

Respondent burden and satisficing in grid questions: A comparison of early versus late positioning in a Web survey instrument

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Background



- In general, “context effect refers to a process in which prior questions affect responses to later questions in surveys”

(Holyk, 2008)

- Question order effects:

Preceding questions are likely to affect responses to subsequent questions by influencing one or more stages of the question-answer process.

- Semantic order effects:

- Facilitation of cognitive processing by clarification of question meaning and increased temporary accessibility of relevant information.

- Serial order (or position) effects:

- Fatigue and burden accumulating over the course of questionnaire completion impair the effort expended on cognitive processing.

(Krosnick & Presser, 2010)

Previous findings



Satisficing	at questionnaire level	at question level (grid)
Respondent fatigue/ burden	increases with the number of questions that have already been answered	... number of items ...
Respondent motivation	gradually declines with each question respondents have to work through	... with each additional item ...
Data quality	is lower for questions positioned later in a questionnaire (e.g., higher item nonresponse, shorter response times, less differentiation)	... items positioned later in a grid...
Evidence	Cape & Philips (2015), Galesic & Bosnjak (2009), Wang and Allen (2015), Yu & colleagues (2015)	

Research Questions



1. What effects do variations in question positioning within the questionnaire have on data quality?
2. What effects do variations in item positioning within the grid question have on data quality?

Methods



- Web survey among university applicants (n=4,034)
- Field phase from July/August, 2015
- Response rate (AAPOR RR6): 24%

- Experimental question: grid question with 10 items on the respondent's perceived general self-efficacy (using a 5-point unipolar agreement scale)

- Between-subjects design with random assignment

- Randomization
 - At questionnaire level (question position within the questionnaire)
 - At question level (item position within the grid)

Experimental Design

At questionnaire level:

Web page
01 ...
02 ...
03 ...
04 ...
05 ...
06 ...
07 ...
08 ... reasons for choice of field of study (single choice)

Random position #1

09 ...
10 ...
11 ...
12 ...
13 ...
14 ...
15 ...
16 ... burden perceived during the application process (open-ended)

Random position #2

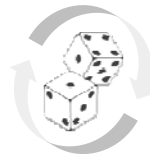
17 ...
18 ...
19 ...
20 ...
21 ... previous experiences of success (open-ended)

Random position #3

22 ...
23 ...
24 ...
25 ...
26 ...
27 ... time spent on PC and Internet usage (open-ended)

Random position #4

28 ...
29 ...
30 ...
31 ...
32 ...
33 ...



At question level:

I can always manage to solve difficult problems if I try hard enough.

If someone opposes me, I can find the means and ways to get what I want.

It is easy for me to stick to my aims and accomplish my goals.

I am confident that I could deal efficiently with unexpected events.

Thanks to my resourcefulness, I know how to handle unforeseen situations.

I can solve most problems if I invest the necessary effort.

I can remain calm when facing difficulties because I can rely on my coping abilities.

When I am confronted with a problem, I can usually find several solutions.

If I am in trouble, I can usually think of a solution.

I can usually handle whatever comes my way.

Analysis



- Indicators of data quality:
 - item nonresponse (percent)
 - response times (seconds)
 - response differentiation (McCarty/Shrum, 2000)

- Balanced sample: cases were excluded at several stages
 - who failed to pass all four possible question positions,
 - who exceeded the session timeout of 7,200 seconds on the target page

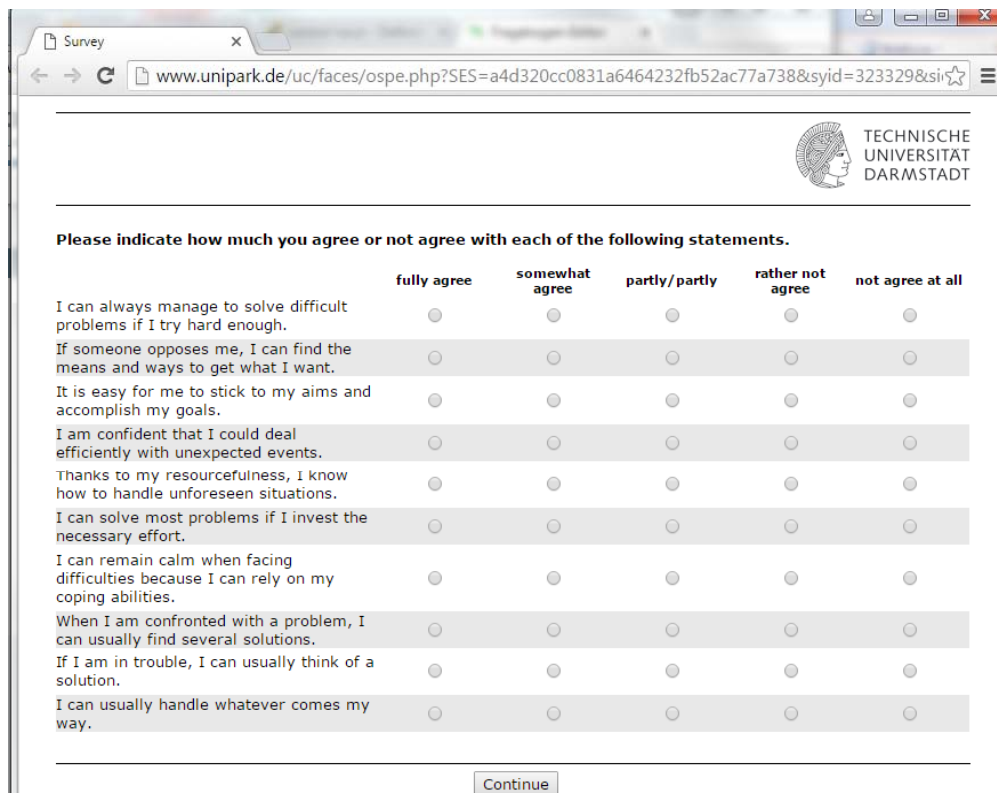
Furthermore, for analysis of response time and response differentiation:

 - who needed longer time than two standard deviations above the group mean
 - who failed to complete all 10 grid items

- Separate consideration of desktop (incl. tablet) and mobile respondents (self-selective groups)

Screenshots

Desktop



Survey

www.unipark.de/uc/faces/ospe.php?SES=a4d320cc0831a6464232fb52ac77a738&syid=323329&ssi

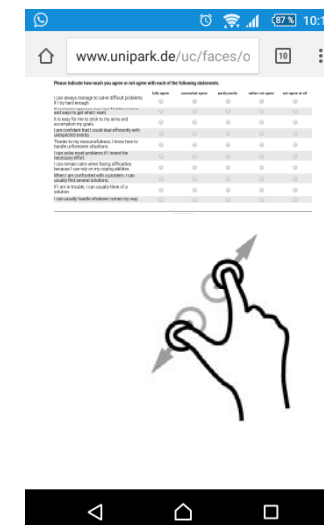
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Please indicate how much you agree or not agree with each of the following statements.

	fully agree	somewhat agree	partly/partly	rather not agree	not agree at all
I can always manage to solve difficult problems if I try hard enough.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If someone opposes me, I can find the means and ways to get what I want.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to stick to my aims and accomplish my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I could deal efficiently with unexpected events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thanks to my resourcefulness, I know how to handle unforeseen situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can solve most problems if I invest the necessary effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can remain calm when facing difficulties because I can rely on my coping abilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am confronted with a problem, I can usually find several solutions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I am in trouble, I can usually think of a solution.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually handle whatever comes my way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

Mobile



www.unipark.de/uc/faces/o

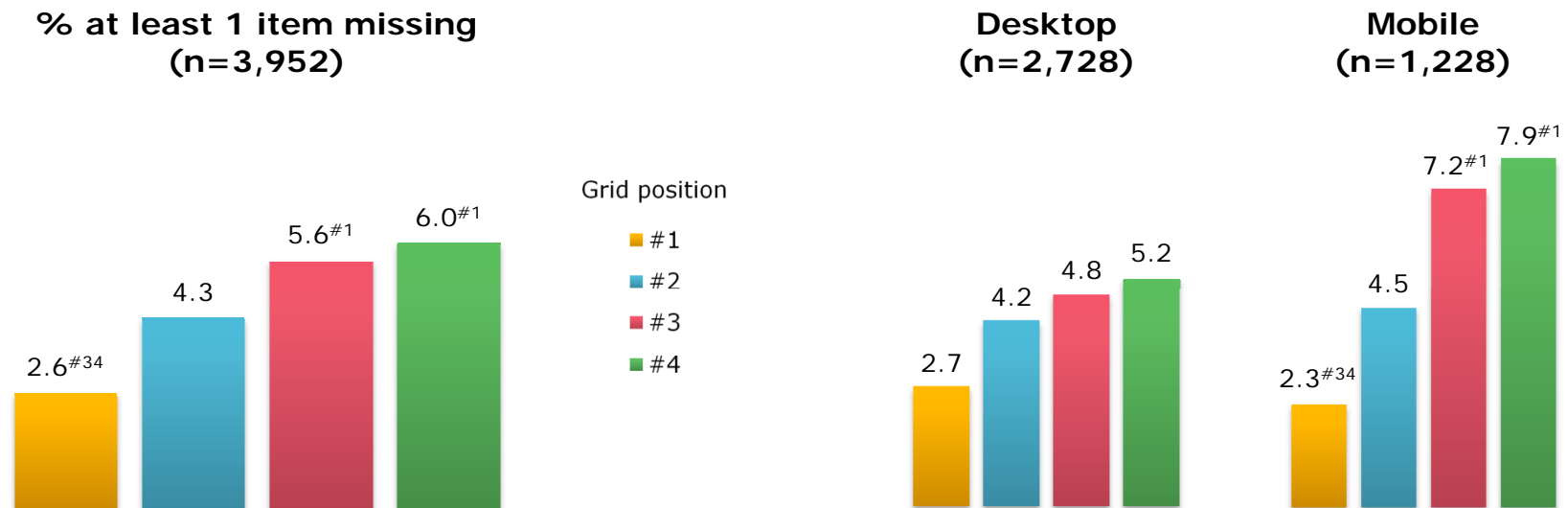
Please indicate how much you agree or not agree with each of the following statements.

	fully agree	somewhat agree	partly/partly	rather not agree	not agree at all
I can always manage to solve difficult problems if I try hard enough.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If someone opposes me, I can find the means and ways to get what I want.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to stick to my aims and accomplish my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I could deal efficiently with unexpected events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thanks to my resourcefulness, I know how to handle unforeseen situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can solve most problems if I invest the necessary effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can remain calm when facing difficulties because I can rely on my coping abilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am confronted with a problem, I can usually find several solutions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I am in trouble, I can usually think of a solution.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually handle whatever comes my way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Results

At questionnaire level

- Item nonresponse depending on grid position:
In total, n=182 with at least 1 item missing.

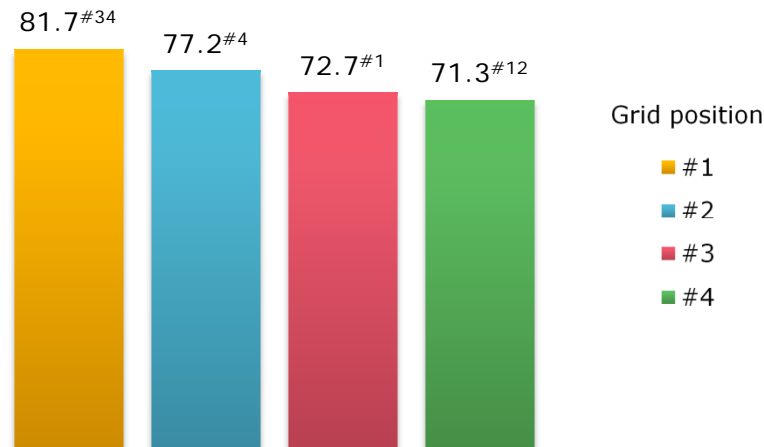


Results

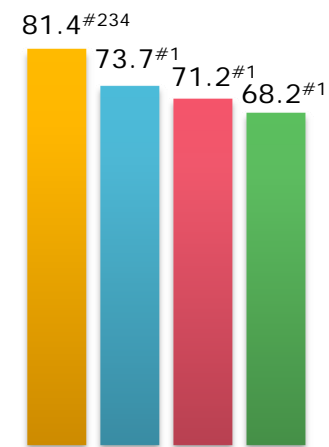
At questionnaire level

- Response time spent on *grid* depending on grid position*

Grid completion time (seconds)
(n=3,734)



Desktop
(n=2,581)



Mobile
(n=1,153)



* Calculations were based on server-side paradata (page level), n=3,770.

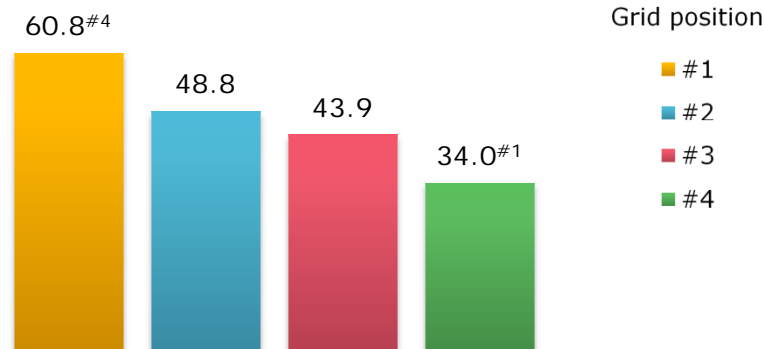
Results

At questionnaire level

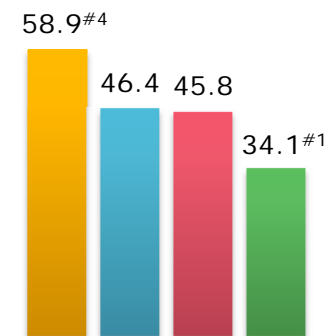


- Response time spent on *grid* depending on grid position, solely considering cases with at least 1 item missing*

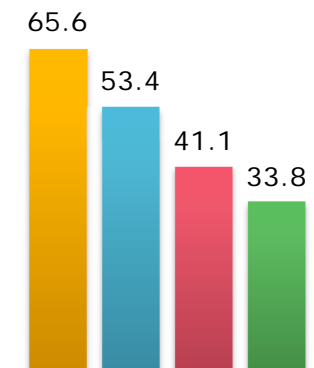
Grid completion time (seconds)
(n=175)



Desktop
(n=110)



Mobile
(n=65)



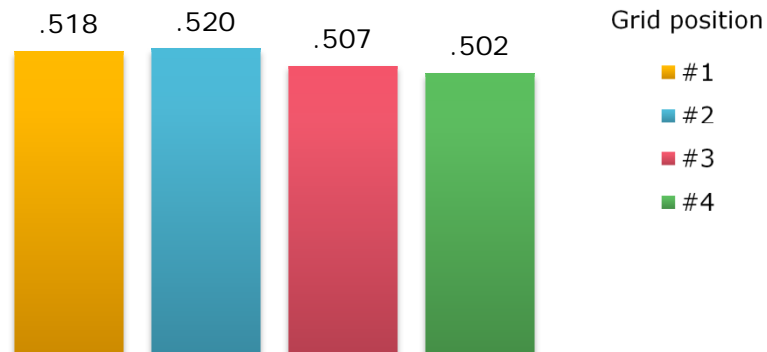
* Calculations were based on server-side paradata (page level); deviations from n=182 due to exclusion of time outliers ± 2 SD from group mean.

Results

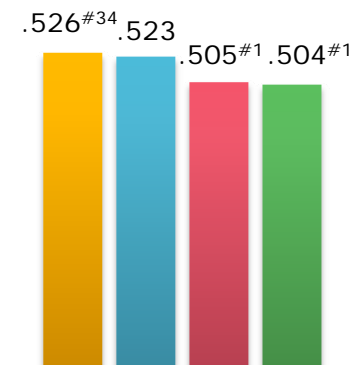
At questionnaire level

- Response differentiation depending on grid position

Degree of differentiation
(McCarty/Shrum, n=3,734)



Desktop
(n=2,581)



Mobile
(n=1,153)

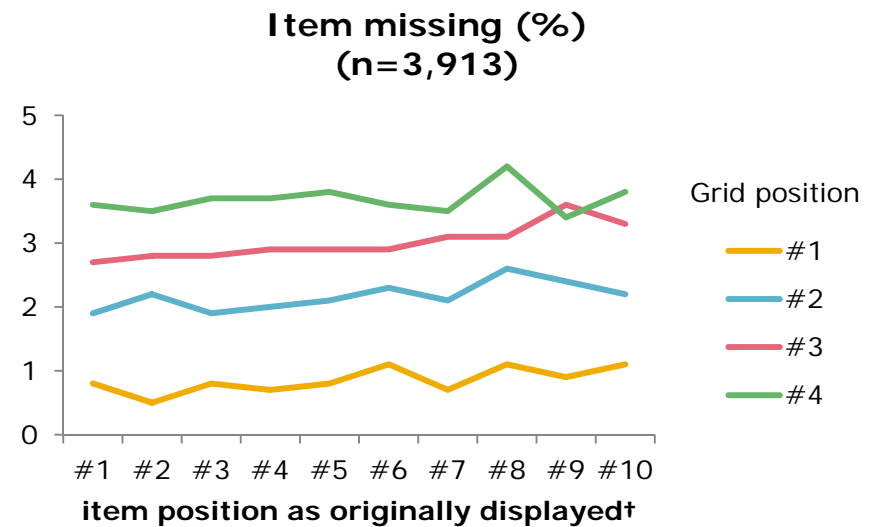
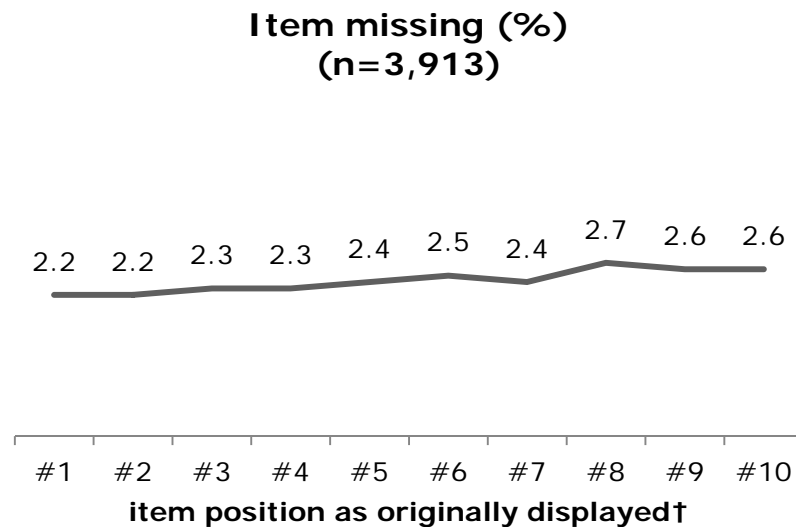


* Calculations were based on server-side paradata (page level), n=3,770.

Results

At question level

- Item nonresponse depending on item and grid position*



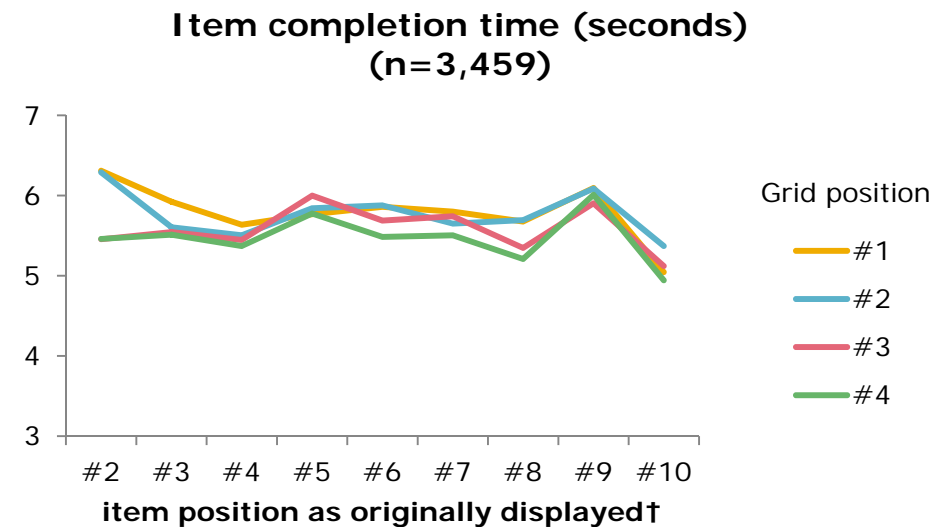
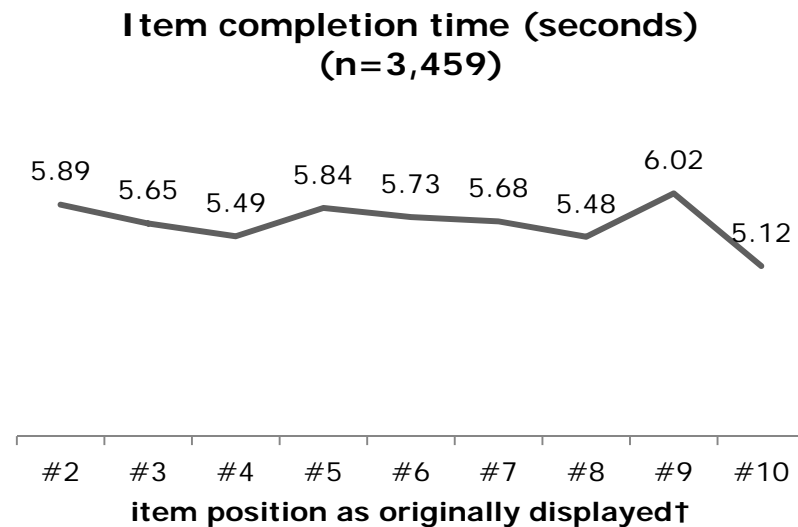
* Calculations were based on client-side paradata (item level), n=3,913.

† Respondents may have seen different items at item position #1, #2, #3, ...

Results

At question level

- Response time spent on *item* depending on item and grid position*



* Calculations were based on client-side paradata (item level), n=3,728.

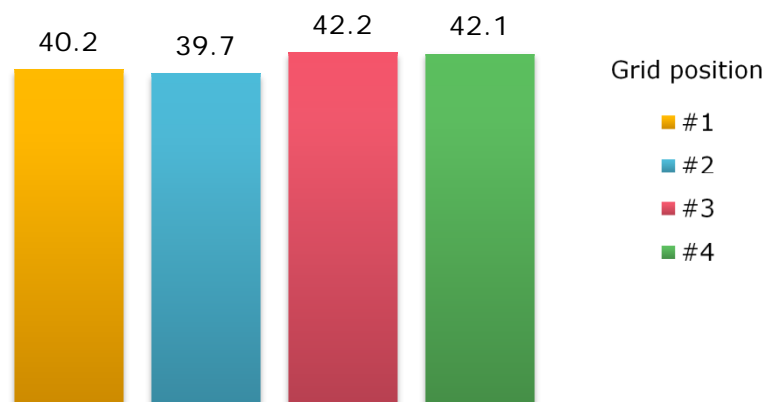
† Respondents may have seen different items at item position #1, #2, #3, ...; item position #1 not considered because of extra time for initial orientation and processing of question stem.

Results

At question level

- Top-down processing of items as originally displayed† using 10 clicks depending on grid position*

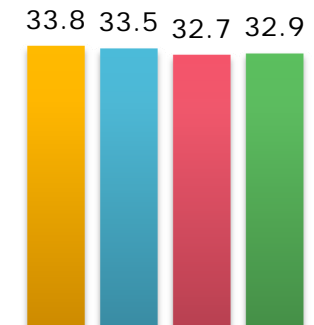
Top-down processing 10 clicks
(%) (n=3,459)



Desktop
(n=2,394)



Mobile
(n=1,065)



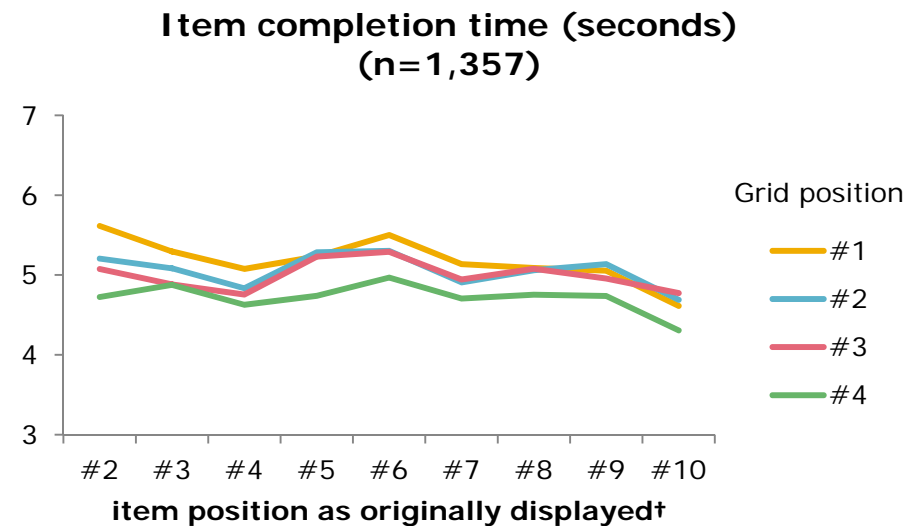
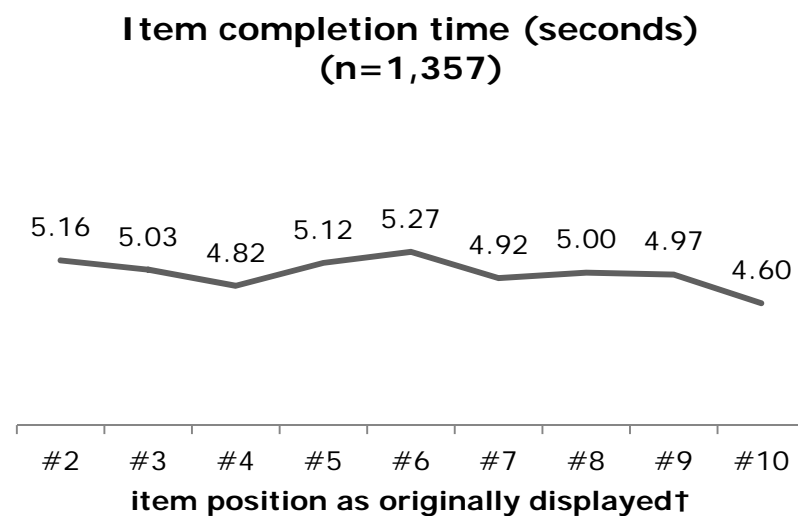
* Calculations were based on client-side paradata (item level), n=3,728.

† Respondents may have seen different items at item position #1, #2, #3, ...; item position #1 has been taken into account in the analysis.

Results

At question level

- Response time spent on *item* depending on item and grid position* for subgroup “top-down processing using 10 clicks”



* Calculations were based on client-side paradata (item level), n=1,480.

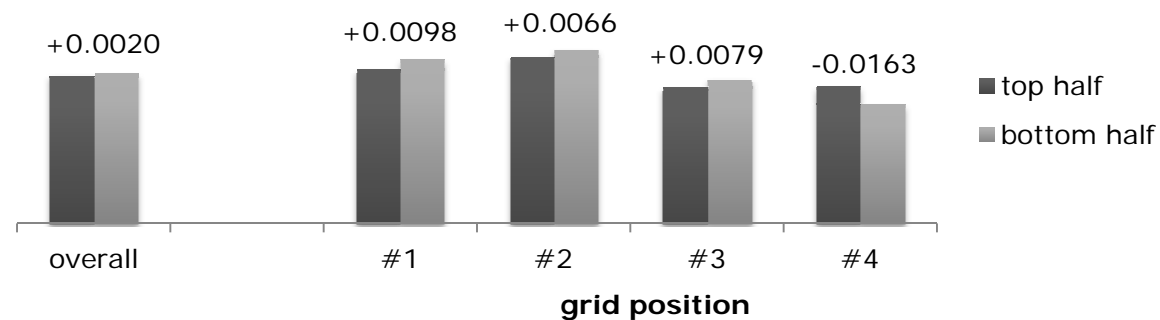
† Respondents may have seen different items at item position #1, #2, #3, ...; item position #1 not considered because of extra time for initial orientation and processing of question stem.

Results

At question level

- Response differentiation depending on item and grid position* for subgroup “top-down processing using 10 clicks”

**Degree of differentiation (McCarty/Shrum):
item position top half - bottom half† (n=1,357)**



* Calculations were based on client-side paradata (item level), n=1,480.

† Respondents may have seen different items at item position #1, #2, #3, ...; item position #1 has been taken into account in the analysis.

Summary



- At questionnaire level:
For grid questions asked later in the questionnaire ...
 - item nonresponse increased, especially for mobile respondents;
 - response times decreased, especially for desktop respondents;
 - response differentiation decreased, especially for desktop respondents.

- At question level:
For items positioned later in the grid ...
 - item nonresponse, response time, and response differentiation remained largely unaffected among desktop and mobile respondents.

Conclusions



- The positioning of a question within the questionnaire has a greater impact on data quality than the positioning of a particular item in a multi-item question.
- Respondent fatigue and burden accumulating over the course of questionnaire completion lower respondent motivation to thoroughly process latter questions.
- It appears that even long multi-item measures can be administered without further deterioration of data quality, even if presented in a non-optimized grid design.



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Thank you.

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