpose?

*Fill appropriate lines if necessary; locations of use will be allocated*

**If someone uses the internet, go to page 5.**

**If no one uses the internet, go to Q53. on page 12**

Next, we are interested in learning about the specific technologies households use to go online. Please focus on how your household as a whole connects to the Internet.

18. [Do you/Does anyone in this household] access the Internet using a data plan for a cell phone, smartphone, tablet, mobile hotspot, or other device?

This type of Internet service is provided by a wireless carrier, and may be part of a package that also includes voice calls from a cell phone or smartphone.

1. Yes
2. No

**If anyone goes online at home and household has a mobile data plan, go to Q19. below.**

**If anyone goes online at home but does not have a mobile data plan, go to Q20. below**

**Else go to Q25. on page 7**

19. In addition to [your/your household's] mobile Internet service or data plan, we are interested in whether [you/your household] also use[s] any other type of Internet service when at home.

**Go to Q21. below**

20. You mentioned that [you/someone in this household/members of this household] use[s] the Internet at home.

21. I am going to read a list of ways that people access the Internet from their homes, other than a mobile data plan. At home, [do you/does anyone in this household] access the Internet using:

*Read and select all that apply*

**1. High-speed Internet service installed at home, such as cable, DSL, or fiber-optic service?**  
*(If needed) This type of Internet service is often provided by a cable company or phone company.*

- 1. Yes
- 2. No

**2. Satellite Internet service? This type of Internet connection is received through a satellite dish.**

- 1. Yes
- 2. No

**3. Dial-up service?**

- 1. Yes
- 2. No

**4. Some other service?**

- 1. Yes **(Go to Q22. below)**
- 2. No **(Go to Q23. below)**

**22. What other service?**

*Enter verbatim response*

**23. Thinking about the company or organization that provides your home Internet service, who provides your Internet service?**

*Read and select all that apply*

**1. Internet service is provided by a company that sells Internet service, such as a cable or phone company.**

- 1. Yes
- 2. No

**2. Internet service is provided by a public agency, nonprofit, or cooperative that sells Internet service.**

- 1. Yes
- 2. No

**3. Internet service is provided for the entire apartment building, condominium, campus, or other community and included in housing costs.**

- 1. Yes
- 2. No

**4. Internet service is publicly available and provided at no charge.**

- 1. Yes
- 2. No

**5. Internet service is provided through some other method.**

- 1. Yes
- 2. No

**24. To the best of your knowledge, are there other companies or organizations where you live that would offer high-speed Internet service installed in your home, such as cable, DSL, or fiber-optic service? *(If needed) This type of Internet service is often provided by a cable company or phone company.***

- 1. Yes
- 2. No

**\*\* Ask Q25 – Q46 for 1st HH member. Then ask for next HH member. Repeat for no more than 2 additional household members.**

**25.** We are interested in learning about the applications and services people commonly use with the Internet. Consider how [you personally/NAME] currently use[s] the technologies we've been discussing, whether at home or any other location. Please focus on activities [you have/NAME has] done online at least occasionally during the past six months, using an Internet-connected device such as a computer, tablet, or cell phone.

**26.** [Do you/Does NAME] use email?

1. Yes
2. No

**27.** What about texting or instant messaging? [Do you/Does NAME] text or use instant messaging?

1. Yes
2. No

**28.** What about using social networks, such as Facebook, Twitter, Snapchat, or Instagram? *(If needed)* [Do you/Does NAME] use social networks?

1. Yes
2. No

**29.** In the past six months, [have you/has NAME] participated in video or voice calls or conferencing over the Internet, such as with Skype or FaceTime? *(If needed)* [Do you/Does NAME] participate in video or voice calls or conferencing?

1. Yes
2. No

**30.** What about streaming or watching videos? [Do you/Does NAME] watch videos over the Internet? Examples include YouTube and Netflix.

1. Yes
2. No

**31.** What about streaming or downloading music, radio programs, or podcasts? *(If needed)* [Do you/Does NAME] stream or download music, radio programs, or podcasts?

1. Yes
2. No

**32.** What about posting or uploading blog posts, original videos, or other content that [you/NAME] created? Do not include photos or videos taken for personal use and shared to social media. *(If needed)* [Do you/Does NAME] publish or upload original content that [you/NAME] created to the Internet?

1. Yes
2. No

**If employed, go to Q33. below**  
**If unemployed, go to Q34. below**

**33.**[Do you/Does NAME] use the Internet to telecommute or work while away from [your/his/her] usual workplace?

1. Yes
2. No

**34.**In the past six months, [have you/has NAME] used the Internet to search or apply for a job? *(If needed)* [Do you/Does NAME] use the Internet to search or apply for a job?

1. Yes
2. No

**35.**What about online classes or job training? *(If needed)* [Do you/Does NAME] use the Internet for educational classes or job training?

1. Yes
2. No

**36.** What about requesting services provided by other people, for example hailing a ride using Uber or Lyft, or reserving a room through Airbnb? *(If needed)* [Do you/Does NAME] use the Internet to request services provided by other people?

1. Yes
2. No

**37.** What about offering [your/his/her] own services for sale via the Internet? Examples include offering rentals on Airbnb and driving for Uber or Lyft. Do not include any goods or possessions sold online, such as clothing, shoes, or crafts. *(If needed)* [Do you/Does NAME] offer [your/his/her] own services for sale via the Internet?

1. Yes
2. No

**38.**[Do you/Does NAME] use the Internet to sell goods? Examples include selling items on Etsy or eBay.

1. Yes
2. No

**39.**In the past six months, [have you/has NAME] used the Internet for online shopping, travel reservations, or other consumer services on the Internet? *(If needed)* [Do you/Does NAME] use the Internet for online shopping, travel reservations, or other consumer services?

1. Yes
2. No

**40.** [Do you/Does NAME] use the Internet for financial services such as banking, investing, or paying bills online?

1. Yes
2. No

**41.** What about interacting with household equipment or appliances that are connected to the Internet, such as a connected thermostat, light bulb, or security system? *(If needed)* [Do you/Does NAME] use the Internet to interact with household equipment or appliances?

1. Yes
2. No

I'm going to ask a couple of questions about how [you have/NAME has] used the Internet for health-related activities during the past six months.

**43.** What about communicating with a doctor or other health professional using the Internet? *(If needed)* [Do you/Does NAME] communicate with a doctor or other health professional using the Internet?

1. Yes
2. No

**44.** What about accessing health records or health insurance records online? *(If needed)* [Do you/Does NAME] access health records or health insurance records online?

1. Yes
2. No

**45.** [Do you/Does NAME] research health information online, such as with WebMD or similar services?

1. Yes
2. No

**46.** [Do you/Does NAME] use an electronic health monitoring service that collects and sends data to [your/his/her] doctor or health care provider through the Internet? Examples include connected devices that monitor vital statistics, blood glucose levels, or blood pressure.

1. Yes
2. No

**\*\* Repeat Q25-Q46 for next HH member**

**47.** *(If multi-person household)* Our remaining questions are about your household as a whole. We are interested in learning generally, without identifying specific people, what challenges your household has had while using the Internet.

*(If single-person household)* We are interested in learning what challenges you have had while using the Internet.

**48.** During the past year, have concerns about privacy or security stopped [you/anyone in this household] from doing any of these activities online:

*Read and select all that apply*

1. **Conducting financial transactions such as banking, investing, or paying bills online?**
  1. Yes
  2. No
2. **Buying goods or services online?**
  1. Yes
  2. No
3. **Posting photos, status updates, or other information on social networks?**
  1. Yes
  2. No
4. **Expressing an opinion on a controversial or political issue on a blog or social network, or in a forum, email or any other venue?**
  1. Yes
  2. No
5. **Searching for information using a platform such as Google Search, Yahoo Search, Microsoft Bing, or another web search engine?**
  1. Yes
  2. No

**49.**Overall, what concerns [you/members of this household] the most when it comes to online privacy and security risks?

*Do not read; select all that apply and/or enter verbatim response if other*

1. Identity theft
2. Credit card or banking fraud
3. Data collection or tracking by online services
4. Data collection or tracking by government
5. Loss of control over personal data such as email or social network profiles
6. Threats to personal safety, such as online harassment, stalking, or cyber-bullying
7. No concerns
8. Other: \_\_\_\_\_

**50.**During the past year, [have you/has any member of your household] been affected by an online security breach, identity theft, or a similar crime?

1. Yes
2. No

**51. CBULLY** During the past year, [have you/has any member of your household] experienced online harassment, stalking, or cyber-bullying?

1. Yes
2. No

**If anyone goes online at home & any location outside of the home, go to page 17**

**If anyone goes online at home but nowhere else, go to page 15**

**If anyone does not use internet at home go to Q52. below**

52. You previously mentioned that [you/members of your household] use the Internet in some places, but not at home.

**Go to Q54. EVRHOM below**

53. *(If multi-person household)* Our remaining questions are about your household as a whole. We are interested in learning why households such as yours do not use the Internet.

*(If single-person household)* For our remaining questions, we are interested in learning why you do not use the Internet.

54. [Have you/Has anyone in this household] ever used the Internet from home?

1. Yes
2. No

55. **NOHM** What are the reasons why [you/members of your household] do not use the Internet at home?

*Do not read; select all that apply and/or enter verbatim response if other*

1. Don't need it
2. Not interested
3. Can't afford it
4. Not worth the cost
5. Can use it elsewhere
6. Not available in area
7. No computing device, or device inadequate or broken
8. Online privacy or cybersecurity concerns
9. Personal safety concerns
10. Household moved or is in the process of moving
11. Other: \_\_\_\_\_

**If more than one response given, go to Q56. below**

**Else go to Q57. on page 14**

56. Of the reasons you just listed for not going online at home, which [do you/does your household] consider to be the most important?

*Read previous responses if needed; select best match and/or enter verbatim response if other*

1. Don't need it
2. Not interested
3. Can't afford it
4. Not worth the cost
5. Can use it elsewhere
6. Not available in area
7. No computing device, or device inadequate or broken
8. Online privacy or cybersecurity concerns
9. Personal safety concerns
10. Household moved or is in the process of moving
11. Other: \_\_\_\_\_

57. Would [you/your household] buy home Internet service if it were offered at a lower price?
1. Yes
  2. No

**If anyone goes online anywhere, go to page 17**

**Else go to page 15**

You previously mentioned that [you/members of your household] use the Internet at home, but not at other locations.

59. [Have you/Has anyone in this household] ever used the Internet from a location other than home?

1. Yes
2. No

60. What are the reasons why [you/members of your household] do not use the Internet outside the home?

*Do not read; select all that apply and/or enter verbatim response if other*

1. Don't need it
2. Not interested
3. Can't afford it
4. Not worth the cost
5. Nowhere to go that has it
6. No computing device, or device inadequate or broken
7. No mobile device, or mobile device inadequate or broken
8. Online privacy or cybersecurity concerns
9. Personal safety concerns
10. Household moved and is no longer near previous Internet use location
11. Other: \_\_\_\_\_

**If more than one NOOU response given, go to Q61. on page 16**

**Else go to page 17**

61. Of the reasons you just listed for not going online outside the home, which [do you/does your household] consider to be the most important?

*Read previous responses if needed; select best match and/or enter verbatim response if other*

1. Don't need it
2. Not interested
3. Can't afford it
4. Not worth the cost
5. Nowhere to go that has it
6. No computing device, or device inadequate or broken
7. No mobile device, or mobile device inadequate or broken
8. Online privacy or cybersecurity concerns
9. Personal safety concerns
10. Household moved and is no longer near previous Internet use location
11. Other: \_\_\_\_\_

Our last few questions are about the use of cable TV and satellite TV services not accessed through the Internet.

**63. TRADTV** [Do you/Does anyone in this household] subscribe to a cable TV or satellite TV? Do not include TV services accessed through the Internet, such as Netflix, Sling TV, or Hulu.

1. Yes **(End Interview)**
2. No **(Go to Q64. below)**

**64. PREVTV** [Have you/has anyone in this household] ever subscribed to cable TV or satellite TV? Do not include TV services accessed through the Internet, such as Netflix, Sling TV, or Hulu.

1. Yes
2. No

**65. NOTV** What are the reasons why [you/members of your household] do not subscribe to a service providing access to TV channels?

*Do not read; select all that apply and/or enter verbatim response if other*

1. Using Internet-based video services instead
2. Don't need it
3. Not interested
4. Can't afford it
5. Not worth the cost
6. Can watch at another location
7. Can watch using an antenna
8. Not available in area
9. No television, or television inadequate or broken
10. Household moved or is in the process of moving
11. Previously experienced poor customer service
12. Previously experienced poor quality
13. Other: \_\_\_\_\_

**End Interview**