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When attention matters: The curious incident of the wandering mind

Jonathan Smallwood
University of California, Santa Barbara, California

Merrill McSpadden
University of British Columbia, Vancouver, British Columbia, Canada

and

Jonathan W. Schooler
University of California, Santa Barbara, California

Attention plays an essential role in the construction of the mental models necessary to make sense of ongoing events. In this article, we consider the implications of temporary inattention during reading for the construction and updating of the situation model during text comprehension. We examined how self-reported mind wandering during reading relates to the online construction of the situation model of the narrative, which in this case involved the pseudonym used by a villain in a detective novella. In successful readers, mind wandering without awareness, referred to as *zoning out*, was less frequent when the text revealed a clue about the villain's identity. Additional analyses indicated that mind wandering interfered with the construction of the situation model independent of the participants' ability to retrieve factual information. The analysis of the temporal consequences of zoning out indicated that lapses had the greatest influence when they occurred early in the narrative. These results confirm the intuition that zoning out during reading is an indication that the construction of the situation model has gone awry, and underscore the fact that our ability to understand ongoing events depends on the ability to pay attention when it matters.

> It is of the highest importance in the art of detection to be able to recognize, out of a number of facts, which are incidental and which vital. Otherwise your energy and attention must be dissipated instead of being concentrated.
>
> —Sherlock Holmes (Conan-Doyle, 1894/2001b, p. 391)

As the fictional detective Sherlock Holmes suggests, paying attention to the right information, at the correct time, and with the appropriate emphasis, is essential in everyday life. Our ability to focus on what is important necessarily requires the construction of mental models (Johnson-Laird, 1983). Mental models combine our general knowledge of the outside world with information from the current situation, thereby enabling us to appraise the significance of ongoing events. In this capacity, mental models serve two distinct purposes: They represent the abstract relations between events, and they direct attention toward information that will further develop the model. Although the importance of attention in making sense of our everyday lives is recognized by psychology (Pashler, 1998), in this article we consider a previously unexplored aspect of this process: how failure to attend to what we are reading is related to the construction of a situation model of the narrative.

Reading As Model Building

Reading provides a useful environment to study model building. When reading, individuals engage in parallel processes in which words are identified, encoded, and parsed to create meaningful propositional statements (Rayner & Pollatsek, 1989). It is widely recognized that, in isolation, these propositions do not capture the meaning of the narrative (Zwaan & Radvansky, 1998). Instead, to make the best sense of the story, the reader must build a model that integrates general world knowledge with information from both within and between different episodes in a narrative. In a process somewhat analogous to that of a detective, readers combine these disparate sources of information to create a *situation model* that denotes the cognitive representation of the narrative.

Situation models are either activated in an automatic, bottom-up manner resulting from general memory principles (Gerrig & O'Brien, 2005) or constructed in a strategic, top-down manner (Graesser, Singer, & Trabasso, 1994). Situation models are independent of modality (Gernsbacher, Varner, & Faust, 1990) and vary on a number of dimensions (e.g., time, space, identity, and causation; Chafe, 1979; Gernsbacher, 1990; Givón, 1992; Zwaan, Langston, & Graesser, 1995). In practice, the situation model serves at least two functions during reading that are illustrated by

J. Smallwood, smallwood@psych.ucsb.edu

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considering how reading changes over the course of the narrative (Zwaan & Radvansky, 1998).

First and foremost, the situation model represents the most up-to-date interpretation of the narrative. Evidence that meaning is represented at the general level of the situation model comes from studies documenting longer verification times for items in the narrative that either are in the background or are inconsistent with the current episodes or situation (Glenberg, Meyer, & Lindem, 1987; O'Brien, Albrecht, Hakala, & Rizzella, 1995). These studies demonstrate that the act of reading requires the creation of a general description of the narrative that summarizes the actions and events that are taking place.

The second function of the situation model is to make the link between past and present segments of the narrative. Most texts convey a narrative in which the main ideas or the gist extends beyond a single sentence (see, e.g., Graesser & Clark, 1985; Mandler & Johnson, 1977), and readers face the problem of constraining attentional resources to the most important themes in the narrative. *Foregrounding* is the reactivation of previous text or background knowledge through automatic or strategic attempts to build associations and to establish causality and coherence in the narrative. Foregrounding is demonstrated by a systematic variation in the accessibility of different concepts, with respect to their relation to the current events in the narrative (McKoon, Gerrig, & Greene, 1996) and task instructions (McCrudden, Schraw, & Kambe, 2005). According to memory-based explanations, foregrounding is a result of resonance, or match, among those events that occur in the current narrative, those that appeared earlier in the discourse, and those that are drawn from general world knowledge (Gerrig & O'Brien, 2005). Other theorists emphasize the importance of problem solving or "effort after meaning" in foregrounding (Graesser et al., 1994). However, regardless of whether the situation model is mediated by strategic or by automatic processes, there is general agreement that it serves a critical function of facilitating "a careful balancing of the need for coherence and the attentional limitations of the human cognitive system" (Van den Broek, Virtue, Eversen, Tzeng, & Sung, 2002, p. 133) and of helping the reader make the most important links between different episodes within the narrative through processes such as foregrounding.

Mind Wandering

Unlike Sherlock Holmes's powers of attention, most people's attention is not steady; it tends to wax and wane and can often leave the task entirely. Schacter (2001) argued that absent-minded lapses "typically occur because we are preoccupied with distracting issues or concerns" (p. 4). The process by which our attention is decoupled from the immediate task context, which makes us become absent minded, is referred to as *mind wandering* (Smallwood & Schooler, 2006). Fresh impetus for research on mind wandering has been driven by recent neuroimaging work. The default network (Raichle et al., 2001) is a network of cortical and subcortical structures that are particularly active when participants are "resting," with their eyes closed, in a scanner. It has been suggested that the activity of the default network during resting is illustrative of a link between this brain system and the maintenance of a general class of experiences that are unconstrained by the current environment (Buckner & Vincent, 2007). Since mind wandering involves a failure to constrain attention to the task at hand, studies have indicated that the default network is more active when tasks are easy or are well practiced (Mason et al., 2007; McKiernan, D'Angelo, Kaufman, & Binder, 2006) and so demonstrate that this brain system forms a core component of the wandering mind.

Generally, the occurrence of task-unrelated mental activity comes at a cost to task performance. Studies have indicated that when one's mind wanders, signal detection is poor (Robertson, Manly, Andrade, Baddeley, & Yiend, 1997; Smallwood et al., 2004), encoding is superficial (Seibert & Ellis, 1991; Smallwood, Baracaia, Lowe, & Obonsawin, 2003; Smallwood, O'Connor, Sudberry, & Obonsawin, 2007), reading comprehension is compromised (Schooler, Reichle, & Halpern, 2005), and memory for events in the text is impaired (Reichle et al., 2007).

Although all task-unrelated activity must interfere with the current task to some extent, there is reason to expect that engaging in mind wandering without recognizing that one is doing so may have the most significant consequence. To investigate awareness during mind wandering, it is necessary to discriminate between off-task experiences that participants know they are having (a phenomenon referred to as *tuning out*) and episodes that individuals do not recognize are occurring (referred to as *zoning out*). In a study designed to estimate the frequency of zoning out (Schooler et al., 2005), participants were instructed to self-report mind wandering as soon as they recognized it. In addition, participants were probed intermittently to determine whether they were currently off task. Despite the fact that participants were asked to report mind wandering as soon as they recognized it, they were still caught by a proportion of the probes. This study also manipulated whether participants were probed during reading and indicated that the thought-probe methodology *did not* adversely affect text comprehension. Importantly, the more frequently the participants' minds wandered, the worse they scored on comprehension questions.

Recent research has documented the consequences of zoning out during basic attentional tasks (Smallwood, Beach, Schooler, & Handy, 2008; Smallwood, McSpadden, & Schooler, 2007). One task employed a go/no-go response inhibition paradigm and required that people remain continuously aware of the task in order to withhold a response to an infrequent target stimulus. In one study, zoning out was assessed by asking participants whether they recognized that they were off task prior to being probed, and we assessed the cortical analysis of the task environment by measuring the amplitude of the P3 component of the event-related potential (Smallwood et al., 2008). The P3 is a positive voltage deflection that occurs approximately 300 msec after the target stimulus is presented and indexes the extent to which the task context is updated in memory (e.g., Donchin & Coles, 1988; Kramer & Strayer, 1988; Wickens, Kramer, Vanasse, & Donchin, 1983). The results indicated that the amplitude of the P3 was small prior to both the self-reports of mind wandering and the behavioral lapses (Smallwood et al., 2008). In addition,

only the amplitude of the P3 during zone-outs was associated with the same measure prior to behavioral lapses (see also Smallwood, McSpadden, & Schooler, 2007). Given that in simple tasks, mind wandering—and zoning out in particular—seems to involve a failure in context updating, the same experience clearly could lead to consequences in more complex tasks, such as reading, in which it is essential to continuously update features of the narrative.

Present Study

This experiment examines whether reports of zoning out are indicative of the occurrence of mental states in which the construction/updating of the situation model has gone wrong. Readers who are building a successful situation model should benefit from processes such as foregrounding and so would be attentive to the text at critical intervals. Conversely, those who fail to compile a situation model would not gain the benefit of foregrounding because the relevant information would not be in memory. In this context, the frequency of reports of zoning out at critical points in the narrative should indicate failure in the construction/updating of specific aspects of the situation model. Moreover, the detrimental consequence of zoning out should be greatest when it occurs earlier in the narrative, because the individual would suffer a "double whammy": They would have a worse model of the text and would lose the benefit of foregrounding to alert them to the significance of subsequent events (see Smallwood, Fishman, & Schooler, 2007).

To test whether zoning out covaries with the construction/updating of the situation model, participants read a Sherlock Holmes novella and provided reports of their mental states at various points in the narrative. These reports were elicited at random points in the narrative and at predetermined intervals after the author delivered a clue regarding the identity of the criminal. The critical events were selected on the basis of an a priori analysis of the text and were deemed to be essential to identifying the villain. After reading, participants answered a series of comprehension questions, one of which related to the villain's identity. The question of identity was not related directly to any single event in the narrative and so could only be correctly answered by successfully compiling a complete situation model. Correct identification of the villain was taken as a measure of success in building a situation model of identity. Using this data, we examined the hypothesis that reports of zoning out provide an indication that construction and updating of the situation model have failed by asking the following questions:

Does zoning out lead participants to be less able to construct a situation model with sufficient detail to both recall factual information and generate the inferences necessary for identifying the pseudonym used by the villain?

Does the relation between reports of zoning out and the construction of the situation model hold true even when difficulties in retrieval of simple factual information are taken into account?

Does zoning out prohibit individuals from taking advantage of processes such as foregrounding and so prevent individuals from seeing the events' significance to the larger narrative?

Finally, is zoning out earlier in the narrative more damaging to the construction of the situation model than it is at later points in the narrative?

METHOD

Participants

Seventy-four undergraduate students from the University of British Columbia (48 female and 26 male, median age 20 years) completed this experiment for course credits.

Materials

Text. The text chosen for this experiment was *The Red-Headed League* (Conan-Doyle, 1892/2001a), which was edited to approximately 5,000 words, excluding the segment in which Holmes debriefs Watson on the nature of the crime. In this novella, Holmes disrupts a robbery in which the criminals tunneled into a bank from a nearby shop. The text was presented word by word in black on a white screen, and participants advanced the text by pressing the space bar.

To examine how zoning out interferes with the construction of the situation model, we chose four episodes in which the author delivered important clues to the identity of the villain, which are referred to here as inference critical episodes (ICEs). These episodes were as follows: (1) Upon hearing the description of Vincent Spaulding, Holmes asks whether he wore an earring; (2) after briefly meeting Spaulding, Holmes moves quickly away and indicates to Watson that the pawnbroker is the third or fourth most daring criminal in London; (3) on the way to disrupt the robbery, Holmes tells the police that he has met the villain John Clay on several occasions; and (4) when Holmes and the police intercept the robbers, Holmes and John Clay indicate that they know each other. Taken together, these episodes suggest that Vincent Spaulding is the pseudonym used by John Clay, a fact confirmed by Holmes in the debriefing. The identity of the villain was *never* mentioned in the edited version of the text, and so could be identified only by inference from a situation model of the narrative.

Thought probes. The procedure for measuring mind wandering was as follows: Probes were triggered when participants advanced beyond a predetermined point in the story. These points were identified by the use of word numbers as an index of position in the narrative. When the probe occurred, the screen changed to blue and text was presented in yellow. Participants were asked, "Just prior to being asked, was your attention on- or off-task?" To answer this question, participants were asked to consider whether, prior to being probed, they knew that they were off task (tuning out), or if instead they had been surprised by the probe, implying that they were unaware that their mind was wandering (zoning out). These definitions were provided in a booklet that was available to the participants throughout the procedure and are identical to those published previously (see Smallwood, McSpadden, & Schooler, 2007, p. 533). Participants responded to the thought probe by pressing the key with the first letter of the experience they wished to report (i.e., T for tuning out, Z for zoning out, or O for on task). After completion of the question, the program reverted to the text, and normal, word-by-word reading resumed.

To explore the significance of mind wandering at points in the text that should engender foregrounding, thought probes were triggered both at random intervals and when participants reached each of the four ICEs. A quasirandomized list was created in which probe intervals of different lengths (random probes, ranging from 100–230 words) were intermingled with those that occurred at the end of the sentence of an ICE. The average duration of each ICE was 85 words (range = 78–117). The average probe intervals for ICE were 161 words from the previous probe (range = 150–250) and were separated from following probes by 125 words (range = 100–140).

Measure of comprehension. We created 23 questions on events that took place in the novella. These were selected from a pool of 30 questions that were piloted on 30 individuals from the same participant pool. Fifteen questions concerned facts that were detailed explicitly in the narrative (*fact based*: e.g., How many gold

sovereigns was Jabez Wilson paid per week? What was the date that the Red-Headed League was dissolved?), and 8 were based on information that was not mentioned directly (*inference based*: e.g., Why do you think that Vincent Spaulding was so interested in photography?). Answers were selected from four choices. The question regarding the pseudonym used by the villain John Clay was one of 8 inference questions detailed above.

Procedure

A research assistant greeted the participants, outlined the procedure, and acquired informed consent. Participants were asked to read the novella, to report their mental state when probed by the computer, and to complete basic comprehension questions at the end of the text. Participants read the text word by word from a computer screen at their own pace, advancing to the next word by depressing the space bar. Words were black displayed on a white screen for a minimum of 100 msec; average reading time per word was 304 msec. After completing the reading, participants answered the comprehension measures. On average, the entire procedure took 50 min. No specific mention of the task of identifying the villain was made to the participants, although it is possible that this is an implicit task when one reads detective stories. At the end of the task, participants were debriefed.

RESULTS

Data from 2 participants were excluded from analysis; 1 individual indicated during debriefing having read the novella prior to the study. Data from a 2nd individual were discarded because of computer problems during data collection. Analysis was performed on the data from the remaining 72 individuals. Because our measures of comprehension employed four multiple-choice questions, chance performance on these items was 25%. Overall accuracy was well above chance ($M = 48\%$). Correct identification of the pseudonym used by the villain was 48%.

Mind Wandering and the Situation Model of Identity

Our first analysis considers whether report of zoning out at the ICEs was associated with an impaired ability to identify the pseudonym used by the villain. Participants were divided into groups on the basis of whether they zoned out at any of the ICEs. Pearson's chi-square indicated that participants' performance on the critical question was related to their reports of zoning out at the probes [$\chi^2(1,72) = 4.7$, $p < .05$]. Of the individuals who never zoned out, 24 out of 39 (61%) successfully identified the villain. This ratio decreased to 10 out of 33 (30%) for individuals reporting one or more zone-outs. The likelihood of individuals determining the pseudonym of the villain, therefore, was significantly lower if participants zoned out at least once at the ICEs (Figure 1, upper panel).

Next, we considered how zoning out is related to performance on a more straightforward measure of comprehension. One question that asked for factual information about an event that occurred in the same period as one of the ICEs was identified: "What do you think was the purpose of Holmes' strange actions outside the pawnbrokers?" (*Answer*: Holmes was interested in the knees of the assistant's trousers). Holmes states the answer explicitly within 20 words of the ICE thought probe. A chi-square indicated that zoning out at this single thought probe also had a detrimental result on participants' ability to answer the factual question [$\chi^2(1,72) = 4.1$, $p < .05$]. Only 4 out of 16 (25%) of the individuals who zoned out correctly answered the fact-based question, compared with 30 of 56 (53%) of the other individuals (see Figure 1, lower panel). In addition to causing problems in inference building, zoning out also interferes with comprehension based on information directly presented in the current episode.

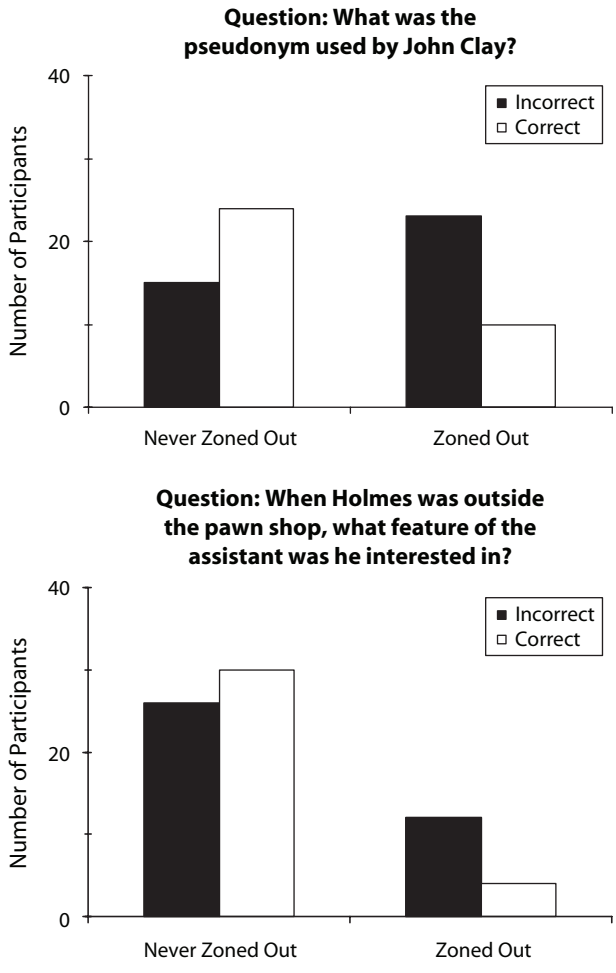

Figure 1. Number of participants who successfully identified the villain divided in terms of whether they zoned out during any of the inference intervals (upper panel). Of the individuals who correctly identified the villain, the majority never zoned out at critical points in the story. A comparable pattern is obvious when the retrieval of information from the text base is considered (lower panel). Fewer participants correctly identified that Holmes was interested in the knees of the assistant's trousers if they zoned out at the point in the story when this fact was presented.

Since both mental state and comprehension data are available for one ICE, we next examined their combined influence on the participants' ability to identify the villain. It is plausible that, because of the shared variance between reports of participants' mental states and their comprehension of information explicitly presented in the text, the relation between zoning out and inference building would be expressed more simply as a consequence of poor retrieval/access to the information contained in the text base. To ex-

amine this question, we entered both the accuracy on the text-based question and reports of zoning out at the single thought probe into a binary logistic regression. The dependent measure was whether the participant identified the name of the villain. This yielded a model that predicted the identity of the villain [$\chi^2(2) = 12.68, p < .005$]. Importantly, both the answer to the text question ($b = 1.199$, $SE = .519$, Wald $= 5.0$, $df = 1$, $p = .025$) and the likelihood of zoning out ($b = -1.441$, $SE = .71$, Wald $= 4.02$, $df = 1$, $p = .045$) were reliable predictors. Thus, both comprehension of information presented in the text and reports of zoning out made independent contributions to a participant's ability to determine the pseudonym used by the villain.

We next examined whether the relation between zoning out and identifying the villain reflects the temporal confluence of mind wandering at ICE. It is possible that the relationship between zoning out and the identification of the pseudonym of the villain results from a general tendency to zone out, which sometimes occurs at ICE. It can be seen from Figure 2 that the major difference between the successful and unsuccessful individuals is the frequency of zone-outs at the ICEs (marked with an *). This difference between groups was confirmed statistically with a series of planned nonparametric tests. To correct for the number of multiple comparisons (5), we used the Bonferroni correction, yielding new α values of .01. Correctly identifying the villain of the narrative was associated with fewer zone-outs at the inference-critical probes (Wilcoxon $z = -2.774$, $p = .006$) but not at other points in the text ($z = -.757$, $p = .45$). Moreover, a within-participants contrast indicated that those individuals who correctly identified the villain zoned out less during inference-critical segments than they did during other segments ($z = -2.446$, $p = .01$). No differences in the reported frequency of tuning out were significant (all z values $< .8$, all p values $> .45$). It is clear that failure to identify the villain was a temporal consequence of zoning out at ICE and not the result of a general tendency to report zone-outs. Moreover, identification of the pseudonym was not associated with tuning out, either at ICE or more generally throughout the text. The temporal specificity of our results rules out a simple retrieval account that would not predict that zoning out at ICE would be the only predictor of a participant's ability to identify the villain. Instead, our result confirms that individuals who identified the villain could do so because they did not zone-out at the ICE and so remained alert to the connection between the current narrative and the larger issue of the villain's identity.

Next, we considered how zoning out is related to the temporal construction of the situation model over time. To test this temporal account, we collapsed reports of zone-outs reported at ICEs, according to two temporal intervals (early vs. late), both of which were entered as independent predictors. The dependent variable was success at identifying the villain. Binary logistic regression yielded a model that reliably predicted the identity of the villain [$\chi^2(2) = 6.19, p < .05$]. Zone-outs at the early ICEs were predictive of the participants' ability to identify a villain ($b = -1.25$, $SE = .51$, Wald $= 5.97$, $p = .015$). By contrast, zone-outs reported at the second half were not ($b = -.68$, $SE = .31$, Wald $= .94$, $p = .27$). Thus, zoning out early was most damaging to the participants' ability to identify the villain, presumably because the initial lapses prevented the individuals from building a situation model with enough detail to afford the benefit of processes such as foregrounding later on.

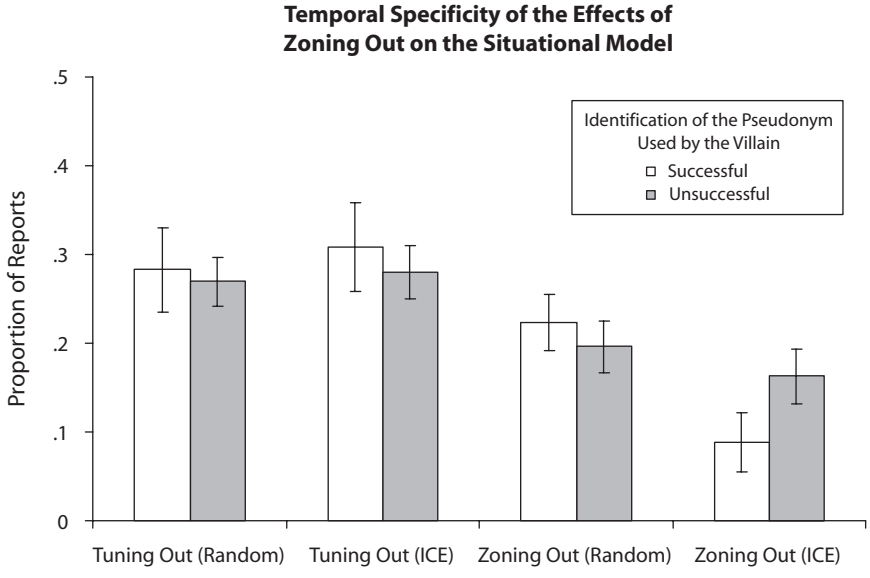

Figure 2. The *y*-axis represents the proportion of reported mental states. The *x*-axis represents the different types of mind wandering (tuning out/zoning out) reported at different time intervals (random/ICE). The white and gray bars indicate participants who were successful or unsuccessful, respectively, in identifying the pseudonym of the villain. It is clear that participants who solved the crime zoned out less often at ICE than at other intervals. Rather than reflecting a retrieval problem, the ability to solve the crime depended on whether readers were zoning out when the author revealed a critical clue in the narrative.

As a final analysis, we explored how the overall rate of mind wandering, zoning out, and tuning out related to overall text comprehension using nonparametric correlations. Consistent with the results of previous work (Schooler et al., 2005), the overall frequency of off-task reports at probes was associated with worse text comprehension (off task, $r = -.28$, $p < .05$). When mind wandering was separated by awareness, reports of zoning out were a reliable negative predictor of comprehension ($r = -.25$, $p < .05$), whereas tuning out was not ($r = -.16$, $p = .16$). As it was with difficulties identifying the villain, zoning out was associated with a general reduction in text comprehension.

DISCUSSION

This study demonstrates the essential relationship between zoning out and the construction of the situation model during reading. Zoning out denied participants the ability to retrieve information from a specific interval in the text and prohibited them from linking the events together to infer the identity of the villain. Importantly, the relationship between zoning out and the inferences of the villain's identity held true when we controlled for participants' retrieval of explicit information from the text base. In terms of the situation model of identity, the occurrence of an attentional lapse at critical junctures early in the narrative had the greatest potential to derail the readers' ability to identify the criminal. It is presumed that earlier lapses denied readers the priming resultant from an intact situation model and so interfered with their ability to link between past and present aspects of the narrative.

Overall, the results of this study provide important corroboration for our intuitive supposition that when we zone-out during reading we are not processing the text with enough detail to produce a viable situation model. Additionally, the study highlights the importance of meta-awareness of mind wandering in determining the detrimental consequences on reading (Schooler, 2002). One implication of this result is that the consequences of inattention during reading seem to depend, at least partially, on a lack of awareness of being off task. Thus, variables that affect one's ability to monitor attention, such as working memory capacity (Kane et al., 2007), could determine the extent to which mind wandering leads to failures in reading comprehension (see the cascade model of inattention; Smallwood, Fishman, & Schooler, 2007).

One of the most interesting features of the detrimental consequences that zoning out had on comprehension was its relation to foregrounding. Unlike their successful colleagues, readers who failed to make the correct inference related to the crime typically zoned out at the moment when the author delivered an important clue. Therefore, the results of this study are consistent with suggestions that the intensity of the signal that tells the reader to look beyond the current narrative does "depend on the degree of attention given to concepts currently in focus" (Gerrig & O'Brien, 2005, p. 229). One implication of this result is that comprehension of texts that rely on foregrounding are particularly damaged if zoning out occurs with great frequency. Garnham, Garrod, and Sanford (2006) argue that in longer narratives, authors must control the patterns of the readers' attention if they are to successfully convey their message. Similarly, extended narratives provided greater contextual support, because the greater detail in the situation models reduces the cognitive load during reading (Stine & Wingfield, 1990). Our results suggest that zoning out has the potential to interfere with the effectiveness of processes that rely on an intact situation model to achieve success, and so could be a disproportionate cause of failures in text comprehension in longer narratives.

Finally, although the detrimental consequences of zoning out on model building seem straightforward, the cognitive or perceptual processes that control behavior when the mind wanders remain elusive. Stine-Morrow, Miller, and Hertzog (2006) suggested two explanations of what it means to zone-out and engage in mindless reading. Mindless reading reflects a breakdown in the top-down control of comprehension, and reading instead proceeds either through simple motor control or by reference to relatively low features of text alone. For future research to distinguish between the different perspectives suggested by Stine-Morrow and colleagues, it would be necessary to manipulate different textual features and to examine which aspects retain control of reading times or eye movements during epochs when participants' self-reports indicate that they are not giving their full attention to the task.

A number of caveats must be kept in mind when interpreting this research. We presented the text word by word, which denied participants the opportunity for regressions to previous parts of the text (see Rayner & Pollatsek, 1989), although it has the advantage of making it easier to detect the influence of zoning out during reading. Although there may be subtle differences in reading processes associated with word-by-word reading versus page-by-page reading, prior findings have shown that there are many overlapping processes; thus, the present results are likely to generalize to more standard reading contexts and also to lectures, social interactions, and films (see Just, Carpenter, & Woolley, 1982). Additionally, future research may examine whether the attentional demands for word-by-word reading could alter the frequency of mind wandering. Finally, we focused only on the situational model of identity, and so it could be important to examine how zoning out relates to other aspects of the narrative, such as the temporal or spatial context within which events unfold. Ultimately, however, our present results suggest that inferences in any situation that requires building mental models are compromised if individuals are zoning out at certain critical points along the way. Thus we are led to a conclusion with which Holmes (were he to exist) would likely agree: Effective deduction is not simply a matter of paying attention, but is a matter of paying attention when it matters.

AUTHOR NOTE

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tion. Correspondence relating to this article may be sent to J. Smallwood, Department of Psychology, University of California, Santa Barbara, CA 93106-9660 (e-mail: smallwood@psych.ucsb.edu).

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