Background

Research consistently demonstrates that survey design elements can impact, for better or worse, how a respondent processes and responds to survey questions. Some survey design elements explored in the past have included inclusion and placement of images (Couper, Tourangeau, and Kenyon, 2004), the use of color (Baker and Couper, 2007), the use of progress indicators (Yan, Conrad, Couper, Tourangeau, 2007), and the use of eye images (Miller & Jeavons, 2008).

In recent years, survey research professionals have focused intensely on improving the quality of data derived from web interviewing and online panels by altering different survey design elements. Lately, the use of red herring questions has become a popular and effective means of identifying strong satisficing behaviors of online survey respondents. These types of questions, also called “trap questions,” are inserted in online surveys to make respondents demonstrate that they have carefully processed and responded to a survey question. Research indicates that failure on a trap question, such as a “mark a 2” statement embedded in an attribute battery, is highly correlated with strong satisficing (Miller, 2006). However, some debate has ensued in the research community about whether such red herring questions demonstrate a lack of respect for the survey respondent because such questions seem so trivial for a respondent who is giving full attention to the task. For this reason, some argue that quality traps and indicators should not be visible to the respondent.

A less conspicuous approach to trapping has been discussed by other researchers. For example, Smith (2003) suggests that a mix of both positively and negatively worded statements in an attribute battery might lead respondents to more carefully read and consider each statement before providing a response.

Extending work on red herring questions and their impact on data quality, Miller and Jeavons (2008) found support for the hypothesized positive effect of trap questions. Their research showed that contrary to popular opinion, data quality can actually improve as a survey progresses. When four trap questions were placed at fairly equal intervals in a battery of 139 statements, fewer respondents failed the last trap question than failed the first such question (Figure 1). Could the mere presence of a trap question cause a respondent to pay greater attention? The research reported here sheds light on that question.
Objectives

Based on existing findings regarding the reduction of respondent satisficing in surveys, we hypothesized that the mere presence of trap questions, when noticed by a respondent, signals that the study sponsor has high expectations about the respondent effort required to complete the survey. The message to the survey respondent is “you can’t skate by with minimal effort on this survey.” Some respondents who otherwise might do a poor job of answering the survey questions will terminate the survey when they see that steps have been taken to improve data quality. For other respondents, this quality expectation signal might cause them to be more engaged during the survey and to pay greater attention to the questions being asked of them.

Three design elements were examined in this research to determine whether trap questions can increase respondent attention and therefore deter respondents from mindless responding that jeopardizes data quality. The following design elements were examined:

- **Inclusion of a survey item directive to give a particular response at the beginning of a statement battery (i.e., a “mark a 2” item)** – Upon reading such a directive early in a battery, respondents could become more attentive because they anticipate other directives. This item represents a fairly conspicuous trap for or deterrent to satisficing behavior.

- **Inclusion of a “reverse worded” pair of statements near the beginning of a statement battery** – Having opposing responses to these items would suggest that the respondent is paying attention to the content of the statements. Here, the reverse wording represents a less conspicuous trap or deterrent to mindless responding.

- **Before the first statement battery, insertion of text urging respondents to be mindful of their responses while completing the survey, and asking them to agree to be attentive during the survey (“opt in”).** – Emphasizing the importance of accurate survey responses could heighten attentiveness during survey completion.

Method

For this research, 1,201 members of a national consumer panel completed a survey regarding their job satisfaction and engagement. Like many questionnaires used in survey research, this survey included several grids of items, which is a format that can elicit satisficing behavior.
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The main body of the questionnaire consisted of 109 agreement ratings using the following five-point scale:

1 – Strongly Disagree
2 – Disagree
3 – Neutral
4 – Agree
5 – Agree Strongly

The 1,201 respondents were randomly assigned to one of four cells:

- Cell 1: A control group with no manipulations
- Cell 2: Inclusion of a “mark a 2” survey item at the beginning of the first statement battery (a highly conspicuous trap question)
- Cell 3: Inclusion of a “reverse worded” pair of statements near the beginning of a statement battery (a less conspicuous trap question)
- Cell 4: Specific request for engaged and thoughtful responding (including an opt-in agreement)

The Appendix contains images showing more detailed descriptions of the surveys used for these four study cells.

On average, the survey took 17 and a half minutes to complete. Data were collected in October, 2008.

Research Findings

Various dependent measures were examined to explore whether the different cell conditions were effective in deterring respondents from mindless responding:

- Elapsed survey time
- Completion rates
- Speeding
- Failure to comply with “mark a 2” directives
- Straightlining
- Mental cheating
- Strength of association between specific items and criterion questions

**Elapsed survey time.** Figure 2 shows that on average, respondents asked to mark a “2” as the very first survey items spent slightly more time completing the survey compared to respondents in other cells.
**Completion rates.** Completion rates did not differ substantially by study cell (Figure 3).

![Completion Rates](https://via.placeholder.com/525x354.png)

*Source: Burke R&D, 2009*

**Speeding.** Recall that the average time it took for respondents to complete the survey was about 17 and a half minutes. Ten percent of control group respondents completed the survey in a mere seven minutes (Figure 4). However, only 5% of respondents in the “mark a 2” cell completed the survey this quickly. While the reverse wording and opt-in agreement cells had a smaller portion of speeders than the control cell, the effects of these two survey design elements pale in comparison to that of the “mark a 2” directive.

![Incidence of Unusually Fast Survey Completion (Speeders)](https://via.placeholder.com/525x354.png)

*Source: Burke R&D, 2009*

Speeders defined as those who completed the survey in less than seven minutes.
**Failure to comply with “mark a 2” directives.** As previously discussed, the current research extends the use of trap or red herring questions from simply flagging satisficing respondents to deterring satisficing behavior during the survey. Thus, in this research, one cell of respondents (Cell 2) saw a “mark a 2” directive at the beginning of the attribute battery, but ALL respondents encountered two “mark a 2” survey items in the body of the survey. Respondent compliance or failure on these latter “mark a 2” items can suggest the degree to which a survey taker is engaged and mindfully responding.

Failure rates on the individual “mark a 2” directives exhibit the same patterns shown by the incidence of speeding across the four study cells: Respondents in the “mark a 2” cell had substantially lower failure rates, while respondents in both the reverse wording and opt-in agreement cells had failure rates similar to respondents in the control group (Figures 5 and 6).

### Figure 5.
**Failure Rate of the First “Mark a 2” Test (Q40)**
Specific question in the attribute battery that says “please mark response number 2”
(1 to 5 agreement scale)

<table>
<thead>
<tr>
<th></th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Cell</td>
<td>21</td>
</tr>
<tr>
<td>Mark a 2</td>
<td>11</td>
</tr>
<tr>
<td>Reverse Wording</td>
<td>17</td>
</tr>
<tr>
<td>Opt-In Agreement</td>
<td>20</td>
</tr>
</tbody>
</table>

Item read: “Please verify where you are in the survey by marking a “2” for this item.”
Source: Burke R&D, 2009

### Figure 6.
**Failure Rate of the Second “Mark a 2” Test (Q83)**
Specific question in the attribute battery that says “please mark response number 2”
(1 to 5 agreement scale)

<table>
<thead>
<tr>
<th></th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Cell</td>
<td>21</td>
</tr>
<tr>
<td>Mark a 2</td>
<td>12</td>
</tr>
<tr>
<td>Reverse Wording</td>
<td>20</td>
</tr>
<tr>
<td>Opt-In Agreement</td>
<td>21</td>
</tr>
</tbody>
</table>

Item read: “Please verify where you are in the survey by marking a “2” for this item.”
Source: Burke R&D, 2009
The pattern remains when examining failure rates to at least one or both subsequent “mark a 2” survey items.

**Figure 7.**

**Failure Rate of the “Mark a 2” Test**

Specific question in the attribute battery that says “please mark response number 2”

(1 to 5 agreement scale)

- **Missed AT LEAST ONE Mark a 2 Question**
  - Control Cell: 25%
  - Mark a 2: 15%
  - Reverse Wording: 21%
  - Opt-In Agreement: 25%

*Speeders defined as those who completed the survey in less than seven minutes.*

*Source: Burke R&D, 2009*

**Figure 8.**

**Failure Rate of the “Mark a 2” Test**

Specific question in the attribute battery that says “please mark response number 2”

(1 to 5 agreement scale)

- **Missed BOTH Mark a 2 Questions**
  - Control Cell: 18%
  - Mark a 2: 8%
  - Reverse Wording: 15%
  - Opt-In Agreement: 16%

*Speeders defined as those who completed the survey in less than seven minutes.*

*Source: Burke R&D, 2009*
Furthermore, failure on what typically have been used as trap questions is associated with poor response quality later in the survey. Among the respondents in Cell 2 (i.e., those who saw a red herring question as the first grid item) who missed that initial directive (4%):

- Eighty-three percent missed the next “mark a 2” question
- Fifty-eight percent missed both subsequent “mark a 2” questions

Similarly, among the respondents in Cell 3 (i.e., those who saw an item and its reverse in the first grid) who did not respond consistently to these two items (15%):

- Thirty-six missed the first “mark a 2” question
- And, in fact, all 36% of these respondents missed both subsequent “mark a 2” questions
Thus, respondents who do not pay enough attention to comply with the initial survey directive are likely to remain inattentive throughout the survey. Accordingly, there might continue to be trapping value in the red herring question even when such items are included principally to improve the quality of responses.

**Straightlining.** Other evidence of respondent inattention comes in the form of straightlining, which occurs when respondents choose the same survey rating for all or many items in a set. Again, results from the current research suggest that this “symptom” of mindless responding is less prevalent among respondents in the “mark a 2” study cell, regardless of whether attribute grids early in the survey (Figure 11) or late in the survey (Figure 12) are examined.

**Figure 11.** Percent Giving the Same Response to the First 14 Agreement Ratings (i.e., straightlining)

![Figure 11](Source: Burke R&D, 2009)

**Figure 12.** Percent Giving the Same Response to a Page of 17 [Q90-Q101] Agreement Ratings (i.e., straightlining)

![Figure 12](Source: Burke R&D, 2009)
Mental cheating. Burke’s proprietary algorithm was applied to data from this research to detect the incidence of mental cheating among respondents in different cells. As found for other measures of inattentiveness, the incidence of mental cheating is lower among respondents in the “mark a 2” cell than among respondents in the other cells (Figure 13).

![Incidence of Mental Cheating](image13.png)

Source: Burke R&D, 2009

Strength of association between specific items and criterion questions. Finally, regressions models were run to determine how well the survey attributes predicted relevant outcome variables. Figure 14 shows that data from the three treatment cells had higher $R^2$ values than did data from the control cell. A higher incidence of random responding could explain the lower $R^2$ value for model based on control cell data.

![Relationship Between Specific Statements and Career Fulfillments (as measured by $R^2$)](image14.png)

Source: Burke R&D, 2009
Conclusions

The existence of undesirable respondents, particularly strong satisficers, is caused by many factors. Among other actions, researchers can reduce satisficing by increasing respondent motivation and attention.

This research suggests that survey quality can be enhanced when particularly conspicuous trap questions (directives) are placed early in a survey.

- Respondents took longer to complete the survey.
- Fewer respondents sped through the survey.
- They were less likely to straightline.
- They were less likely to miss subsequent trap questions.
- Respondents exhibited less evidence of "mental cheating."
- Their responses evidenced a higher association with a criterion measure.

More subtle traps questions, such as a pair of reverse worded statements, were not as effective as more conspicuous red herrings.

In this research, an opt-in statement agreeing to thoughtful and engaged responding did not produce significantly higher quality data.

- The content comprising text interventions might not be read by respondents, even though it appeared on its own page in this research.
- Seasoned survey respondents like panelists who are comfortable navigating surveys without relying on instructions, might simply skate through this sort of intervention.

While more research is warranted, there is some indication that red herring questions have two types of value – as a deterrent, and as a trap.

- The deterrent aspect is enhanced through conspicuousness, while the trapping aspect may be better served through more subtle means.
- Instead of trying to identify poor quality respondents after the fact, we can induce respondents to provide higher quality data at the outset.

Perhaps our efforts should now be focused on ensuring high quality responses, and not on identifying new and more inconspicuous means of trapping respondents whose responses are not genuine. Importantly however, researchers must ensure that actions taken to enhance the quality of responses occur without introducing systematic, undesirable bias into survey data.
Appendix

**Cell 1: Control**

No manipulations were made to the survey for respondents in Cell 1.

**Cell 2: Mark a “2”**

The first attribute in the first grid in the survey for this cell was the following item: Please mark a “2” for this item to begin this portion of the survey.

**Cell 3: Reverse wording**

Item two in the first attribute grid for Cell 3 respondents read “I doubt what is communicated by my organization’s top leadership.” The last item in this same grid was “I believe what is communicated by my organization’s top leadership.”

**Cell 4: Opt-in agreement**

The survey completed by respondents in Cell 4 included a page that preceded the first attribute grid. Respondents were asked to click “Yes” or “No” after reading the following text: Honest and thoughtful answers to surveys are vital to the integrity of marketing research. We and our clients require factual information in order to make important decisions that affect the products and services offered not just to you, but also to people you know, and consumers in general. Please click “Yes” if you agree to think carefully about each survey question and provide thoughtful, accurate, and honest responses.”
Beyond ‘Trapping’ the Undesirable Panelist: 
The Use of Red Herrings to Reduce Satisficing

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