

PSYC 420  
Research into spontaneous thought W22.  
Professor Jonathan Smallwood  
Fall Semester  
Number of credits 3  
On Campus  
Pre-requisites:  
Location: Tuesday 1.00 - 2.30 & Thursday 11.30-1.00 (Both Rm 223 Humphrey Hall)

#### Instructor Information

**Name:** Jonathan Smallwood

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**Office hours:** Monday 12-1

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About me: I am a scientist interested in understanding the organization of human cognition. In my research I use the methods of cognitive neuroscience and psychology to ask questions about how the mind generates different patterns of thought. In my spare time I make and record music which you can listen to on Spotify [here](#). Follow me on **Twitter** to keep up to date with my research and music (**@the\_mindwanders**)

#### 1.0 Land Acknowledgment

I will begin this syllabus by acknowledging that Queen's is situated on traditional Anishinaabe and Haudenosaunee territory. We are grateful to be able to live, learn and teach on these lands. By acknowledging this traditional territory, we recognize its history and its significance for the Indigenous Peoples who lived and continue to live, upon it.

#### 2.0 Diversity and Inclusion

In this class, it is my goal to ensure that students from all backgrounds have a great learning experience, and that everyone feels valued, respected, and welcome. The class will represent a diversity of individuals, identities, beliefs, backgrounds and experiences. The diversity of experiences that the students bring to this class will be viewed as a resource, strength and benefit. **With this in mind, please speak up and participate during class meetings by sharing your opinions and questions about the course, however, please do so with respect for other members of the class.**

#### Welcome

This course is intended to be an in-depth study of how to approach the study of ongoing thought patterns in psychology and cognitive neuroscience. We will understand how people measures ongoing thought patterns. We will read and discuss articles that consider why these are important, how they are linked to the brain and explore how these phenomena are understood in both contemporary psychological and neuroscience research. The course aims to highlight the conceptual challenges that complex naturally occurring patterns of thoughts pose for scientists, and consider the problems faced when attempting to integrate research in this area across psychological and neural levels of analysis.

To take full advantage of this class, it is important that you plan your work load. Key dates (first day of class, tuition due date, last day to add/drop courses) are important to this goal as these help you plan your studies properly. Please find them at [Important Dates](#).

### Expectations

In this class I hope to help you be able to understand how to study ongoing thought patterns and how this can help us understand flexible and adaptive behaviour. Don't worry if this seems complicated – this course is designed so that if you follow the course material you will gain a general understanding of how contemporary researchers think about this important subject of human cognition.

### **LEARNING OBJECTIVES**

To complete this course students will demonstrate their ability to:

- Summarize current theories of ongoing thought patterns and how they relate to both contemporary aspects of cognitive processing including attention, learning and memory, as well as to issues in cognitive neuroscience.
- Critically evaluate current, experimental literature in the field
- Develop oral and presentation skills.
- Develop writings skills.
- Summarize and communicate research findings in this research domain
- Generate new research questions in the area of ongoing thought

### **CLASS MATERIALS**

There is a moderate amount of reading that is required in this course. You are expected to read the articles before coming to class so that you can contribute to the discussions. The basic readings can be found here:

### **READING LIST / CLASS SCHEDULE**

#### Week 1. Introduction to the class

**Tuesday.** Introduction. No Reading Required

**Thursday.** Smallwood, J., and Schooler, J.W. "The science of mind wandering: empirically navigating the stream of consciousness." Annual review of psychology 66 (2015): 487-518.

**Discussion Question:** Can different patterns of ongoing thought be linked to a single unique process?

#### Week 2. Definitional complexity

**Tuesday.** Seli, P., Kane, M. J., Smallwood, J., Schacter, D. L., Maillet, D., Schooler, J. W., & Smilek, D. (2018). Mind-wandering as a natural kind: A family-resemblances view. Trends in cognitive sciences, 22(6), 479-490.

Christoff, K., Mills, C., Andrews-Hanna, J. R., Irving, Z. C., Thompson, E., Fox, K. C., & Kam, J. W. (2018). Mind-wandering as a scientific concept: cutting through the definitional haze. Trends in cognitive sciences, 22(11), 957-959.

**Thursday.** Christoff, K., Irving, Z.C., Fox, K.C.R., Spreng, R.N., Andrews-Hanna, J.R. (2016). Mind-wandering as spontaneous thought: a dynamic framework. *Nature Reviews Neuroscience*, 17, 718-730, doi:10.1038/nrn.2016.113

**Discussion Question:** What are the pros and cons for a definition of different features of ongoing thought?

#### Week 3. Relationship to conscious experience

**Tuesday.** Smallwood, J. et al., (2021). The neural correlates of ongoing thought. *iScience*, 24. doi.org/10.1016/j.isci. 2021.102132

**Thursday.** Gonzalez-Castillo, J., Kam, J.Y., Hoy, C.W., Bandettini, P.A. (2021). How to interpret resting-state fMRI: Ask your participants., *The Journal of Neuroscience*, 10, 41(6): 1130-1141.

**Discussion Question:** What are the advantages for our understanding of brain function that we can gain from experience sampling?

#### Week 4. Executive control

**Tuesday.** Executive failure: McVay, J. C., & Kane, M. J. (2010). Does mind wandering reflect executive function or executive failure? Comment on Smallwood and Schooler (2006) and Watkins (2008).

Response: Smallwood, J. (2010). Why the global availability of mind wandering necessitates resource competition: reply to McVay and Kane (2010).

**Thursday.** Turnbull, A., Wang, H. T., Murphy, C., Ho, N. S. P., Wang, X., Sormaz, M., ... & Vatansever, D. (2019). Left dorsolateral prefrontal cortex supports context-dependent prioritization of off-task thought. *Nature communications*, 10(1), 1-10.

**Discussion Question:** Consider the evidence for an against the notion that mind-wandering states are a lapse in attention?

#### Week 5. Dreaming

**Tuesday.** Horikawa, T., Tamaki, M., Miyawaki, Y. & Kamitani, Y. (2013). Neural decoding of visual imagery during sleep. *Science*, 340, 639-642. DOI: 10.1126/science.1234330

**Thursday.** Siclari, F, Baird, B, Perogamvros, L., Bernardi, G., LaRocque, J.L., Riedner, B., Boly, M., Postle, B.R., Tononi, G. (2017). The neural correlates of dreaming. *Nature Neuroscience*, 20, 6, 872-878.

**Discussion Question:** What are the similarities between waking and dreaming thought?

#### Week 6 - Student presentations of their selected papers

No required reading

#### Week 7. Association with creativity

**Tuesday.** Gable, S. L., Hopper, E. A., & Schooler, J. W. (2019). When the muses strike: Creative ideas of physicists and writers routinely occur during mind wandering. *Psychological science*, 30(3), 396-404.

**Thursday.** Beaty, R. E., Kenett, Y. N., Christensen, A. P., Rosenberg, M. D., Benedek, M., Chen, Q., ... & Silvia, P. J. (2018). Robust prediction of individual creative ability from brain functional connectivity. *Proceedings of the National Academy of Sciences*, 115(5), 1087-1092.

**Discussion question:** What are some of the similarities between creativity and certain patterns of ongoing thought?

#### Week 8 - Ongoing thought in daily life

**Tuesday.** Ho, N. S. P., Poerio, G., Konu, D., Turnbull, A., Sormaz, M., Leech, R., ... & Smallwood, J. (2020). Facing up to the wandering mind: Patterns of off-task laboratory thought are associated with stronger neural recruitment of right fusiform cortex while processing facial stimuli. *NeuroImage*, 116765.

**Thursday.** McKeown, B., Poerio, G.L., Strawson, W.H., Martinon, L., Riby, L.M., Jefferies, E., McCall, C & Smallwood, J. (2021). The impact of social isolation and changes in work patterns on ongoing thought during the first COVID-19 lockdown in the United Kingdom. *Proceedings of the National Academy of Sciences*, 118(4), e2102565118 <https://doi.org/10.1073/pnas.2102565118>

**Discussion Question:** How can studies of experience sampling inform our understanding of thinking in daily life?

#### Week 9 Dynamics of ongoing thought

**Tuesday.** Zanesco, A.P. (2020). Quantifying streams of thought during cognitive task performance using sequence analysis. *Behavioral Research Methods*, 52, 2417-2437, DOI: [10.3758/s13428-020-01416-1](https://doi.org/10.3758/s13428-020-01416-1).

**Thursday.** Karapanagiotidis, T., Vidaurre, D., Quinn, A.J., Vatansever, D., Poerio, G.L., Turnbull, A., Ho, N.S.P., Leech, R., Bernhardt, B.C., Jefferies, E., Margulies, D.M., Nichols, T.E., Woolrich, M.W., Smallwood, J. (2020). The psychological correlates of distinct neural states occurring during wakeful rest. *Scientific Reports*, 10, 21121, <https://doi.org/10.1038/s41598-020-77336-z>

**Discussion Question:** How can understanding dynamics help us better understand patterns of ongoing thought?

#### Week 10. Relationship to well being

**Tuesday.** Engert, V., Smallwood, J., & Singer, T. (2014). Mind your thoughts: Associations between self-generated thoughts and stress-induced and baseline levels of cortisol and alpha-amylase. *Biological psychology*, 103, 283-291, DOI: <https://doi.org/10.1007/s00426-019-01275-2>.

**Thursday.** Vatansever, D., Karapanagiotidis, T., Margulies, D. S., Jefferies, E., & Smallwood, J. (2020). Distinct patterns of thought mediate the link between brain functional connectomes and well-being. *Network Neuroscience*, 1-21, doi: [10.1162/netn\\_a\\_00137](https://doi.org/10.1162/netn_a_00137).

**Discussion Question:** Consider some of the different features of ongoing thought that have links to health and well being?

#### Week 11 Mindfulness

**Tuesday.** Mrazek, M., Franklin, M.S., Phillips, D.T., Baird, B., Schooler, J.W. (2013). Mindfulness training improves working memory capacity and GRE Performance while reducing mind-wandering. *Psychological Science*, 24, 5.  
[doi.org/10.1177/0956797612459659](https://doi.org/10.1177/0956797612459659)

**Thursday.** van der Velden, A. M., Scholl, J., Elmholt, E. M., Fjorback, L. O., Hamer, C. J., Lazar, S. W., ... & Kuyken, W. (2022). Mindfulness training changes brain dynamics during depressive rumination: A randomized controlled trial. *Biological Psychiatry*.

**Discussion Question:** How might mindfulness impact on patterns of ongoing thought?

#### Week 12. Student Research Proposal Presentations

No Required Reading

## Grades

The grades for this class will be based on a combination of class participation, low stakes weekly exercises, class presentations and a single piece of written course work.

- a. Class Participation (20 X 1 = 20%)  
Seminar classes are designed for discussion so there is a substantial participation component to your grade. It's a small group, so these will largely feel like conversations. Feel free to bring a coffee or tea. I expect students to attend all of the classes if possible as this will ensure a more comprehensive understanding of the broader topic. However, students can miss up to four classes (2 weeks worth of classes) without penalty, if I am contacted in advance of the meeting.
- b. Discussion Board Posts (10 x 1 = 10% total)  
Each class you will have the opportunity to write a comment on the class discussion board outlining your thoughts on each paper, based on the readings for that week. **You will need to complete all 10 of these over the course of the class to get full credit.** There is a great deal of flexibility in what you can focus on. The syllabus suggest Discussion Questions you can focus on for each week, but you can also highlight something that you thought was good about one or other or the papers that we read, a parallel between a paper and one from a prior week. Each comment should be at least three sentences long and should be made before the end of that week on On Q (Friday at 5pm EST).
- c. Class Presentations (15 x 2 = 30%)  
In this course you will make two presentations each worth 15% of your final grade. In Week 6 each of you will be responsible for a 5 minute presentation on one paper that is relevant to the topic but is not covered. In the final week of class (Week 12) each of you will give a five minute presentation on your research proposal (see below). In your presentations, the goal is to communicate the findings of the article or the aim of your proposal in a clear and engaging manner. You don't need to produce a power point presentation, although often this can help you give a clearer more timely presentation. You will be graded on both the presentation and the extent to which you led the discussion in a way that encouraged thoughtful participation. Also, in both talks you will be penalised if you run over by more than 10% so make sure you practice your talk.
- d. Final Paper (submission of an acceptable first draft in Week 8 on time = 10%, final paper grade = 30%, Total = 40%).

A 1-page research proposal is due at the end of term. This will propose an experiment to examine a question on a topic of your choice relevant to the class. This will follow an NSERC research grant proposal (as required by MA or PhD scholarship applications) and is designed to help you develop an idea and get some practice and feedback writing a grant. So, you will be submitting a first draft of the paper and feedback will be provided. More detailed information will follow in class. **This should include references formatted in the APA style.** References are not included in the word limit.

First Draft Due: Friday of Week 8 at 5pm.

Final Paper Due: Friday of Week 13 at 5pm.

## Overall Grade Composition

Weekly Participation	20%
Discussion Board comments	10%
Presentations	30%
Research proposal Draft	10%
Final Research paper	30%
Total	100%

### Suggested Time Commitment

In this course, you should expect to invest on average 8 to 10 hours per week. This will include the time you spend in class or lab/tutorial, studying course material, and completing weekly homework or preparing for your larger assignments and exams. You are encouraged to use a term at a glance and a weekly study schedule (visit [SASS](#)) that distributes the 8-10 hours per week and avoid 'cramming'. This way you will be more likely to complete the course successfully and remember what you learned longer.

### Grading Scheme and Grading Method

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale:

#### *Queen's Official Grade Conversion Scale*

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

### Questions about the Course and Contacting the Teaching Team

Address for contacting the teaching team: [jonathan.smallwood@queensu.ca](mailto:jonathan.smallwood@queensu.ca)

### Course Announcements

**All course announcements will be made on the on-Q site associated with the class and via email to the class.**

### Accommodations for Disabilities

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all their academic activities. The Senate Policy for Accommodations for Students with Disabilities was approved at Senate in November 2016. If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the **Queen's Student Accessibility Services (QSAS)** and register as early as possible. For more information, including important deadlines, please visit the QSAS website.

### **Academic Consideration for Students in Extenuating Circumstances**

Academic consideration is a process for the university community to provide a compassionate response to assist students experiencing unforeseen, short-term extenuating circumstances that may impact or impede a student's ability to complete their academics. This may include but is not limited to:

- Short-term physical or mental health issues (e.g., stomach flu, pneumonia, COVID diagnosis, vaccination, etc.)
- Responses to traumatic events (e.g., Death of a loved one, divorce, sexual assault, social injustice, etc.)
- Requirements by law or public health authorities (e.g., court date, isolation due to COVID exposure, etc.)

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances. For more information, please see the Senate Policy on Academic Consideration for Students in Extenuating Circumstances.

Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. Arts and Science undergraduate students can find the Faculty of Arts and Science protocol and the portal where a request can be submitted. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

If you need to request academic consideration for this course, you will be required to provide the name and email address of the instructor/coordinator. Please use the following contact information:

Instructor/Course Coordinator Name: Jonathan Smallwood

Instructor/Course Coordinator email address: [psyc.accom@queensu.ca](mailto:psyc.accom@queensu.ca)

Students are encouraged to submit requests as soon as the need becomes apparent and to contact their Professors/Course Coordinators as soon as possible once Consideration has been granted. Any delay in contact may limit the Consideration options available.



For more information on the Academic Consideration process, what is and is not an extenuating circumstance, and to submit an Academic Consideration request, [please see our website](#).

### Academic Integrity

#### Copyright of Course Materials

Unless otherwise stated, the material on the course website is copyrighted and is for the sole use of students registered in Psyc420. The material on the website may be downloaded for a registered student's personal use but shall not be distributed or disseminated to anyone other than students registered in this course.

#### **Turnitin Statement**

This course uses Turnitin, a third-party application that helps maintain standards of excellence in academic integrity. Normally, students will be required to submit their course assignments through onQ to Turnitin. In doing so, students' work will be included as source documents in the Turnitin reference database, where they will be used solely to detect plagiarism.

Turnitin is a suite of tools that provide instructors with information about the authenticity of submitted work and facilitates the process of grading. Turnitin compares submitted files against its extensive database of content, and produces a similarity report and a similarity score for each assignment. A similarity score is the percentage of a document that is similar to content held within the database. Turnitin does not determine if an instance of plagiarism has occurred. Instead, it gives instructors the information they need to select the authenticity of work as a part of a larger process.

Please read Turnitin's Privacy Pledge, Privacy Policy, and Terms of Service, which govern users' relationship with Turnitin. Also, please note that Turnitin uses cookies and other tracking technologies; however, in its service contract with Queen's, Turnitin has agreed that neither Turnitin nor its third-party partners will use data collected through cookies or other tracking technologies for marketing or advertising purposes. For further information about how you can exercise control over cookies, see Turnitin's Privacy Policy

Turnitin may provide other services that are not connected to the purpose for which Queen's University has engaged Turnitin. Your independent use of Turnitin's other services is subject solely to Turnitin's Terms of Service and Privacy Policy, and Queen's University has no liability for any independent interaction you choose to have with Turnitin.

#### **Academic Integrity**

Queen's students, faculty, administrators and staff all have responsibilities for upholding the [fundamental values of academic integrity](#); honesty, trust, fairness, respect, responsibility and courage. These values are central to the building, nurturing, and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the [Senate Report on Principles and Priorities](#)).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and their behaviour conform to the principles of academic integrity. Information on academic integrity is available in the Arts and Science Calendar (see [Academic Regulation 1](#)), on the [Arts and Science website](#), and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery, use of forged materials, contract cheating, unauthorized use of intellectual property, unauthorized collaboration, failure to abide by academic rules, departure from the core values of academic integrity, and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions appropriate to the severity of the departure that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

### **Copyright of Course Materials**

Course materials created by the course instructor, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the instructor's intellectual property. It is a departure from academic integrity to distribute, publicly post, sell or otherwise disseminate an instructor's course materials or to provide an instructor's course materials to anyone else for distribution (including note sharing sites), posting, sale or other means of dissemination without the instructor's *express consent*. A student who engages in such conduct may be subject to penalty for a departure from academic integrity and may also face adverse legal consequences for infringement of intellectual property rights.