

Increasing Item Completion Rates in Matrix Questions

**Using Usability
to Reduce
Nonresponse
in Online Surveys**

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1 Usability in Online Surveys

- Usability is a part of surveys (Dillman, 2007; Hansen & Couper, 2005)
- Usability principles proposed by authors from different fields
 - Design of everyday things (Norman 1988)
 - User interface design (Shneiderman 1998)
 - Website usability (Nielsen 1993, 2005)
 - Usability in computer-assisted interviewing (Couper 1994)
 - Dialogue Principles (ISO 9241-110, 2006)
- All approaches overlap in terms of
 - **Error tolerance**
 - **feedback**

Human-Survey Interaction



2 Error Tolerance in Human-Survey Interaction

- How error prone is the interaction between respondents and the survey?

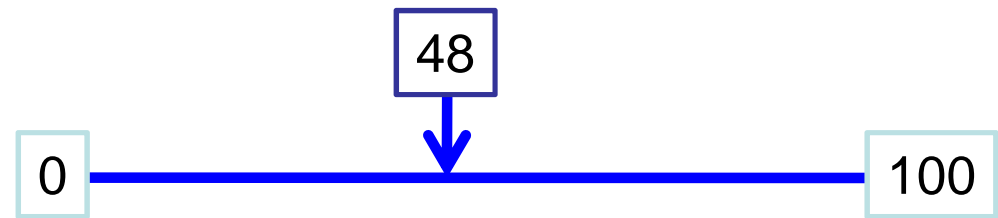
- More than 35% of all respondents clicked around the button (n=1698).

totally agree	agree	undecided	disagree	totally disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- ➔ The solution is to **increase error tolerance** by enlarging the clickable area.
- ➔ Error prone behavior is turned into successful human-survey interaction

Error Tolerance: Nonresponse due to technical errors

- How high is nonresponse for different technologies?
- Sample 1: all student applicants at the University of Mannheim between 2005 and 2006 (n=29014)
- JavaScript 99,5%
- Java 95,6%
- Flash 93,7%



e.g., implementing a visual analog scale

- ➔ Using low coverage technology increases nonresponse
- ➔ JavaScript should be preferred

Validation in other samples

- Is JavaScript also best in other samples than students?
- Sample 2: Online-follow-up of the face-to-face General social survey in Germany (probability sample)
 - ➔ JavaScript 99,7%, n=386
- Sample 3: Market research panel, number of respondents chosen according to known distributions of gender, age and education in full population
 - ➔ JavaScript 99,1%, n=588
- ➔ The recommendation for JavaScript holds for several online populations.

3 Using feedback to Increase Item Response Rates

- Feedback can be provided before and after an answer was clicked.

What do you think?

	totally agree	agree	undecided	disagree	totally disagree
A younger partner provides better support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Older partners provide financial security.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In relationships with large age difference, partners differ too much in terms of what they are interested in.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Younger partners are physically more attractive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Experimental Design and Results

Bitte geben Sie auch zu den folgenden Aussagen an wie sehr Sie diesen zustimmen oder diese ablehnen.

Jeder Satz bezieht sich auf Beziehungen mit großem Altersunterschied, unabhängig davon welcher der beiden Partner der Jüngere ist. Geben Sie bitte eine Antwort pro Aussage.

	stimme sehr zu	stimme zu	teils/ teils	lehne ab	lehne sehr ab
Ein jüngerer Partner kann im Krankheitsfall den Älteren länger unterstützen.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ein älterer Partner bietet finanzielle Sicherheit.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In einer Beziehung mit einem großen Altersunterschied haben die Partner zu unterschiedliche Interessen.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In Beziehungen mit großem Altersunterschied sind tiefgehende Gespräche nicht möglich.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Ein jüngerer Partner ist unternehmungslustiger, offener und ausgelassener als Partner gleichen Alters.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jüngere Partner sind körperlich attraktiver.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wenn die Frau jünger ist als der Mann, ist es besser für die Beziehung.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ältere Männer erfahren mit einer deutlich jüngeren Partnerin Bestätigung durch die Gesellschaft.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- With feedback 95.5% complete answers vs. 92% without feedback
- $n = 459$, $\chi^2 = 3,0$; $p = 0,041$
- ➔ Visual feedback during the answer process eases survey participation and increases the number of complete answers

4 Feedback to Increase Survey Completion Rates

- Feedback on progress of the survey should motivate
- $\text{progress} = \text{current page} / \text{amount of pages}$
- Until recently contradicting results in experiments with progress indicators were published
- No effect (Heerwegh, 2004)
- Negative effect (Crawford, Couper, & Lamias, 2001)
- Positive effect (Couper, Traugott, & Lamias, 2001)
- Visual jumping progress bars due to filter questions are problematic

The value of providing feedback, theoretically...

1. True feedback on progress should be best, i.e. result in highest completion rates.
2. Dynamic calculation approach: not perfectly true but without jumps
3. No progress indicator is better than
4. Jumping progress indicators, i.e. misleading feedback.

Experimental Design

Survey with 30 pages, including two filter jumps

TTrue progress, continuous, not possible in real surveys

Dynamic calculation, increasing

No progress bar

Jumps, current standard, progress bar jumps over filter questions

Results as expected

n=759	Jumps	No progress	Dynamic	True
dropout	47	32	33	24
complete	158	158	161	146
dropout	22,9%	16,8%	17,0%	14,1%
complete	77,1%	83,2%	83,0%	85,9%
Total	205	190	194	170

- 8,8% difference is significant, $\chi^2 = 4,7$; $p = 0,03$
- ➡ Hitherto contradicting experimental results can now be explained with different implementations
- ➡ Investment in good progress indicators pays off in terms of higher completion rates

5 Summary of Studies

- ⇒ Concepts and methods of usability research lead to higher data quality in surveys in terms of reduced nonresponse.
- ⇒ High usability fosters successful human-survey interaction, reduces interaction errors, thereby preventing loss of motivation.
- ⇒ Avoid additional nonresponse by relying on widely available technology for online survey implementations.
- ⇒ Reduce item nonresponse with visual feedback during the answering process.
- ⇒ Reduce dropout with meaningful feedback about the survey progress.

6 Discussion

- Fancy flash-design can increase nonresponse by at least 6%.
- Visual feedback increases substantial answers up to 3,5%.
- Progress indicators show an effect size of up to 8,8% higher response rate compared to problematic but common implementations.
- Usability has a high cost-effectiveness, for example compared with incentives
 - A meta-analysis with lottery (~\$115) showed no positive effect (Göriz, 2006).
 - 0,9% higher response with a \$10 incentive per person would amount to \$10000 for 1000 respondents (cf. Singer, 2002).
- In addition: positive effects on soft factors such as satisfaction, perceived time flow and perceived burden.
- These findings can be extended to online forms

Thank you

More research findings in

Human-Survey Interaction: Usability and Nonresponse in Online Surveys

More information at

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Wie bewerten Sie die folgenden Browser? (Vergeben Sie Noten von eins bis fünf)

	1	2	3	4	5	kenne ich nicht
Microsoft Internet Explorer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Firefox	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opera	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Netscape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mozilla Suite	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Konqueror	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safari	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Camino	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lynx	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Für wie wichtig halten Sie die folgenden Maßnahmen zur Steigerung der Sicherheit im Internet?

	sehr wichtig					sehr unwichtig	weiss nicht
E-mails verschlüsseln	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Festplattendaten verschlüsseln	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
JavaScript deaktivieren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Popups verhindern	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cookies verbieten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Verschlüsselte Webseiten (https)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Viele verschiedene Passwörter nutzen	<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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Viele verschiedene Passwörter nutzen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Schwierig zu knackende Passwörter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Bitte geben Sie auch zu den folgenden Aussagen an wie sehr Sie diesen zustimmen oder diese ablehnen.

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