

Grappling with Grids: How Does Question Format Affect Data Quality and Respondent Engagement?

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Abstract

An ongoing concern over survey quality with focus on online sampling and survey design demands a broad analysis of all components of the process. To identify what matters and to what degree it impacts survey data quality, it is necessary to take all the individual components of this broad perspective and break them down into specific parts taking special care to look within each area for potential quality drivers.

We know online sample can be managed improperly and lead to biased results. We know survey design can be done improperly and skew responses. We know the interview length with online surveys can lead to satisficing or incomplete response, higher drop-out rates, and less satisfaction with the online survey respondent experience. We know there are many components to providing quality and we strive to do what we can as an industry to effectively determine adequate procedural guidelines as we forge ahead with online survey research. For the purpose of this research we have presented findings related to respondent engagement with particular attention paid to the role of grids in the research design and its impact on quality.

Our research findings are from a large internal R&D project conducted with our proprietary online research panel, Viewpoint Forum. In this research we conduct a multi-cell test to identify alternate ways of presenting attributes and the effect of the alternatives on data quality and respondent engagement. Key findings suggest a specific approach to survey design to maximize both data quality and engagement.

Key Words: Grids, Respondent Engagement, Data Quality

1. Introduction and Background

Question grids have long been the standard for public opinion and market research industries. Rather than considering other possible questionnaire design options, we continue with the standard. In the era of paper and pencil surveys, grids were preferred because they were easy to administer. As we moved into web research, grids were still easier to use – the programming time required is minimal and the online interview length is shorter. But is presenting a series of questions in a grid format really the best way to go about collecting information from respondents?

Today the industry is becoming increasingly concerned with respondent experience and data quality. The traditional ways of doing things are coming under question. Whereas before we were concerned with time spent writing and programming questionnaires, today we are concerned with issues of respondent engagement and potential satisficing – that is, are questionnaires written in a way to maximize an accurate representation of respondents' viewpoints?

Researchers have recently begun reconsidering the costs and benefits of long question grids. Jon Puleston and Deborah Sleep (2008) noted that it's more difficult for respondents to remain engaged in web surveys – there is no live person on the other end to establish an emotional connection with. Their research found that grid questions trigger dropout more than any other question format and that respondents spend less time considering their responses to repetitive questions.

In addition to concerns about the respondent experience, a 2009 research project conducted by the Survey Sampling Institute produced an even more alarming finding – that question grids produce bad data. Nate Hardy (2009) mirrored this finding in his conclusion that respondents were more likely to engage in straightlining behaviors in order to get the survey over with. He suggested breaking long lists of questions into smaller sections, preferably continuing them over multiple screens. This finding was mirrored by Steve Davis and Jennifer Drolet's 2009 research. Their follow-up qualitative feedback also indicated that respondents prefer shorter grids of questions and that data quality suffered in the presence of long grids.

With the assumption being that a more engaged respondent is likely to provide more thoughtful answers and therefore a higher level of quality data, it makes sense to analyze the components of research instruments to see how best to produce a higher level of engagement. The appropriate presentation and utilization of grids within the framework of an online survey is an important contributor to respondent engagement and data quality. This paper intends to illustrate how to best present grids within an online survey instrument to maximize respondent engagement and influence data quality while also minimizing respondent fatigue.

2. Design & Methodology

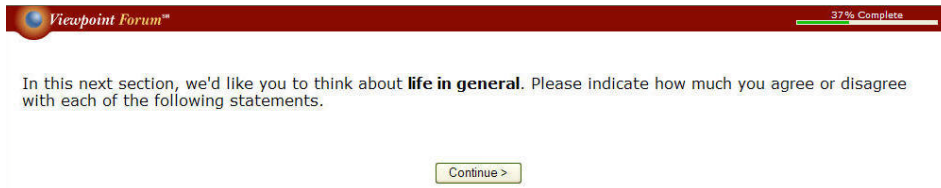
For the purposes of this research we selected the paper-towel category because of its wide reach. We screened for respondents aged 18-65 who were not competitively employed, did at least half of the household grocery shopping, and purchased paper towels at least once in the past three months. Online interviews were conducted during March and April of 2009 using MarketVision's proprietary Internet research panel, Viewpoint Forum. A total of 1,098 respondents qualified for and completed the survey.

The questions used to test the grid section were placed in the context of a generic survey about purchase habits. The attributes included agreement statements about life in general and shopping habits. A section of them was designed specifically to allow us to test for correlations between opposing statements.

Each respondent was placed into one of four cells. Each cell was presented with different question formats. All four cells were balanced on gender, age, education, income, and ethnicity.

Cell 1	Cell 2	Cell 3	Cell 4
1 Per Screen	Traditional Grid	Split Grid	Multiple Per Screen
n=276	n=274	n=275	n=273

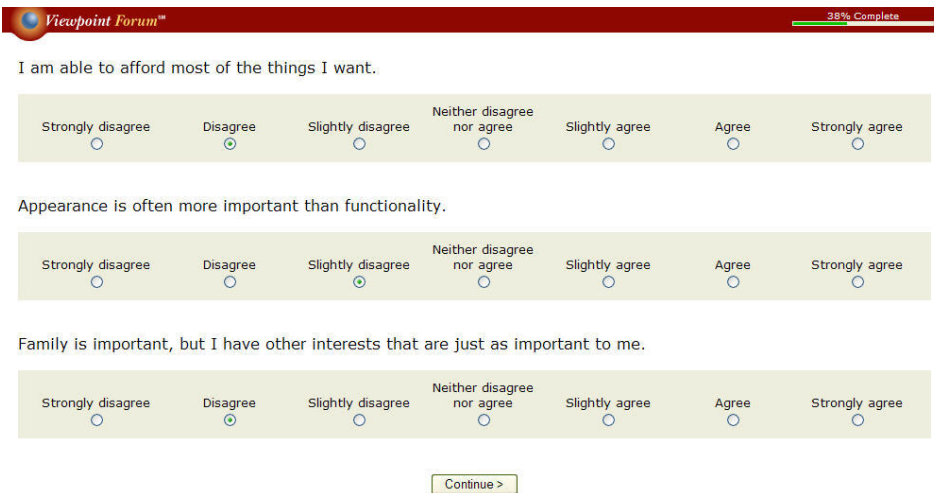
Respondents in Cells 1 and 4 did not see questions in the traditional grid format. Respondents in Cell 1 saw each question on an individual screen. Respondents in Cell 4 saw multiple questions per screen, but they were presented as individual questions rather than as a bank of questions.



Cell 1:



Cell 4:



Respondents in Cells 2 and 3 saw questions in grids. Respondents in Cell 2 saw the questions in the traditional grid format, as a long list of attributes with radio buttons to the right. For respondents in Cell 3, the questions were separated into smaller grids and spread across multiple screens.

Cell 2:

Viewpoint Forum™ 37% Complete

In this next section, we'd like you to think about **life in general**. Please indicate how much you agree or disagree with each of the following statements.

	Strongly disagree	Disagree	Slightly disagree	Neither disagree nor agree	Slightly agree	Agree	Strongly agree
Appearance is often more important than functionality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to afford most of the things I want.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer a routine way of life to one full of change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, I have the time to do the things that are important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had to make a trade-off, I'd choose the happiness of others over my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family is important, but I have other interests that are just as important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Slightly disagree	Neither disagree nor agree	Slightly agree	Agree	Strongly agree

[Continue >](#)

Cell 3:

Viewpoint Forum™ 37% Complete

In this next section, we'd like you to think about **life in general**. Please indicate how much you agree or disagree with each of the following statements.

	Strongly disagree	Disagree	Slightly disagree	Neither disagree nor agree	Slightly agree	Agree	Strongly agree
I prefer a routine way of life to one full of change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had to make a trade-off, I'd choose the happiness of others over my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to afford most of the things I want.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Following the general questionnaire items, respondents were asked a series of questions about their liking and interest in the survey, including two open-ended questions, to capture details of why they liked or disliked the survey.

A week after the survey was completed, we selected 25 respondents to participate in an online community panel dedicated to discussing the survey experience. Nineteen of the invited respondents continued on to participate in the panel.

3. Results & Conclusions

3.1 Respondent Experience

Among the four cells, respondents who saw multiple questions per screen (Cell 4) gave the survey the highest liking percentage.

Which of the following best describes how you much you liked or disliked this survey?

	1 Per Screen (a)	Traditional Grid (b)	Split Grid (c)	Multiple Per Screen (d)
I disliked this survey	1%	2%	4% ABD	0%
I neither liked nor disliked this survey	26%	26%	16% AB	19% AB
I liked this survey	73%	72%	79% ab	80% AB
Mean	2.7	2.7	2.7	2.8 AB

* uppercase letters indicate significant difference ($p \leq .05$)

* lowercase letters indicate significant difference ($p \leq .10$)

In addition, respondents in Cell 4 were more likely to rate the survey as very or somewhat interesting and to report being very or somewhat thoughtful while choosing their responses.

Which of the following best describes how interesting or uninteresting you thought the survey was?

	1 Per Screen (a)	Traditional Grid (b)	Split Grid (c)	Multiple Per Screen (d)
Mean	4.0	4.0	4.1	4.2 ABC
Top two	76%	77%	81%	86% AB
Bottom two	4%	6%	5%	3% b

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* lowercase letters indicate significant difference ($p \leq .10$)

In general, how thoughtful were you when choosing responses to this survey?

	1 Per Screen (a)	Traditional Grid (b)	Split Grid (c)	Multiple Per Screen (d)
Mean	4.7	4.7	4.6	4.8 Ca
Top two	96%	96%	95%	99% Ca
Bottom two	1%	0%	0%	0%

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When probed, many respondents specifically mentioned the lack of long grids as a positive aspect of the survey.

- "It asked a variety of questions in different formats (short answer, ranking, etc)." – Cell 4 (Multiple Questions per Screen)
- "Do more like this one. I was impressed that all the questions could be seen without having to keep scrolling back and forth over the screen to see the answers." – Cell 4 (Multiple Questions per Screen)
- "I prefer this format to the extended format with over 10 questions/responses per page." – Cell 4 (Multiple Questions per Screen)

Respondents in the cells that did not include long question grids (Cells 1 and 3) also specifically mentioned liking the question format in their open-ended responses.

- “I liked the category, and there weren’t too many lengthy and long questions where I had to fill in a ton of bubbles.” – Cell 3 (Split Grid)
- “the survey grids were better than in the past.” – Cell 3 (Split Grid)
- “Easy to take, not too many questions per page.” – Cell 3 (Split Grid)
- “It was a survey.....better than some....I don’t care for the long pages or columns and you didn't have many and what you did have weren’t that long. This is good.” - Cell 1 (1 attribute per screen)

These findings were further bolstered by respondent feedback given through our community panel. Community members were given a discussion prompt and responded on the message board.

Imagine we have 25 product characteristics that need to be rated - how would you best present them to respondents? Please address issues such as question format, number of questions per screen, etc. The more specific your suggestions, the better!

- *“I think I would put it as simple as possible, with no more than 2 or 3 questions per screen.” – jelac07*
- *“No more than 5 at a screen, if you have pictures and what not as well maybe no more than 3 as after a while if it gets cluttered it gets annoying.” – katieleigh*
- *“State up front that there will be 25 questions, then divide them into thematic groups, no more than 3-5 per screen.” – treesabru*
- *“Don’t just throw a list of 25 characteristics up on the same page.” – rabrog*
- *“When I am given 4-5 questions per screen, I feel that I am able to focus on just those questions and give adequate responses.” – msmall*
- *“When the line between "characteristics" is so fine that the questions become redundant, I lose interest and answer just to get to the finish. 4-5 questions on a page is about the max. I do not like to scroll through a long page of check off buttons and have to keep track of which column is for which answer.” – LMJohnson604*

As expected, respondents in Cell 1 (one attribute per screen) had the longest survey completion time. Respondents in Cell 2 (traditional grids) had the shortest completion time. However, there were no significant differences among cells on perceived or actual survey length. This leads to the conclusion that question format may be more important than actual survey completion time.

Completion Time

	1 Per Screen	Traditional Grid	Split Grid	Multiple Per Screen
Median Time (minutes)	18.5	16.3	16.9	17.3

How many minutes do you think it took to complete this survey?

	1 Per Screen	Traditional Grid	Split Grid	Multiple Per Screen
Average length respondents thought survey took to complete (minutes)	15.5	15.3	15.3	15.6

Which of the following best describes how you felt about the length of the survey?

	1 Per Screen (a)	Traditional Grid (b)	Split Grid (c)	Multiple Per Screen (d)
Mean	2.6	2.6	2.7	2.6
Much/Somewhat too Long	33%	32%	29%	36% c
Just about right	67%	68%	71% d	64%
Much/Somewhat too Short	0%	0%	0%	0%

* uppercase letters indicate significant difference ($p \leq .05$)

* lowercase letters indicate significant difference ($p \leq .10$)

3.2 Survey and Data Issues

The drop-out rate for qualified respondents was highest in Cell 2 (traditional grids). We may attribute this to the monotony of the grid format.

Drop-out Rate by Cell

	1 Per Screen (a)	Traditional Grid (b)	Split Grid (c)	Multiple Per Screen (d)
Of respondents assigned to a cell	2% B (n=7)	6% (n=17)	4% (n=10)	1% BC (n=4)

* uppercase letters indicate significant difference ($p \leq .05$)

We analyzed the data for response patterns and identified 66 respondents as “straight-liners,” or people who selected the same response category for all of the questions in a bank. Both respondents who were shown only one attribute per screen (Cell 1) and large grids of questions (Cell 2) were least likely to be identified as “straight-liners.”

Straightlining Behavior

	1 Per Screen (a)	Traditional Grid (b)	Split Grid (c)	Multiple Per Screen (d)
% of straightliners in cell	5%	9%	52%	35%
	(n=3)	(n=6)	(n=34)	(n=23)
as % of cell total	1% BC	2% BC	12%	8%

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* lowercase letters indicate significant difference ($p \leq .10$)

This result should be interpreted with caution, as it may simply be because it was more difficult for respondents who were only shown one question per screen to consistently select the same answer choice. Similarly, for respondents who were given all attributes in one large grid, they may have been consciously attempting to not give the “appearance” of entering straight-lined data.

The survey also included a bank of opposing statements to allow for testing differences in correlation between positively and negatively worded statements. Respondents who were shown one attribute per screen (Cell 1) had significantly stronger negative correlations between the opposing statement couplings than those who were shown all attributes in a single grid. Respondents in Cell 1 may have been more engaged in the survey than those who were presented with traditional grids of questions, thus less likely to rely on straightlining.

Correlations Between Opposing Statements

	1 Per Screen (a)	Traditional Grid (b)	Split Grid (c)	Multiple Per Screen (d)
If I had to make a trade-off, I'd choose the happiness of others over my own. / My first priority in life is my own happiness.	-0.433 Bc	-0.281	-0.311	-0.378
Family is important, but I have other interests that are just as important to me. / My family is by far the most important thing in my life.	-0.236	-0.205	-0.245	-0.234
Appearance is often more important than functionality. / Typically, I'm more concerned with how well something works than how it looks.	-0.279	-0.150	-0.207	-0.215
I prefer a routine way of life to one full of change. / I try to avoid getting stuck in a routine.	-0.437 B	-0.281	-0.379	-0.336
I am able to afford most of the things I want. / I don't have the money to buy a lot of the things I want.	-0.709	-0.652	-0.699	-0.698
In general, I have the time to do the things that are important to me. / I'm frequently too busy to do the things I want to do.	-0.639 B	-0.480	-0.561	-0.581
Average Correlation	-0.456 B	-0.342	-0.400	-0.407

* uppercase letters indicate significant difference ($p \leq .05$)

* lowercase letters indicate significant difference ($p \leq .10$)

This research supports previous findings that question grids can negatively impact data quality and do not promote positive respondent experiences. Respondents are consciously aware of the different question formats they are presented with, and show a strong dislike of long question grids.

In addition to the text-based alternatives tested here, incorporating Flash elements and other interactive tools into online surveys might also be an avenue for consideration. Further research on this topic is needed to determine the best alternative to question grids and how surveys can be designed to ensure a positive respondent experience.

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