DRAFT OF GUIDELINES AND CONTENTS FOR MODULE PS4086

PLEASE NOTE THAT THIS DRAFT IS BASED ON THE CONTENTS OF THE ACADEMIC YEAR 2018-19, AND MUST BE TAKEN AS PROVISIONAL AND SUBJECT TO CHANGE IN ACADEMIC YEAR 19-20

PS4086
Origins and Evolution of Mindreading (Theory of Mind)

Module Controller:	Juan-Carlos Gómez
Semester:	*2*
Class Hour:	TBD
Assessment:	—Continuous assessment (25%): essay paper (**maximum 2000 words** excluding references). Deadline to be agreed in class. —Examination (75%): one two-hour paper (with printed notes and material allowed)
Office Hours:	Any weekday by arrangement (or just drop by)

INTRODUCTORY READINGS IN PREPARATION FOR THE MODULE

—Happe, F. G. E., & Conway, J. R. (2016). Recent progress in understanding skills and impairments in social cognition. *Current Opinion in Pediatrics*, 28(6), 736-742.
https://kclpure.kcl.ac.uk/portal/files/64456609/Conway_Happe_Recent_progress_in_understanding_skills_and_impairments_in_social_cognition.pdf

—Scott, R. & Baillargeon, R. (2017) Early False-Belief Understanding. Trends in Cognitive Science, Vol. 21: P237-249. *https://doi.org/10.1016/j.tics.2017.01.012*.

—Krupenye, C. & Call, J(2019). Theory of mind in animals: Current and future directions. *WIREs Cognitive Science*. 17 May 2019 https://doi.org/10.1002/wcs.1503.

These readings should give you an idea of the contents and problems addressed in the module. Feel free to also explore some of the main readings in each Session, or contact me to discuss the module.

Learning Objectives and Course Guidelines

This module is about the development and evolution of *Mindreading or Theory of mind* —the ability to understand the mental states of oneself and others, which constitutes one of the key psychological adaptations of the human mind.

The course will analyse the current state of research in this area, emphasizing what we can learn about our ability to understand ourselves and others from studying how the ability emerged in evolution, to what extent there are aspects that are uniquely human, how it emerges in developing children, and how sometimes it fails to develop or develops atypically in conditions like Autism.

The module will particularly focus on one of the cutting edge problems addressed in recent years —the contrast between *explicit* and *implicit* Theory of mind. Explicit ToM roughly refers to the ability to consciously represent and verbally invoke mental states to predict and explain behavior, whereas implicit ToM is an ability to take mental states into account without being necessarily able to consciously think or talk about them, automatically, or in an intuitive way.

The first two sessions will be introductory lectures. This will be followed by an analysis of the state of the art on the problem of infant ToM, more specifically implicit false belief in very young infants and the theoretical and methodological issues associated with this line of research. We will then analyse the problem of the evolutionary origins of ToM (is ToM exclusively human? Do animals engage in "mindreading"or just "behaviour reading"?). We will also discuss the problem of the role of language and culture in the development of theory of mind —do different cultures have different theories of mind?— and the impact that the notion of ToM, and the distinction between implicit and explicit understanding, has had on our understanding of Autism.

MODULE FORMAT

This is an advanced module and as such it follows a combination of Lectures and **Discussion Seminars** in which material (mainly journal articles) must be read by the students before the seminar and discussed together under the lecturer's guidance. In some sessions there will be introductory lectures that may be followed by group discussion of target papers. Other sessions will consist of discussions of papers introduced by students or the lecturer. The key to the success of this module format and your own learning is reading the papers before the sessions and actively participating in the discussions with questions, ideas, and queries suggested by your reading.

LEARNING OBJECTIVES

- To know and understand a varied interdisciplinary literature (both conceptual and empirical) on Theory of mind in humans and animals.

- To be able to critically read and assess claims about the significance of empirical findings in relation to methodology.

- To be able to critically assess and discuss theories and interpretations in relation to available evidence.

- To develop and practice presentation and discussion skills.

ASSESSMENT

-C**ontinuous Assessment** (25% of total mark) consists of an essay (maximum 2000 words excluding references) whose topic will be provided by the 2nd week of semester. Deadline for submission is to be agreed in class.

-In the **2-hour exam** (75% of final mark) you will answer two questions out of four that will be marked independently). You will be able to take printed material to the exam, such as printed copies of papers or your own notes, so that you do not have to waste time memorizing authors, dates, or experimental details.

Feedback

You will receive several forms of feedback during the module.

Verbal Feedback on presentations and discussions

One of the main aims of the seminar discussions is to allow and encourage students' exploration and discussion of their own critical views, ideas, and doubts on the papers and topics discussed. I will provide verbal feedback (sometimes in the form of questions or expansions upon suggested ideas), by intervening in the discussion during the seminars. Please feel free to drop by my office or book a meeting if you wish to have further feedback or explanations on your presentation or class interventions, or simply on the material that you are reading.

Feedback on draft presentation.

Prior to your paper presentation you must submit a draft of your Powerpoint presentation or an outline on which you will receive written and/or verbal comments.

Office hours

This year I have not assigned a fixed time for office hours, as these were very rarely used at the designated time in previous years. Most students preferred to arrange meetings by email or by dropping by my office (2.55). Please do not hesitate to make use of this opportunity for individual discussion, clarification, and feedback on specific issues emerging in class discussions or during your readings.

Written feedback on CA essays

After submission of your CA you will receive detailed individualized feedback on your piece of work, in the form of a standard feedback form plus extensive annotations and comments on your essay that you will be able to download from MMS. You will receive this feedback two weeks after submission or earlier. Please read it carefully and if in doubt or in need of further clarification, arrange a meeting with me.

Generic feedback on examination

After the exams have been marked, a Generic feedback document, explaining what was expected in the answers and strengths and weaknesses of the actual answers will be made available on Moodle. If in doubt or in need of further clarification, please contact me with your query and we can discuss it by email or by arranging a meeting

COURSE CONTENTS

SESSION 1*: Introductory Lecture:* *Mindreading —Development, evolution, and alterations of Theory of mind.*

This session will consist of an Introductory Lecture in which the topic of the course will be situated in its historical and conceptual context.

—Baillargeon, Scott, & Bian, L. (2016). Psychological reasoning in infancy. Annual Review of Psychology, 67, 159-186. [doi: 10.1146/annurev-psych-010213-115033].

—Doherty, M. Theory of mind : how children understand others' thoughts and feelings / Martin J. Doherty [Electronic book]. Hove ; New York : Psychology Press, 2009.

SESSION 2*. Developmental Models of Mindreading and Key Current Issues [Lecture]*

This session discusses the main developmental models of Theory of Mind. We will pay special attention to recent discoveries in relation to the "litmus test" of theory of mind —explicit and implicit understanding of false belief— with an introductory discussion of the papers that started the "infant False-Belief" revolution, which is currently at the cutting edge of ToM research.

The ***Core Background Readings*** for this session are:

—Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development*, 72, 655–684. [http://onlinelibrary.wiley.com/doi/10.1111/1467-8624.00304/pdf]

—Kristine H. Onishi and Renee Baillargeon (2005) Do 15-Month-Old Infants Understand False Beliefs?. *Science* VOL 308 8 APRIL 2005: 255-58. http://dx.doi.org/10.1126/science.1107621.

—Southgate, V., Senju, A., & Csibra, G. (2007). Action Anticipation Through Attribution of False Belief in Two-Year-Olds. Psychological Science, 18 (7), 587- 592. ***http://dx.doi.org/10.1111/j.1467-9280.2007.01944.x***

SESSION 3. ***False belief understanding in young infants?***

In this session we will discuss in depth the challenge of current cutting edge research on possible early false-belief understanding in human infants. The papers listed below will be presented for discussion by students. Each represents a different method of non-verbal research.

Core Discussion Readings:

—Eighteen-month-old infants show false belief understanding in an active helping paradigm. David Buttelmann, Malinda Carpenter, Michael Tomasello. *Cognition* 112 (2): Pages 337-342 (August 2009). doi:10.1016/j.cognition.2009.05.006.

DRAFT

—Priewasser, B.; Rafetseder, E.; Gargitter, K.; Perner, J. (in press). Helping as an early indicator of a theory of mind: Mentalism or teleology? Cognitive Development, in press. [https://doi.org/10.1016/j.cogdev.2017.08.002].

—Scott and Baillargeon (2009), Which Penguin Is This? Attributing False Beliefs About Object Identity at 18 Months, *Child Development*. Vol 80: pp. 1172–1196, Get PDF (567K).

—Kovács, A. M., Téglás, E., & Endress, A. D. (2010). The Social Sense: Susceptibility to Others' Beliefs in Human Infants and Adults. *Science*, 330, 1830-1834. http://www.sciencemag.org/content/330/6012/1830.full

Further Reading:
A recent review of these within the context of general ToM:
-Baillargeon, Scott, & Bian, L. (2016). Psychological reasoning in infancy. *Annual Review of Psychology*, 67, 159-186. [doi: 10.1146/annurev-psych-010213-115033].

SESSION 4. *Implicit false-belief in infants and adults: further studies and explanatory models.*

In this session we discuss further infant FB studies, but this time with a focus on the theoretical controversies that surround them and how the infant FB controversies paradoxically can very closely relate to studies on Adult theory of mind.

Core Discussion Readings

—Low, J. & Watts, J. (2013) Attributing False Beliefs About Object Identity Reveals a Signature Blind Spot in Humans' Efficient Mind-Reading System. [http://pss.sagepub.com/content/24/3/305.full.pdf+html]

—Wang, L., & Leslie, A. M. (2016). Is Implicit Theory of Mind the 'Real Deal'? The Own-Belief/True-Belief Default in Adults and Young Preschoolers. *Mind & Language*, 31(2), 147-176. [http://onlinelibrary.wiley.com/doi/10.1111/mila.12099/epdf].

—Grosse Wiesmann,C.; A D. Friederici; T Singer, and N Steinbeis (2017). Implicit and explicit false belief development in preschool children. Developmental Science 2017; 20: e12445. [http://onlinelibrary.wiley.com/doi/10.1111/desc.12445/epdf].

SESSION 5. *Implicit Theory of mind in infants and adults: empirical and theoretical controversies.*

The infant false-belief studies have had a profound influence upon the way in which we think about Theory of mind, not only in child development, but also in adults (and as we shall see in later sessions, in comparative research). In this session we address some of the theoretical discussions and controversies generated, paying special attention to the problem of replicability of empirical results.

Core Discussion Readings:

—Heyes, C. False belief in infancy: a fresh look. *Developmental Science*. 17 (5): 647–659. Get PDF (345K). [See also in same issue commentary by Scott & Baillargeon, How fresh a look? A reply to Heyes (pages 660–664), and response by Heyes, Rich interpretations of infant behaviour are popular, but are they valid? A reply to Scott and Baillargeon (pages 665–666).

—Kulke, L.; Reiß, M.; Krist, H.; & Rakoczy , H. (in press). How robust are anticipatory looking measures of Theory of Mind? Replication attempts across the life span. *Cognitive Development*, in press. [https://doi.org/10.1016/j.cogdev.2017.09.001]

Further reading:

Rolf A. Zwaan, Alexander Etz, Richard E. Lucas, & M. Brent Donnellan (in press). Making replication mainstream. Behavioral and Brain Sciences, in press. Online preview: [https://www.cambridge.org/core/services/aop-cambridge-core/content/view/2E3D8805BF34927A76B963C7BBE36AC7/S0140525X17001972a.pdf/making_replication_mainstream.pdf]

SESSION 6. *Evolutionary precursors: Understanding Perception and Knowledge in non-human primates. LECTURE & Discussion*

In this session we start looking at Theory of mind skills of nonhuman primates, The session will start with an Introductory Lecture summarizing the history of research on non-human ToM and the debate between Behavior Reading vs Mind reading explanation of animal behavior. The second part of the session will discuss traditional evidence for lack of false belief understanding in nonhuman primates.

PART 1: INTRODUCTORY LECTURE: *Theory of mind in non-human primates*.

PART 2: DISCUSSION OF PAPERS —*False belief in non-human primates?*

Core Discussion Readings

—Kaminski, J, Call, J., & Tomasello, M. (2008). Chimpanzees know what others know, but not what they believe. *Cognition, 109*, 224-234. doi:10.1016/j.cognition.2008.08.010.

—Marticorena, A. M. Ruiz, C. Mukerji, A. Goddu, & L. Santos (2010). Monkeys represent others' knowledge but not their beliefs. Developmental Science 14:6 (2011), pp 1406–1416. Monkeys represent others' knowledge but not their beliefs ...

—Martin, A. & Santos, L. (2014). The origins of belief representation: Monkeys fail to automatically represent others' beliefs. Cognition 130: 300–308. [doi:10.1016/j.cognition.2013.11.016]

SESSION 7*. Evolutionary precursors: False belief understanding in apes?.*

Core Discussion Readings

—C. Krupenye, F. Kano, S. Hirata, J. Call, & M. Tomasello (2016). Great apes anticipate that other individuals will act according to false beliefs. Science 07 Oct 2016: Vol. 354, Issue 6308, pp. 110-114. DOI: 10.1126/science.aaf8110. http://science.sciencemag.org/content/354/6308/110.

—Heyes, C. (2017) Apes submentalise. Trends Cogn. Sci. 21, 1–2 . https://www.sciencedirect.com/science/article/pii/S136466131630198X —Krupenye, C., Kano, F., Hirata, S., Call, J., & Tomasello, M. (2017). A test of the submentalizing hypothesis: Apes' performance in a false belief task inanimate control. *Communicative and Integrative Biology*, 10(4) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5595417/

— Buttelmann, D., Buttelmann, F., Carpenter, M., Call, J., & Tomasello, M. (2017). Great apes distinguish true from false beliefs in an interactive helping task. PLoS One, 12(4), [https://doi.org/10.1371/journal.pone.0173793].

SESSION 8. *Controversies about animal and infant ToMs: implicit knowledge or associative processes? A biological or a cultural system?* (Lecture and Discussion).

Core Readings

—Povinelli, D. & Vonk, J. (2004). We Don't Need a Microscope to Explore the Chimpanzee's Mind. *Mind and Language*, 19, 1-28. http://ulceet.com/uploads/Povinelli_Vonk_2004.pdf.

—Tomasello, M. (2018). How children come to understand false beliefs: A shared intentionality account. PNAS, August 21, 2018 |vol. 115 no. 34. 8491–8498. https://www.pnas.org/content/115/34/8491

—Heyes, C. & Frith, C. (2014). The cultural evolution of mind reading. Science , 344, 1243091 (2014). DOI: 10.1126/science.1243091. […].

SESSION 9: ToM in Non-Western cultures and deaf children

In this session we discuss, first, the issue of whether Theories of mind are universal or they can vary across cultures, and, second, ToM development in deaf children and its relevance for understanding the role of language and social learning in mindreading.

Core Discussion Readings

—Barrett et al. (2013). Early false-belief understanding in traditional non-Western societies, 20122654, published online 30 January 2013280, 2013. Proc. R. Soc. B . http://rspb.royalsocietypublishing.org/content/280/1755/20122654 [Full Text (PDF)]

Please make sure you download and read the Supplementary Material as well: Electronic Supplementary Material http://rspb.royalsocietypublishing.org/content/royprsb/suppl/2013/01/25/rspb.2012.2654.DC1/rspb20122654supp1.pdf

—Mayer & Traüble (2015) The Weird World of Cross-Cultural False-Belief Research: A True- and False-Belief Study Among Samoan Children Based on Commands. [https://doi.org/10.1080/15248372.2014.926273].

—M. Meristo, G. Morgan, A. Geraci, L. Iozzi, E. Hjelmquist, L. Surian and M. Siegal (2012). Belief attribution in deaf and hearing infants. Developmental Science (2012), vol. 15: pp 633–640 DOI: 10.1111/j.1467-7687.2012.01155.x. Get PDF (298K).

—Pyers, J. & Senghas, A. (2009). Language Promotes False-Belief Understanding: Evidence From Learners of a New Sign Language. Psychological Science 2009 July ; 20(7): 805–812. http://dx.doi.org/10.1111/j.1467-9280.2009.02377.x .

SESSION 10: Autism: the riddle of explicit and implicit Mindreading I — Social Attention.

In the last two sessions we will discuss the case of autism as the foremost example of atypical development of theory of mind and how it can help solve the scientific riddles of ToM.

Core Discussion Readings

—Leekam, S., Baron-Cohen, S., Perrett, D., Milders, M., & Brown, S. (1997). Eye-direction detection: a dissociation between geometric and joint attention skills in autism. *British Journal of Developmental Psychology*, 15(1), 77-95. [http://onlinelibrary.wiley.com/resolve/doi?DOI=10.1111/j.2044-835X.1997.tb00726.x]

—Jones, W.; Carr, K.; & Klin, A. (2008). Absence of Preferential Looking to the Eyes of Approaching Adults Predicts Level of Social Disability in 2-Year-Old Toddlers With Autism Spectrum Disorder. *Arch Gen Psychiatry* 65(8): 946-954. [PDF].

—W. Jones & A. Klin (2013). Attention to eyes is present but in decline in 2–6-month-old infants later diagnosed with autism. *Nature* (2013) doi:10.1038/nature12715. [Download as PDF (5,002 KB)].

SESSION 11: Autism: the riddle of explicit and implicit Mindreading II — Belief and perspective tracking.

Core Discussion Readings

—Senju et al. (2012). Absence of spontaneous action anticipation by false belief attribution in children with autism spectrum disorder. *Development and Psychopathology* 22 (2010), 353–360. http://www.cbcd.bbk.ac.uk/people/scientificstaff/vicky/hiddenballautism

DRAFT

—Dana Schneider, Virginia P. Slaughter, Andrew P. Bayliss, Paul E. Dux (2013). A temporally sustained implicit theory of mind deficit in autism spectrum disorders. *Cognition* 129, Issue 2, Pages 410–417. http://dx.doi.org/10.1016/j.cognition.2013.08.004. http://www.sciencedirect.com/science/article/pii/S0010027713001613.

—Tobias Schuwerk, Maria Vuori and Beate Sodian (2015). Implicit and explicit Theory of Mind reasoning in autism spectrum disorders: The impact of experience. *Autism* 2015, Vol. 19(4) 459–468. http://journals.sagepub.com/doi/pdf/10.1177/1362361314526004.

THERE WILL BE A *REVISION SESSION* SHORTLY BEFORE THE EXAM. THE EXACT DATE WILL BE AGREED ONCE THE EXAM DATE IS FIXED.