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Left Feels Right! A Usability Study on the Position of Answer Boxes in Web Surveys

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Abstract

The literature on human-computer interaction consistently stresses the importance of reducing the cognitive effort required by users who interact with a computer in order to improve the experience and enhance usability and comprehension. Applying this perspective to Web surveys, questionnaire designers are advised to strive for layouts that facilitate the response process and reduce the effort required to select an answer. In this paper, we examine whether placing the answer boxes (i.e., radio buttons or check boxes) to the left or to the right of the answer options in closed questions with vertically arranged response categories enhances usability and facilitates responding. First, we discuss a set of opposing principles of how respondents may process these types of questions in Web surveys, some suggesting placing the answer boxes to the left and others suggesting placing them to the right side of the answer options. Second, we report an eye-tracking experiment, which examined whether Web survey responding is best described by one or another of these principles, and consequently whether one of three layouts is preferable in terms of usability: (1) answer boxes to the left of left-aligned answer options, (2) answer boxes to the right of left-aligned answer options, and (3) answer boxes to the right of right-aligned answer options. Our results indicate that the majority of respondents conform to a principle suggesting placing the answer boxes to the left of left-aligned answer options. Moreover, respondents require less cognitive effort (operationalized by response latencies, fixation times, fixation counts, and number of gaze switches between answer options and answer boxes) to select an answer in this layout.

Keywords: Web survey, questionnaire design, questionnaire layout, visual design effects, eye tracking, usability

Introduction

When designing Web questionnaires, survey practitioners need to make numerous decisions about the visual presentation of the questions. Earlier research has shown that these decisions can have profound effects on responses (e.g., Couper, 2008; Dillman, Smith, & Christian, 2009). One very basic design choice concerns the format and layout of the response options. Typical formats of response options in Web surveys include radio buttons, check boxes, drop-down boxes, slider bars, and text boxes. Visual layout of these formats can affect how respondents perceive and answer the questions (e.g., Couper, Tourangeau, Conrad, & Crawford, 2004; Tourangeau, Couper, & Conrad, 2004, 2007).

A question that is yet unanswered is whether the answer boxes (i.e., radio buttons and check boxes[1]) should be placed to the left or to the right of the answer options (i.e., the answer text[2]) in closed questions with vertically arranged response categories. Placement to the right has been argued to be more natural and logical because the answer boxes appear after the words or phrases to which they correspond (Jenkins & Dillman, 1995). Placing the answer boxes to the left instead would require respondents first to perceive the input field, move to the right to read the answer text, and then move back to the left to mark an answer. However, it has also been argued that placement to the right may increase the distance between the answer text and the input field, making it more difficult for respondents to find the correct answer box (Couper, 2008). To alleviate this potential problem, one would have to right-align the answer options. However, this layout may also make it more difficult for respondents to navigate through the different answer options and thereby introduce another problem. Finally, cognitive interviews have demonstrated that most respondents are not aware of the position of the answer boxes and do not have a clear preference for either layout (Bowker & Dillman, 2000;

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Dillman, Carley-Baxter, & Jackson, 1999). All in all, to date "there is no strong empirical evidence supporting placing the input fields to the left or right of the response options in a vertically aligned response set" (Couper, 2008, p.177).

In this paper we aim to provide empirical evidence about this issue. The criterion we use to evaluate the two placements against is the amount of cognitive effort required to select an answer. The literature on human-computer interaction consistently stresses the importance of reducing the effort required for interacting with a computer in order to improve the experience and enhance usability and comprehension (e.g., Shneiderman, 1992). Hence, the layout that makes it easier for respondents to select an answer is considered to be superior in terms of usability.

In principle, both placements of the answer boxes may facilitate answering, depending on the ways in which Web survey respondents process survey questions with vertically arranged response categories. Two aspects of answer behavior seem particularly relevant in this respect: 1) whether respondents decide about each answer option immediately after reading it or only after reading all or at least several of the other options; and 2) whether respondents use the mouse pointer as a reading aid. From a usability perspective, the crucial point is whether respondents' eyes and/or mouse pointers are closer to the left or to the right of the answer text before they select an answer box. Placement of the answer boxes to the *right* of the answer text would reduce the effort of selecting an answer if respondents show the following behavior:

A. Respondents decide about each answer option immediately after reading it (so that their eyes are closer to the right, and thus closer to the answer box when they decide whether to select it or not);

OR

B. Respondents follow the text with the mouse pointer while reading the answer text (so that the pointer is on the right side of the text when they finish reading);

OR

C. While reading an answer option, respondents keep the mouse pointer near the corresponding answer box on the right.

On the other hand, placing the input fields to the *left* of the answer text would reduce the effort of answering if respondents show the following behavior:

D. Respondents decide about selecting an answer option only after they have read some or all of the other options; then they scan the options they have read previously by reading part of the options (probably only the beginning) and select one (so that their eyes are closer to the middle or left side of the answer text when they decide whether to select the option or not)

OR

E. While reading an answer option, respondents keep the mouse pointer near the corresponding answer box on the left.

If the position of answer boxes is not in accord with the way respondents process questions, they should experience more cognitive effort.

To examine whether responding to Web survey questions with vertically arranged response categories is better described by one or another of these principles, and consequently whether placing the answer boxes to the left or to the right of the answer text reduces the cognitive effort of answering these types of questions, we conducted an eye-tracking experiment. Besides providing a direct window into the ways in which respondents process Web survey questions, collecting eye-tracking data also enabled us to analyze relatively direct measures of cognitive effort, such as fixation times and fixation counts (cf. Galesic & Yan, 2011). In eye-tracking studies, longer fixation times

and higher numbers of fixations are usually associated with increased cognitive effort (Rayner, 1998). Hence, the layout that produces shorter and fewer fixations is considered to be superior in terms of processing ease.

In this study, we adopt two common assumptions about eye movements: the immediacy assumption and the eye-mind assumption (Just & Carpenter, 1980; Rayner 1998). The immediacy assumption posits that readers try to interpret every word or visual object as soon as they encounter it. The eye-mind assumption states that the eyes remain fixated on a word or object as long as it is being processed. Taken together, these assumptions suggest that there is a close connection between fixation times and processing duration: the time spent fixating a word or object is (more or less) equal to the time it is being processed.

Methods

Design

The eye-tracking experiment reported in this article was conducted in October and November 2012 at the pretest laboratory of GESIS – Leibniz Institute for the Social Sciences in Mannheim, Germany and was part of a larger study with several unrelated experiments (cf. Neuert & Lenzner, 2013). All experiments were independently randomized to reduce the possibility of any systematic carryover effects. The whole study took about one and a half hours of which 30 minutes were devoted to eye tracking and 60 minutes were devoted to cognitive interviewing. The present experiment was embedded in a Web questionnaire that participants completed after participating in a cognitive interview during the second half of the study. Respondents were randomly assigned to one of three question layouts with answer boxes appearing to the left of left-aligned answer options (n = 25), answer boxes appearing to the right of left-aligned

answer options (n = 25), or answer boxes appearing to the right of right-aligned answer options (n = 25; Figure 1). The layout with right-aligned answer options was included in the design to allow for an interpretation of the position of the answer boxes independently of the space between the answer text and the answer boxes.

-------Figure 1 about here-------

To investigate the first aspect of answer behavior (i.e., whether respondents decide about each answer option immediately after reading it or only after reading and re-reading several of the other options), we coded the eye-tracking videos for a) the number of answer options respondents read before they selected an answer box, b) the number of answer options they re-read before they selected an answer box (i.e., to which they returned to after reading at least one other option), and c) the number of answer options they read after the one they would later select.

To investigate the second aspect of answer behavior (i.e., whether respondents follow the text with the mouse pointer while reading, keep it stationary near the input fields, or do not use it as a reading aid), we coded the position of the mouse pointer a) when the question appeared on the screen and b) during reading (see Table 1 for the list of all codes). As indicators of cognitive effort we collected response latencies, recorded respondents' fixation times and counts on the answer text and the answer boxes, and coded the number of gaze switches between answer text and answer boxes. The latter indicates the respondent effort to match an answer box to the corresponding answer text.

All questions were coded by one coder and a randomly selected subset of 30 percent (N = 100) were independently coded by a second coder for purposes of estimating reliability. Inter-rater agreement was excellent (cf. Fleiss, Levin, & Paik, 2003) with intraclass correlation coefficients (ICCs) ranging from .93 to .99 and Kappa

values ranging from .90 to .94 (Table 1). Discrepancies between the two ratings were examined and discussed between the two coders until consensus was reached.

-------Table 1 about here-------

Respondents and Questions

In total, 84 respondents participated in the experiment. Nine participants were excluded from the dataset because of technical difficulties in recording their eye movements, leaving 75 respondents in the analysis. Fifty-five percent were female and respondents were between 17 and 76 years old ($M = 35$, SD = 14.2). Sixty-eight percent had received at least twelve years of schooling, eleven percent had received ten years of schooling, and 21 percent had received nine or less years of schooling. Eighty-eight percent used the Internet daily or almost daily and 81 percent had already participated in at least one Web survey prior to this study.

The experiment included four questions: one check-all-that apply question on child qualities (cf. Kohn, 1969; Krosnick & Alwin, 1987) with 13 answer options and three rating scale questions on respondents' past, current, and future economic situation with five answer options each (see Appendix A for screenshots). In all four questions, the answer options were arranged vertically. The questions were designed in German, which was the native language of 93 percent of the participants.

Apparatus

Participants' eye movements were recorded by a Tobii T120 Eye Tracker, which allows for unobtrusive eye tracking, and the data were analyzed with the Tobii Studio 3.2.1 software. The T120 is accurate within 0.5° with less than 0.3° drift over time. It allows for head movement within a 30 x 22 x 30 cm volume centered up to 70 cm from the camera. The sampling rate is 120 Hz, meaning that 120 gaze data points per second are

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collected for each eye. To ensure that all fixations were unequivocally allocated to the answer options and boxes respondents had actually read, we used a font size of 18 and 16 pixels and double-spaced text with a line height of 40 and 32 pixels for the question text and answer options, respectively. The screen resolution was set to 1280 by 1024 pixels. Before analyzing the eye-tracking data, we applied Tobii Studio's I-VT fixation filter in the default setting (*gap fill-in:* enabled, 75 ms; *eye selection:* average; *noise reduction:* disabled; *velocity calculator window length:* 20 ms; *I-VT classifier:* 30°/s; *merge adjacent fixations:* enabled, max time between fixations: 75 ms, max angle between fixations: 0.5°; *discard short fixations:* enabled, minimum fixation duration: 60 ms) to identify "true" fixations in the raw data[3]. As a sensitivity check, we repeated the analyses of the fixation times and counts on the answer boxes and the answer text using Tobii's ClearView fixation filter set to include only fixations that lasted at least 100 milliseconds and encompassed 20 pixels. The results were similar to the ones we obtained by applying the I-VT filter in the default setting and all of our conclusions remained unchanged.

Procedure

Respondents were invited to the pretest laboratory and seated in front of the eye tracker so that their eyes were approximately 60cm from the screen. Right before the experiment reported in this paper, they completed a standardized calibration procedure in which they fixated on red points displayed on different parts of the screen. The calibration procedure was carried out by an experimenter who oversaw the experiment from a separate observer room next to the laboratory. The experimenter was monitoring respondents' eye movements on a computer monitor in real time. Respondents were instructed to read at a normal pace while trying to understand the questions as well as they could. Only one question at a time was displayed on the screen and the whole questionnaire took about 12

minutes to complete. For their participation in the whole study (including the cognitive interview), respondents received a compensation of 30 Euros.

Results

Processing of Survey Questions

To examine how respondents processed the questions, we first looked at the number of answer options they read and re-read before selecting one of the answer boxes, as well as at the number of options they read after the one they would later select. As a second aspect of respondent behavior, we examined the position of the mouse pointer while respondents were reading and answering the questions. We also examined whether there were differences in response distributions between the three conditions but found no such differences for any of the four questions.

Number of answer options read besides the one that was selected. In all four questions, respondents read most of the answer options before checking an answer box and also re-read some of the answer options (Table 2). This behavior was particularly prominent in responses to the check-all-that-apply question (Q1), which asked respondents to select the three most relevant answers among a set of thirteen answer options, and hence required them to perform a comparative judgment. In responding to this question, many respondents first read most of the answer options from top to bottom. Then they shortly scanned some of the options they had previously read and selected their answers (cf. behavior D on page 5). Answering the rating scale questions (Q2-Q4) required respondents to carry out a different task, namely to select the one "correct" answer among a set of five options. Hence, in processing these questions it would suffice to read only as many options as are listed before the one that is later selected. However, the eye-tracking data show that, for all four questions, respondents read additional answer

options after having read the one they would later select (see last column of Table 2). With regard to this variable, it is possible that there might be different 'types' of respondents: some reading additional answer options after the one they would later select and some deciding immediately whether to select it or not (cf. behavior A on page 4). However, we identified only seven respondents in our experiment who did not read any additional answer options in all four questions and merely nine respondents who did not read any additional answer options when answering questions Q2 to Q4. Hence, most respondents did not decide about each answer option immediately after reading it but after reading and re-reading several of the other answer options as well.

-------Table 2 about here-------

Position of the mouse pointer. When respondents first started to read the question, the mouse pointer was positioned most often in the middle region of the screen (for 80, 88, 96, and 92 percent of the respondents for questions Q1 to Q4, respectively), close to the spot where the "next button" of the previous page was located. Hence, respondents usually did not move the mouse pointer to any part of a question but kept it stationary while starting to read the new question. Tracking the text with the mouse pointer while reading (cf. behavior B on page 4) was rare in our recordings and occurred exclusively in Q1: only four respondents tracked the text in a total of 41 answer options while reading (Respondent 1: 12 options, Respondent 2: 11 options, Respondent 3: 13 options, Respondent 4: 5 options). Sometimes respondents kept the mouse stationary on the answer box of the particular option they were reading (cf. behavior C and E on page 5). For all answer options that were actually read, the average proportion of respondents who held the mouse pointer over the corresponding answer box was 10, 7, 8, and 8 percent for questions Q1 to Q4, respectively. In most cases, however, they kept the mouse stationary on some other region of the screen while reading the answer options (Q1: 85 percent, Q2:

93 percent, Q3: 93 percent, Q4: 92 percent). Overall, respondents did not use the mouse pointer as a reading aid.

Cognitive Effort

As indicators of cognitive effort we examined the response latencies for the four questions, respondents' fixation times and counts on the answer boxes and on the answer options, and the number of gaze switches between these two regions (see Appendix B for means of cognitive effort indicators for each individual question).

Response latencies. We used JavaScript to collect client-side response latencies, which were measured from the time a question appeared on the screen to the time respondents clicked on the submit button to receive the next question. Given that the distribution of response times was skewed, which is typical for this kind of data (cf. Yan & Tourangeau, 2008), we applied logarithmic transformations on the response latencies (cf. Fazio, 1990).

Across the four questions, respondents required more time to answer the questions when the boxes were placed to the right (of both left-aligned and right-aligned text) than when they were placed to the left of the answer options (Table 3). To examine the effects of the three different question layouts on response latencies, we conducted an ANCOVA with the mean log-transformed response latency as dependent variable and respondents' baseline speed as a covariate. The baseline speed was computed for each respondent separately, by averaging the speed of answering to two attitudinal questions asked directly after the experiment reported in this paper (see Appendix C for question wording).This covariate was included in the analysis to control for inter-individual differences in respondents' speed of answering questions. The ANCOVA showed a marginally significant effect of the question layout on response latencies ($F(2,71) = 3.01$,

$p = .056$). Sidak post hoc tests revealed a marginally significant difference ($p = .066$) between the "left" condition and "right" condition (i.e. when the boxes appeared to the right of left-aligned answer options) with respondents requiring less time to answer the questions in the former layout.

-------Table 3 about here-------

Fixation times & counts. Across the four questions, respondents fixated for a longer time and more often on the answer boxes if these were placed to the right of the answer text (for both the "right" and the "right-aligned" condition) than if they were placed to the left of the answer text (Table 3). To examine the effect of the placement of the answer boxes on fixation times and fixation counts, we conducted ANCOVAs of the means of the four questions with reading rate or fixation rate as covariates, respectively. These covariates were computed from the same two questions as the baseline speed. Reading rate refers to the average fixation time on these questions and fixation rate refers to the average number of fixations on these questions. Again, these covariates were chosen to control for interindividual differences in respondents' reading rate and fixation rate.

Statistically significant effects were found for both the fixation times on the answer boxes ($F(2, 71) = 4.19$, $p = .019$) and the fixation counts on the answer boxes ($F(2, 71) = 4.91$, $p = .010$). Sidak post hoc tests showed that respondents required significantly shorter ($p = .015$) and fewer ($p = .008$) fixations on the answer boxes when the boxes appeared to the left of left-aligned answer options ("left" condition) than when they appeared to the right of left-aligned answer options ("right" condition). No significant between-group effects were found for fixation times and fixation counts on the answer options ($F(2, 71) = 1.65$, $p = .199$ and $F(2, 71) = 1.60$, $p = .210$, respectively). This finding is important because it reveals that the placement of the answer boxes to the

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right increases fixation times and counts on the answer boxes while it does not affect the depth of processing the answer options.

Number of gaze switches between answer text and answer boxes. Across the four questions, respondents made more gaze switches between the answer text and the answer boxes when the boxes were placed to the right (of both left-aligned and right-aligned text) than when they were placed to the left of the answer options (Table 3). An ANOVA of the means of the four questions revealed a significant between-group effect ($F(2,72) = 5.69$, $p = .005$). Sidak post hoc tests showed that respondents made significantly fewer gaze switches ($p = .005$) if the answer boxes appeared to the left of left-aligned answer options ("left" condition) than if they appeared to the right of left-aligned options ("right" condition). All in all, these findings indicate that respondents had more difficulties to identify the appropriate input field if the answer boxes were placed to the right (of both left-aligned and right-aligned answer options) than if they were placed to the left of the answer options.

Discussion

This eye-tracking study examined how respondents process and answer closed questions with vertically arranged response categories in Web surveys and whether placing the answer boxes to the left of left-aligned answer text, to the right of left-aligned answer text, or to the right of right-aligned answer text makes it easier for respondents to select an answer. Our results show that most respondents do not use the mouse pointer as a response aid but keep it stationary in the middle region of the screen. In this regard, it does not make any difference whether the answer boxes are placed to the left or to the right of the response options: the mouse pointers are about equally close to the answer boxes before selecting an answer in all three conditions. However, with regard to

respondents' reading behavior we found that most respondents read several answer options before scanning the options briefly again and selecting an answer (cf. behavior D on page 5). Hence, just before selecting an answer box their eyes are usually closer to the left than to the right of the answer text. Placement of the answer boxes to the left of left-aligned answer text ("left" condition) therefore facilitates the response task by making it easier for respondents to select an answer. This reduced effort is indicated by shorter fixation times and fewer fixation counts on the answer boxes as well as fewer gaze switches between answer text and answer boxes in comparison to the layout, in which the boxes appear to the right of left-aligned answer text ("right" condition).

With respect to response latencies, we identified a marginally significant effect between the "left" and "right" conditions with respondents requiring more time to answer the questions in the latter condition. Our eye-tracking data revealed that this effect was mostly driven by longer and more numerous fixations on the answer boxes and by a larger number of switches between the answer text and the answer boxes in the "right" condition. In contrast, no significant differences were found for the time respondents spent looking at the answer text suggesting that the depth of processing the answer options did not differ between conditions.

With regard to our measures of cognitive effort it is important to note that longer response latencies, longer fixation times, higher numbers of fixations, and higher numbers of gaze switches between answer text and answer boxes do not necessarily indicate processing difficulties. In principle, these measures could also indicate a deeper processing and a more conscientious response style. However, as was mentioned above, we did not find statistically significant differences in the fixation times or counts on the answer options between the conditions, and hence the longer fixation times did not result

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from a more careful evaluation of the answer text. In contrast, our findings indicate that the additional time is spent on finding the appropriate answer box.

Our results indicate that the superiority of the placement of answer boxes to the left cannot be explained by the shorter distance between the boxes and the answer text alone. On the one hand, the cognitive effort required by the "right-aligned" condition (in which the answer boxes were placed to the right of *right*-aligned text) was lower than the effort required by the "right" condition (in which the boxes were to the right of *left*-aligned text). This indicates that the distance between the boxes and answer options indeed should be kept as short as possible as it influences respondent burden. On the other hand, cognitive effort required by the "left" condition was even lower than the effort required by the "right-aligned" condition. This finding suggests that in addition to keeping the distance between boxes and answer options short, it would be advisable to left-align the answer text, because this layout is more in accord with the ways in which respondents process survey questions with vertically arranged response categories. Respondent effort could also be reduced by shading every other row and thereby visually connecting the answer options and their corresponding answer boxes. This would make it easier for respondents to find the appropriate answer box. However, we would still expect to find the same pattern across the three layouts, except that overall response times and fixation times would be shorter. The eyes of the respondents would still be closer to the left than to the right of the answer text before they decide to select and answer. Hence, shading might attenuate but not eliminate the effects of placement and proximity. However, this notion clearly calls for future studies that systematically explore the interactions between placement, proximity and shading.

There are some limitations to this study which suggest additional directions for future research. First, our findings are restricted to closed Web survey questions (both

single-choice and check-all-that-apply) with vertically arranged answer options. Even though these types of questions probably form a large part of the questions asked in social science research, further research is needed to examine whether our findings also generalize to other kinds of questions, such as forced-choice questions, for example, in which respondents are asked to provide an answer (e.g., yes/no) for each item in a list. Second, our participants answered the questions in a laboratory while their eyes were being recorded so there is the possibility that they were more conscientious than they would have been in a more private and natural environment. Earlier studies have shown that even when answering questions in front of an eye tracker in the laboratory, respondents often skip some parts of the question text or do not read all of the answer options (Galesic, Tourangeau, Couper, & Conrad, 2008; Graesser, Cai, Louwerse, & Daniel, 2006). We found the same sort of "satisficing" behavior (Krosnick & Alwin, 1987) in our data so we can at least assume that our participants did not completely change their usual answer behavior. Nevertheless, we cannot rule out the possibility of a laboratory effect and we encourage future studies to examine whether our findings can be replicated outside of the laboratory. This could be done, for example, by analyzing the response times of these different question layouts when they have been implemented in a regular Web survey. Third, our current data does not enable us to examine the quality of the answers obtained by the three different question layouts. While our findings reveal that placing the answer boxes to the left of left-aligned answer text reduces the cognitive effort for respondents, it remains unclear whether this reduced effort also results in more reliable and valid responses. Given that these measures are the ultimate criteria for judging the quality of a survey question, future research is needed to examine which of the three question layouts produces the most reliable and valid data.

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This research can also be viewed in the light of common design choices in different modes of self-administered surveys and mixed-mode surveys. In our experience, most Web surveys are designed with left-aligned text and answer boxes on the left side, whereas paper-based surveys commonly implement both right-aligned and left-aligned answer boxes (with left-aligned text, however). Examples of different positions of answer boxes in self-administered surveys can be found in the ISSP 2011 source questionnaire (primarily right-aligned) and its German implementation (primarily left-aligned) as well as in the US American Community Survey 2013 (left-aligned) and the German census 2011 household questionnaire (right-aligned). Considering our data and the goal of unimode design in mixed-mode studies (Dillman et al., 2009), it seems advisable to left-align the answer boxes both on paper and on the Web.

Bios

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Notes

[1] To improve readability, we use only the term answer boxes in the remainder of this article. This term includes radio buttons as well as check boxes.

[2] The terms "answer option" and "answer text" are used interchangeably in this article. Both refer to the text of the answer categories, excluding the answer boxes (i.e., the input fields).

[3] The Tobii I-VT filter is an update of older fixation filters and allows for more sophisticated data cleaning. The default values were selected to provide the best fixation classification possible across recordings with different levels of noise. Detailed descriptions about the general principles behind the I-VT fixation filter can be found in Olson (2012) and Tobii Technology (2012).

a) boxes to the left of left-aligned answer options

b) boxes to the right of left-aligned answer options

c) boxes to the right of right-aligned answer options

Figure 1. Screenshots of Q4 for the three layout designs.

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Table 1. Reading patterns, codes, and inter-rater agreement

Reading patterns	Code	Agreement percent	ICC*/ Kappa†
No. of answer options read before selecting an answer box	No. of options	93.0	.99
No. of answer options that were re-read	No. of options	94.0	.96
No. of answer options read after the one respondents would later select	No. of options	93.0	.99
Position of mouse pointer when question appeared on screen	1 = top left, 2 = top center, 3 = top right, 4 = middle left, 5 = middle center, 6 = middle right, 7 = bottom left, 8 = bottom center, 9 = bottom right	94.0	.90
Position of mouse pointer while reading an answer option	0 = option not read, 1 = on answer box for that option, 2 = on answer box for some other option, 3 = on answer text for that option, 4 = on answer text for some other option, 5 = elsewhere on page, 6 = tracking answer text of that option with mouse pointer	95.9	.94
No. of gaze switches between answer text and boxes	No. of switches	84.0	.93

NOTE.—Inter-rater agreement is based on independent ratings of N = 100 questions. *Intraclass correlation coefficients (ICCs) were calculated for interval level data. † Kappa values were calculated for nominal level data.

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Table 2. Means and standard deviations of question processing indicators

Question	No. of options read before selecting an answer box		No. of options re-read before selecting an answer box		No. of options read after the one respondents would later select	
	Mean	*(SD)*	*Mean*	*(SD)*	*Mean*	*(SD)*
Q1[a] (13 options)	8.07	(5.72)	1.71	(2.62)	3.61	(4.26)
Q2 (5 options)	3.41	(1.16)	0.68	(0.95)	0.85	(0.93)
Q3 (5 options)	2.92	(1.14)	0.65	(0.86)	0.73	(0.78)
Q4 (5 options)	3.00	(1.17)	0.80	(1.09)	0.68	(0.83)

NOTE.—[a]Q1 asked respondents to select three answer options. Respondents' behavior was only analyzed for their first answer.

Table 3. Means and standard errors (in parentheses) of cognitive effort indicators in the three conditions

Cognitive effort indicators	Condition		
	left	right	right-aligned
Raw response latencies (in sec.)	17.56[+] (1.23)	20.04 (1.23)	21.76[+] (1.23)
Log-transformed response latencies	4.24[+] (0.21)	4.31[+] (0.22)	4.29 (0.22)
Fixation times on answer boxes (in sec.)	1.46* (0.27)	2.55* (0.27)	2.04 (0.27)
Fixation counts on answer boxes	3.14* (0.62)	5.89* (0.62)	4.41 (0.63)
Fixation times on answer options (in sec.)	7.81 (0.57)	9.01 (0.57)	9.16 (0.58)
Fixation counts on answer options	37.08 (2.53)	42.69 (2.55)	42.56 (2.57)
No. of switches between answer options and answer boxes	5.48* (0.44)	7.51*/[+] (0.44)	6.12[+] (0.44)

NOTE.— For response latencies, fixation times, and fixation counts the table reports estimated marginal means after controlling for the covariates respondent baseline speed, reading rate, and fixation rate, respectively. */[+] = Sidak post hoc test shows that the difference between these conditions is significant at $p < .05$(*) and $p < .10$([+]).

APPENDIX A

Screenshots and translations of questions

Q1 Question on child qualities

**Wählen Sie drei Eigenschaften aus dieser Liste aus,
die ein Kind Ihrer Meinung nach vor allem haben sollte.
Dass es...**

- ☐ gute Umgangsformen hat
- ☐ wirklich etwas leisten will
- ☐ ehrlich ist
- ☐ sauber und ordentlich ist
- ☐ gesunden Menschenverstand und eine gute Urteilsfähigkeit besitzt
- ☐ Selbstbeherrschung besitzt
- ☐ sich als Junge wie ein Junge und als Mädchen wie ein Mädchen benimmt
- ☐ mit anderen Kindern gut auskommt
- ☐ seinen Eltern gehorcht
- ☐ verantwortungsbewusst ist
- ☐ anderen gegenüber rücksichtsvoll ist
- ☐ sich dafür interessiert, wie und warum Sachen funktionieren
- ☐ ein guter Schüler ist

Weiter

**Wählen Sie drei Eigenschaften aus dieser Liste aus,
die ein Kind Ihrer Meinung nach vor allem haben sollte.
Dass es...**

gute Umgangsformen hat	☐
wirklich etwas leisten will	☐
ehrlich ist	☐
sauber und ordentlich ist	☐
gesunden Menschenverstand und eine gute Urteilsfähigkeit besitzt	☐
Selbstbeherrschung besitzt	☐
sich als Junge wie ein Junge und als Mädchen wie ein Mädchen benimmt	☐
mit anderen Kindern gut auskommt	☐
seinen Eltern gehorcht	☐
verantwortungsbewusst ist	☐
anderen gegenüber rücksichtsvoll ist	☐
sich dafür interessiert, wie und warum Sachen funktionieren	☐
ein guter Schüler ist	☐

Weiter

English translation of Q1:

Which three qualities on this list would you say are the most desirable for a child to have? That he...

…has good manners
…tries hard to succeed
…is honest
…is neat and clean
…has good sense and sound judgment
…has self-control
…acts like a boy or she acts like a girl
…gets along well with other children
…obeys his parents well
…is responsible
…is considerate of others
…is interested in how and why things happen
…is a good student

Q2 Question on respondents' past economic situation

Kommen wir nun zur wirtschaftlichen Lage.
Wie hat sich Ihre *eigene* wirtschaftliche Lage in den letzten ein bis zwei Jahren entwickelt?
Ist sie ...

- ○ wesentlich besser geworden
- ○ etwas besser geworden
- ○ gleich geblieben
- ○ etwas schlechter geworden
- ○ wesentlich schlechter geworden

Weiter

Kommen wir nun zur wirtschaftlichen Lage.
Wie hat sich Ihre *eigene* wirtschaftliche Lage in den letzten ein bis zwei Jahren entwickelt?
Ist sie ...

wesentlich besser geworden	○
etwas besser geworden	○
gleich geblieben	○
etwas schlechter geworden	○
wesentlich schlechter geworden	○

Weiter

Kommen wir nun zur wirtschaftlichen Lage.
Wie hat sich Ihre *eigene* wirtschaftliche Lage in den letzten
ein bis zwei Jahren entwickelt?
Ist sie ...

wesentlich besser geworden ○

etwas besser geworden ○

gleich geblieben ○

etwas schlechter geworden ○

wesentlich schlechter geworden ○

Weiter

English translation of Q2:

Now some questions on the economic situation.
How has your *own* economic situation been developing over the last one or two years? Has it been…

getting much better
getting somewhat better
remained the same
getting somewhat worse
getting much worse

Q3 Question on respondents' current economic situation

Wie beurteilen Sie heute Ihre *eigene* wirtschaftliche Lage?

○ Sehr gut

○ Gut

○ Teils / teils

○ Schlecht

○ Sehr schlecht

Weiter

Wie beurteilen Sie heute Ihre *eigene* wirtschaftliche Lage?

Sehr gut   ○

Gut   ○

Teils / teils   ○

Schlecht   ○

Sehr schlecht   ○

Weiter

Wie beurteilen Sie heute Ihre *eigene* wirtschaftliche Lage?

Sehr gut ○
Gut ○
Teils / teils ○
Schlecht ○
Sehr schlecht ○

Weiter

English translation of Q3:

How do you assess your *own* economic situation today?

Very good
Good
Partly good, partly bad
Bad
Very bad

Q4 Question on respondents' future economic situation

Was glauben Sie, wie wird Ihre *eigene* wirtschaftliche Lage in einem Jahr sein?

- ○ Wesentlich besser
- ○ Etwas besser
- ○ Unverändert
- ○ Etwas schlechter
- ○ Wesentlich schlechter

Weiter

Was glauben Sie, wie wird Ihre *eigene* wirtschaftliche Lage in einem Jahr sein?

Wesentlich besser	○
Etwas besser	○
Unverändert	○
Etwas schlechter	○
Wesentlich schlechter	○

Weiter

Was glauben Sie, wie wird Ihre *eigene* wirtschaftliche Lage in einem Jahr sein?

Wesentlich besser ○
Etwas besser ○
Unverändert ○
Etwas schlechter ○
Wesentlich schlechter ○

Weiter

English translation of Q4:

What would you say, how is your *own* economic situation going to be next year?

Much better
Somewhat better
The same
Somewhat worse
Much worse

APPENDIX B

Means and standard errors (in parenthesis) of response latencies for the individual questions in the three conditions

Question	Raw response latencies (in sec.)			Log-transformed response latencies		
	left	right	right-aligned	left	right	right-aligned
Q1	42.97 (3.53)	54.26 (3.55)	54.52 (3.59)	4.61 (0.03)	4.72 (0.03)	4.70 (0.03)
Q2	12.93 (0.78)	12.38 (0.78)	12.71 (0.79)	4.08 (0.03)	4.08 (0.03)	4.08 (0.03)
Q3	7.69 (0.55)	6.67 (0.55)	7.02 (0.56)	3.86 (0.03)	3.80 (0.03)	3.80 (0.03)
Q4	8.26 (0.68)	9.70 (0.69)	8.33 (0.69)	3.89 (0.03)	3.94 (0.03)	3.90 (0.03)

NOTE.— Reported are estimated marginal means after controlling for respondents' baseline speed (covariate).

Means and standard errors (in parenthesis) of fixation times, fixation counts and no. of gaze switches for the individual questions in the three conditions

Question	Fixation times on answer boxes (in sec.)			Fixation counts on answer boxes			Fixation times on answer options (in sec.)			Fixation counts on answer options			No. of switches between answer options and answer boxes		
	left	right	right-aligned	left	right	right-aligned	left	right	right-aligned	left	right	right-aligned	left	right	right-aligned
Q1	2.91 (0.77)	5.70 (0.77)	3.91 (0.78)	7.66 (2.01)	14.70 (2.03)	9.36 (2.04)	22.35 (2.04)	28.47 (2.04)	29.16 (2.05)	109.78 (9.35)	137.42 (9.44)	139.12 (9.48)	12.72 (1.37)	18.08 (1.37)	13.76 (1.37)
Q2	0.99 (0.18)	1.41 (0.18)	1.46 (0.19)	1.48 (0.41)	2.72 (0.41)	2.92 (0.42)	3.60 (0.35)	3.19 (0.35)	3.17 (0.35)	16.55 (1.42)	14.94 (1.43)	14.03 (1.44)	2.60 (0.34)	3.64 (0.34)	3.48 (0.34)
Q3	0.92 (0.19)	1.25 (0.19)	1.44 (0.20)	1.89 (0.43)	2.67 (0.44)	2.51 (0.44)	2.64 (0.24)	1.89 (0.24)	1.96 (0.24)	10.79 (0.96)	8.20 (0.97)	7.13 (0.97)	3.28 (0.46)	3.60 (0.46)	3.84 (0.46)
Q4	1.02 (0.23)	1.85 (0.23)	1.36 (0.23)	1.52 (0.43)	3.45 (0.43)	2.87 (0.45)	2.66 (0.29)	2.47 (0.29)	2.37 (0.30)	11.20 (1.11)	10.18 (1.12)	9.94 (1.3)	3.32 (0.48)	4.72 (0.48)	3.40 (0.48)

NOTE.— For fixation times and fixation counts the table reports estimated marginal means after controlling for the covariates reading rate and fixation rate, respectively.

APPENDIX C

Questions to compute baseline speed (covariate)

The following are English translations of the original German questions. The German wording of the questions are available from the authors on request.

Q1   How successful do you think the government is nowadays in dealing with threats to Germany's security?

Answer options:
Very successful; Quite successful; Neither successful nor unsuccessful; Quite successful; Very unsuccessful

Q2   And how successful do you think the government is nowadays in fighting unemployment?

Answer options:
Very successful; Quite successful; Neither successful nor unsuccessful; Quite successful; Very unsuccessful