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Do Instructional Manipulation Checks Measure Inattention or Miscomprehension?

Instructional Manipulation Checks (IMCs) are intended to detect inattention, a common occurrence in survey responding. We use eye tracking to empirically assess the attention that survey respondents dedicate to a short and a long IMC. We find that all 21 respondents pass the short IMC. In contrast, six respondents fail the long IMC. Our eye-tracking results show that some respondents who fail the long IMC check allocate more cognitive effort and time to processing this check than others, suggesting that lack of comprehension rather than inattention may be the relevant underlying mechanism for their failure. For other respondents failing the IMC, lack of attention and speeding is more likely to be the culprit. These findings culminate into the suggestion that future researchers should assess the time that respondents failing an IMC dedicated to this check to distinguish between miscomprehension (long time) and inattention (short time).

Keywords: attention, eye-tracking, instructional manipulation check (IMC), questionnaire design, survey research

Subject classification codes: include these here if the journal requires them

Introduction

Data quality has been an important topic for market researchers over time (Black et al., 2005). Based on a review of literature, Paas et al. (2018) identify various characteristics that may cause survey questions to be misunderstood, including respondent fatigue, mistakenly selecting the wrong answer category, failure to follow instructions, and skipping parts of the question. This paper focuses on respondent inattention. Academic and market researchers are increasingly using Instructional Manipulation Checks (IMCs) to identify inattentive respondents (e.g., Huang et al., 2012; Meade & Craig, 2012, Oppenheimer et al., 2009; Paas and Morren, 2018; Paas et al., 2018).

An IMC typically involves embedding an additional question in the survey, which is similar in length and response format to other questions but does not measure content relating to the survey (Oppenheimer et al., 2009), e.g., “If you have read this question, please skip answering it”. If a respondent follows the instruction, it is assumed that this individual has completed the questionnaire with the required level of attention. Contrarily, if the respondent fails to act upon the instruction, the individual is assumed not to have answered the survey questions carefully enough. This is relevant for researchers, as inattentive survey responding reduces the quality of survey data.

Previous studies find significant associations between IMC failure and other well-known survey response inattention indicators, e.g., straight-lining (the use of the same answer option irrespective of the question asked), speeding (completion of the survey in an unreasonably short time), and response inconsistency (e.g., age equals 50 according to one survey answer and the same respondent indicated to be born in 2000 in response to another survey question) (Huang et al., 2012; Meade & Craig, 2012; Paas et al., 2018). However, associations between different indicators of respondents’ inattention tend to be modest (Meade & Craig, 2012). In addition, Morren and Paas (2020) found that failing a short and simple IMC did not correlate significantly with failing a longer and more complex IMC, and they consequently proposed that different forms of respondent inattention may occur, see also Meade and Craig (2012). These previous research findings have led to the suggestion that multiple measures of inattention are required to fully capture respondent inattention behaviour (Meade & Craige, 2012; Liu & Wronski, 2018; Maniaci & Rogge, 2012; Morren and Paas, 2020).

The literature on IMCs has only addressed overt scores derived from variables that are deemed to be valid indicators of respondent inattention, e.g., IMCs, speeding, straight-lining, and inconsistencies between answers to alternative questions about the same variable. The underlying process of respondent inattention has not been observed directly. Interestingly, several previously published empirical studies reported an association between IMC-failure and the educational level of respondents (Anduiza & Galais, 2017; Morren and Paas, 2020), which suggests that comprehension capability of respondents may influence the probability of them failing an IMC, in addition to respondent inattention.

In this paper we first present the relevant theory, then conduct an eye-tracking study that clarifies the process underlying IMC-failure and conclude with a discussion and derive practical implications. The key theoretical contribution of this study is that it provides, for the first time, insights into the process involved in IMC failure. This is of practical value because it helps determine the suitability of IMC's for detecting inattentive respondents in survey studies.

Background

IMCs and respondent attention when completing a survey

Sometimes, survey respondents accidentally chose incorrect answer categories, skip or misread questions (unintentionally or intentionally), or fail to follow survey instructions (Huang et al., 2012; Morren and Paas, 2020). Under such conditions, the overt answers that respondents provide to survey questions are affected by a random error process. Respondent inattention may result in systematic error, which – in turn – reduces the validity of the overt measurements (Paulhus, 1991). Respondents who are inattentive are assumed to follow satisficing strategies: their survey responding behaviour is characterised by a reduction in cognitive burden and consequently a skipping or superficial completion of large parts of the survey (Morren and Paas, 2020; Krosnick, 1991; Oppenheimer et al., 2009).

Previous research has proposed that respondent inattention can be detected with the help of observed indicators such as IMCs, straight-lining, speeding, and response inconsistency (Huang et al., 2012; Meade & Craig, 2012; Paas and Morren, 2018). From a latent trait theory perspective (Paas and Sijtsma, 2008; Sijtsma & Molenaar, 2002) such research assumes that respondents' values on such observed indicators results largely from their level of attention to the survey, which is a latent variable.

The unobservable relationships between the latent trait of respondent attention and observable inattention indicators (inconsistent survey responses, speeding, straight lining, and IMC failure), can be assumed to result in positive empirical correlations between those four observed indicators (Paas and Sijtsma, 2008; Sijtsma & Molenaar, 2002). It has at times been found that respondents' scores on some of the indicators for detecting inattentive responding behaviour are indeed positively associated. For example, respondents who fail IMCs are more prone to display speeding behaviour (Oppenheimer et al., 2009; Paas and Morren, 2018; Paas et al., 2018). For alternative indicators of respondent inattentiveness (e.g., response pattern such as straight-lining, inconsistent responses), however, the association is weak, suggesting that different indices are required to distinguish between alternative forms of inattentive responding (Morren and Paas, 2020; Meade and Craig, 2012). Therefore, researchers have used sophisticated segmentation approaches to cluster respondents based on their performance on various indicators for inattentiveness (e.g., Maniaci and Rogge (2012); Morren and Paas (2020)). A further complication is that the response process resulting from respondent inattentiveness has never been directly observed, but only derived from weak correlations between indicators that are assumed to reflect inattentiveness.

Other arguments against the validity of IMCs as a measure of respondent inattention include that more than one-third of respondents who said they noticed the IMC did not answer the question correctly and that about one-fifth of respondents who answered the IMC correctly indicated that they had not noticed it (Liu and Wronski, 2018); and that IMC failure frequently occurs among less educated respondents (Anduiza and Galais, 2017; Morren and Paas, 2020), suggesting that lack of comprehension (rather than inattention) may cause IMC failures. These considerations call for more research about respondents' processing of IMCs, and most importantly whether failing the check indeed relates to the latent variable of respondent attention.

Eye-tracking respondent attention to IMCs

As a direct measure for respondent inattentiveness, we will employ eye-tracking to observe whether eye movement behaviour is different between respondents who fail IMCs and those who pass. Process tracing methods, such as eye-tracking, measure attention directly by observing the time individuals dedicate to specific text parts or survey stimuli (Baumgartner et al., 2018; Galesic et al., 2008; Lenzner et al., 2011, 2014; Menold, 2017).

Previous eye-tracking studies observed how respondents process survey questions. Baumgartner et al. (2018) used eye-tracking to study how respondents read survey questions on a computer screen to distinguish between two mechanisms: lack of motivation to process survey questions carefully (inattention), and inability to comprehend instructions, survey questions or answer options offered (comprehension) (Tobii, 2013). Results indicate that inattention and comprehension of survey questions are distinct and uncorrelated constructs. Opposite items, reversed items, and negatively worded items receive more attention, but also generate more incorrect answers, pointing to difficulty of the survey question rather than inattention as the error-generating mechanism (Baumgartner et al., 2018).

Lenzner et al. (2011) found eye movements to be associated with cognitive processing involved in respondents' reactions to survey questions. Text features such as low-frequency words and imprecise terms reduce question comprehension, undermining the integrity of the survey response process. Lenzner et al. (2011) conjectured that eye-tracking research can provide valuable insights that can support the development of approaches aimed at reducing the cognitive effort of respondents and, with it, response error. For example, respondents dedicate more visual attention to numeric rating scales than to verbally labelled rating scales (Menold, 2017) and placing answer boxes to the left of left-aligned answer options requires less cognitive effort (Lenzner et al., 2014).

Responding to IMCs has not previously been studied using eye-tracking. Rather, it was assumed that respondents who pass the IMC had dedicated more attention to the task of responding to survey questions than those who failed. The present study provides objective measures of attention, allowing to differentiate between different potential reasons for respondents failing IMCs.

Methodology

Eye-tracking allows unobtrusive, sensitive, and real-time measurement of visual attention (Duchowski, 2007). Researchers recommend using eye-tracking as an additional measure to gain more insight about experimental studies (Hsu & Chen, 2020), and statistical analysis (Kim et al., 2018). We used the desktop mounted eye-tracker Tobii TX-300 in a laboratory setting, which recorded eye movements at 300 Hz using infrared corneal reflection with a 0.5-degree precision (Tobii, 2003). Eye-tracking measures of eye movements are behavioural indicators of visual attention and information acquisition (Wedel and Pieters, 2008). Eye movements consist of fixations and saccades (Duchowski, 2007; Rayner, 1998). Fixations last for about 200 to 300 milliseconds. Saccades are short (20-40 milliseconds) rapid eye movements between fixations during which information processing is suppressed (Rayner, 1998).

The duration of fixations indicates the extent to which respondents cognitively process textual and visual information (Rayner, 1998; Russo, 2011). That is, average fixation duration (the mean of all individual fixations) and total fixation time (the sum of all individual fixations) are indicators of processing depth or effort (Rayner, 1998; Russo, 2011). When reading English, eye fixations last about 200-250 milliseconds, and can range from just under 100 milliseconds to over 500 milliseconds (Rayner, 1998). During saccades, no information is acquired, and the reader changes focus from one region of the text to a new region. In the English language saccades generally are between 1 and 15 letter spaces with a mean size of 7-9 letters (Rayner, 1998). The occurrence of fixations and saccades are influenced by the characteristics of the text that is read. For example, a more difficult text results in increases of fixation duration and smaller saccades (Rayner, 1998).

Akin to Morren and Paas (2020) and Oppenheimer et al. (2009), we used two alternative IMCs in a within subject design: a long and a short check. Both IMCs instructed the participants not to answer the question. The IMCs were incorporated in an online questionnaire, consisting of 19 questions that were presented on 17 pages, and asked about travel behaviour and various respondent characteristics. The long IMC (shown in Figure 1A) consists of a paragraph that ends with the instruction to skip the question. The short IMC (question 23 shown in Figure 1B) consists of a single item that is embedded in an item battery of similar questions: "*Please do not answer this. It is to check your attention*".

*[Figures 1A and 1B here – **see end of document for tables and figures**].*

The study was carried out at a university eye-tracking laboratory where participants were informed that a camera would record their eyes while they were answering the questionnaire. The IMCs were not mentioned. Next, participants sat in front of the eye-tracker. The distance between participants and the eye-tracker was approximately 60 cm. After a nine-point calibration process on the eye-tracker screen, participants started answering survey questions while their eye movement were recorded. Participants did not have a time limit to answer the questions and they moved to the next question at their own initiative by using the mouse. We recorded all eye movements, from the moment they started looking at the questionnaire until they completed it. The experiment protocol was approved by the Human Ethics Committee of the university (Approval number 2019000331).

After answering the survey questions, study participants viewed recordings of their eye movements and commented on what they were thinking about while completing the task. Such verbal feedback is valuable because eye movements accurately show what respondents look at, but they cannot explain why respondents look at the focal object or in our case, text (Duchowski, 2007; Russo, 1978). Comments were recorded and served as an additional source of insight. The entire task took 15 to 20 minutes; participants were debriefed upon completion of the task and received a $20 gift voucher.

The initial sample consisted of 23 participants (12 men, 11 women), aged 18 to 43 (mean=29; SD= 6.45), recruited from university staff and students (12 full time employees, 11 students) at a large Australian university. All participants had at least one university degree. We suggest that these 23 participants will have fewer difficulties with comprehending survey instructions than average survey respondents. Two participants with poor eye data quality were removed from the analysis. The quality of eye-tracking data can suffer if people blink excessively, wear thick glasses, or contact lenses. The reported results are, therefore, based on data from the remaining 21 participants.

We processed the eye-tracking data with the iMotions software (iMotions, 2018) and defined the areas of interest around all instructions on the survey screens, including two IMCs, along with answer options. Gaze data with a minimum duration of 100 milliseconds is considered as a fixation (iMotions, 2018). As indicators of processing depth, we used the following two measures (iMotions, 2018; Russo, 2011):

(1) *Total time spent in seconds (s)*: total duration of all respondent's fixations on the area of interest.

(2) *Average fixation duration in milliseconds (ms)*: average of all respondent's fixation times on the area of interest.

A non-parametric Mann-Whitney test evaluated pairwise differences between participants who failed an IMC versus those who passed.

Results

Preliminary quantitative results

All 21 participants passed the short IMC. On average they spent 2.00 seconds (SD= 1.29) on this check. The short manipulation check consists of 11 words, requiring the average reader to allocate 2.2 seconds (200 ms per standard word) (Carver, 1992). Two participants dedicated substantially more time than others to the short IMC – approximately 4.65 seconds.

Six of the 21 respondents (28.57%) failed the long manipulation check. One of them only dedicated 2.5 seconds to the IMC. At the other extreme, another respondent who failed the long IMC spent about 60 seconds processing it. Among the 15 respondents who passed the long IMC, one dedicated only seven seconds to it, another one 52 seconds. The long IMC contained 105 words, requiring the average reader to dedicate 21 seconds (200 ms per standard word) to reading and comprehending the passage (Carver, 1992). An overview of the preliminary statistics for the short and long IMCs is reported in Table 1.

[Table 1 here].

Contradicting the expectation that attention levels determine IMC performance, the total fixation time on the long IMC among respondents who failed was not significantly higher from respondents who passed (23.39 s versus 21.54 s, $p>0.05$). The average fixation duration for the long IMC was significantly higher for the six participants who failed the check than the 15 participants who passed it (277 ms versus 225.93 ms, respectively, $p<0.05$). Thus, we suggest that some respondents may have experienced difficulties in comprehending the long IMC.

The time dedicated to the short IMC also suggest that comprehension plays a role. Two respondents who allocated more time to processing the short IMC (approximately 4.65 s), compared to the 19 others (on average, 1.72 s), failed the long IMC, despite dedicating a lot of time to this longer check. For these respondents failing a manipulation check is less likely to be caused by decreased levels of attention.

Preliminary qualitative results

The eye-tracking results suggest that two mechanisms may explain failure of the long

IMC: lack of attention and lack of comprehension. However, one could argue that those respondents passing the test, while dedicating less time to the text, are fast readers, whereas those respondents that dedicated more than the theoretically required 21 seconds to the test and still failed may be slow readers, i.e., the previously mentioned required 200 ms for reading a standard word is an average across all readers (Carver, 1992).

The qualitative comments provided by respondents as they reviewed their eye movement results provide support for the proposition that miscomprehension may play a role in failing the long IMC. The following comments were made by the three respondents who failed the long IMC, and dedicated more than the required 21 seconds to this check:

> "I read it (the instruction) two times … I was thinking about what we did in our last holiday, I checked the answers again to make sure I ticked all the activities in my last holiday" (male, 34 years old, 60 seconds spent on the long IMC).

> "Where I read 'most modern theories' I thought it gives me some idea about the whole concept not the instructing me" (male, 36 years old, 23 seconds spent on the long IMC).

> "I did read it, I understand it is a holiday question as well as activities I participate in during holidays" (male, 29 years old, 27 seconds spent on the long IMC).

Inattention clearly played a major role also in the comments of two other respondents who failed the long IMC:

> "I scanned it, I thought it was the same paragraph in all of them (male, 21 years old, 2 seconds spent on the long IMC).

> "I thought I read it carefully … it was a big chunk" (female, 31 years old, 8 seconds spent on the long IMC).

The sixth and final respondent who failed the long IMC dedicated just under 21 seconds to the instruction (18 seconds) and shared the following remarks:

> "I remember reading that I think it says to continue the survey not to answer that, I understood the meaning but, I did not read the question again, so I thought I will answer that" (male, 24 years old, 18 seconds spent on the long IMC).

Eye-tracking results

Figure 2 reports the gaze plots for two of the six respondents who failed the long manipulation check. These gaze plots display the location, order, and time spent looking at areas of interest of the screens that present the IMCs (Tobii, 2018). Time spent looking – represented as fixation duration – is shown by the diameter of the fixation circles, where larger circles indicate more time, and each line represents a saccade. Numbers within the circles display the order of the fixations.

The left part of Figure 2 shows the eye movements of a respondent who did not read the instructions thoroughly enough to pass the long IMC, i.e., this respondent can be labelled as inattentive. For this respondent, the fixation circle number 1 at the center identifies the first fixation that is dedicated to the IMC. Subsequent fixations are numbered 2-61 and trace the location and order. Fixations number 2, 3, and 4 are not visible. They are hidden behind fixations number 21 and 22. As can be seen in the left gaze plot, the participant did not read the instructions thoroughly, skipping most of the first few sentences, and skimmed the answer options. The participant that is represented in the right gaze plot read the instructions and answer options thoroughly with 268 fixations. Furthermore, the fixations of this respondent cover almost the entire instruction of the long IMC. Nevertheless, this respondent still failed the long IMC. We conjecture that they are more likely to have failed due to miscomprehension rather than inattention.

[Figure 2 here].

Four of the six respondents who failed the long IMC display plots that are similar to the right part of Figure 2, suggesting they may have failed due to miscomprehension. The other two respondents, who failed the long IMC, displayed plots that were similar to the left plot in Figure 2, which is more consistent with inattentiveness.

The eye movement patterns that were observed among the 15 participants who passed the long IMC can also be described using the plots in Figure 2. Five of these 15 respondents displayed a plot similar to the right plot in Figure 2, which confirms that they read the instruction thoroughly. Two participants displayed plots which were similar to the left part the Figure 2; they skipped some part of the instruction. The remaining eight respondents displayed eye movement patterns that were somewhere in between the two extremes shown in Figure 2. These eight respondents at times skipped the first few lines of the long IMC. This suggests that some participants could dedicate less attention to comprehend the long IMC, while others needed to read the check thoroughly to achieve sufficient comprehension for passing.

Although all 21 respondents passed the short IMC, two had dedicated more time to reading this check. The right plot in Figure 3 reports the eye movements of one of these two respondents, while the left part of Figure 3 reports the eye movements of the respondent that dedicated the least amount of time to the short IMC and still passed.

[Figure 3 here].

The participant in the right gaze plot of Figure 3 read almost every word in the table, including the short IMC. The participant in the left gaze plot had fewer fixations, scanned the items in the table, including the short IMC. Despite this, both respondents passed the short IMC. This illustrates that some respondents need to dedicate more attention to comprehend the short IMC.

Discussion and Conclusions

When a respondent fails an IMC, this is generally interpreted to be caused by a lack of attention for the survey (Krosnick, 1991; Meade and Craige, 2012; Oppenheimer et al, 2009; Paas et al., 2018). However, previous papers reported that the empirical relationships between failing IMCs and other survey inattention indicators (e.g., speeding, inconsistent answers, straight-lining) tend to be weak, at best (Meade and Craig, 2012; Morren and Paas, 2020). We conjectured that direct observation of respondent inattention is required to investigate the relationships between failure of IMCs and inattention of respondents.

Our study employed eye-tracking to obtain such empirical data. The results show that participants failing the long IMC do not necessarily pay less attention to the instructions than those who pass. Four of the six respondents who failed the long IMC did read the instruction thoroughly but still failed, while the remaining two respondents that failed the long IMC dedicated less attention.

The reported eye-tracking results are consistent with insights gained from comments that the study participants made after the survey: some respondents indirectly stated that they did not comprehend the long IMC. Our findings are also consistent with empirical results that were reported by Baumgartner et al. (2018) who concluded that difficulty – in addition to inattention – may cause incorrect survey responses.

The reported empirical findings may also extend to shorter IMCs, although all respondents in our study passed the shorter attention check. Yet, two respondents read the instruction word by word, while it was sufficient for others to quickly scan the short IMC to pass. Interestingly, the two participants who read the short IMC word by word, according to the eye-tracker data, also failed the long IMC, while they dedicated much attention to the long IMC. This finding suggests that in the general population, in which not everyone has received university level education (as was the case in the sample of our reported empirical study), some individuals may also fail short IMCs due to miscomprehension instead of inattentiveness.

Our study has practical implications for survey researchers: IMCs should be kept short and simple. Failing longer and more complex IMCs may often be caused by lack of comprehension, rather than respondent inattention. Misinterpreting the cause for failure of the IMC could lead to the elimination of the answers provided by attentive respondent from the data set, possibly introducing unnecessary survey bias in the case that those respondents failing the long IMC differ on variables such as first language, educational level, or experience with surveys. A more general implication is that our empirical findings are a reminder that survey instructions should be as short and simple as possible. Shortening the survey length increases the quality of survey data via more completions rates, less missing data, and less satisficing behaviour (Paas et al., 2018). Shortening the survey length could also address low response rates in web-based surveys, which reduces both sample size and statistical power of empirical studies (Basa-Martinez et al., 2018).

Based on the empirical results that are reported in this paper, we suggest that future researchers should use the time spent on an IMC in conjunction with whether the respondent passed or failed the check. Our eye-tracking results suggest that those respondents that dedicated much time to an IMC and failed, are likely to have miscomprehended the check. Such respondents may also have provided inappropriate answers to other questions because of miscomprehension. Besides this, some respondents dedicated less time to the IMC and failed, here the culprit is more likely to be insufficient attention.

The reported study has several limitations. The sample size is relatively small, i.e., n=21, which is due to the time-consuming and labour-intensive nature of collecting eye-tracking data (Duchowski, 2007). Nevertheless, we have found that miscomprehension plays a role in failing such checks and should hence be considered by researchers employing IMCs. Also, our sample consisted of respondents with higher educational levels. We expect that the failure rates on IMCs will be higher among the general population and miscomprehension could possibly also play a role for the failure of the simpler, short IMCs, which implies it is also important to assess the time that respondents failing a short IMC have dedicated to this specific check. Another limitation is that we conducted our study in a laboratory setting, which is a different experience from completing a survey at home. Knowing that their eye movements are being monitored, participants could possibly have paid more attention to the survey questions.

Varying the survey setting and having a larger more varied sample of respondents represents key directions for future research. In terms of the survey setting, future research could use two different short surveys (one followed by the other) which differ in a way that enables identification of drivers of IMC failure, including textual difficulty, length of sentences, and range of topics used. In terms of the sample, a larger sample would be invaluable because it would allow to assess differences between groups of the population. For example, being an English native speaker is likely to positively affect comprehension. Consumer involvement (Behe et al., 2015), age (Espigares-Jurado et al., 2020), culture and education level (Oppenheimer et al., 2009) may impact how they process visual information. We observed that five out of six respondents who failed the long IMC were male. Gender may have impacted information processing. Such respondent characteristics and their role for IMC-failure can be investigated in future work.

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Table 1. Attention measures for the long instruction manipulation check.

Participants who passed	Total fixation time (s)	Average fixation duration (ms)
Average	21.54	225.93
Min	7.63	172.00
Max	51.94	279.00
Standard deviation	11.02	24.73
Participants who failed		
Average	23.39	277.00
Min	2.42.00	225.00
Max	60.15	356.00
Standard deviation	14.78	49.44

Most modern theories of decision making recognize the fact that decisions do not take place in a vacuum. Individual preferences and knowledge, along with situational factors can greatly impact the decision making process. In order to facilitate our research on decision making, we are interested in knowing certain factors about you, the decision maker. Specifically, we are interested in whether you actually take the time to read the directions, if not some of our survey questions will be ineffective. So, in order to demonstrate that you have read the instructions, please ignore the holiday activity items below. Instead simply continue with the survey. Thank you.

Please select the activities in which you participate in during holidays? (click on all that apply)

- ☐ Skiing (1)
- ☐ Visiting cultural sights, such as museums, art galleries or historic buildings (2)
- ☐ Nightlife (3)
- ☐ Activities for my children (4)
- ☐ Water sports (5)
- ☐ Other sports (6)
- ☐ Visit beaches (7)
- ☐ Concerts and other performing arts (8)

Figure 1A. Long instructional manipulation check.

How important are the following things to you?

	Not important (2)	Important (3)	Very important (4)
Being myself. (15)	○	○	○
Learning something new. (16)	○	○	○
Interacting with people from cultures other than my own. (17)	○	○	○
Gaining understanding about cultures other than my own. (18)	○	○	○
Reflecting on myself. (19)	○	○	○
Behaving like a child again. (20)	○	○	○
Developing personally. (21)	○	○	○
Developing socially. (22)	○	○	○
Please do not answer this. It is to check your attention. (23)	○	○	○
Growing spiritually. (24)	○	○	○
Adding meaning to my life. (25)	○	○	○
Ticking things off my bucket list. (26)	○	○	○

Figure 1B: Short instructional manipulation check.

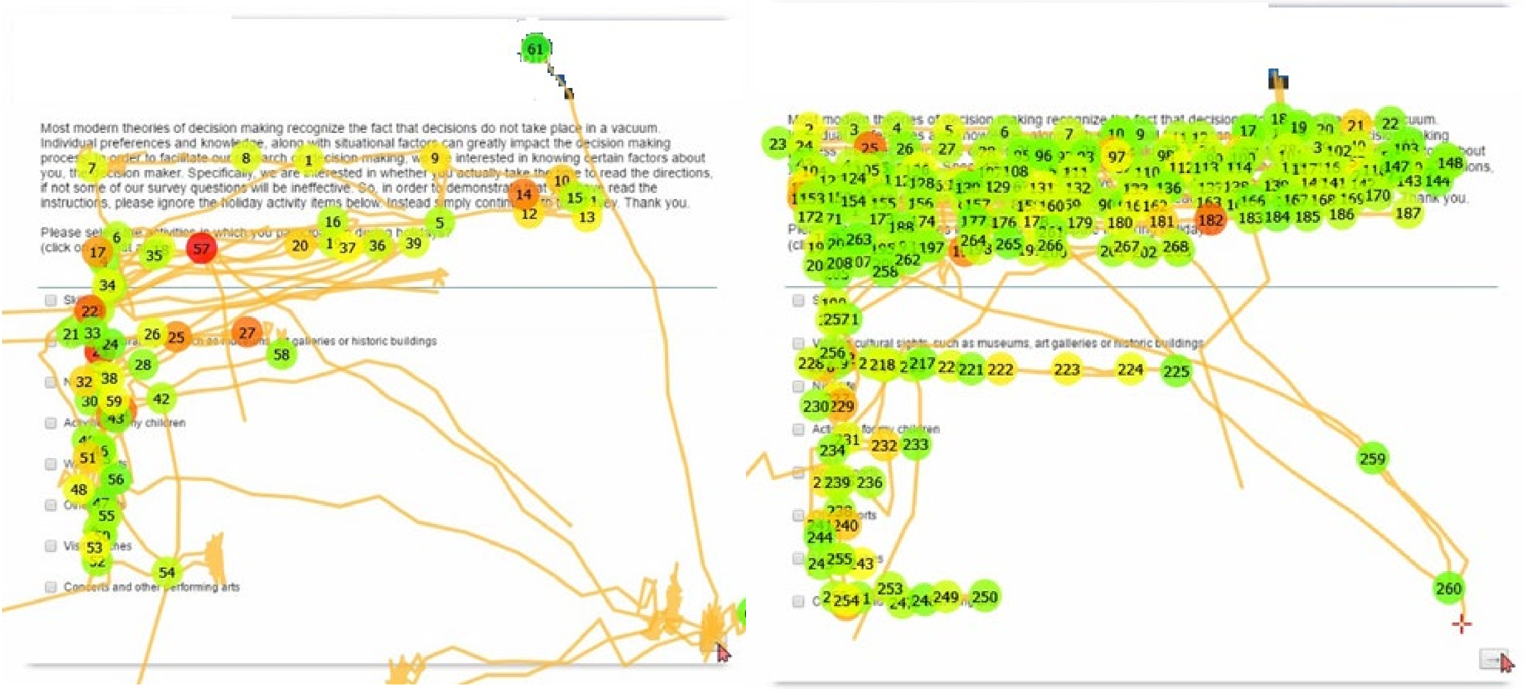

Figure 2. Gaze plot of respondents who failed the long instructional manipulation check: low attention (left, fixations number 2, 3 and 4 are behind fixations number 21 and 22) and comprehension failure (right) (university logo has been removed).

Figure 3. Gaze plot of respondents spent the least (left) and most (right) attention to the short instructional manipulation check (university logo has been removed).