

# Introduction to Social Neuroscience

مقدمه ای بر علوم اعصاب اجتماعی  
کارگروه علوم اعصاب اجتماعی ، شاخه دانشجویی نقشه برداری مغز ایران  
آزمایشگاه ملی نقشه برداری مغز ، تهران

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دکتر سمیه حیثیت طلب

سخنران: هادی محمدپور



# Resource and Materials

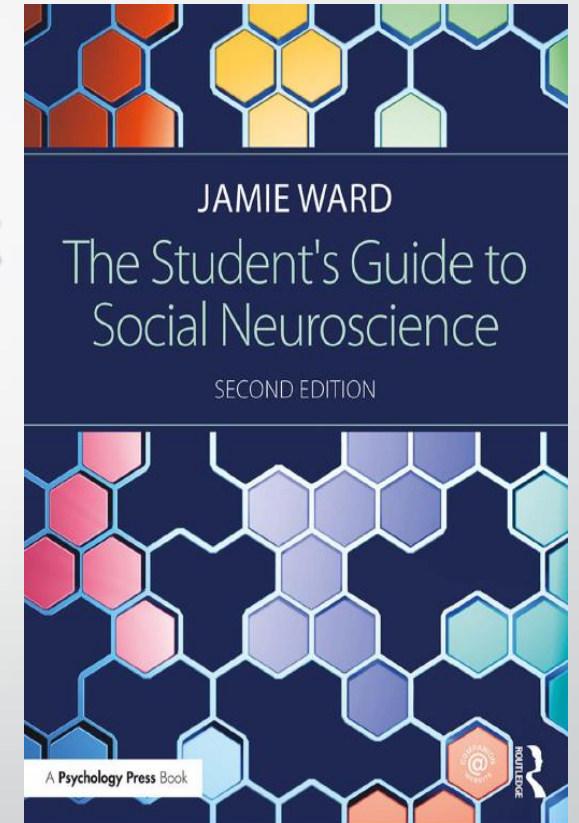
**Writer: Dr. Jamie Ward**

**Professor of Cognitive Neuroscience in Sussex University , UK**

**Director of Sussex Neuroscience Program**

**President of the British Association of Cognitive Neuroscience**

**Founding Editor of Journal of Cognitive Neuroscience**



# Resource and Materials

Chris and Uta  
Frith



About this edition:

“Social Neuroscience has vigorously established itself as one of the newest and most exciting sub-disciplines of psychology. Ward’s pioneering *Student’s Guide* is now updated covering new insights in the biological basis of social behaviour and their relevance to everyday life. Down-to-earth and imaginatively linked with web based materials, it can’t fail to inspire the next generation of students.”

**Chris and Uta Frith, University College London**

About the previous edition:

“I stopped using textbooks more than a decade ago, but that’s about to change. Given that Ward’s is the very first textbook focusing on social neuroscience, I am extremely impressed. It will be the best around for years to come. It is current, broad, and precise. The writing style will be accessible to undergraduates, graduates, and even professors. It is the perfect introduction to this exciting new field.”

**Matthew D. Lieberman, University of California, Los Angeles**

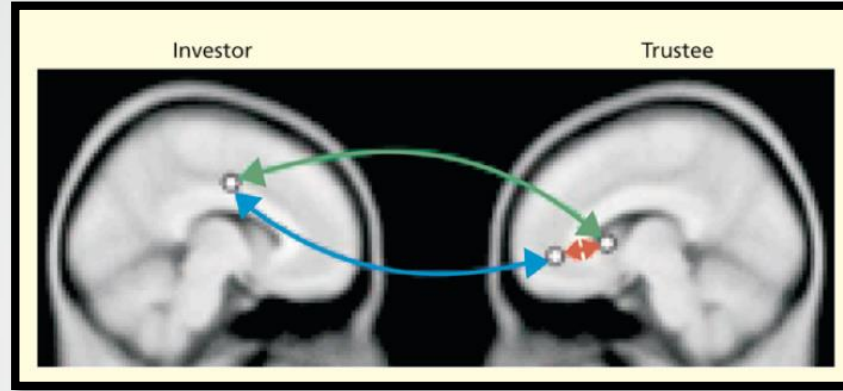


Matthew D. Lieberman



# Emergence of Social Neuroscience

**Hyperscanning**



**Mega-brain**



# Emergence of Social Neuroscience

- Allport (1968) defined **social psychology** as 'an attempt to understand and explain how the thoughts, feelings, and behaviors of individuals are influenced by the actual, imagined, or implied presence of others'
- By extension, a reasonable working definition of social neuroscience would be:
- *an attempt to understand and explain, using neural mechanisms, how the thoughts, feelings, and behaviors of individuals are influenced by the actual, imagined, or implied presence of others.*



# Emergence of Social Neuroscience

- Cognitive psychology's role: decompose complex social behaviors into simpler mechanisms (operating in individual minds)
- Social neuroscience links together all these disciplines: linking cognitive and social psychology, and linking 'mind' (psychology) with brain (biology, neuroscience)



# Emergence of Social Neuroscience

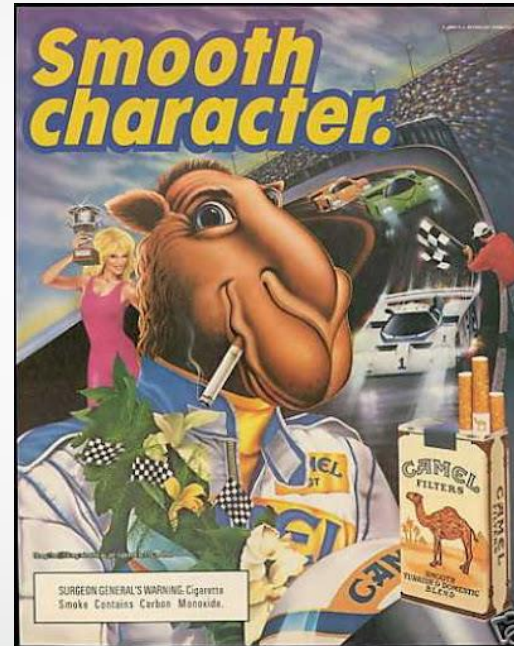
- brief history:
- Bill Clinton's State of the Union Address:
- Sue tobacco companies to recover money Medicaid spend on smoke-related diseases
- Scientists published a paper:
- geneticists report that a specific gene can affect whether or not someone starts smoking—and, if he does, whether he becomes addicted



# Emergence of Social Neuroscience

- **brief history:**
- People who have one particular gene, which is involved in the brain's use of the molecule dopamine, are less likely to smoke than those without the gene; if they do smoke, they start later and have an easier time quitting. So maybe it's not those Joe Camel ads after all.

(Howard, O'Donnell, Stevenson, & Oxfeld, 1999 , p. 6)

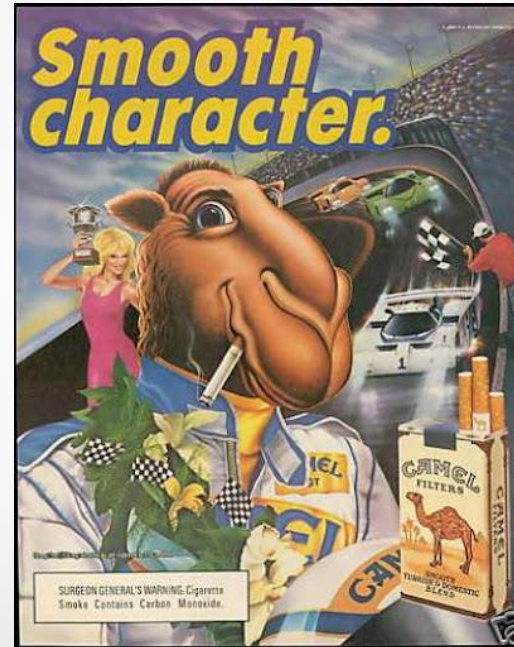




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# Emergence of Social Neuroscience

- **brief history:**
- **Thesis:**
- **Social behaviors are mediated by situation, context and environmental factors**
- **Antithesis:**
- **Social behaviors are mediated by brain, molecules, cells, hormones and genes**
- **Synthesis: environment make changes in brain that leads to social behavior**



# Emergence of Social Neuroscience

- **brief history:**
- **Social Neuroscience – 1992 :Cacioppo and Bernston**
- **Social support affect immune functioning**
- **Social rank affect health and longevity**



# Emergence of Social Neuroscience

- **brief history:**
- **Face perception in cognitive psychology**
- **Social behavior break down as a result of brain damage or in neurodevelopmental situations in autism**
- **Social cognition**

**Cognitive neuroscience methods: fMRI and TMS**

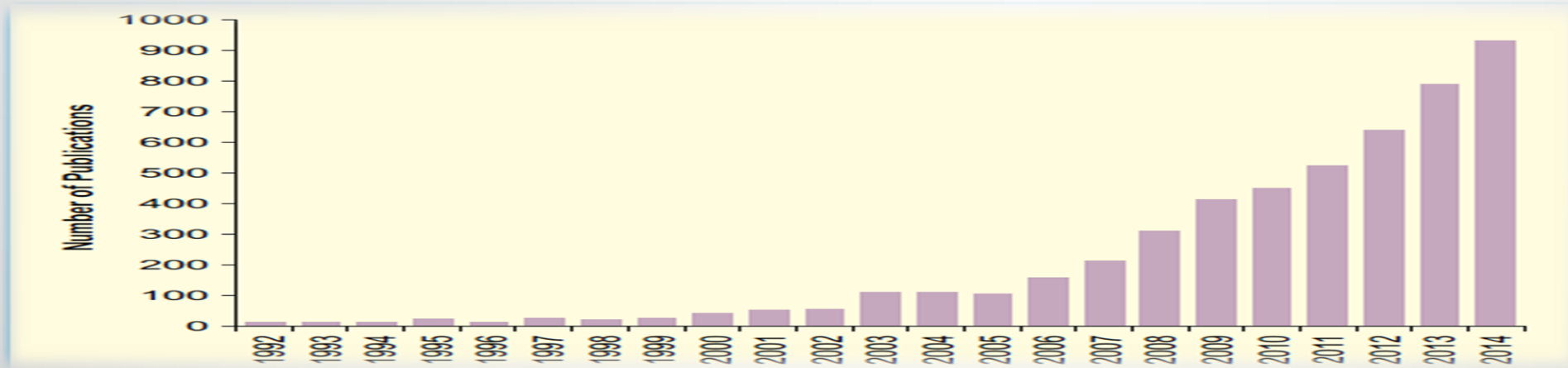


# Emergence of Social Neuroscience

- **brief history:**
- **Year 2000, other names: Social Cognitive Neuroscience , Social, Cognitive and Affective Neuroscience (SCAN)**
- **First journals :**  
**Social Neuroscience and Social, Cognitive and Affective Neuroscience (2006)**
- The Society for Social and Affective Neuroscience (SANS; [www.socialaffectiveneuro.org](http://www.socialaffectiveneuro.org)) and Society for Social Neuroscience (S4SN; [www.s4sn.org](http://www.s4sn.org)) were established in 2008 and 2010



# Emergence of Social Neuroscience



- **brief history:**
- **List of articles with containing Social and Neuroscience in their names**



# Emergence of Social Neuroscience

- **brief history:**
- *Some of the topics of interest to social psychologists are not amenable to brain localization techniques because of the complexity of the processes; they have embedded in them subprocesses that interact, and such complex processes are difficult to localize. It would be a pity if, in their justifiable enthusiasm for this powerful tool [i.e. neuroimaging], social psychologists subtly shifted their research programs to problems that are amenable to brain localization or shifted their theoretical language to constructs that are localizable.*



# Emergence of Social Neuroscience

- **brief history:**
- Their characterization of social neuroscience in terms of localization of functions is inaccurate (or, at least, outdated). Social neuroscience should be concerned primarily with the underlying mechanisms, and these are unlikely to be localized to discrete brain regions.

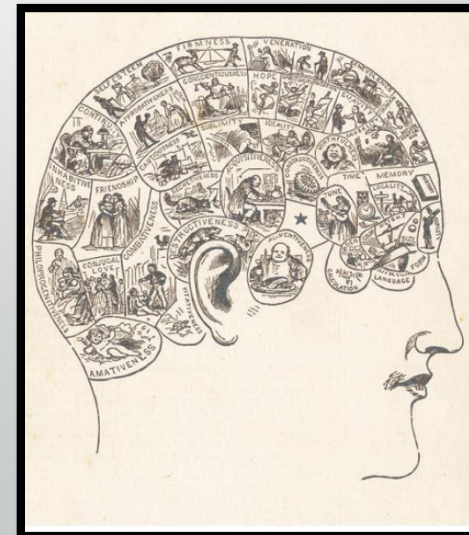




# Social Brain ?

- Is social brain distinct from all other functions ?
- Modularity, Domain specificity
- Modules for faces, reasoning about mental states, detecting cheating

Modern phrenology ?

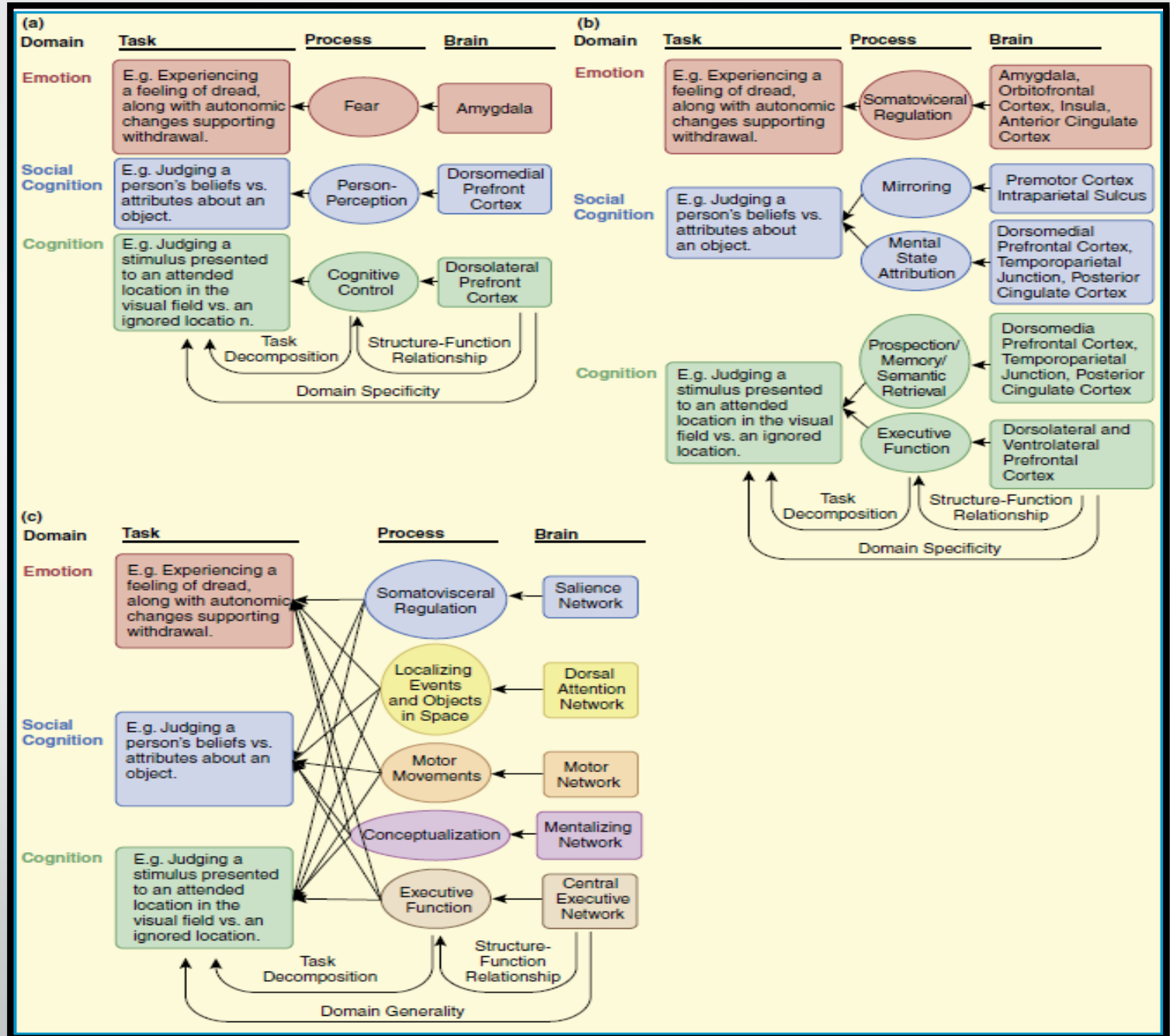


# Social Brain ?

- **Four perspectives:**
- **1. Specialized brain regions**
- **2. Not uniquely specialized regions**
- **3. Social nature of information**
- **4. Specialized neural mechanisms**



# Social Brain ?



# Is neuroscience an appropriate level of explanation for studying social behavior ?

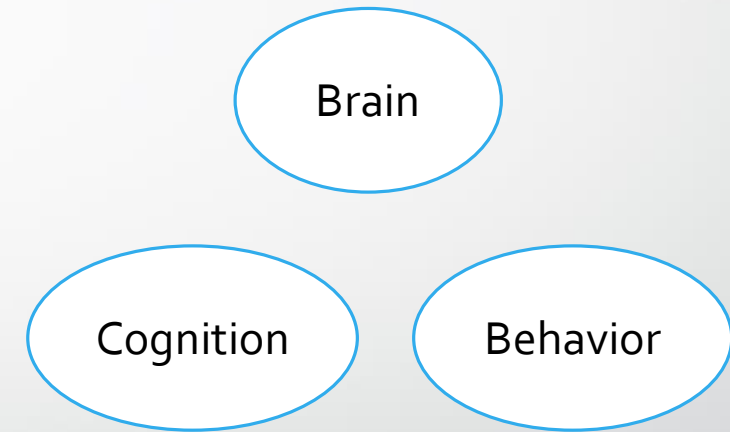
- **Most general criticism**
- **Distorted view: Reductionism**
- **Most researchers: bridging between different levels of explanations**

**E.g. Questionnaires with neuroimaging**



# Is neuroscience an appropriate level of explanation for studying social behavior ?

- Another way of bridging: reverse inference



- E.g. the activation of amygdala in studies of race-processing



# Is neuroscience an appropriate level of explanation for studying social behavior ?

- **Problems of reverse inference**
- *Forward inference*: If someone is frightened their amygdala is activated.
- *Reverse inference*: If the amygdala is activated then someone is frightened

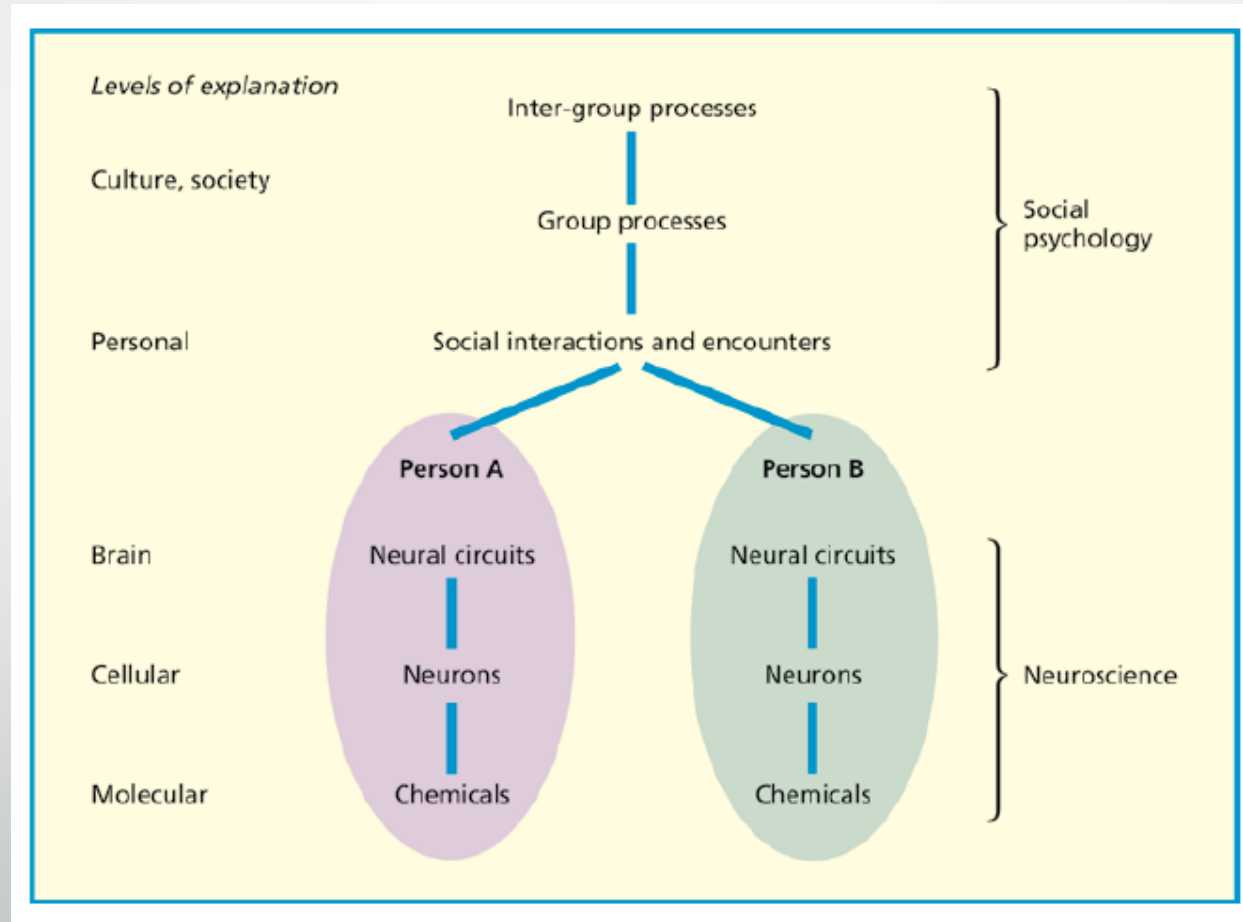


# Is neuroscience an appropriate level of explanation for studying social behavior ?

- Problems of reverse inference
- TMS, PET, ...
- Legitimate but not problem free



# Is neuroscience an appropriate level of explanation for studying social behavior?





# Is neuroscience an appropriate level of explanation for studying social behavior ?

- **Blank slate scenario:**
- brain just accepts, stores, and processes whatever information is given to it without any pre-existing biases, limitations, or knowledge
- culture, society, and the nature of social interactions invent and shape themselves



# Is neuroscience an appropriate level of explanation for studying social behavior ?

- **Blank slate scenario is not the case !**
- **Examples:**
  - number of close friends is predicted by the size of the human brain
  - tendency to form monogamous attachments is dependent on brain chemistry
  - social conventions, such as the law, may reflect a basic tendency to empathize with others and reason about causes and effects
  - Infants treat social and non-social stimuli differently. Rudimentary knowledge about how faces should be structured



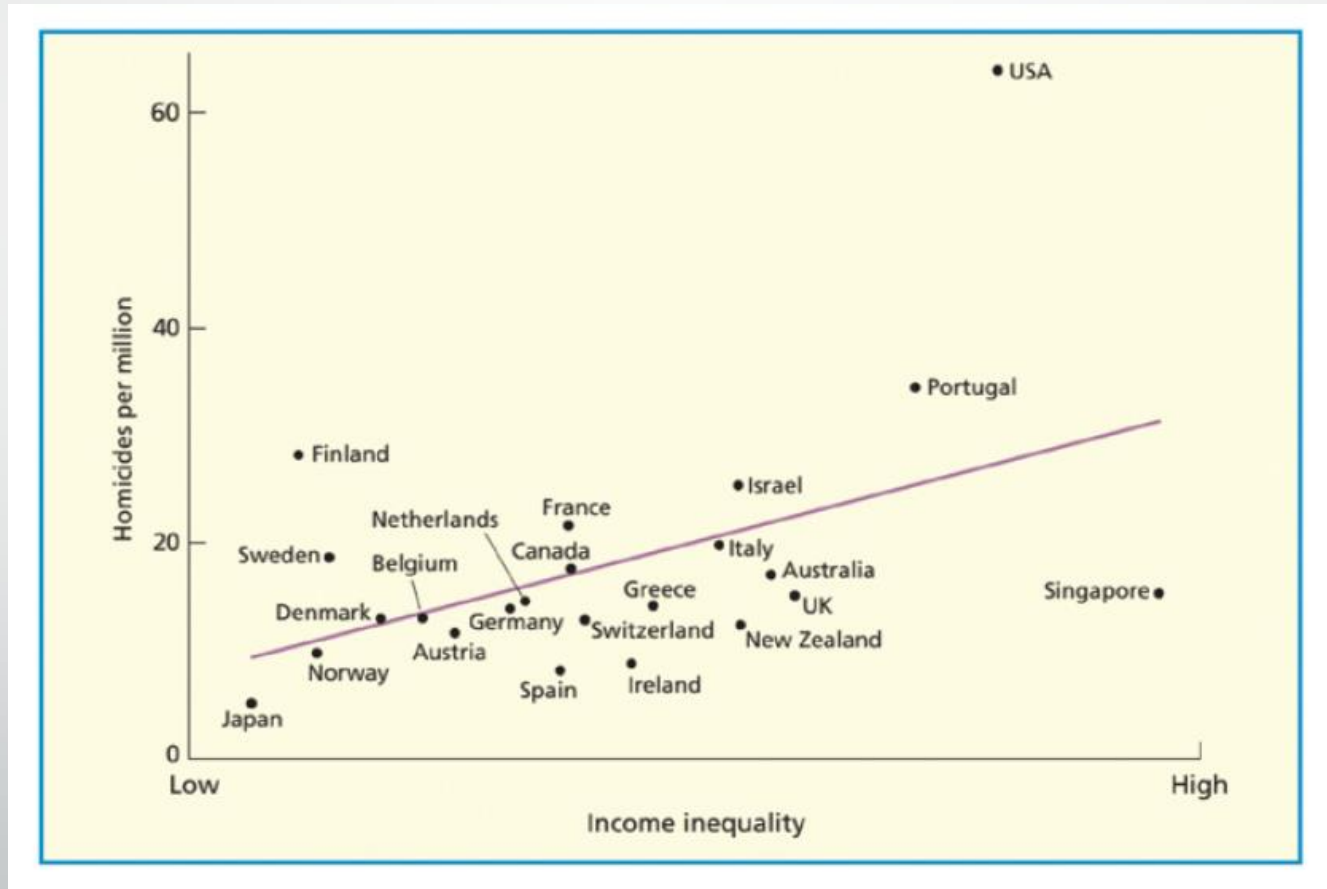
# Is neuroscience an appropriate level of explanation for studying social behavior ?

- **Social neuroscience:**
- Social processes are all in the brain, but some of them are created by environmental constraints and historical accidents (and learned by the brain) whereas others may be caused by the inherent organization, biases, and limitations of the brain itself.



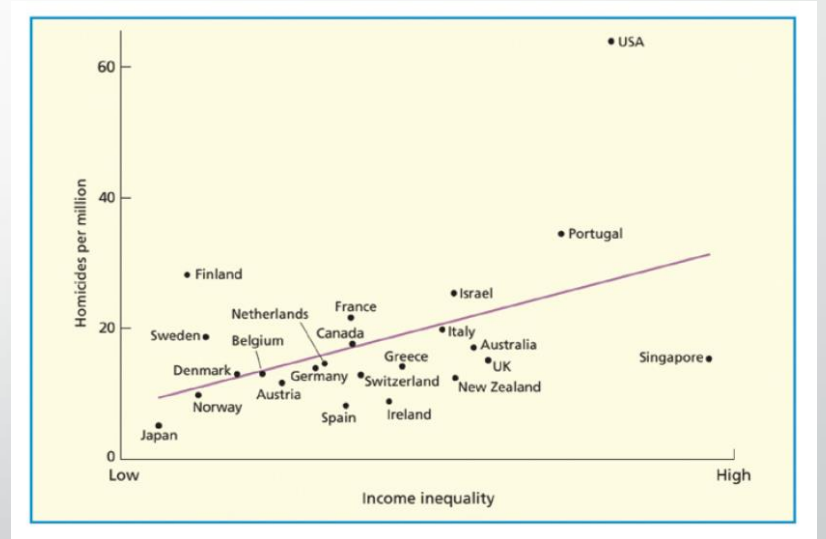
# Is neuroscience an appropriate level of explanation for studying social behavior ?

- examples of interacting levels of explanations



# Is neuroscience an appropriate level of explanation for studying social behavior ?

- income inequality is cultural
- the fact that aggression is linked to resource control and perceived injustice is likely to be independent of culture

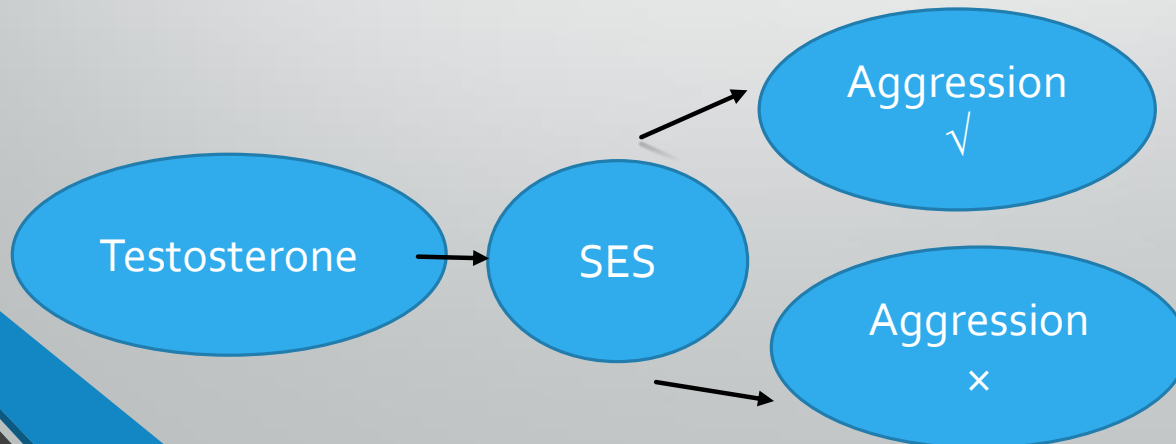
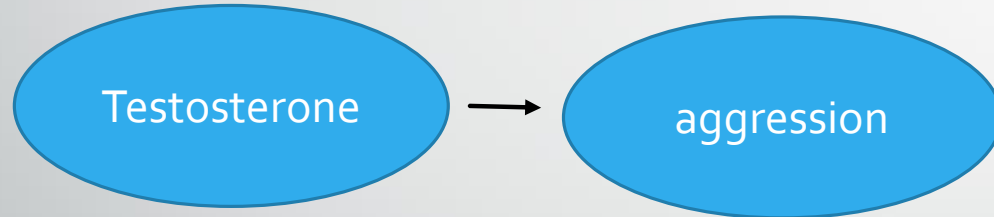
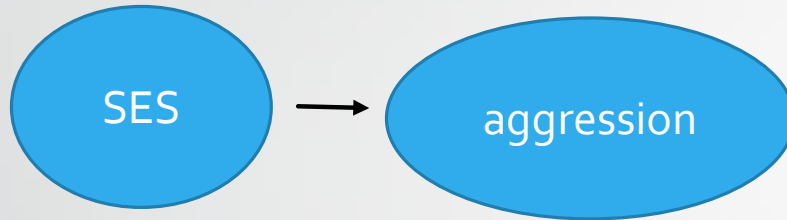


# Is neuroscience an appropriate level of explanation for studying social behavior ?

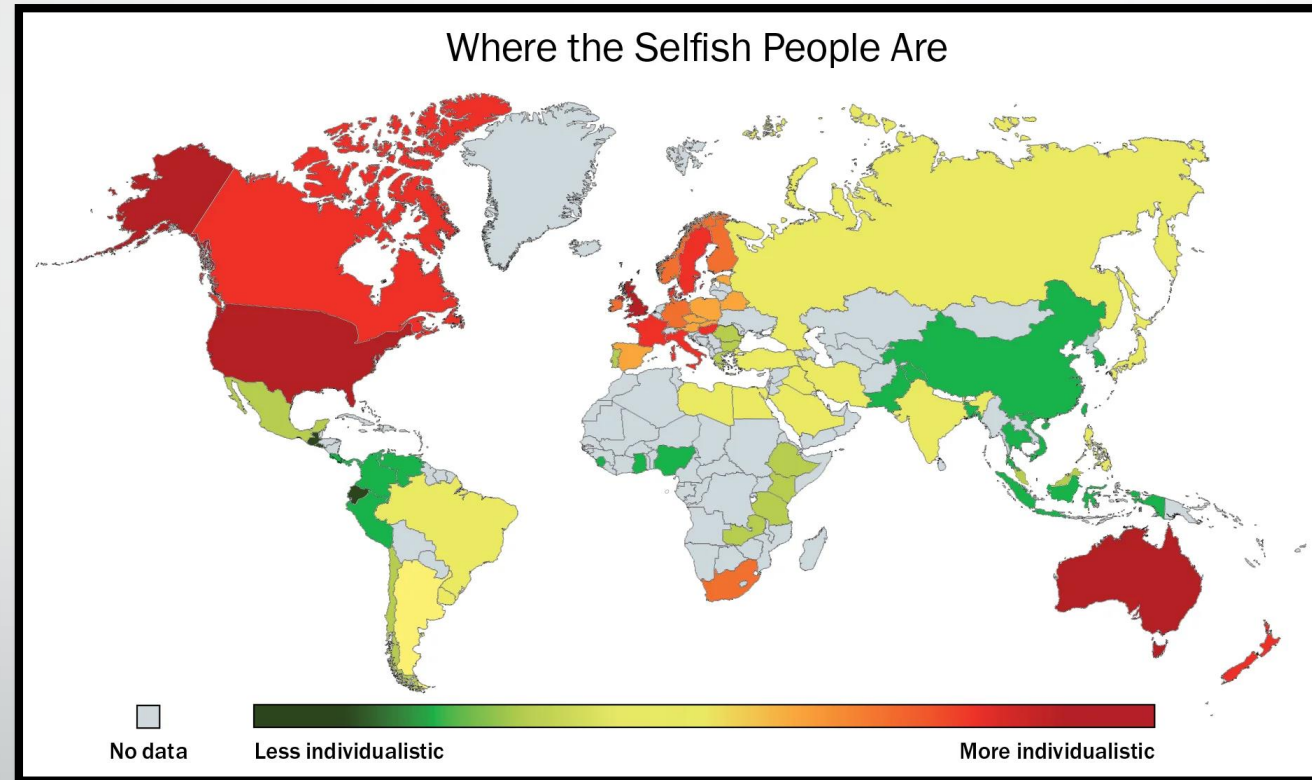
- **examples of interacting levels of explanations**
- Cultural differences may act as an 'accelerator' or 'brake' on biological tendencies
- Levels of testosterone in males are correlated with levels of aggression in people of low SES individuals but not high SES



# Is neuroscience an appropriate level of explanation for studying social behavior ?



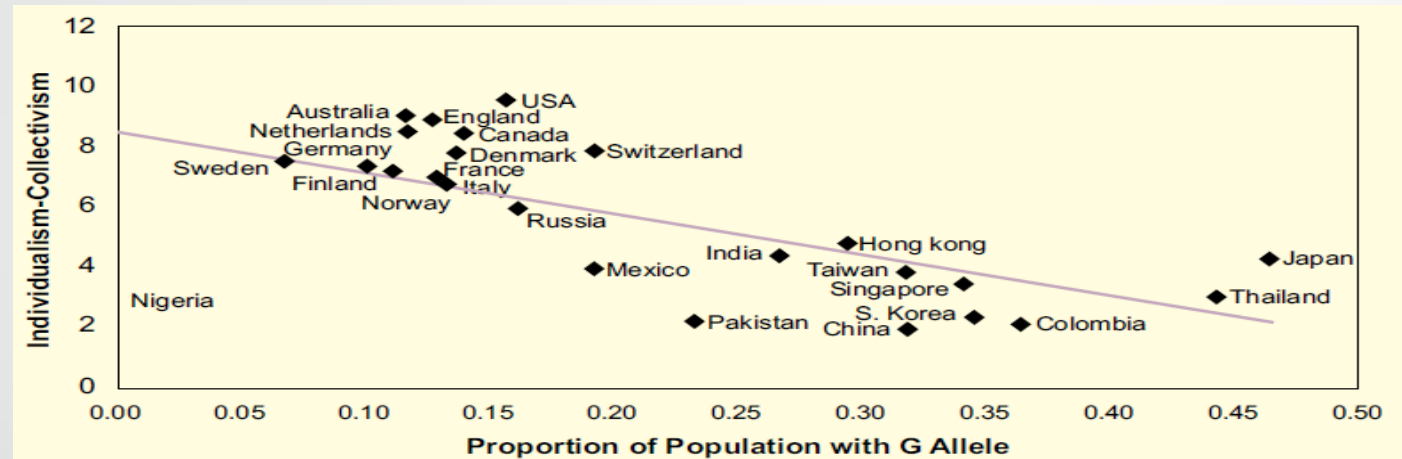
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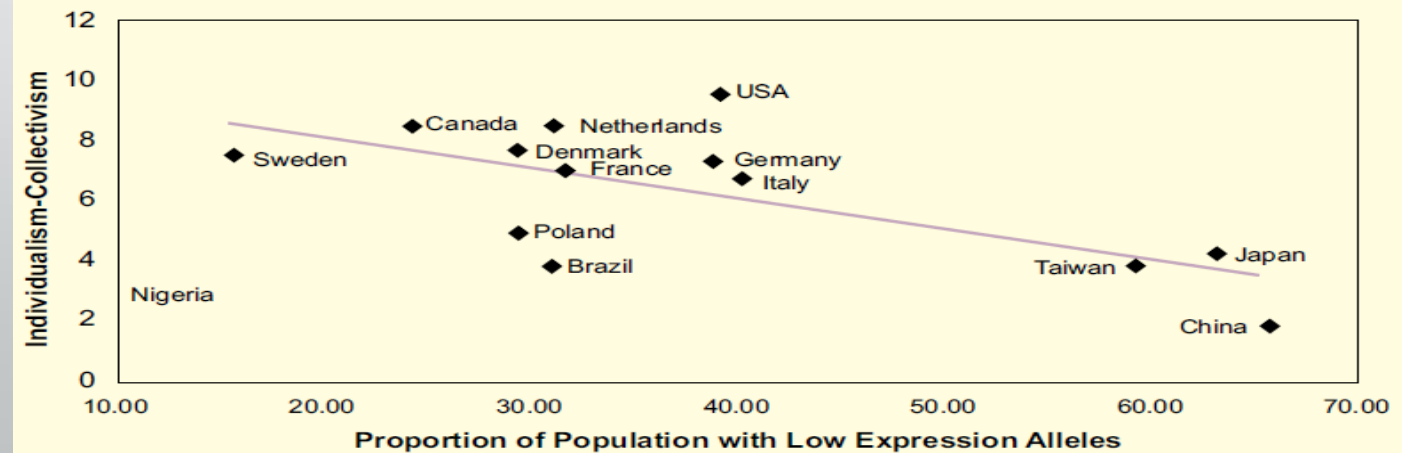


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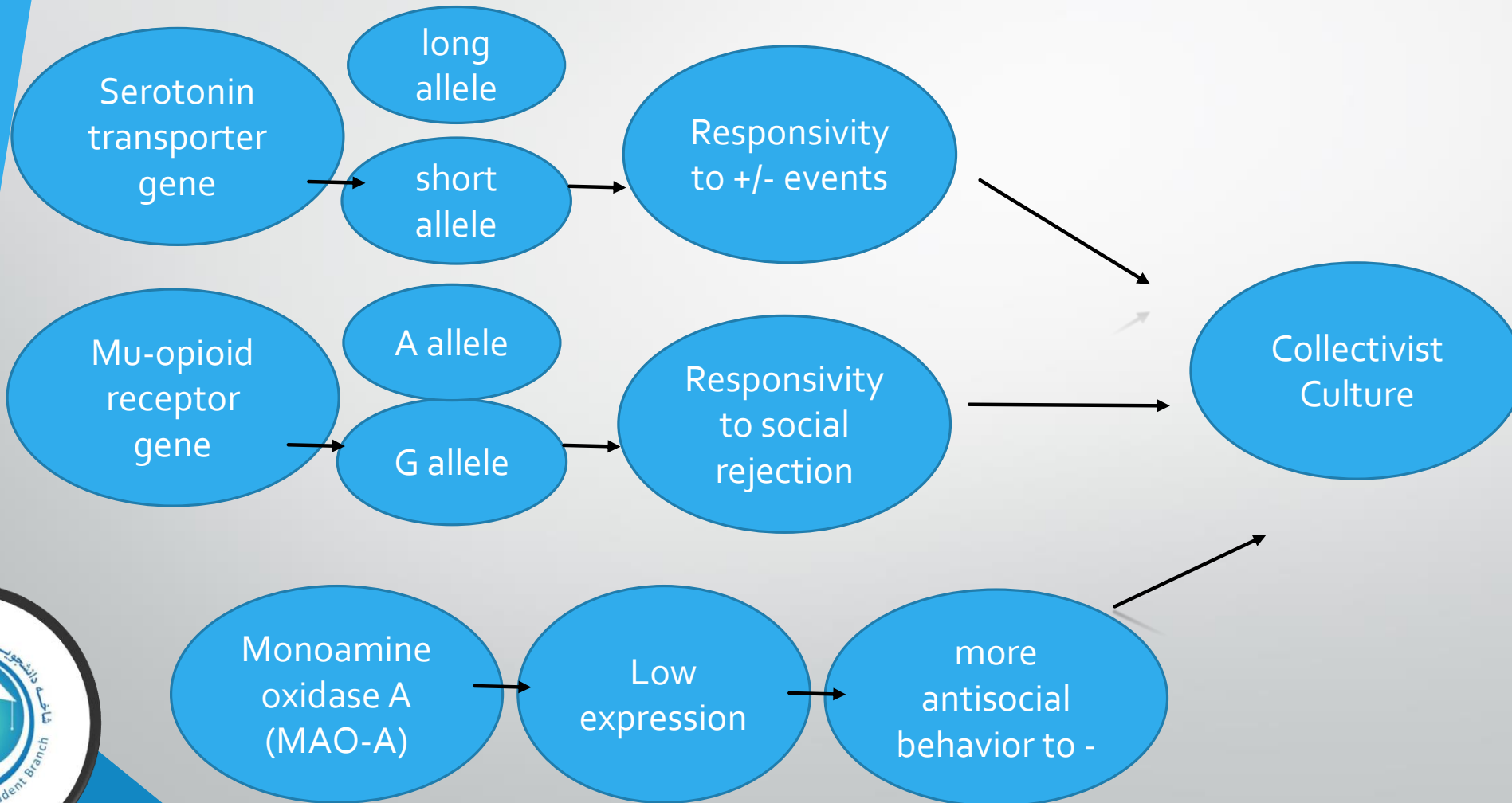
Mu-opioid receptor gene



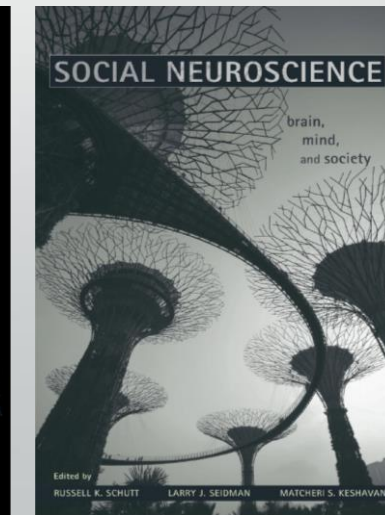
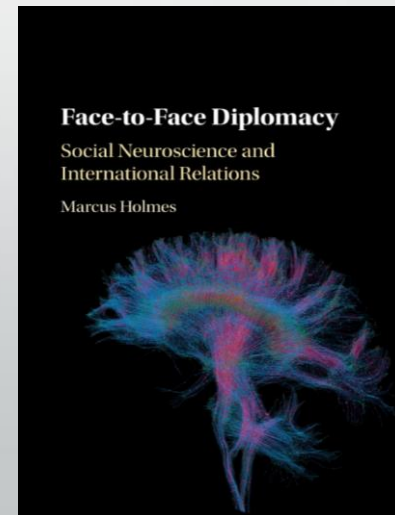
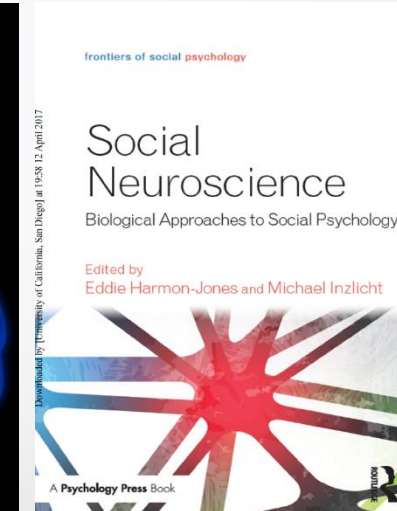
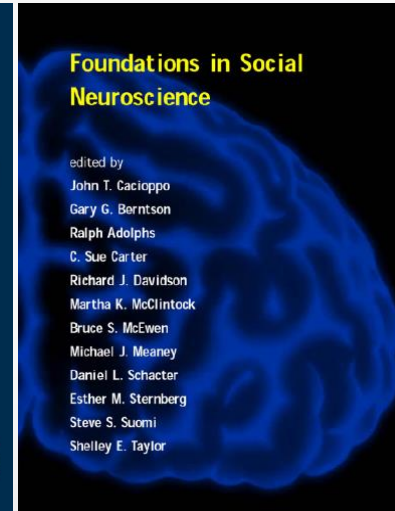
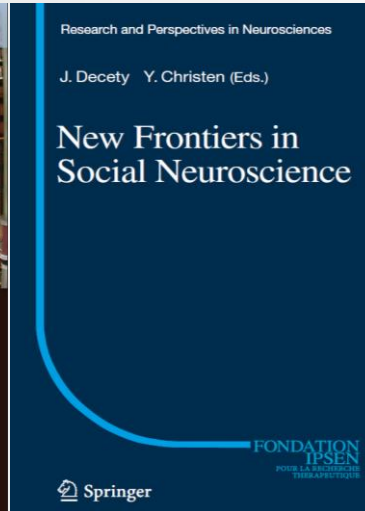
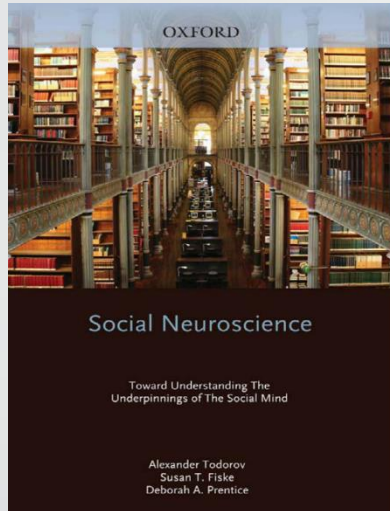
Monoamine oxidase A (MAO-A)



# Is neuroscience an appropriate level of explanation for studying social behavior?



# More Resources



# More Resources

<https://www.youtube.com/watch?v=G8pZlupf-7o> [Joan Chiao: Cultural Neuroscience: Bridging Cultural and Biological Sciences]

<https://www.youtube.com/watch?v=fxAUXoc-7XI> [Chris Frith: How the Brain Creates Culture]

<https://www.youtube.com/watch?v=JoXmZW6xYSg> [A brief animation on the social brain]

<http://vimeo.com/58254376> [Professor Ned Block: An interview with the philosopher on the mind-body problem]

[http://www.ted.com/talks/lang/eng/vs\\_ramachandran\\_the\\_neurons\\_that\\_shaped\\_civilization.html](http://www.ted.com/talks/lang/eng/vs_ramachandran_the_neurons_that_shaped_civilization.html) [VS Ramachandran: Mirror Neurons]

<https://www.youtube.com/watch?v=M8UQcnJevdo> [Russell Poldrack: From Reverse Inference to Pattern Classification]

<https://www.youtube.com/watch?v=nPjo1uzRHYo> [Ralph Adolphs: The Social Brain]

<https://vimeo.com/65307997> [Lisa Feldman Barrett: Models of the Mind symposium]

<https://vimeo.com/65200081> [Randy Buckner: Models of the Mind symposium]

<https://vimeo.com/65200079> [Randy Buckner, Lisa Feldman Barrett, and Amanda Pustilnik: Models of the Mind panel discussion]



# Broadcasting Channels and Groups



[https://t.me/Social\\_Neuroscience\\_Workgroup](https://t.me/Social_Neuroscience_Workgroup)

[https://t.me/Social\\_Neuroscience\\_WG](https://t.me/Social_Neuroscience_WG)

<https://t.me/StudentBranchNBML>

