



# Assessing the associations among trait and state levels of deliberate and spontaneous mind wandering <sup>☆</sup>



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## ABSTRACT

Recent research has demonstrated that mind wandering can be subdivided into spontaneous and deliberate types, and this distinction has been found to hold at both the trait and state levels. However, to date, no attempts have been made to link trait-level spontaneous and deliberate mind wandering with state-level assessments of these two subtypes of mind wandering. Here we evaluated whether trait-level deliberate and spontaneous mind wandering map onto state levels of these subtypes of mind wandering. Results showed correspondence between trait-level reports of spontaneous and deliberate mind wandering and their state-level counterparts, indicating that people's reports on the intentionality of their mind wandering in the laboratory correspond to their reports of the intentionality of mind wandering in everyday life. Thus, the trait- and state-level scales of mind wandering were found to validate each other: Whereas the state-level measures provided some construct validity for the trait-level measures, the trait-level measures indicated that the state-level measures may be generalizable to everyday situations.

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## 1. Introduction

Although mind wandering is often thought of as a unitary construct reflecting spontaneously occurring, unintentional thoughts, it has been suggested that this cognitive experience can be subdivided into two specific types: *spontaneous* and *deliberate* mind wandering (Carriere, Seli, & Smilek, 2013; Forster & Lavie, 2009; Phillips, Mills, D'Mello, & Risko, in press; Seli, Carriere, & Smilek, 2014; Seli, Cheyne, Xu, Purson, & Smilek, 2015; Seli, Smallwood, Cheyne, & Smilek, 2015; Shaw & Giambra, 1993). True to their names, spontaneous mind wandering reflects the unintentional engagement in internally-focused thought, whereas deliberate mind wandering reflects the willful, intentional engagement in such thoughts. The available evidence suggests that the distinction between spontaneous and deliberate mind wandering holds at both the trait level – when people are reporting on their levels of mind wandering in daily life (e.g., Seli et al., 2014) – and also at the state level – when people respond to thought probes asking them to report on their momentary cognitive experiences in the laboratory (e.g., Forster & Lavie, 2009; Seli, Cheyne, et al., 2015). To date, however, no attempts have been made to directly link trait-level spontaneous and deliberate mind wandering with state-level assessments of these two types of mind wandering.

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Thus, the purpose of the present study is to evaluate whether trait-level deliberate and spontaneous mind wandering map onto state levels of these subtypes of mind wandering.

Trait-level tendencies to experience deliberate and spontaneous mind wandering have been previously assessed using two 4-item self-report scales referred to as the Mind wandering: Deliberate (MW-D) and the Mind wandering: Spontaneous (MW-S) scales (Carriere et al., 2013). On the one hand, the MW-D is comprised of items related to deliberate (or intentional) mind wandering, including: (1) “I allow my thoughts to wander on purpose,” (2) “I enjoy mind wandering,” (3) “I find mind wandering is a good way to cope with boredom,” and (4) “I allow myself to get absorbed in pleasant fantasy.” On the other hand, the MW-S is comprised of items related to spontaneous (or unintentional) mind wandering, including: (1) “I find my thoughts wandering spontaneously,” (2) “When I mind-wander, my thoughts tend to be pulled from topic to topic,” (3) “It feels like I don’t have control over when my mind wanders,” and (4) “I mind-wander even when I’m supposed to be doing something else” (see Carriere et al., 2013). Critically, research examining trait levels of spontaneous and deliberate mind wandering has shown that these two types of mind wandering are, at times, differentially associated with a number of variables of theoretical interest, which clearly indicates the importance of distinguishing between these types of cognitive experiences. For example, the MW-S and MW-D scales have been shown to share different and/or unique associations with variables such as mindfulness (Seli et al., 2014), fidgeting (Carriere et al., 2013), attention deficit/hyperactivity disorder (ADHD; Seli et al., 2015), and obsessive-compulsive disorder (OCD; Seli, Risko, Purdon, Smilek, in press).

Importantly, when considering the items of the MW-S and the MW-D, one potential concern that arises is that some of the items comprising these scales appear to have poor face validity. Consider, for instance, item number 2 of the MW-D, which refers specifically to the enjoyment of thinking as opposed to the intentionality of one’s thoughts. Based on this, and other items of the MW-D, one could interpret this scale as indexing the enjoyment of mind wandering rather than the level of intentionality associated with it. Also consider, for example, item 2 of the MW-S, which refers to the topical stability of mind wandering, and may not, at face value, appear to index a lack of intention in mind wandering. Considering the foregoing, one concern is that these two scales may not in fact capture a difference in the intentionality of mind wandering, but might instead index other aspects of mind wandering, such as the level of enjoyment associated with mind wandering or its topical stability.

While there might be concerns surrounding the validity of the trait-level measures of spontaneous and deliberate mind wandering, the validity of assessments of these two types of mind wandering at the state level is much less of a concern. This is because, at the state level, thought probes have directly asked people whether they were deliberately or spontaneously mind wandering, which leaves little room for alternative interpretations about the characteristics of these two types of mind wandering (e.g., Forster & Lavie, 2009; Seli, Cheyne, et al., 2015; Seli, Wammes, Risko, & Smilek, in press). As demonstrated at the trait level, research examining state levels of deliberate and spontaneous mind wandering has provided evidence to suggest that these two types of mind wandering are dissociable. For example, this research has shown that deliberate and spontaneous mind wandering uniquely predict people’s retention of lecture material (Seli, Risko, & Smilek, in press), and that they are selectively influenced by re-reading (Phillips et al., in press). Moreover, it has recently been shown that a manipulation of task difficulty produces different rates of these two types of mind wandering, with a more difficult task resulting in less deliberate, and more spontaneous, mind wandering than an easy task (Seli, Risko, & Smilek, in press).

Given that studies examining spontaneous and deliberate mind wandering at trait and state levels have proceeded independently up to this point, the purpose of the present study is to determine whether trait- and state-level reports of these experiences are related. More specifically, given the aforementioned concerns surrounding the possibility that trait-level measures are perhaps not indexing the intentionality of mind wandering, but instead some other factor(s), our goal was to determine whether we could validate – by providing convergent evidence – these trait measures by showing that they uniquely relate to their state-level counterparts. To examine this possibility, in the present study participants completed a sustained-attention task (the Metronome Response Task; MRT; Seli, Carriere, Levene, & Smilek, 2013; Seli, Cheyne, & Smilek, 2013) during which they were presented thought probes requiring them to report whether any state-level mind wandering they experienced was engaged deliberately or spontaneously. After completing this task, we administered the MW-D and MW-S scales to index trait levels of deliberate and spontaneous mind wandering. Having obtained both state- and trait-level measures of deliberate and spontaneous mind wandering, we then examined the unique associations of state levels of deliberate and spontaneous mind wandering with trait-level measures of these experiences.

## 2. Method

### 2.1. Participants

Participants were 102 undergraduate psychology students (mean age was 19.61; 71 females) at the University of Waterloo who received partial course credit in exchange for their time. It was determined, a priori, that we would collect data from as many participants as possible before the end of the academic term.

### 2.2. Measures

#### 2.2.1. The Metronome Response Task (MRT)

The MRT (Seli et al., 2013) is a sustained-attention task requiring participants to monitor a constant sequence of tones in order to provide a key-press response in synchrony with each of the tones. Each MRT trial began with 650 ms of silence,

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