



What is a BAF about ?

- article
- master memoire
- thesis
- field of study
- an anecdote
- history of cog. science
- an important scientist
- a new method
- a original idea
- an argument for a theory/hypothesis

The Current Research on Spontaneous Thoughts



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EDITED BY

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FOX &

KALINA

CHRISTOFF

≡ The Oxford Handbook of
**SPONTANEOUS
THOUGHT**

MIND-WANDERING, CREATIVITY, AND DREAMING

Let's Start with a Little Experiment...



The Seven Deadly Sins

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2. What kind of contents are they bearing ?

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7. What are the clinical stakes ?

Toward a Universal Definition

Introduction : toward an interdisciplinary
science of spontaneous thought
(Kieran C. R. Fox, Kalina Christoff,
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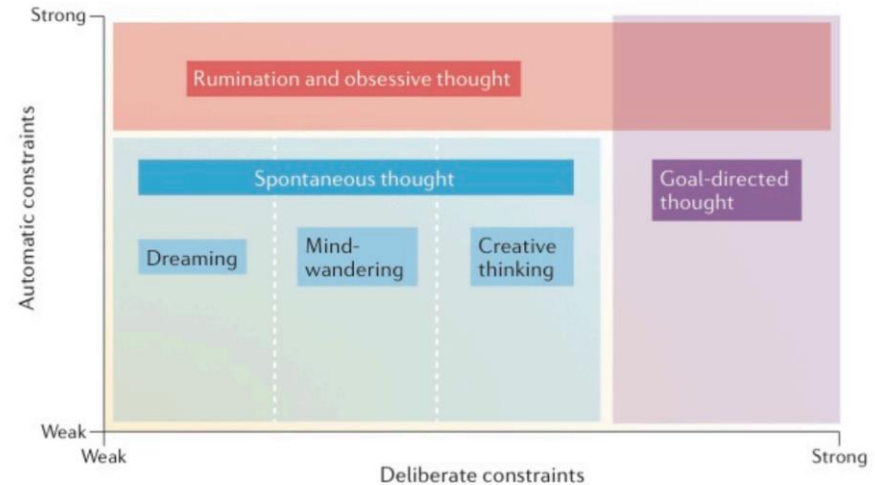


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Figure 1. Conceptual space relating different types of thought and their constraints.



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Why Mind-Wandering is Interesting for
Philosophers (Thomas Metzinger, 2018)

-> the importance of metacognition



Special Kinds of Contents



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Vivian G. (1961). Some Characteristics of
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-> Questionnaire given to 240 college
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-> L. Nalborczyk's quest

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-> for a review, see David Stawarczyk, Phenomenological properties of mind-wandering and daydreaming : a historical overview and functional correlates (2017, chapter n. 16 of the *Oxford Handbook of Spontaneous Thought*)

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Metacognition



Metacognition

Are retrospective questionnaires a good way to study spontaneous thoughts ?

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-> Krumm, Alek E, and Russell T Hurlburt. "A complete, unabridged, "pre-registered" descriptive experience sampling investigation: The case of Lena."
Phenomenology and the cognitive sciences, 2021



Metacognition

Some sub-questions to investigate

Metacognition

Two sub-questions to investigate

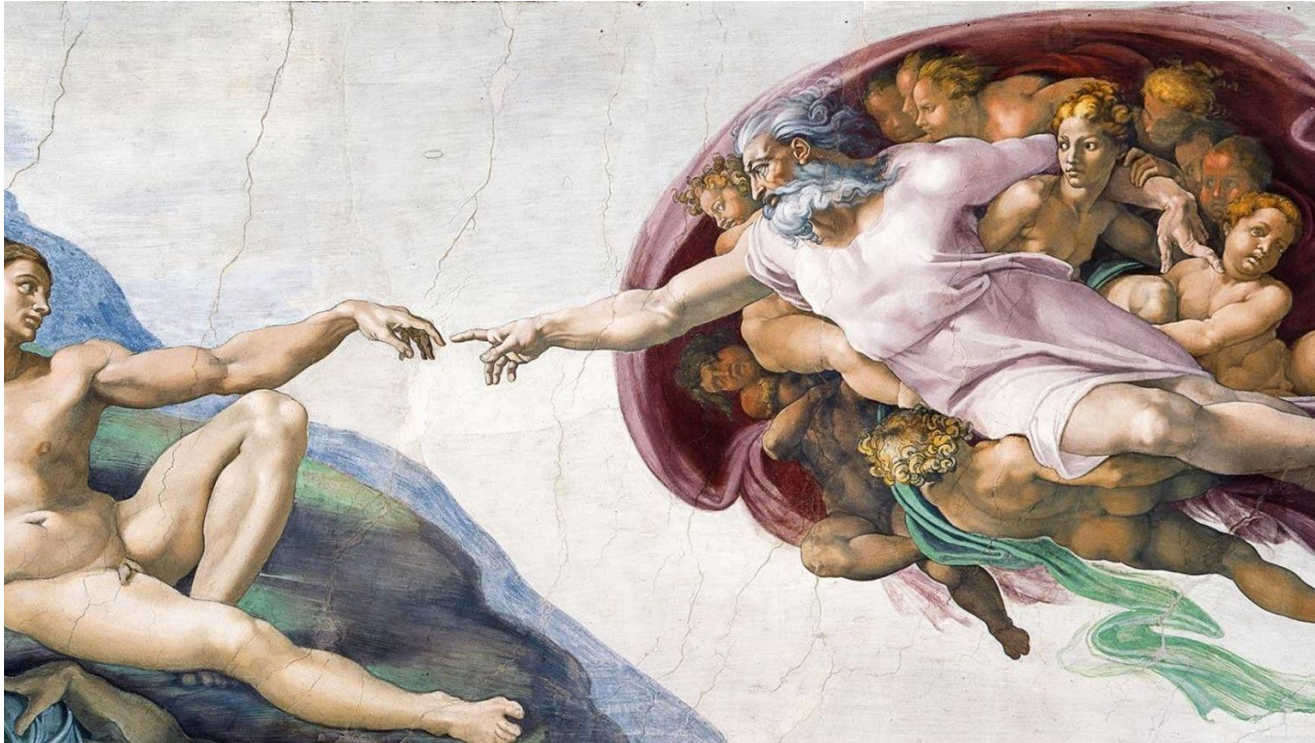
- How can we make the difference between our spontaneous thoughts (memory revival, prospective thoughts, dreams...) and our physical environment ?

Metacognition

Two sub-questions to investigate

- How can we make the difference between our spontaneous thoughts (memory revival, prospective thoughts, dreams...) and our physical environment ?
- How do we infer the origin of spontaneous thoughts ?
 - From external sources : God, demons... (Spontaneous thought in contemplative traditions, Halvor Eifring, chapter 38 of the *Handbook*)
 - From deep, hidden sources : unconscious, intuition... (When the absence of reasoning brings meaning : metacognitive appraisals of spontaneous thought, Morewedge & Kupor, chapter 4 of the *Handbook*)

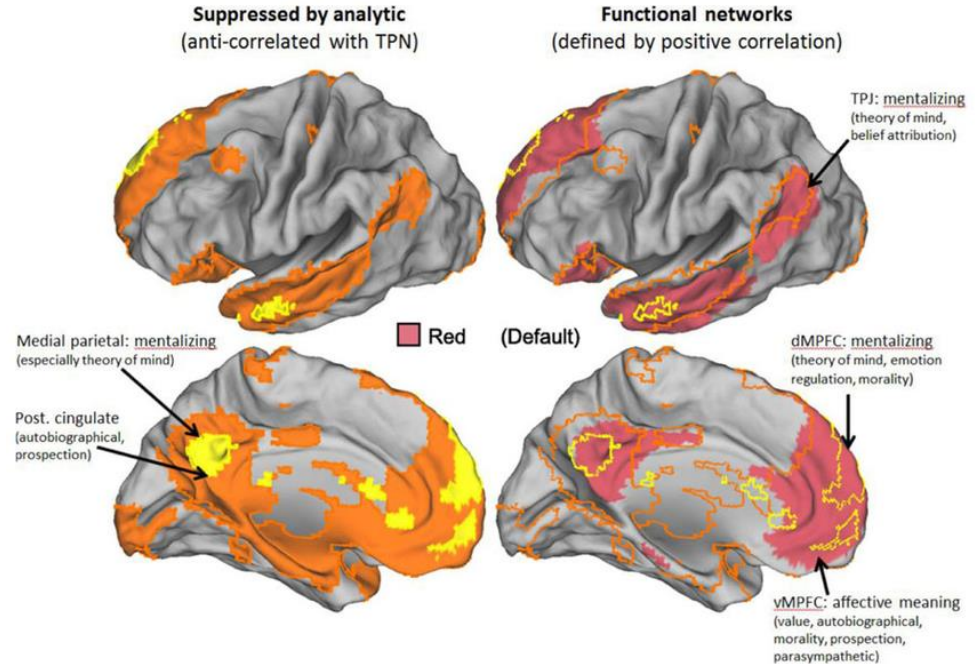
Generation and Elaboration



Generation and Elaboration

The DMN

Boyatzis, Richard E.; Rochford, Kylie; Jack, Anthony I. (2014). *Antagonistic neural networks underlying differentiated leadership roles. Frontiers in Human Neuroscience*



Generation and Elaboration

Intracranial Methods

Kieran C. R. Fox, Neural origins of self-generated thought : insights from intracranial electrical stimulation and recordings in humans (chapter 14 of the *Handbook*)

Medial Prefrontal Lobe :

- Electrical stimulations of the hippocampus and the parahippocampal regions often elicit : memory recall, visual hallucinations, daydreaming
- Electrical stimulations of the amygdala regularly elicit memory recall, out-of-body-experiences, visual hallucinations, daydreaming

Temporopolar Cortex :

- Not a lot of temptatives, but when tried, electrical stimulations often elicit memory recall or visual hallucination.

Generation and Elaboration

Non-Invasive Methods

M. Ellamila, K.C.R.Fox, M.L. Dixon, S. Pritchard, R.M.Todd, E.Thompson, K. Christoff, Dynamics of neural recruitment surrounding the spontaneous arising of thoughts in experienced mindfulness practitioners. *NeuroImage*

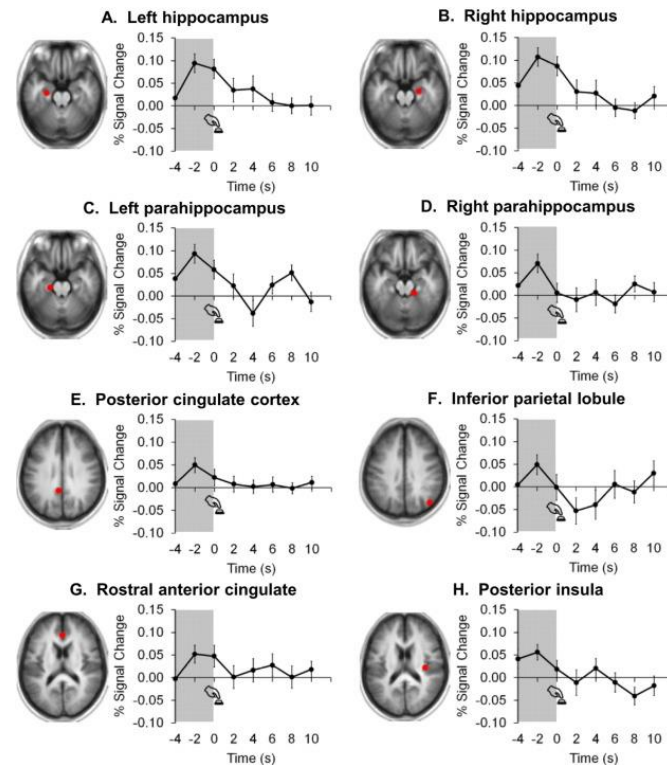


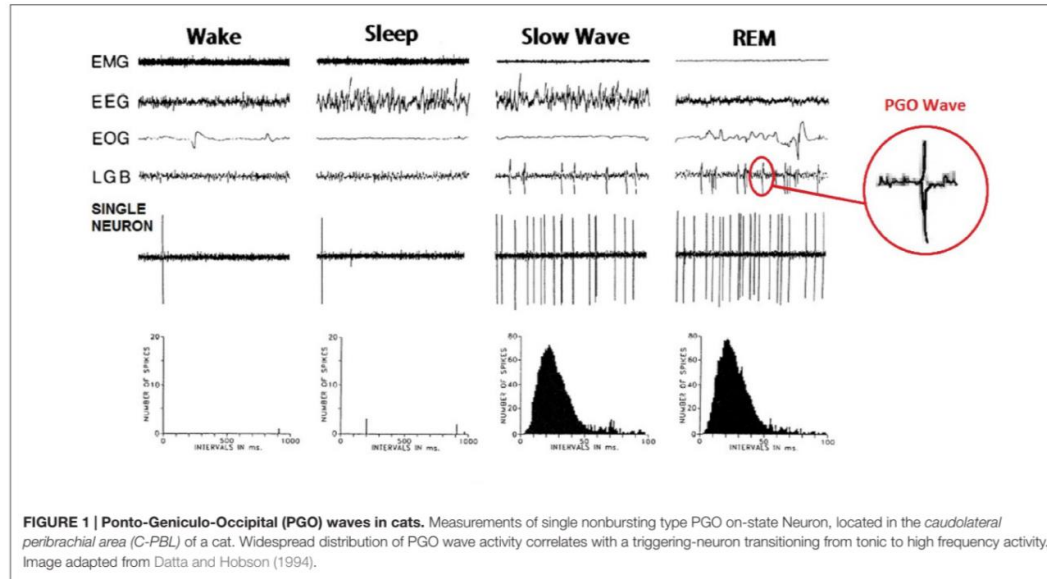
Table 14.1. Summary of Human Electrophysiology Studies Demonstrating Elicitation of Memories, Thoughts, or Hallucinatory, Dream-Like Experiences

Brain Region	Stimulations/ Discharges Eliciting	Total Stimulations/ Discharges	Percentage Eliciting	References
Temporal Lobe				
Hippocampus	25	46	54%	Bancaud, Bruner-Bourgin, Chauvel, & Halgren, 1994; Fish, Gloor, Quesney, & Oliver, 1993; Halgren, Walter, Cherlow, & Crandall, 1978; Kahane, Hoffmann, Minotti, & Berthoz, 2003; Mulak, Kahane, Hoffmann, Minotti, & Bonaz, 2008; Vignal et al., 2007
Amygdala	13	36	36%	Ferguson et al., 1969; Fish et al., 1993; Halgren et al., 1978; Vignal et al., 2007
Parahippocampal region	9	16	56%	Feindel & Penfield, 1954; Penfield & Perot, 1963; Vignal et al., 2007
Temporopolar cortex	5	11	45%	Bancaud et al., 1994; Halgren et al., 1978; Mulak et al., 2008; Ostrowsky, Desestret, Rylvlin, Coste, & Mauguière, 2002; Penfield & Perot, 1963
Inferior temporal gyrus	1	21	5%	Penfield & Perot, 1963
Middle temporal gyrus	7	42	17%	Kahane et al., 2003; Mullan & Penfield, 1959; Penfield, 1958; Penfield & Perot, 1963
Superior temporal gyrus	24	99	24%	Morris, Luders, Lesser, Dinner, & Hahn, 1984; Mullan & Penfield, 1959; Penfield & Perot, 1963
Temporo-occipital junction	4	17	24%	Lee, Hong, Seo, Tac, & Hong, 2000; Morris et al., 1984; Penfield & Perot, 1963
Frontal Lobe				
Inferior frontal gyrus	1	7	14%	Blanke, Landis, & Seeck, 2000
Middle frontal gyrus	2	8	25%	Blanke, Landis, et al., 2000
Orbitofrontal cortex	1	4	25%	Mahl, Rothenberg, Delgado, & Hamlin, 1964
Supplementary motor area	1	6	17%	Beauvais, Biraben, Seigneuret, Saikali, & Scarabin, 2005
Parietal Lobe				
Inferior parietal lobule	2	42	5%	Blanke, Perrig, Thut, Landis, & Seeck, 2000; Schulz, Woermann, & Ebner, 2007
Posteromedial cortex (including posterior cingulate cortex)	0	248	0%	Foster & Parvizi, 2017

Generation and Elaboration

The PGO Waves

J.A. Gott, D.T.J. Liley, J.A. Hobson, Toward a functional understanding of PGO waves, 2017. *Front. in human Neuroscience*



Some Potential Functions

- Mills et al., Why the mind wanders : how spontaneous thought's default variability may support episodic efficiency and semantic optimization (chapter 2 of the *Handbook*)
- Chandra S. Sripada, An exploration/exploitation trade-off between mind-wandering and goal-directed thinking (chapter 3 of the *Handbook*)
- Michel Jouvett's theory of psychological individuation