

## **PS4079**

### **Sex differences and gender development**

Fridays, 11am - 1pm, Old Library, Semester 2, 2016-17

Module controller: Dr Gillian Brown (grb4@st-andrews.ac.uk)

#### **Overview of content**

This module will critically evaluate the empirical evidence for sex differences in psychological traits, such as spatial skills and social cognition, and examine how gender develops across the lifespan. We will consider the distinction between the terms 'sex' and 'gender', and we will examine how 'nature' and 'nurture' jointly contribute to behaviour and cognition. While studies non-human animals can contribute to our understanding of sex differences, this module will focus specifically on human research, including empirical studies of individuals with disorders of sexual development. We will examine how sex differences in susceptibility to mental health disorders could arise, focusing, as an example, on the hypothesis that prenatal exposure to testosterone increases liability for autism spectrum disorders. We will additionally consider what inferences can be drawn from studies that report sex differences in brain structure and function. By the end of the module, students will hopefully feel better placed to evaluate reports of sex differences in human psychological traits and have a fuller understanding of the factors that potentially underpin sex differences in behaviour and cognition.

#### **Structure and reading material**

This module will consist of short lectures, class discussions and student group presentations. A full timetable is provided at the end of this handbook. The powerpoint slides for each lecture will be made available on the day before the class via Moodle, and each lecture will have specific learning objectives. We will critically evaluate empirical journal articles and gain information from review articles. The list of reading material for the first six sessions is provided in this handbook (pdfs are available on Moodle), and the reading material for the student presentation will be made available in Week 5, along with a sign-up sheet. All students will be encouraged to take part in the class discussions and to share their individual views and perspectives. My intention is to provide an inclusive, equitable and respectful learning environment, and I hope that you enjoy the module.

The following books are recommended for general background reading:

Baron-Cohen, S. 2003. *The Essential Difference*. Penguin Books. [This book presents evidence for sex differences in systemizing/empathizing and describes the 'extreme male brain' hypothesis of autism, which we will be critically evaluating in this module]

Fine, C. 2010. *Delusions of Gender: the Real Science Behind Sex Differences*. Icon Books. [This book provides an engaging summary of the evidence that social and cultural environments influence sex differences in behaviour and cognition.]

Hines, M. 2004. *Brain Gender*. Oxford University Press. [This book summarizes the evidence that early hormone exposure are involved in the development of sex differences in the brain and behavior, including evidence from disorders of sexual development.]

### **Assessments**

The assessments for this module will consist of two parts:

i) One 'continuous assessment' essay (25% of the final grade). 1000 word limit. *The essay title will be provided in the first session in Week 1, and the deadline for the essay is **5pm on Friday 3<sup>rd</sup> March, 2017***. Essays must be uploaded to MMS (a coversheet not required, but please use at least 1.5 line spacing). Students are expected to use relevant material from the sessions and also provide evidence of independent reading. Suggested number of references = around 10-12.

ii) Two 'continuous assessment' essays (75% of the final grade). 1000 word limit per essay. *Students will be given four essay titles on Monday 10<sup>th</sup> April 2017 and must write two out of the four essays*. The deadline for both essays is **5pm, Friday 21<sup>st</sup> April, 2017**. Essays must be uploaded to MMS (a coversheet not required, but please use at least 1.5 line spacing). Students are expected to use relevant material from the sessions and also provide evidence of independent reading. Suggested number of references per essay = around 12-20.

### **Feedback on essays and student presentations**

Feedback on the first essay will be provided within 21 days of the submission deadline, and feedback from the first essay is intended to be useful for the subsequent assignments. Students are expected to work together in groups for the presentations. The student presentations are not assessed, but informal feedback will be provided to each group. If any student has concerns about

presenting in front of the class, please feel free speak with me in advance.

### **Transferable skills/graduate attributes**

The type of skills that will be developed include: constructing a coherent argument; applying critical evaluation; engaging with the views and opinions of others; demonstrating original thought; and communicating with clarity and accuracy, both orally and in writing.

## **COURSE MATERIAL**

### **Week 1**

*Lecture:* Introduction. *Class discussion:* Sex differences in human behavior and cognition.

You don't need to carry out any reading in advance of this session. Instead, think about what aspects of human behaviour and cognition you think exhibit sex differences, based on your own experiences of the world, and think about which questions on this topic interest you most.

*Before next week's class (Week 2)*

Watch the debate by Prof. Steven Pinker and Prof. Elizabeth Spelke (2005, Harvard University) on 'The science of gender and science' (**links to the video and transcript versions are on Moodle**). Also, please read the two articles listed under '*Further reading*' below before the Week 2 session.

*Further reading:*

Hyde, J. S. 2005. The gender similarities hypothesis. *American Psychologist* 60: 581-592.

Zell, E., Krizan, Z. and Teeter, S. R. 2015. Evaluating gender similarities and differences using metasynthesis. *American Psychologist* 70: 10-20.

### **Week 2**

*Lecture:* Sexual differentiation. *Class discussion:* The Pinker/Spelke debate.

*Before next week's class (Week 3), please read the following three articles (which will form the basis of next week's class discussion) and carry out the Further Reading below:*

Dar-Nimrod, I. and Heine, S. J. 2006. Exposure to scientific theories affects women's math performance. *Science* 314: 435.

Hyde, J. S., Lindberg, S. M., Linn, M. C., Ellis, A. B. and Williams, C. C. 2008. Gender similarities characterize math performance. *Science* 321: 494-495.

Machin, S. and Pekkarinen, T. 2008. Global sex differences in test score variability. *Science* 322: 1331-1332.

*Further reading:*

Doyle, R. A. and Voyer, D. 2016. Stereotype manipulation effects on math and spatial test performance: a meta-analysis. *Learning and Individual Differences* 47: 103-116.

Halpern, D. F. 2004. A cognitive-process taxonomy for sex differences in cognitive abilities. *Current Directions in Psychological Science* 13: 135-139.

### **Week 3**

*Lecture:* Hormones and the brain. *Class discussion:* Sex differences in maths ability.

*Before next week's class (Week 4), read the following three articles:*

Mathews, G. A., Fane, B. A., Conway, G. S., Brook, C. G. D. and Hines, M. 2009. Personality and congenital adrenal hyperplasia: possible effects of prenatal androgen exposure. *Hormones and Behavior* 55: 285-291.

Pasterski, V., Geffner, M. E., Brain, C., Hindmarsh, P., Brook, C. and Hines, M. 2011. Prenatal hormones and childhood sex segregation: playmate and play style preferences in girls with congenital adrenal hyperplasia. *Hormones and Behavior* 59: 549-555.

Wong, W. I., Pasterski, V., Hindmarsh, P. C., Geffner, M. E. and Hines, M. 2013. Are there parental socialization effects on the sex-typed behaviour of individuals with congenital adrenal hyperplasia? *Archives of Sexual Behavior* 42: 381-391.

*Further reading:*

Berenbaum, S. A. and Beltz, A. M. 2016. How early hormones shape gender development. *Current Opinion in Behavioral Sciences* 7: 53-60.

Hines, M. 2010. Sex-related variation in human behavior and the brain. *Trends in Cognitive Sciences* 14: 448-456.

### **Week 4**

*Lecture:* Sex differences in susceptibility to mental health disorders. *Class discussion:* Prenatal

hormones and gender development

*Before next week's class (Week 5), read the following three articles:*

Connellan, J., Baron-Cohen, S., Wheelwright, S., Batki, A. and Ahluwalia, J. 2000. Sex differences in human neonatal social perception. *Infant Behavior and Development* 23: 113-118.

Wheelwright, S., Baron-Cohen, S., Goldenfeld, N., Delaney, J., Fine, D., Smith, R., Weil, L. and Wakabayashi, A. 2006. Predicting autism spectrum quotient (AQ) from the systemizing quotient-revised (AQ-R) and empathy quotient (EQ). *Brain Research* 1079: 47-56.

Baron-Cohen, S., Bowen, D. C., Holt, R. J., Allison, C., Auyeung, B., Lombardo, M. V., Smith, P. and Lai, M-C. 2015. The "Reading the Mind in the Eyes" test: complete absence of typical sex difference in ~400 men and women with autism. *PLoS One* 10: e0136521.

*Further reading:*

Baron-Cohen, S. 2002. The extreme male brain theory of autism. *Trends in Cognitive Sciences* 6: 248-254.

Krahn, T. M. and Fenton, A. 2012. The extreme male brain theory of autism and the potential adverse effects for boys and girls with autism. *Bioethical Inquiry* 9: 93-103.

## **Week 5**

*Lecture:* The nature-nurture debate. *Class discussion:* Sex differences in systemising/empathising

*Further reading:*

Eagly, A. H. and Wood, W. 1999. The origins of sex differences in human behavior: evolved dispositions versus social roles. *American Psychologist* 54: 408-423.

Wood, W. and Eagly, A. H. 2012. Biosocial construction of sex differences and similarities in behavior. *Advances in Experimental Social Psychology* 46: 55-123.

## **Week 6**

*Lecture:* Sex differences in the brain. *Class discussion:* Resolving the nature-nurture debate.

*Further reading:*

Fine, C. 2013. Is there neurosexism in functional neuroimaging investigations of sex differences? *Neuroethics* 6: 369-409.

Rippon, G., Jordan-Young, R., Kaiser, A. and Fine, C. 2014. Recommendations for sex/gender neuroimaging research: key principles and implications for research design, analysis, and interpretation. *Frontiers in Human Neuroscience* 8: 650.

### Weeks 7 to 10

The list of papers for student presentations, and the sign-up sheet, will be provided in Week 5.

### Timetable

Week	Date	Lecture	Discussion topic
1	27 <sup>th</sup> Jan	Introduction	Sex differences in human behaviour and cognition
2	3 <sup>rd</sup> Feb	Sexual differentiation	The Pinker/Spelke debate
3	10 <sup>th</sup> Feb	Hormones and the brain	Sex differences in maths ability
4	17 <sup>th</sup> Feb	Sex differences in mental health	Prenatal hormones and gender development
5	24 <sup>th</sup> Feb	The nature/nurture debate	Sex differences in systemising/empathising
6	3 <sup>rd</sup> Mar	Sex differences in the brain	Resolving the nature-nurture debate ESSAY DEADLINE
7	10 <sup>th</sup> Mar	Student presentations	
SPRING BREAK			
8	31 <sup>st</sup> Mar	Student presentations	
9	7 <sup>th</sup> Apr	No session – personal study time	
10	14 <sup>th</sup> Apr	Student presentations	
11	21 <sup>st</sup> Apr	No session - ESSAY DEADLINE	