



Children with positive attitudes towards mind-wandering provide invalid subjective reports of mind-wandering during an experimental task



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ABSTRACT

This study investigated mind-wandering (MW) in children during a laboratory task, and explored the influence of children's attitudes towards MW on the accuracy of their subjective reports. Children's MW experiences were probed during the adapted Sustained-Attention-to-Response-Task (SART), and their attitudes was measured by a questionnaire, according to which children were divided into positive or negative group. Results showed that (1) MW in children was basically identical to MW in adults which was associated with poor performance, increased behavioural variability, and a prospective bias; (2) reliable correlations between behavioural correlates and MW frequency were observed in negative group, but not in positive group; and (3) positive group reported more MW than negative group, while no behavioural correlate was significantly different between the two groups. We concluded that (1) overall, children could accurately introspect their MW experiences during SART; and (2) children with positive attitudes provided invalid subjective reports of MW.

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1. Introduction

Mind-wandering (MW), often referred to as task-unrelated thought (TUT), stimulus-independent thought (SIT), or day-dreaming, occurs when our mind drifts away from the ongoing task and focuses instead on internal thoughts which is unrelated to the present situation (Smallwood, 2010; Smallwood & Schooler, 2006; Stawarczyk, Majerus, Catale, & D'Argembeau, 2014; Zavagnin, Borella, & De Beni, 2014). Rapid advances have occurred in the study of MW over the past decade, but little is known about the MW experiences of children. The current study, for the first time, assessed the MW experiences of children during a laboratory task. We aimed to determine (1) whether or not the self-reports of MW by children, approximately 10 years of age, are accurate, and (2) whether or not the accuracy of children's subjective reports would be affected by their attitudes towards MW.

Previous studies based on introspection tasks suggested that children 8 or 9 years of age developed some capacity to introspect their MW experiences. First, the 8-year-olds are able to perceive their wandering mind. They can be aware that they are having some thoughts and ideas rather than a mind empty of thoughts and ideas when asked to sit quietly (p. 97) (Flavell, Green, & Flavell, 2000), with the fact that the mind frequently wanders when people sit quietly (Smallwood, 2010).

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Second, not only can the 8-year-olds perceive their wandering mind, but they can also describe the content of their wandering mind (Chen, 2013). Third, by 9 years of age children have already acquired some knowledge of MW. They can understand that people have only limited control over their mental activity and are continually and spontaneously experiencing mental content of one kind or another (Flavell, Green, & Flavell, 1998).

However, to date, no investigation has been made on the validity of children's self-reports of MW, which is problematic since children's reporting of MW may lack accuracy. The accuracy of introspective reports depends on participants' ability to be meta-conscious of their experience (Schooler & Schreiber, 2004), but children lack such ability to be aware of their subjective state (Siegler & Stern, 1998). Moreover, MW is a type of spontaneous mental activity which often occurs without intention or even awareness that one's mind has drifted (Giambra, 1995; Schooler, 2002; Smallwood & Schooler, 2006). Therefore, although some evidence suggests that children can report on their MW experiences, it is possible that their reporting is inaccurate. To figure out this problem, an exam of the validity of children's self-reports of MW is very essential. However, previous studies are based on introspection tasks which exclude any measure to assess the validity of children's reporting of MW, such as behavioural, physiological or neurocognitive correlates (Schooler & Schreiber, 2004).

One of the factors that might influence subjective report of MW is the attitudes towards MW. Attitudes have long been considered as closely connected with people's behaviour (e.g., (Levanoni & Sales, 1990; Levine & Strube, 2012; Mooghali & Bahrampour, 2015; Smith et al., 2008)). And early investigations of daydreaming (a typical manifestation of MW in daily life) suggested that there is a close relationship between subjective report of daydreaming and attitudes. Subjects who frequently reported daydreaming when randomly sampling their thoughts were likely to retrospectively report high acceptance of daydreaming (Hurlburt, 1980). In addition, providing people with positive information about daydreaming, which made them more positive towards this phenomenon, led to an increased frequency of self-reported daydreaming (Gold & Cundiff, 1980a, 1980b).

However, previous studies didn't concern the validity of self-reports of MW. Obviously, participants' report of MW is determined by both the occurrence of MW that is how much a person engages in MW, and the validity of self-reports. Therefore, the close relationship between the subjective report of MW and attitudes may reflect a close connection between the validity of participants' self-reports of MW and their attitudes towards MW. Actually, this sort of speculation had been made in one previous study as "participants with a low acceptance of daydreaming might cloak their true daydreaming frequency and intensity by underreporting" (p. 241) (Giambra, 1999). The probability of this kind of speculation is still higher, given that as was discussed above, children's introspection ability haven't grown as mature as the adults', so that the validity of their introspection of MW would be rather susceptible to outside influences.

In the present study we specially concentrated on the validity of self-reports of MW, not only for all the children as a whole, but also for those children with positive/negative attitudes towards MW. And the correspondence between the behavioural correlates and the subjective reports was considered as an important demonstration of accurate introspections (Schooler & Schreiber, 2004; Smallwood, Obonsawin, Heim, & Reid, 2002). These correspondences have been repeatedly demonstrated in previous studies of MW in adults, including that (1) MW is associated with poor performance in the SART (Hu, He, & Xu, 2012; Smallwood, Baracaia, Lowe, & Obonsawin, 2003; Smallwood, Davies, Heim, Finnigan, Sudberry, O'Connor, & Obonsawin, 2004; Smallwood, Fitzgerald, Miles, & Phillips, 2009); (2) MW is associated with increased behavioural variability (McVay & Kane, 2009; Seli, Cheyne, & Smilek, 2013); (3) MW possesses a prospective bias in the health population (Smallwood, Nind, & O'Connor, 2009; Smallwood et al., 2011).

During the current study, one hundred three primary students of grades 4 or 5 were recruited. While completing the adapted Sustained Attention to Response Task (SART), the participants were randomly probed regarding the content of their current thoughts. Children's attitudes towards MW were assessed by a questionnaire specifically developed to measure their explicit attitudes towards MW, according to which children were divided into positive group or negative group.

2. Methods

2.1. Participants

One hundred three primary students in grades 4 or 5 were recruited as subjects (56 boys and 47 girls). The age ranged from 9 to 11 years, with a mean age of 10.6 years ($SD = 0.61$). Six participants were excluded from the analysis as two students failed to complete the task and the other students exceeded 2 SD from the average of the MW ratio (i.e., the frequency of MW). All participants were right-handed with normal or corrected-to-normal vision, and no one had psychiatric history. Participants gave informed consent according to the guidelines of the Zhejiang Normal University Review Ethics Board.

2.2. Materials

Our pilot study ($N = 11$) showed that the normal SART was too difficult for children, with an error rate $>70\%$ ($M = 0.71$, $SD = 0.13$). Moreover, the error rate increased rapidly in the second half of the task, from 65% to 77%. Consequently, some adjustments were made to simplify and shorten the task. The version of the SART used in this study was adapted from Stawarczyk, Majerus, Maj, Van der Linden, and D'Argembeau (2011).

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