

COURSE SYLLABUS
PSYC G4440: Topics in Neurobiology & Behavior
Prenatal Drug Exposure & Cognition

Meeting Time:
Thursday 6:10-8:00 pm, Room 405 Schermerhorn Hall
Columbia University
Fall, 2018

Instructor: Ciara A. Torres, PhD
Office Hours: Monday (7-8:30 pm), Saturday (6 – 7 pm) and by appointment
(by videochat)
Email: cat2119@columbia.edu

Bulletin Description: Examines current topics in neurobiology and behavior.

Course Description: This seminar provides an overview of the effects produced by exposure to recreational drugs during pregnancy. Students will obtain a basic working knowledge of the neural mechanisms that are thought to mediate these effects. Given recent state legislative changes regarding marijuana – which can now be consumed legally for recreational purposes in nine states (and Washington, DC) – this semester, special emphasis will be placed on the topic of prenatal marijuana-associated cognitive alterations in human offspring. We will examine the extent to which the drug produces long-term disruptions on neural and cognitive markers. Required readings will include seminal reviews in the area of prenatal marijuana exposure, as well as primary empirical literature. The student who successfully completes this seminar will be equipped with tools to enhance critical thinking about scientific research in the area of substance use.

Course Requirements: Basis for Student Evaluation.

	Percentage of course grade
Attendance/Participation	39 (3 pts/session)
Weekly Journals	26 (2 pt/entry)
Student Presentations	15
Student Papers	20

Attendance. Because this is an upper level undergraduate/graduate seminar, attendance is mandatory and absences are rarely excused. To be excused from a class session you must personally notify Prof. Torres before the session and must present some evidence certifying the legitimacy of your absence. For each attended session, students will earn a maximum of 3 points (attendance and participation).

Class Participation and Weekly Journals. This seminar requires that all students be active participants, engaging in stimulating, thought-provoking (and sometimes lively) dialogue. Each week, students will be assigned readings related to the topic of discussion for that week and will be expected to come to class prepared with discussion issues related to the current readings. To facilitate this process, students will keep a journal documenting important questions or issues about the readings. Although journal entries should be of an intellectual nature, raising questions,

for example, about the appropriateness of the conclusions drawn by the study authors based on the study design and/or presented data, they should be no more than a few paragraphs. At the start of each session, journals will be submitted. Late journals will not be accepted.

Student Presentations. Each week, two related papers (all available on Courseworks) will be discussed. Articles assigned for Weeks 2 and 3 will be discussed either by Prof. Torres or together as a group. Starting on Week 4, students will present. Students are expected to know what 2 articles they are interested in presenting by Week 1. Each student will be given 30 minutes to present one paper. Students will be expected to use PowerPoint or other visual aids that will facilitate communication of the paper.

Presentations will be judged by the following criteria:

1. Presentation Skills
 - a. Eye contact with audience
 - b. General preparedness
2. Presentation Content
 - a. Study rationale
 - b. Hypothesis tested
 - c. Experimental design/methodology
 - d. Results and authors' conclusions
3. Ability to Point out Merits and/or Limitations of the Article
4. Ability to Facilitate Discussion

Letter to the Editor. A major portion of the student's grade for the course will be based on a publishable letter submitted to a journal editor. Letters will raise issues/concerns about a recently published paper in the area of neurobiology of substance abuse. Typically, such letters are no more than 300 words. Letters are expected to incorporate topics, concepts, and principles covered in class – specifically in the area of how exposure to recreational drugs affect cognition. For example, students should ask questions such as the following: Have the authors satisfied the criteria for determining causation? Is the model being used appropriate for the stated goals of the study? Do the data collected in laboratory animals correspond with those obtained humans?

Students are expected to work with Prof. Torres throughout the semester to discuss their topics and are required to have selected an article to submit a Letter to the Editor to by October 1st. Both the selected article and a list of three concerns you have about its methodology, analysis and/or authors' conclusion should be sent to cat2119@columbia.edu by this date.

Students are also expected to submit several drafts to Prof. Torres before submitting their letters, if appropriate, to a journal for consideration for publication. It is the student's responsibility to research the targeted journal's Letter submission procedures. The first draft is due by October 15th, though you are welcome to submit it to Prof. Torres earlier than that (five points will be deducted from the Paper/Letter grade if first draft is turned in beyond October 15th). The second draft is due by November 5th. All final Letter submissions are due prior to December 13th at 6 pm (three points will be deducted from the Paper/Letter grade if first draft is turned in beyond December 13th).

Grading Scale.

- 97-100% - A+
- 93-96% - A
- 90-92% - A-

87-89% -	B+
83-86% -	B
80-82% -	B-
77-79% -	C+
73-76% -	C
70-72% -	C-
60-69.9% -	D
Below 60% -	F

Academic Integrity. Maintaining academic integrity is a critical responsibility of all Columbia students. Academic dishonesty includes (but is not limited to): plagiarism (using another person's work without attribution), misrepresentation of authorship (e.g., having work prepared by or purchased from someone else) and lying about completion of work (e.g., claiming that you submitted a post when you did not, or purposefully submitting a corrupted file to obtain more time to complete an assignment). Violations of the Honor Code will not only result in a failing grade for this course, but can also lead to serious disciplinary actions from the University, including expulsion. If you are falling behind in the course, know that you will be unable to finish work on time, or otherwise feel that you cannot complete your work, please talk to Prof. Torres as soon as possible to make a plan, rather than taking actions that will jeopardize your entire academic career.

Students with Disabilities. In order to receive disability-related academic accommodations, students must first be registered with Disability Services (DS). More information on the DS registration process is available online at www.health.columbia.edu/ods. Prof. Torres must be notified of registered students' accommodations before accommodations will be provided. Students who have, or think they may have, a disability are invited to contact DS for a confidential discussion at (212) 854-2388 (Voice/TTY) or by email at disability@columbia.edu.

Note: Aspects of this course may be changed if unforeseen circumstances arise; these changes, however, will be announced before they are initiated.

Class Schedule

<u>Dates</u>	<u>Readings</u>	<u>Topics</u>
W1: 9-6-18	Fried, 2002	Introduction Overview
W2: 9-13-18	Hart et al., 2012 Richardson et al., 2005	Statistical vs clinical significance An example in infancy
W3: 9-20-18	Noland et al., 2003a Singer et al. 2005	Infancy
W4: 9-27-18	Fried and Watkinson, 1990 Hayes et al., 1991	Childhood 1
W5: 10-4-18	O'Connell & Fried, 1991 Day et al., 1994	Childhood 2
W6: 10-11-18	Leech et al., 1999 Noland et al., 2003b	Childhood 3
W7: 10-18-18	Frank et al., 2005 Noland et al., 2005	Childhood 4
W8: 10-25-18	Beeghly et al., 2006 Goldschmidt et al., 2008	Childhood 5
W9: 11-1-18	Fried et al., 1997 Fried et al., 1998	Early adolescence 1
W10: 11-8-18	Fried and Watkinson, 2000 Richardson et al., 2002	Early adolescence 2
W11: 11-15-18	Rose-Jacobs et al., 2011 Rose-Jacobs et al., 2012	Early adolescence 3
11-22-18		University holiday
W12: 11-29-18	Fried et al., 2003 Smith et al., 2004	Late adolescence & adulthood 1
W13: 12-6-18	Goldschmidt et al., 2012 Smith et al., 2016	Late adolescence & adulthood 2
12-13-18		Letter due

Readings (available on Courseworks)

- Fried, P. A. (2002). Conceptual issues in behavioral teratology and their application in determining long-term sequelae of prenatal marijuana exposure. *J Child Psychol Psychiatry*, 43(1), 81-102.
- Hart, C. L., Marvin, C. B., Silver, R., & Smith, E. E. (2012). Is cognitive functioning impaired in methamphetamine users? A critical review. *Neuropsychopharmacology*, 37(3), 586-608.
- Richardson, G. A., Day, N. L., & Goldschmidt, L. (1995). Prenatal alcohol, marijuana, and tobacco use: infant mental and motor development. *Neurotoxicol Teratol*, 17(4), 479-487.
- Noland, J. S., Singer, L. T., Mehta, S. K., & Super, D. M. (2003a). Prenatal cocaine/polydrug exposure and infant performance on an executive functioning task. *Dev Neuropsychol*, 24(1), 499-517.
- Singer, L. T., Eisengart, L. J., Minnes, S., et al. (2005). Prenatal cocaine exposure and infant cognition. *Infant Behav Dev*, 28(4), 431-444.
- Fried, P. A., & Watkinson, B. (1990). 36- and 48-month neurobehavioral follow-up of children prenatally exposed to marijuana, cigarettes, and alcohol. *J Dev Behav Pediatr*, 11(2), 49-58.
- Hayes, J. S., Lampart, R., Dreher, M. C., & Morgan, L. (1991). Five-year follow-up of rural Jamaican children whose mothers used marijuana during pregnancy. *West Indian Med J*, 40(3), 120-123.
- O'Connell, C. M., & Fried, P. A. (1991). Prenatal exposure to cannabis: a preliminary report of postnatal consequences in school-age children. *Neurotoxicol Teratol*, 13(6), 631-639.
- Day, N. L., Richardson, G. A., Goldschmidt, L., et al. (1994). Effect of prenatal marijuana exposure on the cognitive development of offspring at age three. *Neurotoxicol Teratol*, 16(2), 169-175.
- Leech, S. L., Richardson, G. A., Goldschmidt, L., & Day, N. L. (1999). Prenatal substance exposure: effects on attention and impulsivity of 6-year-olds. *Neurotoxicol Teratol*, 21(2), 109-118.
- Noland, J. S., Singer, L. T., Arendt, R. E., Minnes, S., Short, E. J., & Bearer, C. F. (2003b). Executive functioning in preschool-age children prenatally exposed to alcohol, cocaine, and marijuana. *Alcohol Clin Exp Res*, 27(4), 647-656.
- Frank, D. A., Rose-Jacobs, R., Beeghly, M., Wilbur, M., Bellinger, D., & Cabral, H. (2005). Level of prenatal cocaine exposure and 48-month IQ: importance of preschool enrichment. *Neurotoxicol Teratol*, 27(1), 15-28.
- Noland, J. S., Singer, L. T., Short, E. J., et al. (2005). Prenatal drug exposure and selective attention in preschoolers. *Neurotoxicol Teratol*, 27(3), 429-438.
- Beeghly, M., Martin, B., Rose-Jacobs, R., et al. (2006). Prenatal cocaine exposure and children's language functioning at 6 and 9.5 years: moderating effects of child age, birthweight, and gender. *J Pediatr Psychol*, 31(1), 98-115.

Goldschmidt, L., Richardson, G. A., Willford, J., & Day, N. L. (2008). Prenatal marijuana exposure and intelligence test performance at age 6. *J Am Acad Child Adolesc Psychiatry*, 47(3), 254-263.

Fried, P. A., Watkinson, B., & Siegel, L. S. (1997). Reading and language in 9- to 12-year olds prenatally exposed to cigarettes and marijuana. *Neurotoxicol Teratol*, 19(3), 171-183.

Fried, P. A., Watkinson, B., & Gray, R. (1998). Differential effects on cognitive functioning in 9- to 12-year olds prenatally exposed to cigarettes and marihuana. *Neurotoxicol Teratol*, 20(3), 293-306.

Fried, P. A., & Watkinson, B. (2000). Visuoperceptual functioning differs in 9- to 12-year olds prenatally exposed to cigarettes and marihuana. *Neurotoxicol Teratol*, 22(1), 11-20.

Richardson, G. A., Ryan, C., Willford, J., Day, N. L., & Goldschmidt, L. (2002). Prenatal alcohol and marijuana exposure: effects on neuropsychological outcomes at 10 years. *Neurotoxicol Teratol*, 24(3), 309-320.

Rose-Jacobs, R., Soenksen, S., Appugliese, D. P., et al. (2011). Early adolescent executive functioning, intrauterine exposures and own drug use. *Neurotoxicol Teratol*, 33(3), 379-392.

Rose-Jacobs, R. A., Augustyn, M.; Beeghly, M.; et al. (2012). Intrauterine substance exposures and Wechsler Individual Achievement Test-II scores at 11 years of age. *Vulnerable Children and Youth Studies*, 7(2), 186-197.

Fried, P. A., Watkinson, B., & Gray, R. (2003). Differential effects on cognitive functioning in 13- to 16-year-olds prenatally exposed to cigarettes and marihuana. *Neurotoxicol Teratol*, 25(4), 427-436.

Smith, A. M., Fried, P. A., Hogan, M. J., & Cameron, I. (2004). Effects of prenatal marijuana on response inhibition: an fMRI study of young adults. *Neurotoxicol Teratol*, 26(4), 533-542.

Goldschmidt, L., Richardson, G. A., Willford, J. A., Severtson, S. G., & Day, N. L. (2012). School achievement in 14-year-old youths prenatally exposed to marijuana. *Neurotoxicol Teratol*, 34(1), 161-167.

Smith, A. M., Mioduszewski, O., Hatchard, T., Byron-Alhassan, A., Fall, C., & Fried, P. A. (2016). Prenatal marijuana exposure impacts executive functioning into young adulthood: An fMRI study. *Neurotoxicol Teratol*, 58, 53-59.