

# “It is disturbing!”: Participant experiences during cued RTA

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## Abstract

In this study, a usability evaluation is employed that applies a cued retrospective think aloud (RTA) method, in which user verbalizations are stimulated by a performance replay. Several studies have compared the outcomes of cued RTA methods using different cues as independent variable. However, none of these studies investigated user experiences during cued RTA. In an explorative study, we interviewed five users about their experience in cued RTA when presented with a gaze video or screen video cue. The findings of this study provide valuable support for researchers and usability practitioners in improving cued RTA as a usability evaluation method.

## 1 Introduction and Background

Think aloud (TA) is a commonly used method for usability evaluation and “may be the single most valuable usability engineering method” (Nielsen, 1993, p. 195). Two TA approaches are used to detect usability problems and to understand how users interact with products: the concurrent think aloud (CTA), in which users verbalize thoughts *while* performing a task, and the retrospective think aloud (RTA), in which users verbalize steps and experiences *after* completing a single or block of tasks (Willis and McDonald, 2016). In a so-called cued RTA setting, users are presented with recordings of their previous interactions (Van Gog, Paas, Van Merriënboer, and Witte, 2005), with, for example, screenshots, screen recordings, or gaze paths. Findings from some studies suggest that cued RTA is more effective than un-cued RTA regarding, for example, the numbers of words verbalized and usability problems identified (e.g., Tobii Technology, 2009; Olsen, Smolentzov, and Strandvall, 2010). In contrast, studies comparing different cues found heterogeneous results; in the study by Tobii Technology (2009), the gaze video cue was more effective than the screen video cue, whereas Elling, Lentz and de Jong (2011) found no difference between them.

However, to the best of our knowledge, *how users experience the cues during RTA* has not been investigated. Thus, we conducted an explorative study and interviewed participants regarding their experience when viewing a gaze versus a screen video as cue for RTA. We believe that understanding participant experiences during cued RTA helps to (i) improve the cued RTA method, and (ii) better understand whether a specific cue helps or not.

## 2 Study Procedure and Data Collection

Five German native speakers (three males and two females, aged 19–27), who were neither color blind nor used optical aids, participated in the study. First, the test leader provided a short overview of the test procedure and explained the apparatus employed. SMI eye-tracking glasses were used in both groups to record participant interaction with a Samsung tablet (the glasses were only calibrated in the gaze video group). Second, participants were instructed to solve 10 short tasks using the Evernote Android App (evernote.com). The tasks included creating and editing notes; none of the participants had previously worked with Evernote. Third, after completing the task session, participants answered a short demographic survey while the test leader exported and prepared the videos for replay. Fourth, participants were asked to think aloud while watching a replay on the test leader's laptop. In the gaze video group, the test leader briefly explained the gaze point (the circle in Fig. 1) to participants P1, P2, and P3. The videos were replayed at full speed, and users were not allowed to pause, forward, or rewind.



Fig. 1: Retrospective think aloud (RTA) method with a gaze video cue including recordings of the screen, the gaze (circle in the middle of the screen), and surrounding information (e.g., fingers, head movements).

Finally, each participant was interviewed about the following: (i) whether and how the gaze/screen video supported him or her during RTA, (ii) how he or she experienced (gaze video group) or anticipated experiencing (screen video group) when confronted with his or her own eye movements, and (iii) additional cues that might help them during RTA.

### 3 Results

**Helpfulness of a gaze/screen video cue:** Most participants (P2, P3, P4, P5) stated that having the gaze/screen video cue was *helpful* during RTA. Only one participant (P1) claimed that he would not need a cue for such a short task. However, he stated that for longer tasks, a cue might be helpful. One participant (P4) emphasized that a video cue for short tasks might help if a participant is engaged in an *unfamiliar task* (e.g., using an application or device for the first time). Participant P2 indicated that seeing *noticeable sequences of her eye movements* (e.g., looking several times to some areas in the interface) helped to remind her that she experienced difficulties when solving tasks. Participant P5 (in the screen video cue group) stated that he wanted to see his gaze, as this would help her during RTA. **Reactions to the gaze:** One participant (P1) from the gaze video cue group indicated that he was *irritated* to see how often and fast his gaze jumped. Participant P2 expressed her belief that a very “jumpy” gaze might *distract* a participant from the RTA task. Although P3 was *fascinated* to see his own gaze (“cool!” he exclaimed), he said that seeing the gaze might be *disturbing* for a participant. P5 believed that watching the gaze replay might be *shameful* for some, as the replay displays the gaze to both the participant *and* others (e.g., the test leader), thus revealing that the participant did not correctly perform the task (perhaps because he or she was looking at the wrong areas). **Additional ideas for improving cued RTA:** Some participants (P4, P5) suggested that *acoustic* cues be given from a tablet (e.g., hearing a vibration when tapping). One participant (P2) suggested that reading the task list might also help during RTA. Especially for longer tasks, one participant (P4) said that she wanted to be informed before starting a task and that she must also perform an RTA. Two participants (P2, P3) wanted to *take notes* during a task, but also suggested that this might distract them from performing the task. One participant (P3) suggested that a person should be allowed to *set a cue or marker during* the task as a reminder to mention something specific during the RTA.

### 4 Discussion

The goal of this study was to explore the manner in which participants experience retrospective thinking aloud (RTA) with a gaze or screen video cue. Although only a small sample and very short task were utilized, improvements for cued RTA settings can be derived from this study. One such improvement includes a dedicated test to help explain eye movements to participants. Moreover, as indicated by participants, distractions and interruptions during the RTA might explain why gaze video cued RTA is not always the best cued RTA form. We recommend allowing participants to switch to a simple screen video as an alternative cue for RTA if they feel uncomfortable seeing their own eye movements. In

addition, we recommend allowing participants to reduce the speed of the video replay, as our study showed that very fast eye movements irritated participants. Future work should validate results by recording participant eye movements *during* cued RTA to fully understand the visual information that attracts a participant's attention and even affects RTA outcomes.

## References

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