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Encoding during the attentional lapse: Accuracy of encoding during the semantic sustained attention to response task

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Abstract

An experiment investigated the relationship between the ability to encode verbal stimuli during an attentional lapse. The task employed a variation on the sustained attention to response task (SART, Robertson, Manly, Andrade, Baddeley, & Yiend, 1997) which involved the detection of an infrequent target against a background of words. As a manipulation, participants were either instructed to encode the stimuli or were merely exposed to the stimuli. Retrieval was measured using process dissociation. Irrespective of the instructions given to the participants during the task, participants were more likely to retrieve information on the basis of recollection after an error was made than before, whilst the likelihood of retrieving information on the basis of familiarity remained invariant over the same period. The implications of this result for methods of investigating subjective experience are discussed.

Keywords: Attentional lapses; Task unrelated thought; Stimulus independent thought; Familiarity; Recollection

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1. Introduction

During a cognitive task ones' attention often cycles between task relevant information available in the external environment and information that is derived from internal sources, such as when one is experiencing a day dream. During periods of rest in a cognitive task, presumably when attention is directed away from task relevant information, fMRI evidence suggest that it is likely that the individual is processing information derived from internal sources of information such as memories (Christoff, Ream, & Gabrieli, 2004). In the literature, these spontaneous shifts in awareness have been variously described as stimulus independent thought (SI, Antrobus, 1968; Teasdale, Lloyd, Proctor, & Baddeley, 1993; Teasdale et al., 1995), task unrelated thought (TUT, Giambra, 1989, 1995; Smallwood, Obonsawin, & Heim, 2003a; Smallwood, Baraciaia, Lowe, & Obonsawin, 2003b; Smallwood, Obonsawin, & Reid, 2003c; Smallwood et al., 2003d; Smallwood, Davies, et al., 2004; Smallwood, O'Connor, Sudberry, & Ballantyre, 2004) or zone outs (Schooler, 2002; Schooler, Reichle, & Halpern, 2005). Despite variations in terminology these labels emphasise that periodically during a cognitive task ones' attention becomes "decoupled from the current environment and instead becomes directed to the processing of internally generated information" (Smallwood et al., 2003b, p. 253). In the context of this paper, we will employ the label TUT to refer to these phenomena.

Traditionally, research has investigated these phenomenon using thought sampling techniques (see Antrobus, 1999, for a review). Thought probes can occur on the basis of a self-report methodology in which the individual reports whenever they experience a TUT using a button (e.g., Giambra, 1989, Experiments 1 and 2, Cunningham, Scerbo, & Freeman, 2000). Alternatively, individuals can probed at various periods during a task and are then asked to report their experiences, either using a button push (Giambra, 1995; Schooler et al., 2005) or verbal reports, which can be subsequently transcribed and coded using published criteria (Teasdale et al., 1993, 1995; see also Smallwood et al., 2003b). One way to assess the validity of these approaches is to attempt conceptual replication between different approaches to thought sampling. Various studies have demonstrated reasonable consensus between different thought sampling techniques. For example, both transcribed verbal reports (Smallwood et al., 2003c) and button pressing techniques (Giambra, 1995) indicate that TUT likelihood increases as task duration increases during vigilance tasks. Similarly, both thought probe techniques and retrospective self-report measures indicate that TUT is associated with questionnaire measures of dysphoria (Smallwood et al., 2003d). Finally, in an important series of studies Schooler et al. (2005) demonstrated that the self-monitoring of cognitive experiences did not change the frequency of probe caught zone outs, nor the subsequent comprehension of text. Despite the consensus between these different approaches to thought sampling, it is important to note that all of these approaches share the limitations associated with self-report in general (Nisbet & Wilson, 1977).

Given the limitations of self-report as the sole index of a psychological process, it is important to explore methods of evaluating the experience of phenomena such as TUT in the absence of thought monitoring. A recently developed task, the Sustained Attention to Response Task (SART) has been shown to be sensitive to the experience of everyday attentional lapses as measured by the Cognitive Failures Questionnaire (CFQ, Robertson, Manly, Andrade, Baddeley, & Yiend, 1997) and also to the experience of TUT using both thought probes