



What did you have in mind? Examining the content of intentional and unintentional types of mind wandering



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ARTICLE INFO

Keywords:

Mind wandering
Content
Intentional
Unintentional
Thought probes
Experience sampling

ABSTRACT

It has recently been argued that researchers should distinguish between mind wandering (MW) that is engaged with and without intention. Supporting this argument, studies have found that intentional and unintentional MW have behavioral/neural differences, and that they are differentially associated with certain variables of theoretical interest. Although there have been considerable inroads made into the distinction between intentional/unintentional MW, possible differences in their content remain unexplored. To determine whether these two types of MW differ in content, we had participants complete a task during which they categorized their MW as intentional or unintentional, and then provided responses to questions about the content of their MW. Results indicated that intentional MW was more frequently rated as being future-oriented and less vague than unintentional MW. These findings shed light on the nature of intentional and unintentional MW and provide support for the argument that researchers should distinguish between intentional and unintentional types.

1. Introduction

As investigations of the common experience of mind wandering have progressed, research has begun to move beyond the traditional practice of dichotomously categorizing people's thoughts as reflecting a state of "on-task" focus or "mind wandering," and has focused on more specific distinctions regarding the mind-wandering experience. One important distinction that has emerged from this work is the distinction between intentional and unintentional mind wandering. Specifically, research has shown that mind wandering can occur *unintentionally*, despite people's best intentions to refrain from engaging in such cognitive activity, and that it can occur *intentionally*, with deliberation, or the wilful allowance of its occurrence (e.g., Seli, Risko, & Smilek, 2016). This distinction has been important because, as has been recently shown, the behavioral (see Seli, Risko, Smilek, & Schacter, 2016, for a review) and neural (Golchert et al., 2017) associates of intentional and unintentional mind wandering can be quite different. For instance, whereas unintentional mind wandering is uniquely *positively* associated with one's propensity to be reactive to his/her inner experiences (an aspect of mindfulness), intentional mind wandering is uniquely *negatively* associated with this same variable (Seli, Carriere, & Smilek, 2015). Here, we extend prior work that has distinguished intentional and unintentional mind wandering by considering whether and how these two types of mind wandering differ in terms of their content.

In addition to examining potential differences in intentional and unintentional mind wandering, our investigation builds on

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research examining the content of general mind-wandering episodes, which has explored various aspects of bouts of mind wandering (although notably without distinguishing between intentional and unintentional types), such as its temporal focus (e.g., Baird, Smallwood, & Schooler, 2011), self-relatedness (Baird et al., 2011), emotional valence, level of specificity, and the extent to which it is comprised of images versus words (Gorgolewski et al., 2014; Medea et al., 2016; Ruby, Smallwood, Engen, & Singer, 2013a; Ruby, Smallwood, Sackur, & Singer, 2013b; Smallwood et al., 2016; Stawarczyk, Majerus, Maquet, & D’Argembeau, 2011). This work is important because many researchers have been interested in examining the consequences of mind wandering (see Mooneyham & Schooler, 2013, for a review), and it is reasonable to assume that such consequences might differ as a function of the content of one’s mind wandering (Smallwood & Andrews-Hanna, 2013). Consistent with this supposition, research exploring the content of mind-wandering episodes has indicated that the content of such episodes does indeed play an important role in predicting certain outcomes. For instance, it has now been well-established that mind wandering that is focused on the past (compared with mind wandering that is focused on the present or the future) tends to be associated with decreases in happiness (Poerio, Totterdell, & Miles, 2013; Ruby, Smallwood, Engen, et al., 2013; Smallwood & O’Connor, 2011). In other work, it has been shown that more perseverative or ruminative types of mind wandering tend to be associated with pathological states such as depression and anxiety (Ottaviani & Couyoumdjian, 2013). Moreover, research has found that bouts of mind wandering that are characterized as “negative” are associated with poorer working memory and sustained-attention performance compared with bouts of mind wandering that are characterized as “neutral” or “positive” (Banks, Welhaf, Hood, Boals, & Tartar, 2016). Although the foregoing research has played an important role in informing our understanding of the consequences of mind wandering in general, to date, research has not examined the potential differences in the content of intentional and unintentional types of mind wandering. However, such differences, if present, could provide a more nuanced picture of the wandering mind.

In the present study, to examine the possibility that intentional and unintentional mind wandering differ in terms of content, we had participants complete a sustained-attention task (the Choice Reaction Time task; CRT; Smallwood, Nind, & O’Connor, 2009) during which we asked them to (a) categorize their mind wandering as being intentional or unintentional, and (b) provide responses to nine questions (e.g., Karapanagiotidis, Bernhardt, Jefferies, & Smallwood, 2016; Medea et al., 2016; Smallwood et al., 2016) pertaining to the content of their intentional and unintentional mind-wandering episodes (see Table 1). We then examined the within-participant ratings given to each of these content questions as a function of intentional and unintentional mind wandering. As our study was exploratory, we did not have any specific hypotheses with respect to the potential differences in content across intentional and unintentional mind wandering. However, we think that specific hypotheses are not critical to this study because we simply sought to explore the possibility that the content of intentional and unintentional mind wandering differ in some respects, and that such differences (if observed) would potentially inform theoretical accounts of mind wandering. For the sake of completeness, we also included an analysis of the relation between CRT performance and intentional/unintentional mind wandering.

2. Materials and method

We report how we determined our sample size, all data exclusions (if any), and all measures in the experiment (Simmons, Nelson, & Simonsohn, 2012).

2.1. Participants

One hundred fifty undergraduate students from the University of Waterloo participated for partial course credit. It was determined in advance that we would collect data from as many participants as possible before the end of the academic term. In accordance with Smallwood, Brown, et al. (2011), data from four participants were removed from all subsequent analyses because these participants’ accuracy rates were below 50% on the CRT (Smallwood, Brown, et al., 2011). Hence, data from 146 participants were analyzed.

2.2. Choice Reaction Time task (CRT)

The CRT (Konishi, McLaren, Engen, & Smallwood, 2015; see Fig. 1) was programmed using PsychoPy2 (Peirce, 2007). On each

Table 1
Probe items assessing the content of periods of intentional and unintentional mind wandering.

Content	Item	Response scale (0–100)
Future orientation	My thoughts involved future events.	Not at all - Completely
Past orientation	My thoughts involved past events.	Not at all - Completely
Self-referential	My thoughts involved myself	Not at all - Completely
Other-referential	My thoughts involved other people	Not at all - Completely
Valence	The content of my thought was:	Negative - Positive
Images	My thoughts were in the form of images	Not at all - Completely
Words	My thoughts were in the form of words	Not at all - Completely
Intrusiveness	My thoughts were intrusive	Not at all - Completely
Vagueness	My thoughts vague and non-specific	Not at all - Completely

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