

**University of Waterloo**  
**Department of Psychology**  
**PSYCH 461**  
**Honours seminar in Cognitive neuroscience**  
**Winter 2021**

**\*\*online course with live Webex meetings Thursdays 10-11.20am\*\***

### **Instructor Information**

Instructor: Roxane Itier  
Office Hours: by appointment only (through Webex or Teams)  
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If you would like to contact me, please use the e-mail address above and **make sure you add “PSYCH 461” to your message subject line**, to make sure that I do not miss your e-mail, as I receive a lot of emails on a daily basis. Students are responsible for all e-mail that is sent to their official UW e-mail address. Check LEARN and your e-mail regularly for important and time sensitive messages.

### **Course Description**

#### ***The Social Brain: Cognitive Neuroscience of face processing and social cognition***

We encounter people every day of our lives and the cues we extract from their face shape our social behavior. For example you behave differently with your professor than with your best friend, or with someone looking distressed than with someone looking ready to jump at you. Successfully decoding the human face is central to navigating appropriately our social environment and relies on complex brain networks that can go awry or simply break down as seen in Autism Spectrum disorders or prosopagnosia. This course will consider the cognitive and brain basis of face processing and its links to social cognition, including the recognition of face identity, facial expressions of emotion, gaze perception and social attention. We will take a multidisciplinary approach and integrate classic and more recent data from neuroimaging techniques, with a specific emphasis on EEG/ERPs, cognitive theories and behavioural evidence, neuropsychology and clinical disorders. Students will develop an understanding of how cognitive neuroscience informs current theories of socio-cognitive perceptual functions and get a better idea of what the fascinating social brain is all about.

### **Course Goals and Learning Outcomes**

The goal of this course is to provide students with a basic understanding of some of the most used neuroimaging methods, especially the ERP methodology, and approaches to the study of face perception and its links to social cognition. Upon completion of this course, students should:

- A. Have a general understanding of the cognitive processes involved in the perception of human faces and how they relate to social cognitive processes.
- B. Have acquired basic knowledge in various brain neuroimaging techniques and especially EEG/ERPs

- C. Be able to interpret primary source material (empirical journal articles) related to the study of brain investigation of face perception and social cognition.
- D. Be able to critique scientific papers in general.
- E. Have solidified their presentation skills through the use of online powerpoint presentations.

## Required Text

There is no textbook for this course.

## Readings and course information available on LEARN

We will read one or two papers every week (listed below and in the course progression table). Those readings will be posted on LEARN under the content tab on the Thursday of the week preceding the virtual class discussion (i.e. a week before). The syllabus, discussion forums, assignments and important announcements will be posted on LEARN. It is your responsibility to check LEARN and your official university email address regularly for course updates.

List of already selected readings (will be available on LEARN every week):

Bentin, S., Allison, T., Puce, A., Perez, E., & McCarthy, G. (1996). Electrophysiological studies of face perception in humans. *Journal of Cognitive Neuroscience*, 8(6), 551-565.

Bruce V, Young A. (1986). Understanding face recognition. *Br. J. Psychol.* 77:305–27

Calvo MG, Nummenmaa L. (2016). Perceptual and affective mechanisms in facial expression recognition: An integrative review. *Cogn Emot.* 30(6):1081-106.

Duchaine B, Yovel G. (2015). A Revised Neural Framework for Face Processing. *Annu Rev Vis Sci.*, 1:393-416.

Dalmaso M, Castelli L, Galfano G. (2020). Social modulators of gaze-mediated orienting of attention: A review. *Psychon Bull Rev.* 27(5):833-855.

Haxby, JV., Hoffman, EA., Gobbini, MI. (2000). The distributed human neural system for face perception. *Trends Cogn. Sci.* 4,223–233.

Itier, RJ. (2015). Attention to eyes in face perception. In J. M. Fawcett, E. F. Risko & A. Kingstone (Eds.), *The handbook of attention* (pp. 369-387). Cambridge, MA, USA: MIT Press.

Itier, RJ., & Batty, M. (2009). Neural bases of eye and gaze processing: the core of social cognition. *Neurosci Biobehav Rev*, 33(6), 843-863.

Itier, RJ., & Neath-Tavares, K. N. (2017). Effects of task demands on the early neural processing of fearful and happy facial expressions. *Brain Res*, 1663, 38-50.

Jacques C, Jonas J, Maillard L, Colnat-Coulbois S, Koessler L, Rossion B. (2019). The inferior occipital gyrus is a major cortical source of the face-evoked N170: Evidence from simultaneous scalp and intracerebral human recordings. *Hum Brain Mapp.* 40(5):1403-1418.

- McCrackin SD, Itier RJ. (2019). Individual differences in the emotional modulation of gaze-cuing. *Cogn Emot.* 33(4):768-800.
- Nomi JS, Uddin LQ. (2015). Face processing in autism spectrum disorders: From brain regions to brain networks. *Neuropsychologia.* 71:201-16.
- Nummenmaa L, Calder AJ. (2009). Neural mechanisms of social attention. *Trends Cogn Sci.* 2009 13(3):135-43.
- Parkington, KB., Itier, RJ. (2018). One versus two eyes makes a difference! Early face perception is modulated by featural fixation and feature context. *Cortex*, 109, 35-49.
- Rossion B, Dricot L, Goebel R, Busigny T. (2011). Holistic face categorization in higher order visual areas of the normal and prosopagnosic brain: toward a non-hierarchical view of face perception. *Front Hum Neurosci.* 4:225.
- Senju A, Johnson MH. (2009). The eye contact effect: mechanisms and development. *Trends Cogn Sci.* 13(3):127-34.
- Tavares PP, Mouga SS, Oliveira GG, Castelo-Branco M. (2016). Preserved face inversion effects in adults with autism spectrum disorder: an event-related potential study. *Neuroreport.* 27(8):587-92.
- Woodman GF. (2010). A brief introduction to the use of event-related potentials in studies of perception and attention. *Atten Percept Psychophys.* 72(8):2031-46.

### **Virtual live weekly meetings**

As this is a seminar where active discussion is the primary mode of learning, we will meet virtually (due to the COVID-19 pandemic) weekly through Webex, on Thursdays 10-11.20am Eastern Time zone (=Waterloo time). There is a direct link to our WebEx forums in the course on LEARN.

Those live sessions will be recorded (please read the Video Recording consent letter posted on LEARN), to allow students who cannot attend the live meeting to benefit from the discussion. I would much rather not have to record at all so if all of you can attend then we won't record these sessions (just like it would be if we were meeting live on campus). These recordings are only to help those you cannot attend and will be made accessible on LEARN within 24h of our meetings. It is important that you join these meetings as much as possible as we will discuss the material during these sessions, and address your discussion posts. It is also the best way to ensure that you understand the content to prepare for your written assignments. These meetings are our only way to truly connect on a weekly basis and have an interactive discussion.

## Course Requirements and Assessment

Assessment	Weighting
Discussion Board	20%
Presentation	17%
Written assignment 1	30%
Written assignment 2	30%
Participation in SONA Experiments	3%
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Total	100%

### Discussion board (20% of grade):

The class will be divided into Group A and Group B students. Every week starting on Week 3 until the end of the term, you will submit a thoughtful question or answer to the discussion board for that week. On Week 3, Group A students will each submit one question while Group B students will submit one answer to one of the questions. On Week 4, it will be the opposite: Group B students will submit one question and Group A students will submit one answer. This pattern will repeat for the following weeks until the end of the term. Groups A and B will be determined before Week 3.

Discussion contributions should not exceed 150 words. Please make an effort to be concise, yet clear, precise and thoughtful. Discussion contributions will be evaluated on a simple 3-point system (unsatisfactory, satisfactory, outstanding). I will drop the lowest mark from the overall discussion board mark. Failure to contribute to the discussion post will result in a 0 mark.

Comments should show active and critical engagement with the course material by linking it to other material in this course, or by posing a constructive critique of a point being made. You may also earn marks for asking clarification questions about something in the course material you do not understand. However, only asking clarification questions will not result in full marks for engagement. Responses that only voice agreement with what has already been said (e.g., “I agree”, “good point”, “I was thinking the same” etc.) will result in an “unsatisfactory” mark. Responses are expected to create or facilitate further dialogue, which will enhance everybody’s learning.

There will be two deadlines for each discussion board. Questions (for a given group) are due Mondays at 23:59 ET. Responses to these questions (other group) are due Tuesdays at 23:59 ET. This gives you time to read all the questions asked and chose the one you prefer to answer. It is important that you respect these deadlines. It gives me time to review all the posts (questions and answers) on Wednesday, to prepare for our e-meeting on Thursdays during which I will address issues (misunderstanding, clarifications etc). Failure to complete the deadlines will result in a 0 mark.

*To submit your questions or answers, go to the course on LEARN, click on “Connect”, chose “Discussions”, then select the Topic of the week under our forum.*

### Presentation (17% of grade):

Students should send me an e-mail by January 19<sup>th</sup> at the latest with their 3 top preference weeks for presentation. I will assign students to each week/paper based on their preferences as much as possible.

Starting on Week3, each week during our e-meeting on Webex, 1, 2 or 3 students (depending on enrollement) will present a 10-15 minute powerpoint slide presentation live (15min max if there are 1 or 2 students presenting, 10min max if there are 3). This will be achieved by sharing your screen with the others in the class and going over your presentation. The live component is really important to engage more with each other during these difficult isolating times created by the pandemic. We can then discuss the presentation, the papers and your questions and answers for that week.

Alternatively, if a student cannot attend the live meeting, they will submit a 'voice-over' Power Point presentation (see link to information below). The file will be reviewed in class during the live meeting, so we can discuss the paper as usual. Presentations should be submitted on the associated dropbox on LEARN, by 9am on the date of the scheduled presentation. I will post instructions regarding that on LEARN. Failure to submit your presentation by the assigned date will result in a zero, unless you contact me ahead of time to reschedule (for good reason). Again, these presentations are here to provide visual support to our live discussions so not showing up for your presentation will impact the entire class.

This presentation should discuss the week's assigned readings. The presentation should be a summary of the article you were assigned and should provide enough material for us to discuss these readings and incorporate discussion posts. You can supplement the presentation with information taken from other papers made during your research. Presenting students should make an effort to read the questions and answers posted on the discussion board ahead of time and incorporate them if possible during their presentation. Of the 17% grade, 10% will go to the actual presentation and 7% will go to your capacity in integrating the weeks posts and responding to class mates questions.

Here are tips to create your power point presentation and add audio:

<https://contensis.uwaterloo.ca/sites/open/resources/CEL-ORR/toc/modules/creating-narrated-ppt.aspx>

## **Written assignment (30% x 2 papers = 60% of the grade)**

On two occasions (see deadlines below) you will submit an integration paper. These written assignments should be 3-pages long (single spaced, Arial 11 font, "normal" margin in word with 1" on each side) and be composed of three parts, each written on one page: a synthesis/critique of the papers studied, a research experiment proposal and a list of the references you cite in your text.

### **\*Synthesis/critique (14% of one assignment grade)**

The first page should incorporate the readings of the weeks preceding and your own research of the topics. This should not be a single summary cut and pasted from the papers abstracts! This should be a real integration of the readings, a synthesis and a critique, where you link all the papers together, summarise and contrast the main findings, highlight the various techniques, highlight the strength and weaknesses of the articles, discuss possible issues or convergence of findings and relate these readings to others in the literature that you will find yourselves online.

The quality of your writing, the coherence of your narrative and your critical thinking will be taken into account. It is important that you spend time, ahead of time (not last minute), exercising your writing

skills for these assignments. You are limited in space on purpose so make every word count. Clarity of expression is a key aspect of research writing and thinking and can be very concise yet specific and precise. This is an important exercise that will be useful whatever you do after your undergraduate degree.

**\*Research experiment proposal (14% of one assignment grade)**

The second page should be a research experiment proposal of your choice, using the ERP technique. You will need to state which course article you are basing yourself on and what unresolved issue you are trying to address. The critical mindset required to produce a good study proposal is an important research skill, and in turn requires a different approach to reading articles. (You'll probably want to read each article at least twice, once for a basic understanding of what the authors did and what they concluded from their research, and a second time with a greater focus on what might have been done differently and how that might have affected the conclusions drawn from the study.)

Your proposal should follow a fixed format with the following headings: Claim (what is the novel research idea you are testing?), Study (describe the proposed study to test your claim), Hypothesis (describe the expected result of your proposed study if your claim is correct), Implications (if the hypothesis were supported, how would this change our understanding of the research topic addressed).

What matters as much as the study you propose is the argument you make for its usefulness. Top marks will go to those papers that provide a clear, compelling rationale for why the proposed follow-up study would be informative. There are many possible follow-up studies that could be conducted; your task is to make a compelling case for the one you have proposed. Avoid proposing follow-up studies relying on formulaic changes to methodology (e.g., increased sample size, use of more realistic stimuli, change in subject population) unless a clear case can be made for why it would help to address some interesting research question.

**\*the 3<sup>rd</sup> page – reference list (2% of one assignment grade)**

List your references to research articles (the ones we saw in class and the ones you found on your own) in the following format:

Itier, R. J. (2015). Attention to eyes in face perception. In J. M. Fawcett, E. F. Risko & A. Kingstone (Eds.), *The handbook of attention* (pp. 369-387). Cambridge, MA, USA: MIT Press.

Bentin, S., Allison, T., Puce, A., Perez, E., & McCarthy, G. (1996). Electrophysiological studies of face perception in humans. *Journal of Cognitive Neuroscience*, 8(6), 551-565.

Please stick to one page of references as much as possible.

Assignments should be submitted to the corresponding dropbox on LEARN. Late submissions will be subject to a 10% penalty per late day. Unsubmitted assignments will receive a 0. Not respecting the 1 page rule will be penalized.

The deadline for the written assignments are:

**-assignment #1: March 11, 23.59 E.T. (integrate articles from Week 3 to Week 7 inclusive)**

**-assignment #2: April 19, 23.59 E.T. (integrate articles from Week 8 to 12 inclusive)**

## Course Outline

We will progress according to the following tentative schedule, subject to change depending on unforeseeable circumstances, change in enrollement, pace of progression etc. The readings will be posted on LEARN the week before. Presentations should not take more than a week to prepare.

week	dates	Assigned readings	Submit Questions (by Monday 11.59pm)	Submit Answers (by Tuesday 11.59pm)	Live webex discussion Thursday 10-11.20am E.T
1	January 11-15	Orientation and planning	-	-	January 14
2	January 18-22	LECTURE Woodman, 2010	-	-	January 21 Live lecture
3	January 25-29	Bruce & Young, 1986 Bentin et al., 1996	January 25	January 26	January 28
4	February 1-5	Haxby et al., 2000 Rossion et al., 2011	February 1	February 2	February 4
5	February 8-12	Duchaine & Yovel, 2015 Itier, 2015	February 8	February 9	February 11
	February 15-19	READING WEEK			
6	February 22-26	Parkington & Itier, 2018 Jacques et al., 2019	February 22	February 23	February 25
7	March 1-5	Itier & Batty, 2009	March 1	March 2	March 4
8	March 8-12	Senju & Jonhson, 2009 TBD	March 8	March 9	March 11  <b>Assignment #1 due, 23.59 E.T.</b>
9	March 15-19	Nomi & Uddin, 2015 Tavares et al., 2016	(March 15)  Pause – no discussion board	(March 16)  Pause – no discussion board	March 18
10	March 22-26	Calvo & Numenmaa, 2016 Itier & Neath-Tavares, 2017	March 22	March 23	March 25

11	March 29-April 2	Numenmaa & Calder, 2009 TBD	March 29	March 30	April 1
12	April 5-9	McCrackin & Itier, 2019 Dalmaso et al., 2020	April 5	April 6	April 8
	April 12-16		REG SONA credits deadline Assignment # 2 due April 19, 23.59 E.T.		

## Academic Integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. Check the [Office of Academic Integrity website](#) for more information.

## Discipline

A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check [the Office of Academic Integrity](#) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check [Guidelines for the Assessment of Penalties](#).

## Grievance

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#). When in doubt, please be certain to contact the department’s administrative assistant who will provide further assistance.

## Appeals

A decision made or penalty imposed under [Policy 70, Student Petitions and Grievances](#) (other than a petition) or [Policy 71, Student Discipline](#) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to [Policy 72, Student Appeals](#).

## Accommodation for Students with Disabilities

**Note for students with disabilities:** [AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with [AccessAbility Services](#) at the beginning of each academic term.



## Mental Health Support

All of us need a support system. The faculty and staff in Arts encourage students to seek out mental health support if they are needed.

### On Campus

***Due to COVID-19 and campus closures, services are available only online or by phone.***

- Counselling Services: [counselling.services@uwaterloo.ca](mailto:counselling.services@uwaterloo.ca) / 519-888-4567 ext. 32655
- [MATES](#): one-to-one peer support program offered by the Waterloo Undergraduate Student Association (WUSA) and Counselling Services

### Off campus, 24/7

- [Good2Talk](#): Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Grand River Hospital: Emergency care for mental health crisis. Phone: 519-749-4300 ext. 6880
- [Here 24/7](#): Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- [OK2BME](#): set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 extension 213

Full details can be found online on the Faculty of Arts [website](#)

Download [UWaterloo and regional mental health resources \(PDF\)](#)

Download the [WatSafe app](#) to your phone to quickly access mental health support information

## Territorial Acknowledgement

We acknowledge that we are living and working on the traditional territory of the Attawandaron (also known as Neutral), Anishinaabe and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes ten kilometres on each side of the Grand River.

For more information about the purpose of territorial acknowledgements, please see the [CAUT Guide to Acknowledging Traditional Territory \(PDF\)](#).

## Academic freedom at the University of Waterloo

[Policy 33, Ethical Behaviour](#) states, as one of its general principles (Section 1), “The University supports academic freedom for all members of the University community. Academic freedom carries with it the duty to use that freedom in a manner consistent with the scholarly obligation to base teaching and research on an honest and ethical quest for knowledge. In the context of this policy, 'academic freedom' refers to academic activities, including teaching and scholarship, as is articulated in the principles set out in the Memorandum of Agreement between the FAUW and the University of Waterloo, 1998 (Article 6). The academic environment which fosters free debate may from time to time include the presentation or discussion of unpopular opinions or controversial material. Such material shall be dealt with as openly, respectfully and sensitively as possible.” This definition is repeated in Policies 70 and 71, and in the Memorandum of Agreement, Section 6.

## **Sona Participation and Research Experience Marks Information and Guidelines**

Experiential learning is considered an integral part of the undergraduate program in Psychology. Research participation is one example of this, article review is another. A number of undergraduate courses have been expanded to include opportunities for Psychology students to earn grades while gaining research experience.

Since experiential learning is highly valued in the Department of Psychology, students may earn up to **3%** of their final mark in this course through research experience (i.e., course work will make up 97% of the final mark and research experience will make up the other 3% for a maximum grade of 100%). **Be sure to review the guidelines referred to later in this document.**

The two options for earning research experience grades; participation in research through online and remotely operated (replacing in-lab) studies, and article review; are described below. Students may complete any combination of these options to earn research experience grades.

### **Option 1: Participation in Psychology Research**

Research participation is coordinated by the Research Experiences Group (REG). Psychology students may volunteer as research participants in remotely operated (replaces in-lab) and/or online (web-based) studies conducted by students and faculty in the Department of Psychology. Participation enables students to learn first-hand about psychology research and related concepts. Many students report that participation in research is both an educational and interesting experience. Please be assured that all Psychology studies have been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee.

### ***How to earn extra marks for your Psychology course(s) this term by participating in studies ...***

- You will earn "credits" which will be converted to "marks" (1 credit = 1%)
- You can schedule your remotely operated (replacing in-lab) and ONLINE studies using the "Sona" website.
- **FOR THE WINTER 2021 TERM ALL OF YOUR CREDITS** can be earned through ONLINE AND REMOTELY/ ONLINE OPERATED (replacing in-lab) studies.

### ***Educational focus of participation in research***

To maximize the educational benefits of participating in research, students will receive feedback information following their participation in each study detailing the following elements:

- Purpose or objectives of the study
- Dependent and independent variables
- Expected results
- References for at least two related research articles

- Provisions to ensure confidentiality of data
- Contact information of the researcher should the student have further questions about the study
- Contact information for the Director of the Office of Research Ethics should the student wish to learn more about the general ethical issues surrounding research with human participants, or specific questions or concerns about the study in which s/he participated.

Participation in remotely operated (replaces in-lab) studies has increment values of 0.75 participation credits (grade percentage points) for each 30-minutes of participation. Participation in ONLINE studies is worth .25 credits for each 15-minutes of participation. Researchers will record student's participation and at the end of the term the REG Coordinator will provide the course instructor with a credit report of the total credits earned by each student.

### **How to participate?**

**Study scheduling, participation and grade assignment is managed using the SONA online system. All students enrolled in this course have been set up with a SONA account. You must get started early in the term.**

**For instructions on how to log in to your SONA account and for a list of important dates and deadlines please, as soon as possible, go to:**

[Participating/SONA information: How to log in to Sona and sign up for studies](#)

*\*\*\* Please do not ask the Course Instructor or REG Coordinator for information unless you have first thoroughly read the information provided on this website.\*\*\**

More information about the REG program in general is available at:

[Sona Information on the REG Participants website](#) or you can check the [Sona FAQ on the REG website homepage](#) for additional information.

### **Option 2: Article Review as an alternative to participation in research**

Students are not required to participate in research, and not all students wish to do so. As an alternative, students may opt to gain research experience by writing short reviews (1½ to 2 pages) of research articles relevant to the course. The course instructor will specify a suitable source of articles for this course (i.e., scientific journals, newspapers, magazines, other printed media). *You must contact your TA to get approval for the article you have chosen before writing the review.* Each review article counts as one percentage point. To receive credit, you must follow specific guidelines. The article review must:

- **Be submitted before the [last day of lectures](#). Late submissions will NOT be accepted under ANY circumstances.**
- Be typed
- Fully identify the title, author(s), source and date of the article. A copy of the article must be attached.

- Identify the psychological concepts in the article and indicate the pages in the textbook that are applicable. Critically evaluate the application or treatment of those concepts in the article. If inappropriate or incorrect, identify the error and its implications for the validity of the article. You may find, for example, misleading headings, faulty research procedures, alternative explanations that are ignored, failures to distinguish factual findings from opinions, faulty statements of cause-effect relations, errors in reasoning, etc. Provide examples whenever possible.
- Clearly evaluate the application or treatment of those concepts in the article.
- Keep a copy of your review in the unlikely event we misplace the original.