

Psychology 335: Developmental Neuropsychology

Mondays & Wednesdays, 1 – 2:20 pm, PAS 2083

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Course Description: Developmental neuropsychology is a field in which brain-behaviour relationships are examined in the context of typical and atypical development. This course will focus on the structural development of the brain, the emergence of functional brain systems, and the neuropsychological underpinnings of childhood brain disorders. Emphasis will be placed on the integration of theoretical perspectives and empirical research in neuropsychology with clinical practice.

Course Web Site: Announcements, lecture slides, and grades will be posted on Learn.

Required Readings: Required readings have been compiled in a custom course pack that is available for purchase at the UW Book Store. Readings for the assignments can be accessed on the course web site in Learn. A supplementary brain atlas is available on reserve at the UW Porter library (3 hour loan).

Learning Objectives:

1. Develop familiarity with methods used in developmental cognitive neuroscience (e.g., behavioral paradigms, neuroimaging, electrophysiological recording)
2. Understand major concepts related to the structural and functional development of the brain
3. Become familiar with the development of neuropsychological functions
4. Identify the neural, cognitive, and behavioural sequelae of brain-based disorders of childhood
5. Evaluate different approaches to neuropsychological intervention
6. Hone critical thinking and written communication skills

Outcome Measures: Your final grade will depend on the points you accrue on four quizzes, two critical reflection papers, a cumulative final exam, and required research experience. The quizzes will be based on assigned readings and lecture material. They will consist of objective questions (e.g., multiple choice, fill-in-the-blank, short answer) and will require knowledge of basic facts and the application of these facts to real-world situations. The critical reflection papers will require that you read and report on empirical studies or articles from the popular media related to the field of developmental neuropsychology. The breakdown of grades will be as follows:

Quizzes (4 of 5):	4 x 10 points = 40 points
Final Exam:	30 points
Papers (2):	2 x 14 points = 28 points
<u>Required Research Experience:</u>	<u>2 points</u>
Total:	100 points

Student Expectations: To achieve **at least an average grade** in this course, students are expected to (1) attend all lectures, (2) do all assigned readings, (3) complete at least 4 of the 5 in-class quizzes, (4) submit written assignments on or before the due date, (5) participate in the required research experience (which may be experimental participation or article review – for details see below), (6) ensure sufficient time for studying, and (7) ask clarification questions in class, during office hours, or via e-mail (note that questions asked outside of class will be reposted anonymously to Learn). Please note that lecture slides will be posted before each class; however, slides are intended to facilitate note-taking of lecture material. **This means that students who do not attend lectures will miss a significant amount of information that is required to get at least an average grade in the course.**

Policy on Quizzes and the Final Exam: There are no make-up quizzes in this course. Students are required to complete 4 of the 5 quizzes. Students who miss a quiz for any reason will receive a quiz grade that is based on marks from the 4 other quizzes that are completed. Students who take all 5 quizzes will receive a quiz grade that is based on their 4 highest marks (i.e., the lowest quiz mark will be dropped). This means that it is to the student's advantage to take all 5 quizzes.

The cumulative final exam is required of all students. Students may only miss the final exam in extenuating circumstances and appropriate documentation must be provided. Please note that student travel plans are not acceptable grounds for missing the final exam. Students in extenuating circumstances and with acceptable documentation must contact the instructor no later than 48 hours after the exam date. If contact is made, the student will be permitted to re-take the final. If no contact is made, a mark of 0 will be given for the final exam. Information regarding University policies for missed exams is available at www.registrar.uwaterloo.ca/exams/ExamRegs.pdf.

Policy on Assignments: Assignments should be uploaded to the Dropbox on the course web site in Learn. All assignments must be submitted prior to the start of class on the identified due date (i.e., prior to 1 pm). Late assignments will only be accepted from students in extenuating circumstances and with appropriate documentation provided that they contact the instructor no later than 48 hours after the assignment due date. If no contact is made, a mark of 0 will be given for the assignment. Please note that student travel plans are not acceptable grounds for a late submission. If a student anticipates being absent from class on the day that an assignment is due, the student should submit his/her assignment to the Dropbox beforehand. Information regarding University policies for late assignments is available at www.registrar.uwaterloo.ca/exams/ExamRegs.pdf.

Plagiarism detection software (Turnitin) will be used to screen assignments in this course to verify that use of all materials and sources is documented. Students who do not want to have their assignment screened by Turnitin may submit their assignment directly to the instructor along with hard copies of cited material in which cited information is highlighted (if applicable).

Plagiarism is a serious academic offence. Assignments that are plagiarized may, at the discretion of the instructor, receive a grade of 0. **To avoid potential problems, please familiarize yourselves with**

plagiarism and make sure to appropriately cite all ideas that are not your own. See the following link for more information:

www.lib.uwaterloo.ca/ait/purchase.html.

Writing is a skill that is developed with practice. Part of the grade on the written assignments reflects the student's ability to write in a clear and coherent manner. Students wishing to improve their writing prior to handing in their assignment are strongly encouraged to seek consultation through the Writing Center at the University of Waterloo, which is a free service provided by professional writers (<http://uwaterloo.ca/writing-centre/>). Note that this service is not only for ESL students, but for all students wishing to strengthen their written communication skills. In the past, the Writing Centre has requested that students bring in their assignment at least 2 weeks before the due date.

Grade Appeals: If you feel that your grade is unfair, you have the right to appeal. Please send the instructor an e-mail stating (a) the item in question and (b) your rationale for the appeal. Submit this e-mail to the instructor within one week after receiving the grade. Grade appeals are not handled by the TAs of this course.

Opportunity for Extra Credit: Students may earn a "bonus" grade of up to 2% through additional research experience. This bonus will be added to the final grade up to a maximum of 100 points (i.e., it is not possible to earn more than 100 points in the course). The two options for earning the bonus 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 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 undergone prior ethics review and clearance through the Office of Research Ethics.

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 is worth 0.5 participation credits (grade percentage points) for each half-hour of participation. Researchers will record student's participation and will report the total credits earned by each student at the end of the term to the course instructor.

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. *It is important that you get an early start on your studies.* For detailed instructions on when and how access your SONA account and for a list of important dates and deadlines please, as soon as possible, click on:

<http://www.arts.uwaterloo.ca/~regadmin/regparticipant/sonainfo/#SonaSignUp>

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 is available at:

<http://www.arts.uwaterloo.ca/~regadmin/regparticipant/>

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 empirical articles that relevant to the course. Each review article counts as one percentage point. To receive credit, you must follow specific guidelines. The article review must:

- Be based on a study that has a developmental focus (e.g., including child and/or adolescent participants, or examining a phenomenon that is relevant to development)
- Be selected from one of the following publications: Developmental Neuropsychology, Journal of the International Neuropsychological Society, or Neuropsychologia
- Identify the title, author(s), source and date of the article. A pdf of the article must be attached.
- Identify the psychological concepts in the article and critically evaluate the application or treatment of those concepts. 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.
- Be submitted to course dropbox on Learn on or before the last day of lecture (April 1). Late submissions will not be accepted.

Plagiarism detection software (Turnitin) will be used to screen article reviews for the reasons noted above. Students who do not want to have their reviews screened by Turnitin may submit their assignment directly to the instructor along with hard copies of cited material in which cited information is highlighted (if applicable).

Accommodations for Students with Disabilities: Access-Ability Services, located in Needles Hall Room 1132, 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 Access-Ability Services at the beginning of each academic term. Any accommodations for which you qualify will be provided, provided that I receive written approval from the ODP.

Academic Integrity and Discipline: 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. Students are expected to know what constitutes academic integrity to avoid committing academic offenses, and to take responsibility for their actions (www.uwaterloo.ca/academicintegrity/). A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses, should seek guidance from the course instructor, academic advisor, or the Undergraduate Associate Dean. Violations of the standards of Academic Integrity will be met with penalties. Anyone known to be plagiarizing material, copying from another student, or using crib notes will receive a grade of zero on that assignment, quiz, or exam. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 - Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline (www.adm.uwaterloo.ca/infosec/Policies/policy71.htm).

Grievances and Grievance Appeals: 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. For more information, read Policy 70 - Student Petitions and Grievances, Section 4 (www.adm.uwaterloo.ca/infosec/Policies/policy70.htm). A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read Policy 72 - Student Appeals for more information (www.adm.uwaterloo.ca/infosec/Policies/policy72.htm).

Course Schedule:

Date	Topic	Readings
Jan 7	Course overview	
9	History of the field and methods	Johnson, M.H. (2011). <i>Developmental cognitive neuroscience: An introduction</i> (pp. 17-30).
14	Brain development I: Structural brain development	Anderson, A., Northam, E., Hendy, J., & Wrennall, J. (Eds.). (2001). <i>Developmental neuropsychology: A clinical approach</i> (pp.39 – 68).
16		
21	Brain development II: The specializing brain	Johnson, M. (2001). Functional brain development in humans. <i>Nature Reviews Neuroscience</i> , 2, 475-483.
23	Early brain insult and recovery	Anderson, A., Northam, E., Hendy, J., & Wrennall, J. (Eds.). (2001). <i>Developmental neuropsychology: A clinical approach</i> (pp.103-124). Reading for assignment 1 (see course web site):

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		<p>Kennard, M.A. (1936). Age and other factors in motor recovery from precentral lesions in monkeys. <i>American Journal of Physiology</i>, 115, 138-146.</p> <p>Assignment 1 Due: Is earlier better? Evaluating tenets of the “Kennard Principle”</p>
28	Intelligence	QUIZ 1
		No assigned reading.
30	“What” and “Where” Visual Functions	<p>Atkinson, J., & Nardini, M. (2008). The neuropsychology of visuospatial and visuomotor development. In J. Reed & J. Warner-Rodgers (Eds.), <i>Child neuropsychology: Concepts, theory, and practice</i> (pp.183-217).</p>
Feb 4	NO CLASS	
6	Non-executive Attention	<p>Nelson, C.A., de Haan, M., & Thomas, K.M. (Eds.). (2006). <i>Neuroscience of cognitive development: The role of experience and the developing brain</i> (pp. 154-158).</p>
11	Memory	<p>Nelson, C.A., de Haan, M., & Thomas, K.M. (Eds.). (2006). <i>Neuroscience of cognitive development: The role of experience and the developing brain</i> (pp. 71-91).</p>
13	Language	QUIZ 2
		<p>Hoover, J.R., Sterling, A.M., & Storkel, H.L. (2011). Past, present, and future of pediatric neuropsychology. In A. Davis (Ed.), <i>Handbook of pediatric neuropsychology</i> (pp.71-78).</p>
18	READING WEEK	
20		
25	Executive Functions	<p>Zelazo, P.D., & Muller, R. (2011). Executive function in typical and atypical development. In U. Goswami (Ed.), <i>The Wiley-Blackwell handbook of childhood cognitive development, Second edition</i> (pp.574-603)</p>

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27	Social Cognition	Cadinu, M.R., & Kiesner, J. (2000). Children's development of a theory of mind. <i>European Journal of Psychology of Education, 15</i> (2), 93-111.
Mar 4		QUIZ 3
6	ADHD	Willcutt, E.G. (2010). Attention-deficit/hyperactivity disorder. In K.O. Yeates, M.D. Ris, H.G. Taylor, & B.F. Pennington. (Eds.). <i>Pediatric neuropsychology: Research, theory, and practice</i> (pp.393-417).
11	Autism Spectrum	Bade-White, P.A., Obrzut, J.E., & Randall, P.P. (2009). Neuropsychological aspects of pervasive developmental and autism spectrum disorders. In C.R. Reynolds & E. Fletcher-Janzen (Eds.). <i>Handbook of clinical child neuropsychology</i> (pp. 765-781).
13	Fetal Alcohol Exposure	Mattson, S.N, & Vaurio, L. (2010). Fetal alcohol spectrum disorders. In K.O. Yeates, M.D. Ris, H.G. Taylor, & B.F. Pennington. (Eds.). <i>Pediatric neuropsychology: Research, theory, and practice</i> (pp.265-293).
18	Hydrocephalus and Spina Bifida	QUIZ 4
		Anderson, A., Northam, E., Hendy, J., & Wrennall, J. (Eds.). (2001). <i>Developmental neuropsychology: A clinical approach</i> (pp.185-219).
20	Phenylketonuria	Welsh, M., & Pennington, B. (2000). Phenylketonuria. In K.O. Yeates, M.D. Ris, & H.G. Taylor. (Eds.). <i>Pediatric neuropsychology: Research, theory, and practice</i> (pp.112-146).
25	Traumatic Brain Injury	Yeates, K.O. (2010). Traumatic brain injury. In K.O. Yeates, M.D. Ris, H.G. Taylor, & B.F. Pennington. (Eds.). <i>Pediatric neuropsychology: Research, theory, and practice</i> (pp.112-146).
27	Neuropsychological Interventions	Teeter, P.A. (2009). Neurocognitive interventions for childhood and adolescent disorders: A transactional model. In C.R. Reynolds & E. Fletcher-Janzen (Eds.). <i>Handbook of clinical child neuropsychology</i> (pp. 427-458). Reading for assignment 2 (see course web site): Hurley, D. (2012, April 18). Can you make yourself smarter? <i>The New York Times</i> . Retrieved April 30, 2012 from http://www.nytimes.com

		Assignment 2 Due: Neuro-enhancement: Is it possible to make ourselves smarter?
Apr 1	Wrap-up	QUIZ 5
		FINAL REVIEW