



## The experience of reading

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### ABSTRACT

What do people consciously experience when they read? There has been almost no rigorous research on this question, and opinions diverge radically among both philosophers and psychologists. We describe three studies of the phenomenology of reading and its relationship to memory of textual detail and general cognitive abilities. We find three main results. First, there is substantial variability in reports about reading experience, both within and between participants. Second, reported reading experience varies with passage type: passages with dialogue prompted increased reports of inner speech, while passages with vivid visual detail prompted increased reports of visual imagery. Third, reports of visual imagery experiences, inner speech experiences, and experiences of conscious visual perception of the words on the page were at best weakly related to general cognitive abilities and memory of visual and auditory details.

### 1. Introduction

What sorts of conscious experiences do you have while reading? You are, in fact, reading at this very moment. So think, what are you experiencing right now?

Systematic studies that explicitly focus on people's self-reported conscious experiences while reading are rare. In a way, this is surprising. Academics spend much of their lives reading. People studying the aesthetics of fiction and poetry are interested in the reading experience (Carroll, 2001; Fish, 1970; Holland, 1975; Kivy, 2008; Lamarque and Olsen 2004; Miall & Kuiken, 2002; Phelan, 2007; Robinson, 2005). However, almost all existing explicit claims about people's conscious experiences (or phenomenology) while reading are based on unsystematic armchair introspection by the scholar in question or, in some cases, on the retrospective reports of casual readers. This has led to a bewildering array of assertions about the phenomenology of reading by psychologists, philosophers, and literary theorists.

For example, some scholars assert that, at least for them, reading a narrative, such as a story or a novel, normally involves experiences of *visual imagery* (e.g., Ahsen, 1984; Dennett, 1991, p. 366; Nannicelli, 2013; Wittgenstein, 1946-1948/1975, p. 44). Others express skepticism about the frequency of conscious visual imagery or its empirical relation to textual details (e.g. Berkeley, 1710/2009, Intro, Section 20; Burke 1757/1990, p. 152; Kurby & Zacks, 2013). Similarly, some scholars assert that the phenomenology of reading normally involves *inner speech*, inner hearing, or some sort of voice in the head (Baars, 2003; James, 1890, p. 361; Kivy, 2008; Morin, 2009; Perrone-Bertolotti, Rapin, Lachaux, Baciú, & Loevenbruck, 2014; Vellmans, 2009), while others deny that reading must involve such a voice (Brouwers et al., 2018; Faw, 2009; Reed, 1916; Woodworth, 1906, p. 704). Scholars also disagree about whether people normally have *conscious visual experience of the words on the page* when they read. Jaynes (1976, p. 26), for example, says that once readers are absorbed in the text, they have no visual experience at all of the words on the page, that one normally experiences only the meaning of the words and has no conscious experience of the letters as they appear on the page. Russell

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T. Hurlburt (Hurlburt & Schwitzgebel, 2007, p. 50) seems to agree that this is often the case, while Charles Siewert finds this “just about as obviously false a remark as one could make about visual experience” (1998, p. 249).

The experimental literature on the *cognitive architecture* involved in reading, while large, is mostly silent on the question of readers’ conscious experiences. Some of the most well understood cognitive processes involved in reading are those that process phonological (sound) information. While the body of research on phonological coding (e.g. Leininger, 2014; Seidenberg & McClelland, 1989; Van Orden, Johnston, & Hale, 1988) and the phonological loop (Baddeley 2010; Coltheart, Rastle, Perry, Langdon, & Ziegler, 2001; Frost, 1998; Lauro, Reis, Cohen, Cecchetto, & Papagno, 2010; Paap & Noel, 1991) show that the sound of a word plays a foundational role in processing textual information, this process could be, and likely often is, unconscious. Many of the cognitive processes involved in reading are largely unconscious, such as visuospatial memory (Baddeley, 2000, 2007; Pham & Hasson, 2014) and the use of situational models in narrative comprehension (Kurby & Zacks, 2013; Zwaan, 2016; Zwaan & Radvansky, 1998). Our eyes move multiple times a second while reading, but this does not entail that we are conscious of each saccade, and similarly, attunement to the sound of the words while reading does not entail an auditory experience of any sort. Unfortunately, the experimental literature often fails appropriately to highlight the important distinction between possibly non-conscious cognitive processes involving phonological information and the conscious experience of inner speech (e.g. Kurby, Magliano, & Rapp, 2009; Leininger, 2014). The same general trend is at work in the research on the visuospatial sketchpad and situational models of narrative comprehension. This leaves us in a rather odd position: the experimental literature on reading has told us a lot about the cognitive architecture recruited for reading but very little about the conscious experiences that people have while reading.

We see two possible explanations for the broad disagreement in reports about the experience of reading. One explanation is that people have radically different types of experience while reading, and individuals or researchers tend to overgeneralize from their own case, or from one text type or one type of reading situation, to others. Another explanation is that people are often radically mistaken about even this seemingly obvious feature of their stream of experience. These explanations are not incompatible, and versions of both are endorsed by Russell T. Hurlburt, who along with his collaborators has begun some systematic work using self-reports of sampled experience while reading long passages of text (Brouwers et al., 2018; Caracciolo & Hurlburt, 2016). Hurlburt and collaborators’ primary conclusions are that people vary considerably in their experience while reading and that inner speech is much less frequent than is commonly assumed.

Hurlburt’s work depends on his time-intensive Descriptive Experience Sampling (DES) method (Hurlburt, 2011). DES involves extensive personal interviews about individual moments of sampled experience, collected using a beeper. DES interviews are conducted by expert interviewers who can, if things go well, help participants “bracket presuppositions” in order to access their “pristine” experiences. Although we believe DES is a valuable method, it has several shortcomings for the present purpose: (1) Since it is time intensive, DES studies are always limited to small samples. (2) Since DES requires expert interviewers who follow no set script, it is difficult to replicate and it can be difficult to assess the extent to which “experimenter effects”, such as interviewer bias, are influencing the results. (3) To focus exclusively on the sampled experiences, DES normally does not include other measures, such as reading comprehension measures or other types of subjective report, which might better illuminate the cognitive processes at issue. (For extensive discussion of the methodological pros and cons of Descriptive Experience Sampling, see Hurlburt & Schwitzgebel, 2007.)

Shirley A. Long, Mark Sadoski, and their collaborators have also explored introspectively-reported imagery experience while reading. Studying fifth-graders’ (age 10–11 years) responses to poetry, narrative, and expository writing, Long, Winograd, and Bridge (1989) found that their respondents reported visual imagery about 60% of the time when stopped at selected points in the passages, and that the levels of imagery reports were similar for the different passage types. However, their power was limited by having only 26 participants in their design. Goetz, Sadoski, Stowe, Fetsco, and Kemp (1993) similarly collected introspective imagery and emotion reports from undergraduate students while reading a full-length story. They found correlations between the presence of reported imagery and emotion, and in a paragraph-by-paragraph analysis, found that 7–25% of participants reported visual imagery for the paragraphs in question. Unfortunately, Goetz and collaborators do not report individual differences between participants, and with only 40 participants, they had limited power to detect such differences. Furthermore, by asking about imagery and emotion after almost every paragraph, Goetz and collaborators may have created experimenter demand effects toward reporting imagery after at least some paragraphs. (For similar research, see also Goetz, Sadoski, & Olivarez, 1991; Sadoski, Goetz, Olivarez, Lee, & Roberts, 1990; Krasny & Sadoski, 2008.) Sadoski and Quast (1990) also report a relationship between introspectively rated imagery and recall of passage details. There is also a literature on the effect of imagery instructions in improving reading comprehension (e.g. Cohen & Johnson, 2011; Gambrell & Bales, 1986; Johnson, Cushman, Borden, & McCune, 2013; Sadoski, 2005) and a literature on “narrative transportation” based on Green and Brock’s (2000) influential measure, tending to find higher “transport” reflecting higher levels of reader engagement and motivation. Although these research paradigms are related to the present research question, in neither literature are introspective reports of specific imagery experiences systematically collected.

Below we present three studies of reading experience using medium-to-large samples of participants and several Likert-scaled and yes/no questions about the sampled experience. In addition to asking directly about participants’ experiences, we also include measures intended to reveal possible differences in the cognitive processes of readers who report different types of experience. In addition, we varied the types of texts to which participants were exposed, which might be expected to influence the cognitive processes employed (Kurby & Zacks, 2013; Long, et al., 1989; Nijhof & Willems, 2015) and possibly therefore also the conscious experiences of the reader. We aimed to test five hypotheses.

**Hypothesis 1.** Between subjects, people report very different types of experience while reading. For example, some people report

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