The nature and temporal focus of mind wandering in dysphoria: A laboratory study

Ben Plimpton; Priya Patel; Lia Kvavilashvili
University of Hertfordshire, UK

Introduction

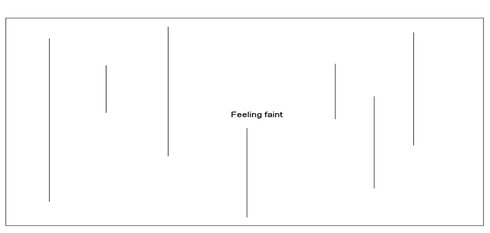
- **Definition:** Mind wandering refers to "a situation in which executive control shifts away from a primary task to the processing of personal goals" (Smallwood & Schooler, 2006, p. 946).
- **Characteristics:** Mind wandering occurs spontaneously, often when we are engaged in a cognitively undemanding activity (Antrobus, 1968; Giambra, 1995).
- **Triggers:** It is often characterised as stimulus independent (Stawarczyk et al., 2011), which implies that the content of task-unrelated thought does not rely on environmental cues. However, there is a clear lack of research on the role of environmental triggers in prompting mind wandering incidents.
- **Temporal focus:** Initial evidence shows that during mind wandering people tend to think more about the future than the past or present (Baird et al., 2011).
- **Effects of mood:** Dysphoria appears to increase the frequency of mind wandering (Smallwood et al., 2007; Smallwood, et al., 2009) and the likelihood that it will be oriented to the past rather than the future or present (Smallwood & O'Connor, 2011).

Aims

- **To examine the role of cues in triggering mind wandering**
- **To examine the temporal focus of mind wandering as a function of mood**

Method

- **Participants:** Invitation to the laboratory was limited to those scoring in the dysphoric (16-64) and non-dysphoric (0-9) range on the Beck Depression Inventory (Beck, et al., 1961). The final sample included 19 stable dysphoric (13 female) and 21 stable non-dysphoric (14 female) participants with the following mean BDI scores: Dysphoric – 22.16 (*SD*=6.03, range 16-32); Non-dysphoric – 3.05 (*SD*=2.66, range 0-9).
- **Materials:** A vigilance task previously used to study ***Involuntary Autobiographical Memory*** (Schlagman & Kvavilashvili, 2008) was adapted. In a 600-slide computer presentation, participants had to ignore 589 slides with horizontal lines and respond to 11 target slides with vertical lines by pressing the space bar. Slides were presented at 1500 ms intervals and each had a word or phrase in the centre (see Figure 1).
- **Procedure:** Participants were told that the study was about mood and concentration, and were instructed to focus on the lines, ignoring the words. In addition, they were stopped 11 times during the presentation, and asked to record their thoughts at that moment.



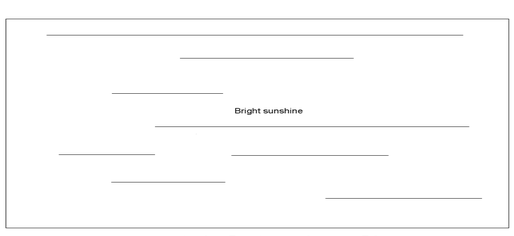


Figure 1: Examples of target (left) and non-target (right) stimuli

Results

Temporal focus:

- Out of 375 valid thought probes collected, 280 (75%) were spontaneous, task-unrelated thoughts. These were classed by participants as current thoughts, past memories, or future thoughts (Figure 2). Only the main effect of type of thought was significant, $F(2, 68)=4.38$, $p=0.02$, $\eta_p^2=0.11$. In both groups, past memories occurred much more than future ($p=0.01$) or current thoughts ($p=0.02$).

Triggers and mood congruence:

- Majority of spontaneous task unrelated thoughts were reported as being triggered by words on the screen (74% in Dysphoric and 73% in Non-dysphoric group). There was no effect of group on the valence of reported cues, $\chi^2(2, N=188)=2.60$, $p=0.27$ (Table 1). However, on a scale of 1 to 5, dysphoric participants rated their thoughts as more negative ($M=2.78$, $SD=1.47$) than the non-dysphoric participants ($M=3.43$, $SD=1.14$), regardless of temporal location, $F(1, 21)=6.14$, $p=0.02$, $\eta_p^2=0.23$.

Table 1: Frequency (percentages) of reported cue valence by mood group.

Mood Group	Negative	Positive	Neutral	Total
Dysphoric	33 (34.4)	38 (39.6)	12 (12.5)	83 (100)
Non-dysphoric	36 (32.7)	44 (40)	25 (22.7)	105 (100)
Total	69 (33.5)	82 (39.8)	37 (18)	188 (100)

Note*: On 18 occasions, participants indicated that their thought had been triggered by words on the computer screen, but did not specify which word or phrase.*

Type of future thought:

- Thought probes, classed as future thoughts by participants, were later coded as daydreams, planning thoughts, or thoughts about upcoming events. There was a significant mood by type-of-future-thought interaction, $F(2, 68)=7.75$, $p=0.001$, $\eta_p^2=0.19$ (see Figure 3). Dysphoric participants reported more wishful daydreams ($p=0.003$), and non-dysphoric participants more planning thoughts ($p=.045$).

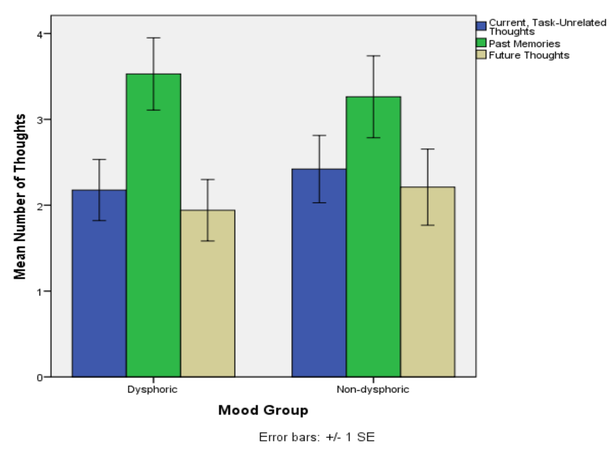


Figure 2: Temporal location of thought as a function of mood group

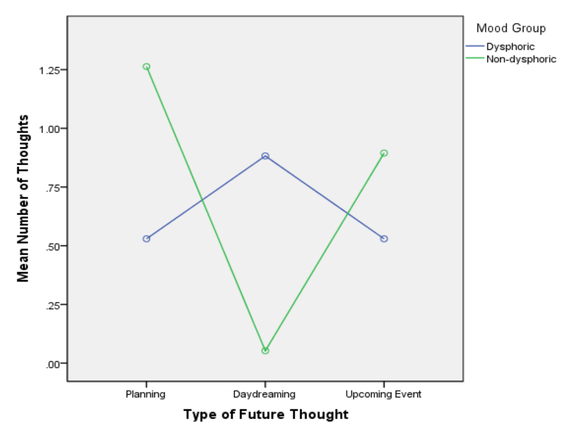


Figure 3: Mean number of thoughts as a function of future thought type and mood group

Discussion

- **This vigilance task elicits a high rate of mind wandering**. Of all thought probes recorded, 75% were spontaneous and off-task, which is a higher proportion than has been reported using other methods.
- **The majority of off-task thoughts were reported to be triggered by irrelevant word cues on the screen**. This emphasises the importance of external triggers in eliciting task-unrelated thoughts (*cf.* Smallwood et al., 2009), and brings into question the definition of mind wandering as stimulus independent.
- **Mood did not impact on the temporal focus of mind wandering**. The results suggest a general tendency to retrospect when mind wandering. This replicates previous findings with dysphoric populations (Smallwood & O'Connor, 2011), but contrasts with results from healthy samples (Baird et al, 2011).
- **The adaptive value of prospective thought may be compromised in dysphoria**. In the present study dysphoric participants were engaging in wishful, fanciful thinking about the future that was not goal-directed. This has clinical implications for the specific thought patterns that might be addressed in therapeutic interventions.

References

Antrobus, J. S. (1968). Information theory and stimulus-independent thought. *British Journal of Psychology*, *4*(59).

Baird, B., Smallwood, J., & Schooler, J. W. (2011). Back to the future: autobiographical planning and the functionality of mind-wandering. *Consciousness and cognition*, *20*(4), 1604–11

Beck, A.T., Ward, C.H., Mendelson, M, Mock, J, and Erbaugh, J. (1961). An Inventory for Measuring Depression. *Archives of General Psychiatry, 4,* 53-63.

Giambra, L. M. (1995). A Laboratory Method of Investigating Influence on Switching Attention to Task-Unrelated Imagery and Thought. *Consciousness and cognition*, 1–21.

Schlagman, S., & Kvavilashvili, L. (2008). Involuntary autobiographical memories in and outside the laboratory: How different are they from voluntary autobiographical memories? *Memory & Cognition*, *36*(5), 920–932.

Smallwood, J., Fitzgerald, A., Miles, L. K., & Phillips, L. H. (2009). Shifting moods, wandering minds: negative moods lead the mind to wander. *Emotion (Washington, D.C.)*, *9*(2), 271–6

Smallwood, J., Nind, L., & O'Connor, R. C. (2009). When is your head at? An exploration of the factors associated with the temporal focus of the wandering mind. *Consciousness and cognition*, *18*(1), 118–25.

Smallwood, J., & O'Connor, R. C. (2011). Imprisoned by the past : Unhappy moods lead to a retrospective bias to mind wandering (August 2012), 37–41

Smallwood, J., O'Connor, R. C., Sudbery, M. V., & Obonsawin, M. (2007). Mind-wandering and dysphoria. *Cognition & Emotion*, *21*(4), 816–842.

Smallwood, J., & Schooler, J. W. (2006). The restless mind. *Psychological bulletin*, *132*(6), 946–58. doi:10.1037/0033-2909.132.6.946

Stawarczyk, D., Majerus, S., Maj, M., Van der Linden, M., & D'Argembeau, A. (2011). Mind-wandering: phenomenology and function as assessed with a novel experience sampling method. *Acta Psychologica*, *136*(3), 370–81.

Correspondence: Ben Plimpton, b.plimpton@herts.ac.uk, Dept. of Psychology, University of Hertfordshire, College Lane, Hatfield, Herts AL10 9AB, UK