

Human Social-Perceptual Mechanisms

The Neuroscience of some very mild
superpowers.

Rick van der Zwan

Social perceptions are made in very high performance environments ...

...and we all are, for the most part, very expert observers (even if we don't know it).

Indeed, so good are we at social perceptions that they amount to ***very mild super powers!***



Very mild super powers.

- Until recently, social interactions always involved physical proximity.

Physical proximity is not a feature of emerging social environments...but people seek sooner or later to be in the company of those with whom they interact!

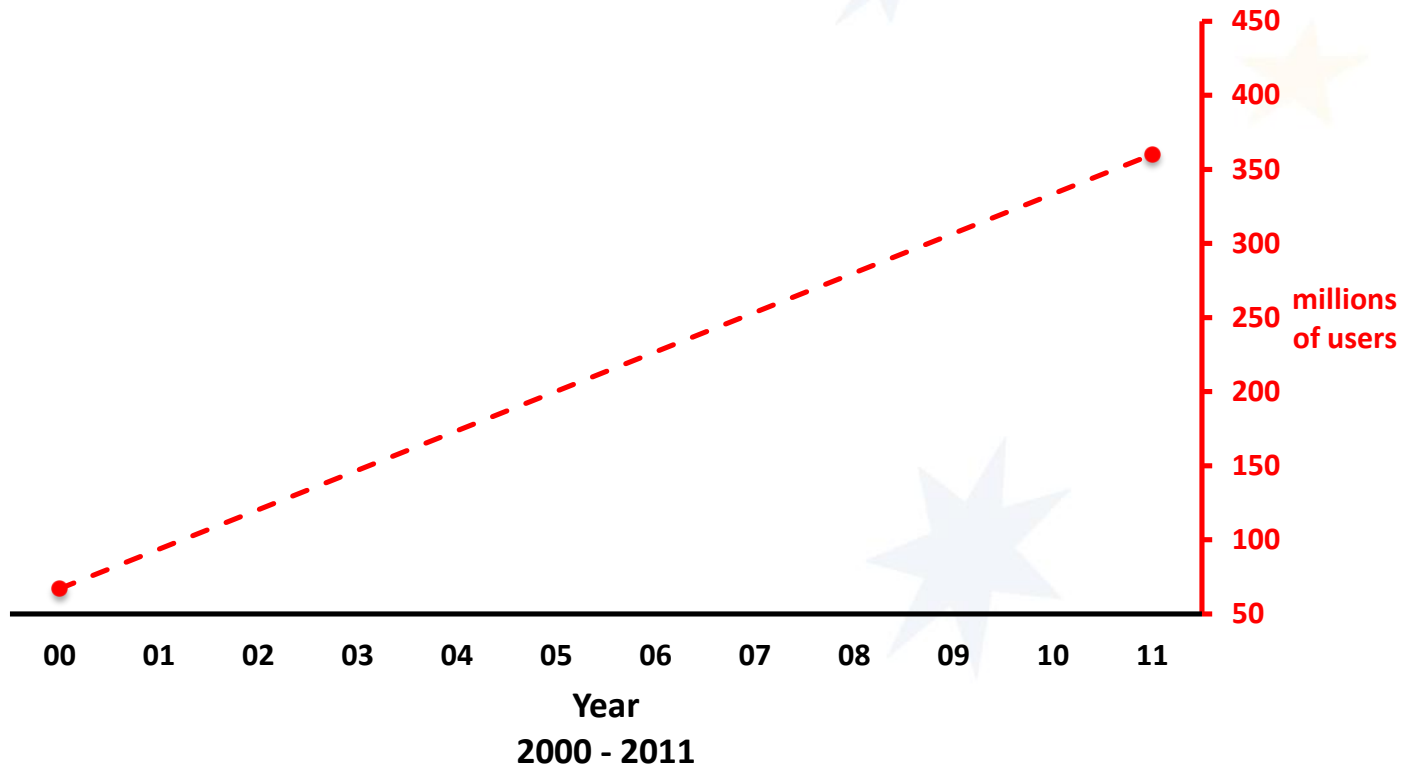
“For over a century, pundits have been predicting that new forms of communication would make urban life irrelevant...That didn’t happen.”

“More recently, faxes, email, and videoconferencing were all supposed to eliminate the need for face-to-face meetings, yet business travel has soared over the last 20 years.”

Glaeser 2012

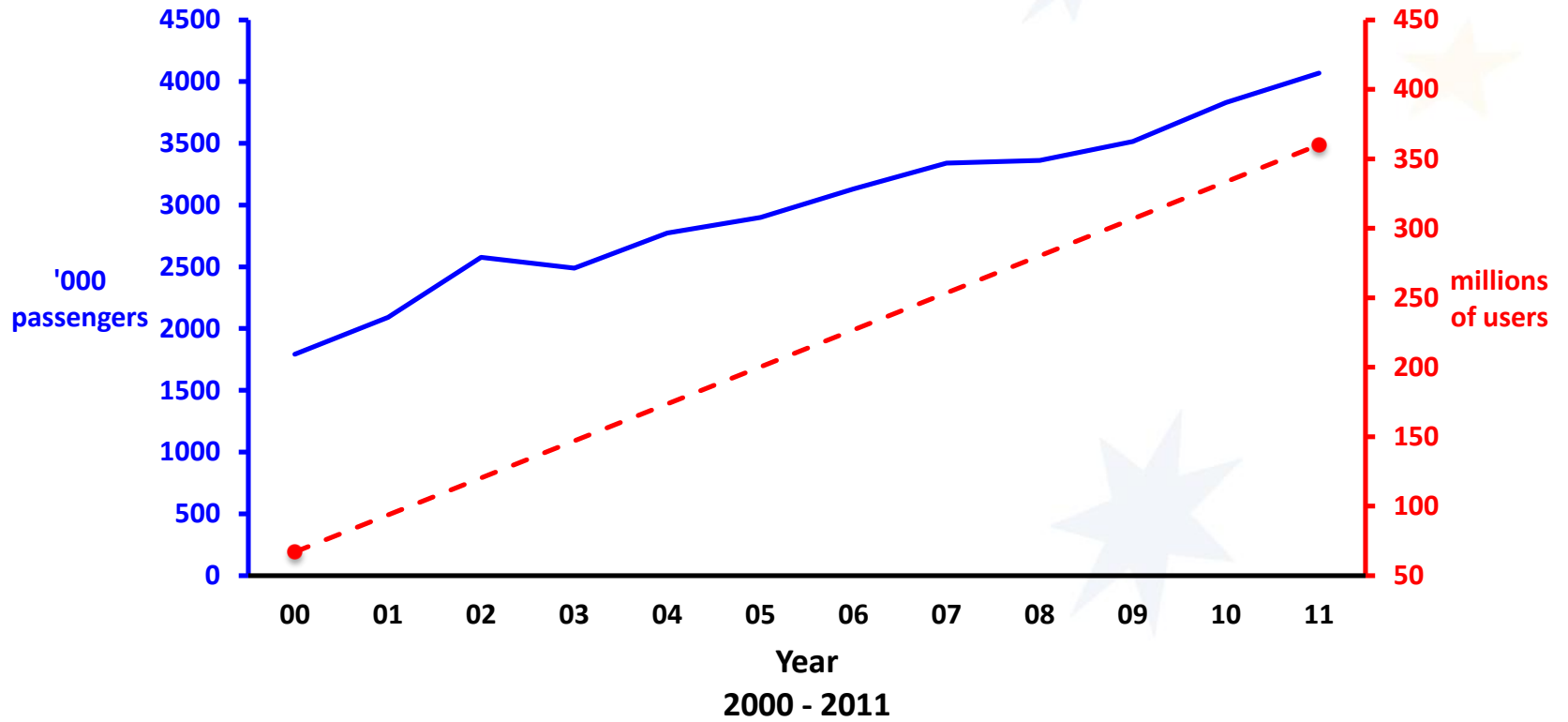


Tanit Sakakini



Very mild super powers – an aside.





Very mild super powers – an aside.

So, why do people want to be face-to-face with each other?

What is it about being face-to-face that is important for humans?

What can that tell us about neural processes?

And what are the implications?

The aim of this presentation:

- **to describe the perceptual and neural correlates of social environments.**
 1. **How high performance is “high performance”?**
 2. **Is there any real meaning to the notion of pathways?**
 3. **The real challenge – emerging social environments!**

What do I mean by High Performance?

How important are social cues?

Lets talk about mind reading!



Galago
Aotus
Otolemur

monochromat



Lemur
Loris
Tarsius

dichromat



Pongo
Pan
Homo

trichromat

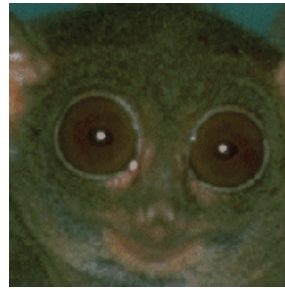
monochromats



dichromats



trichromats



3 species

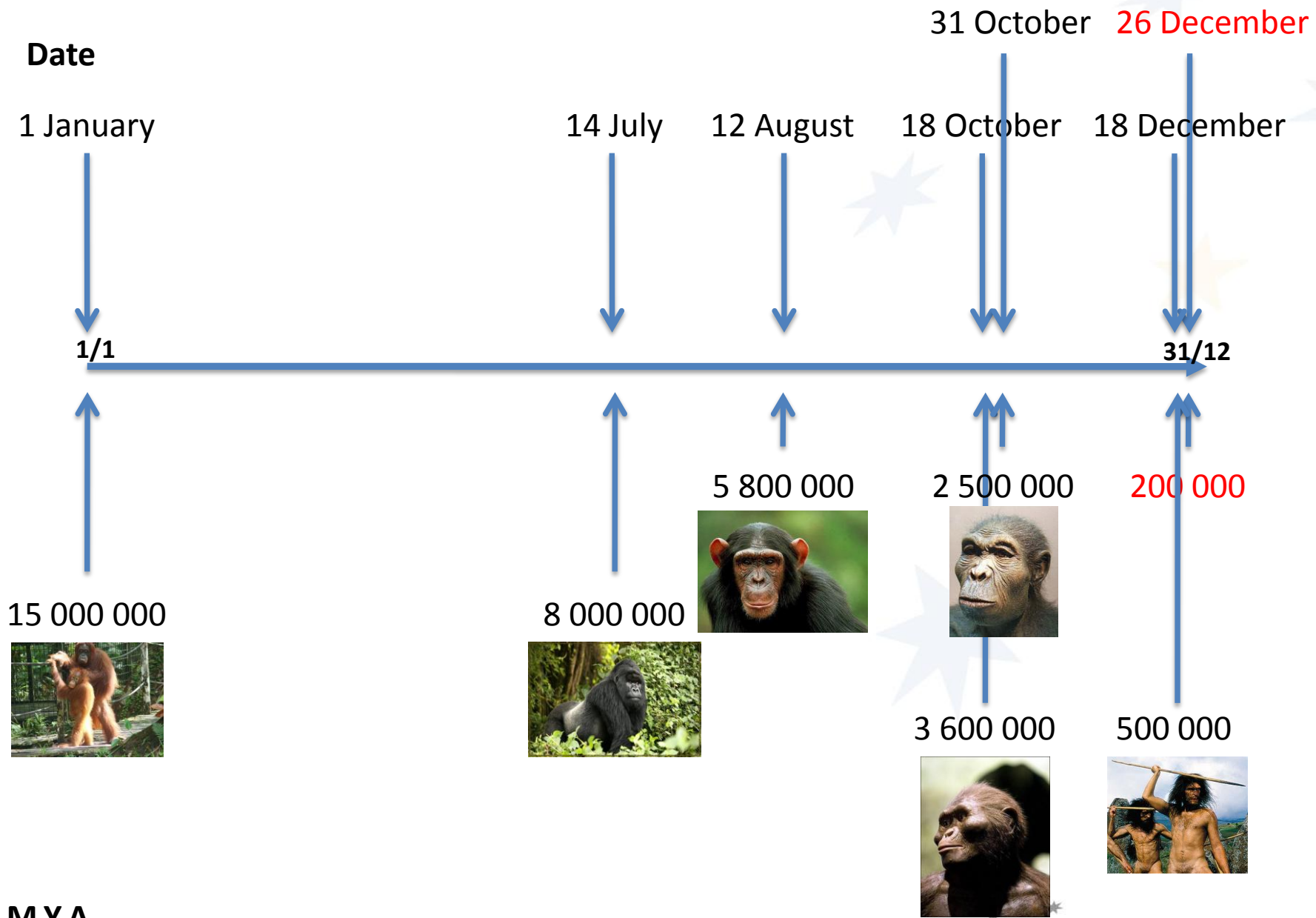
10 species

22 species

increasing social cooperation



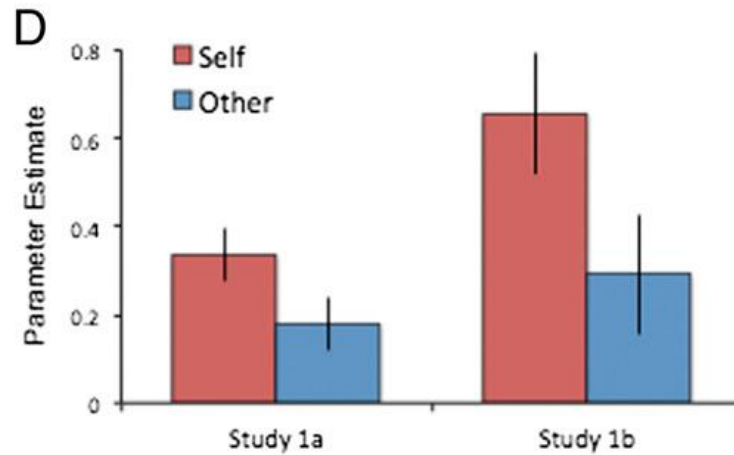
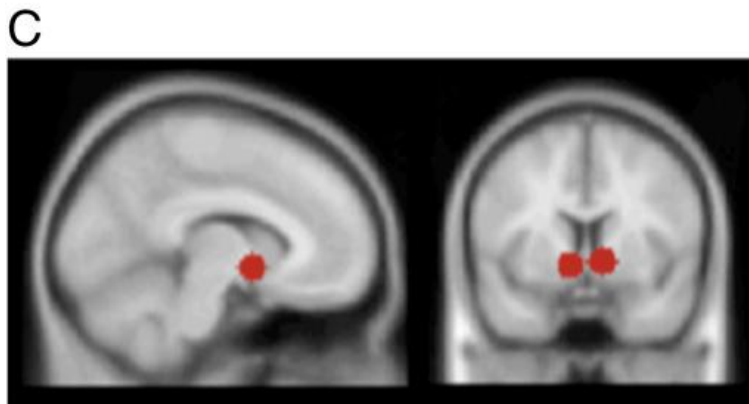
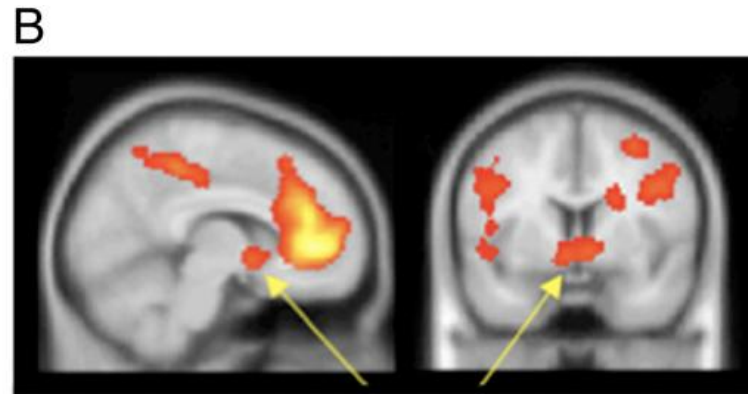
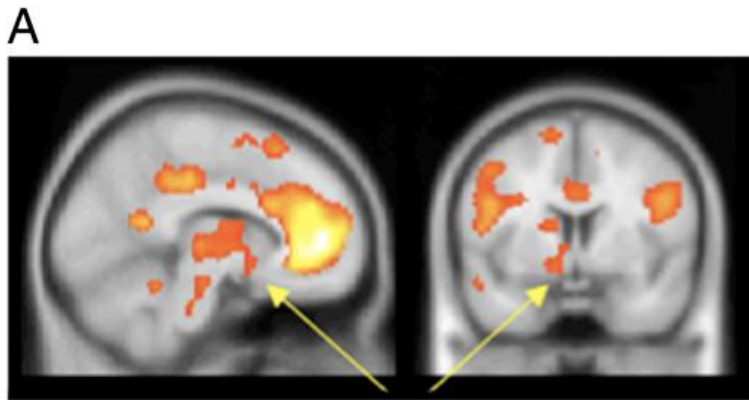




M.Y.A



van der Zwan & Brooks (*submitted*)



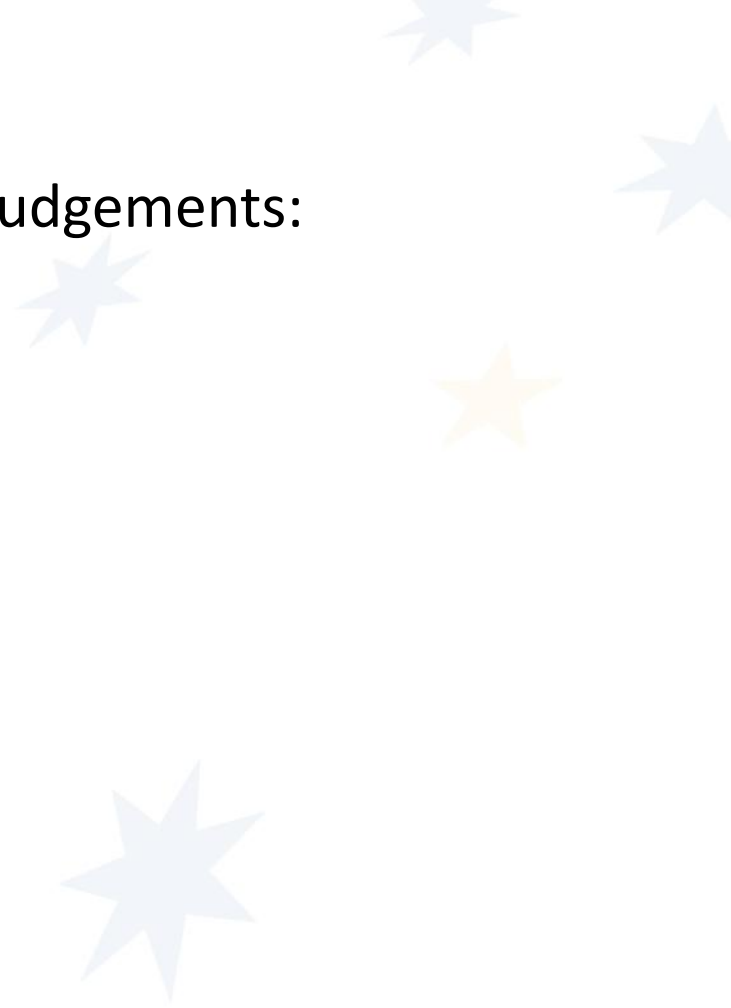
Tamir & Mitchell 2012

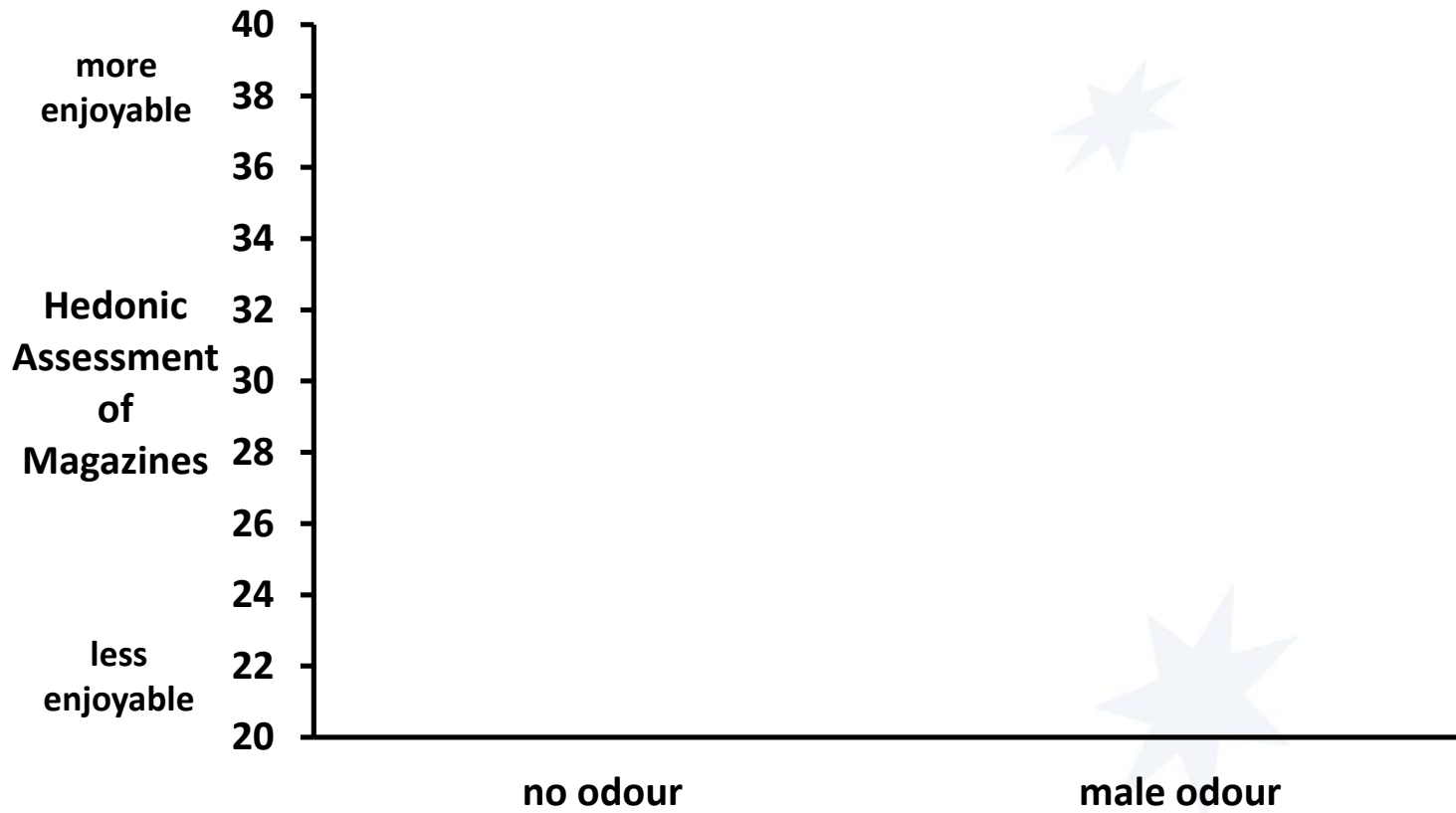
So, colour vision is really important and not just for picking fruit... but so are lots of other cues.



Olfaction and olfactory cues

Olfactory cues inform socially relevant judgements:





Ebster & Kirk-Smith 2005

Olfaction and olfactory cues

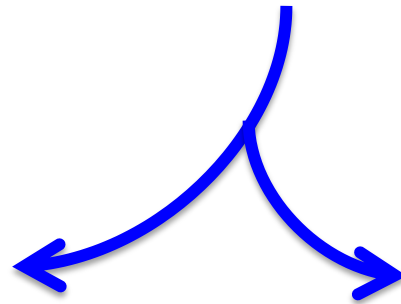
Olfactory cues inform socially relevant judgements:

- Attractiveness
- Trustworthiness
- Confidence
- Social/Competitive Dominance
- Health
- Fertility status

.....and probably lots of stuff we don't know about yet.

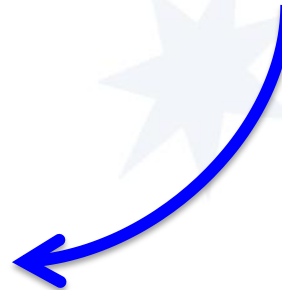
So colour vision, audition, olfaction, motion processing, form processing all mediate social perceptions.

Social information is very high value.



It is a multidimensional perceptual skill.

And it is multidimensional to reduce ambiguity.



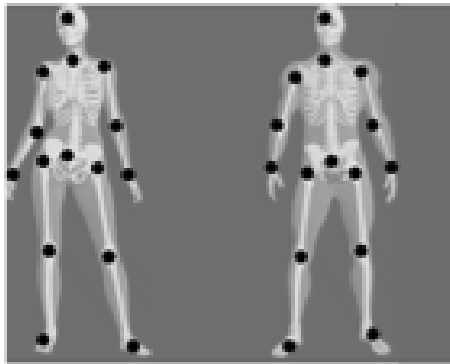
Is there any real meaning to the notion of pathways?

Humans are adept “thin slicers” (Ambady & Rosenthal 1992)

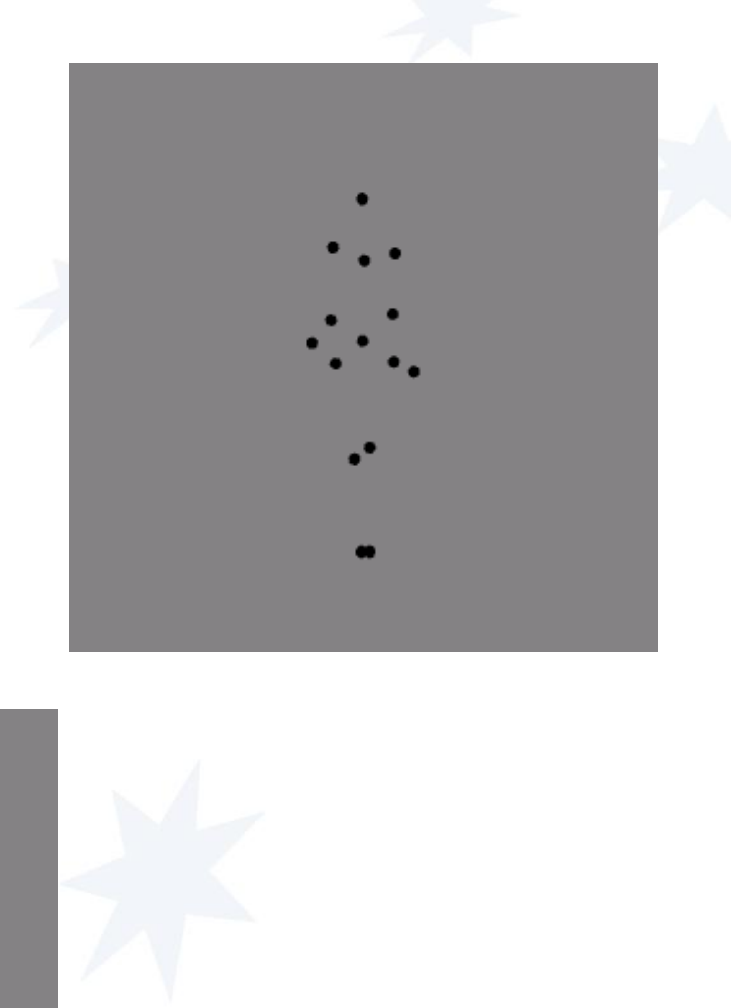
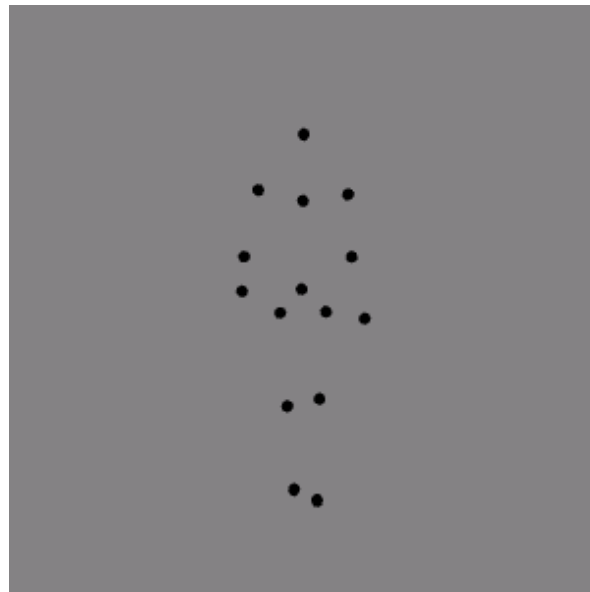
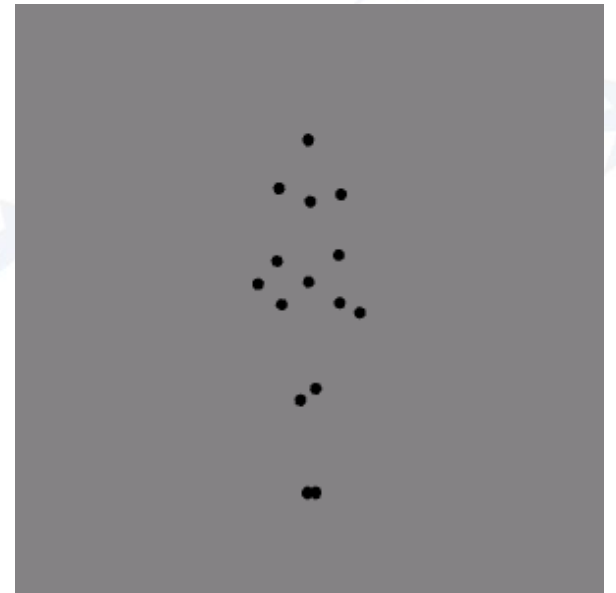
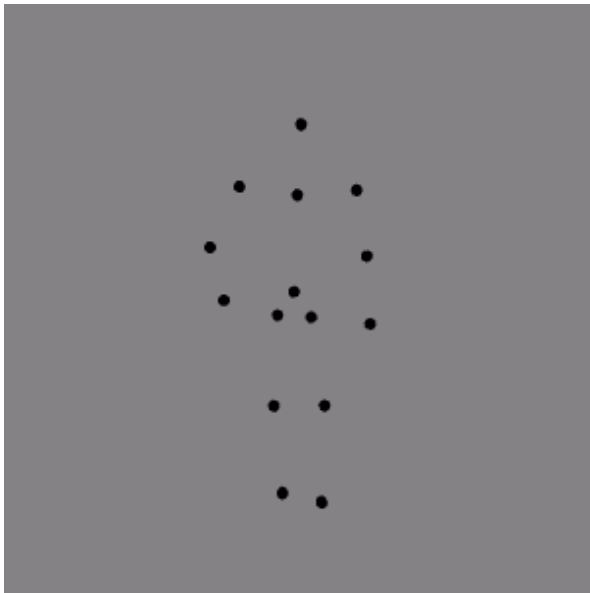
We can discriminate, in a moment (< 100msec), an individual's

- Sex
- Gender
- Age
- Race
- Trustworthiness
- Social Status
- Vulnerability
- Dominance
- Competence
- Attractiveness

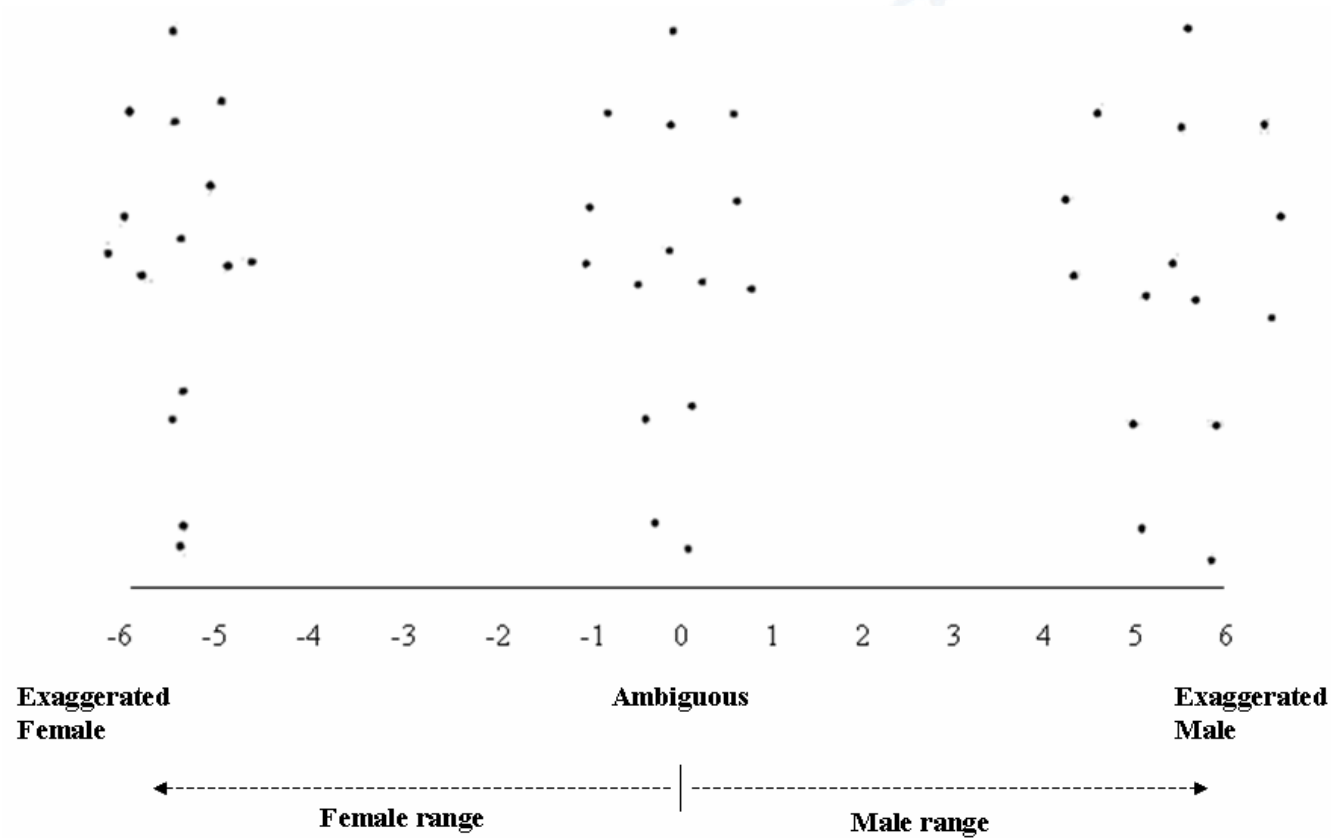
.....but accurately only when we are in their presence



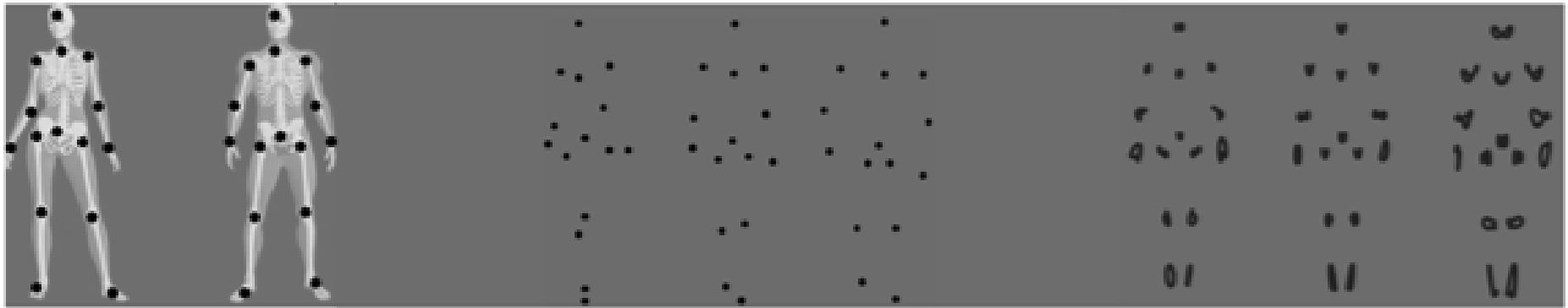
What do you mean by “pathway”?



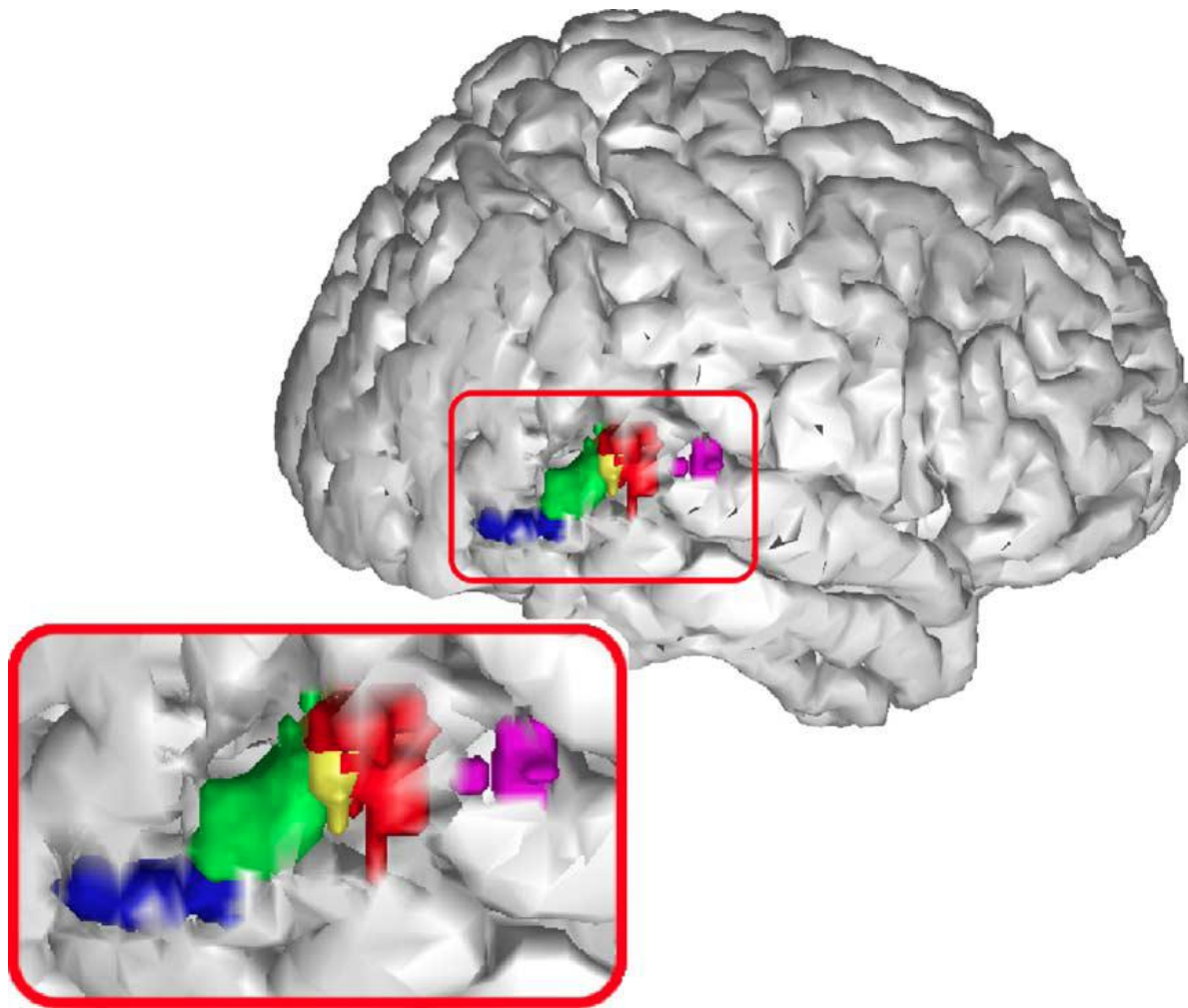
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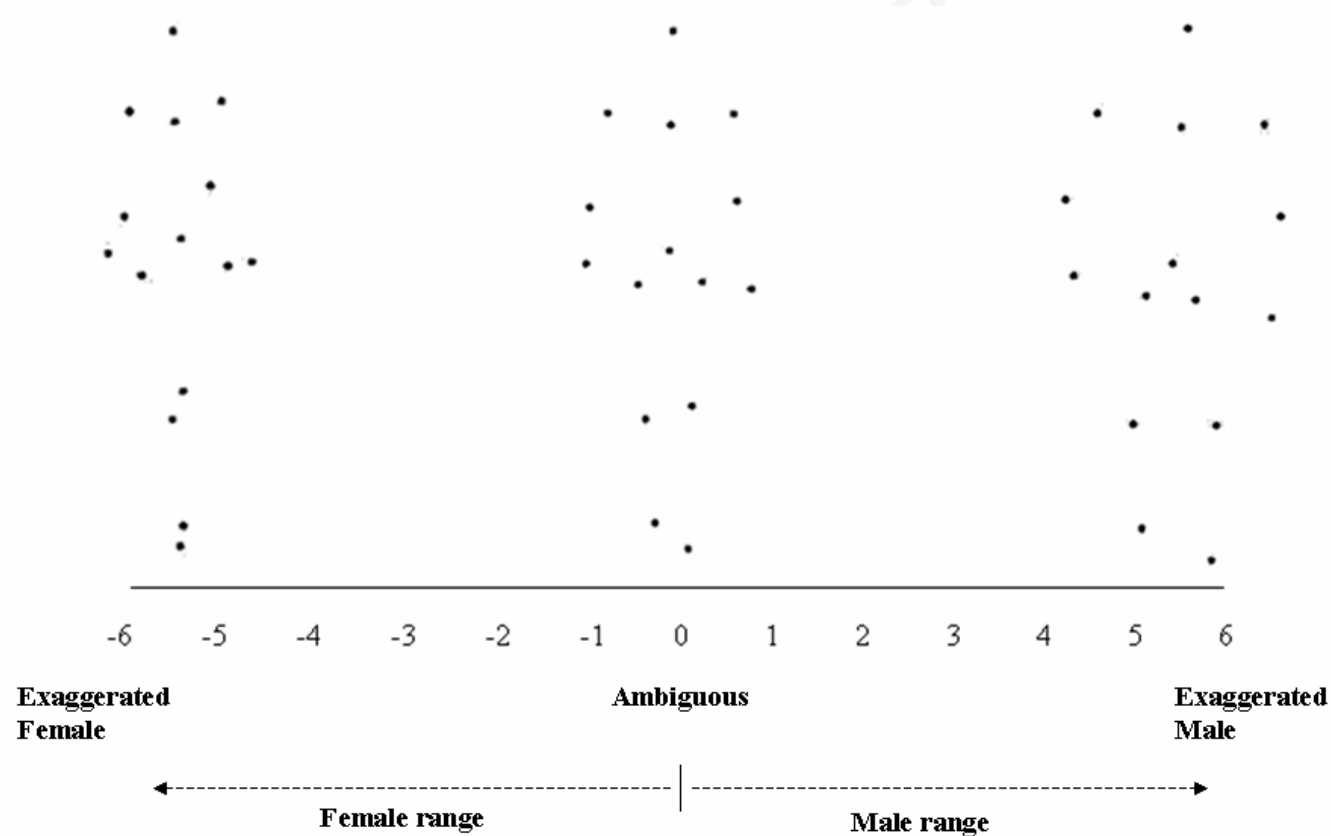
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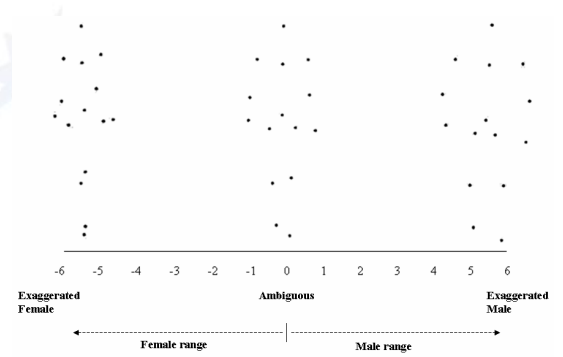
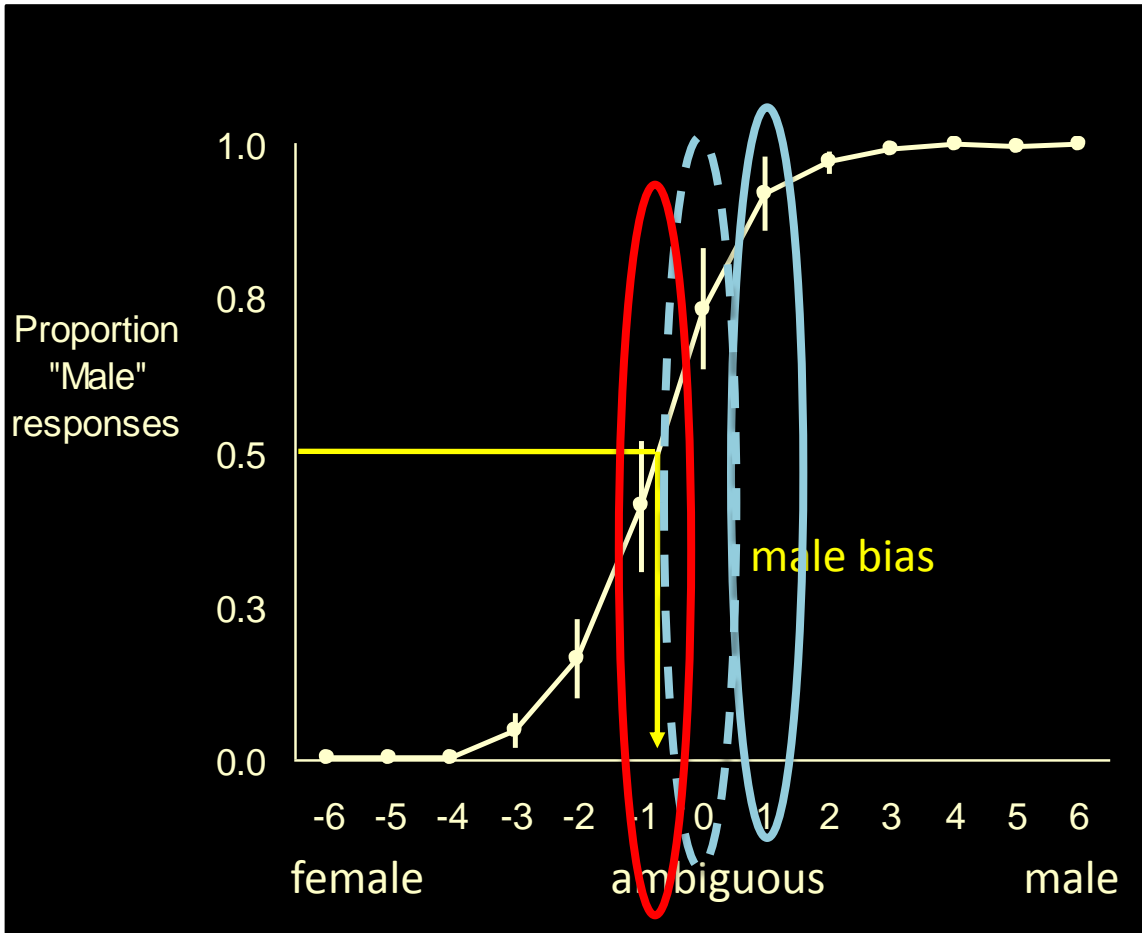
What do you mean by “pathway”?



Bidet-Caulet et al. 2005

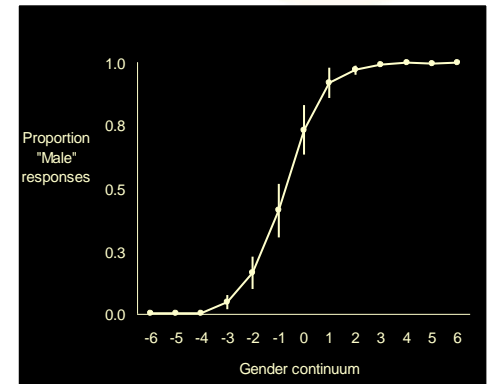
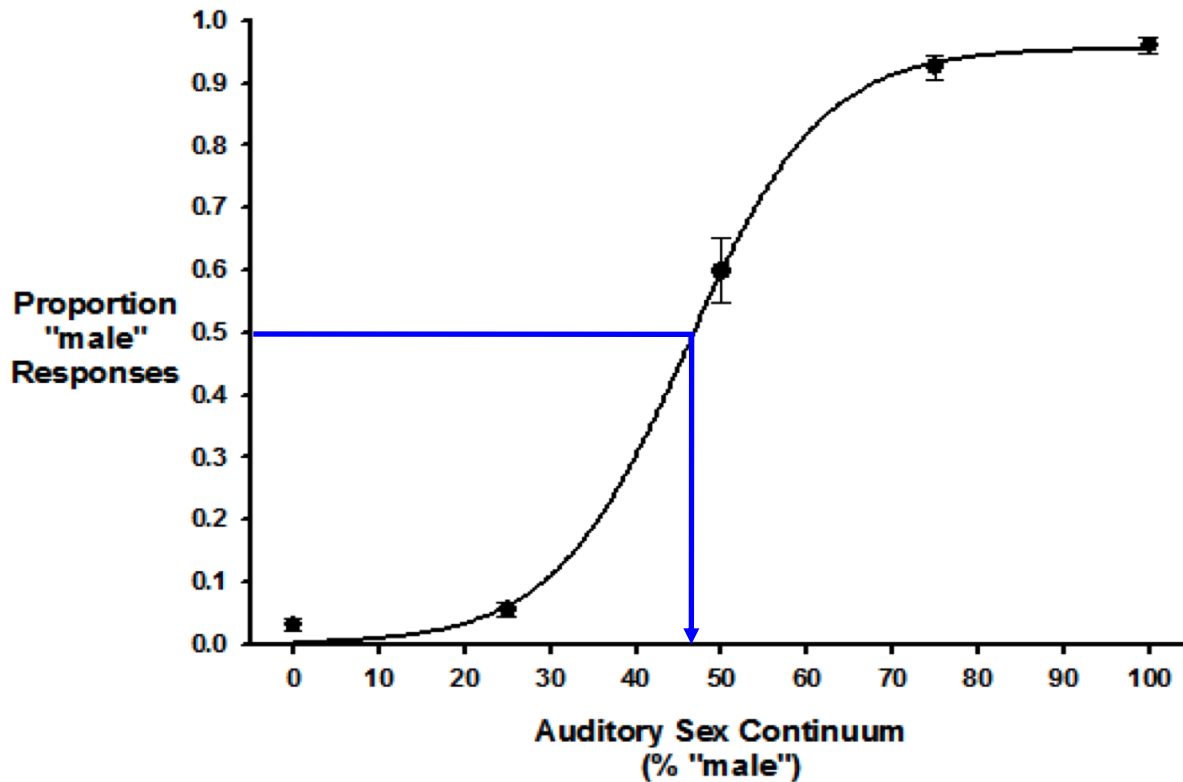


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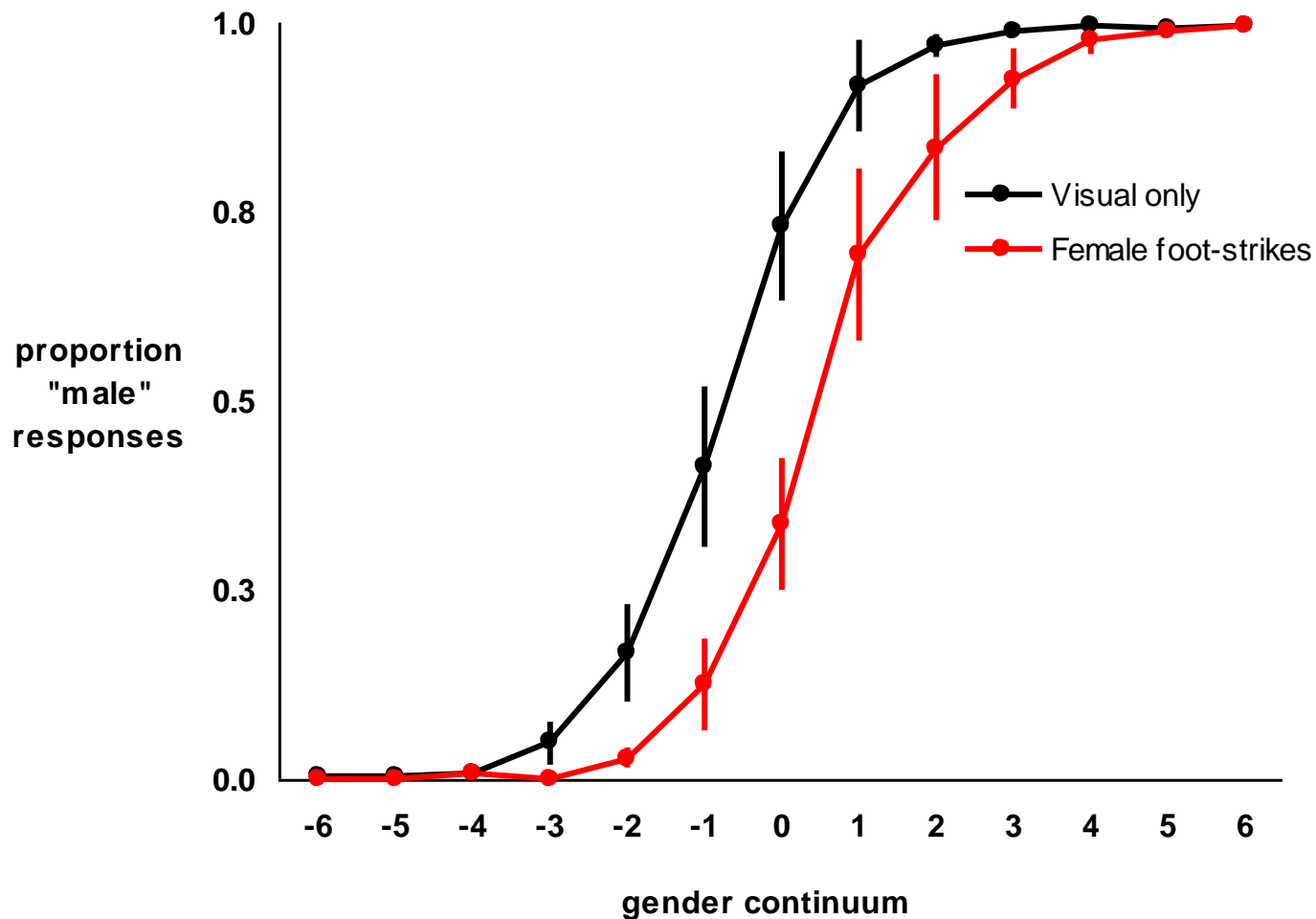


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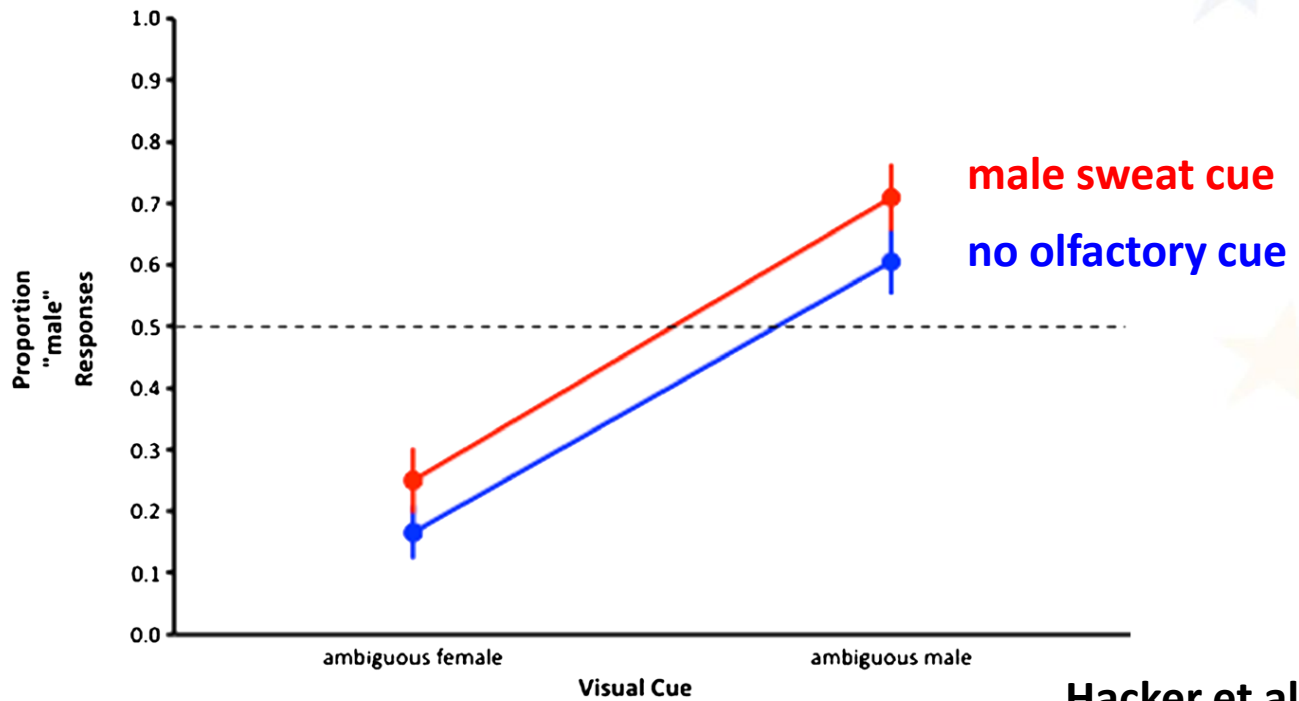
Auditory Processes Mediating Sex Perceptions: An Auditory Sex Continuum



What do you mean by “pathway”?

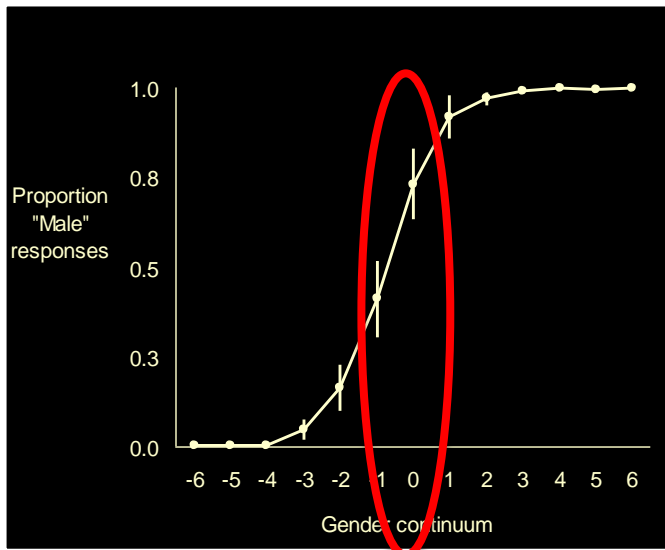


van der Zwan et al. 2009

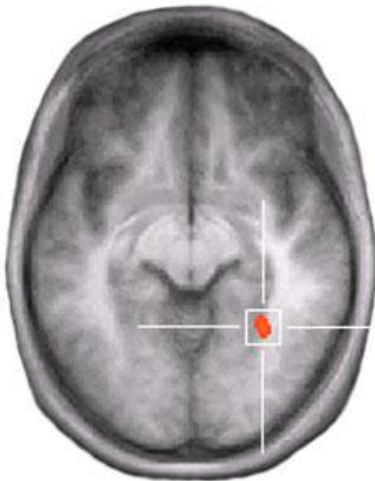
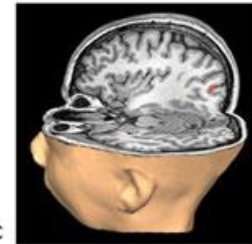
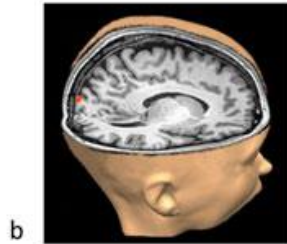
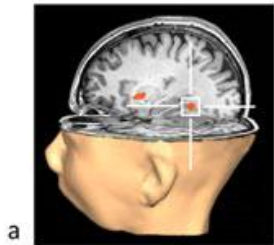
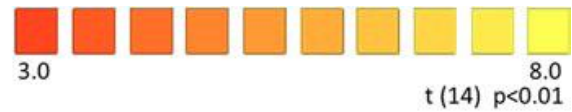


male sweat cue
no olfactory cue

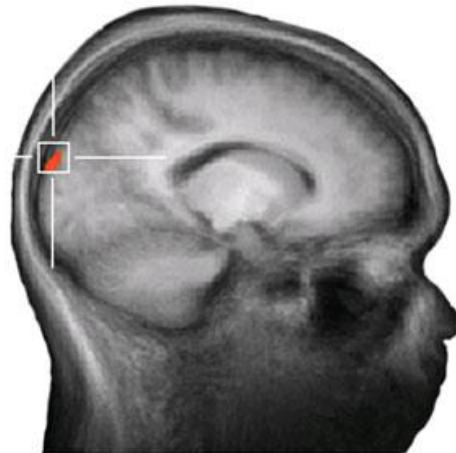
Hacker et al. 2013



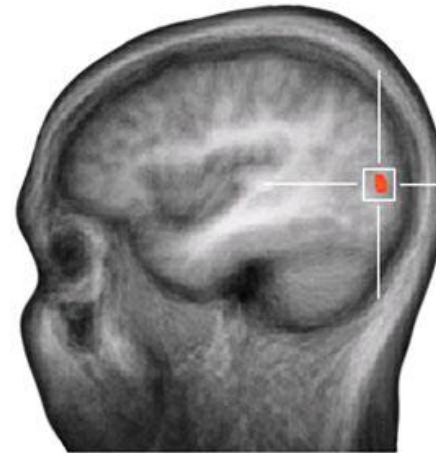
What do you mean by "pathway"?



Right collateral sulcus
[X= 29, Y= -51, Z= -8]



Left precuneus
[X= -16, Y= -94, Z= 19]



Right lateral occipital gyrus
[X= 40, Y= -79, Z= 4]

Podrebarac et al 2013

What do you mean by “pathway”?

So, what do we mean when we use the term “pathway”?

Perceptions are multisensory experiences, even if we are not aware of the cues.

And in the high performance arena of social interactions, multisensory signals are everything!

The Challenge: Building High-Performance Virtual Social Environments.

Can we model, with accuracy, the integration of socially relevant cues to create high performance virtual social environments?

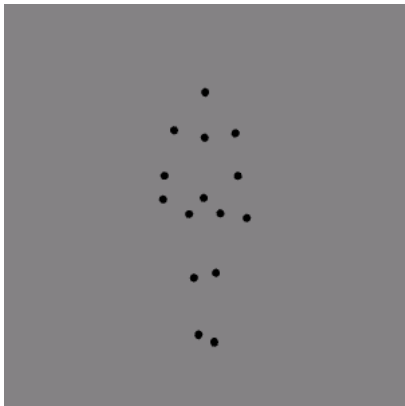
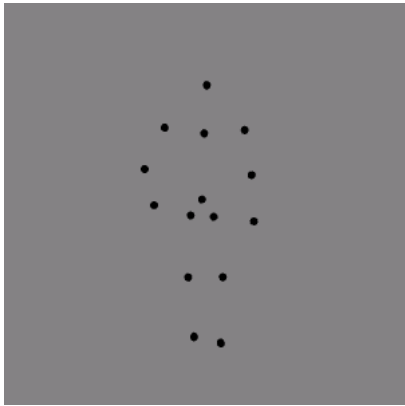
How do emerging environments overcome the tyranny of distance?

Can we use what we know to enhance performances in real environments?

The Mollon Doctrine

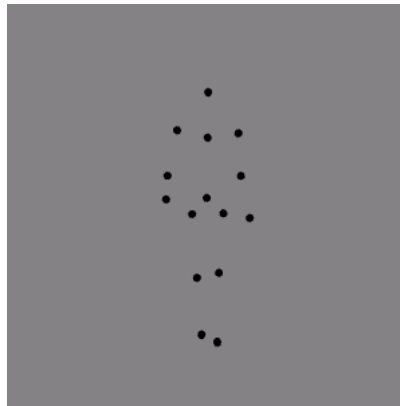
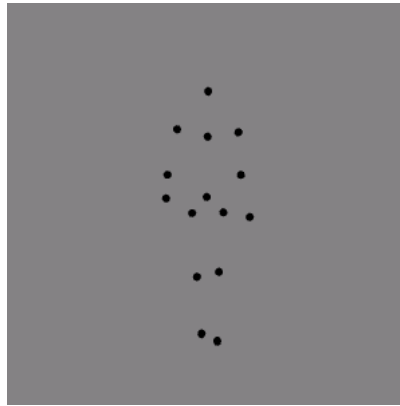
“If you can adapt it, it’s there” (1974, p.479)

**Adapting to
this**

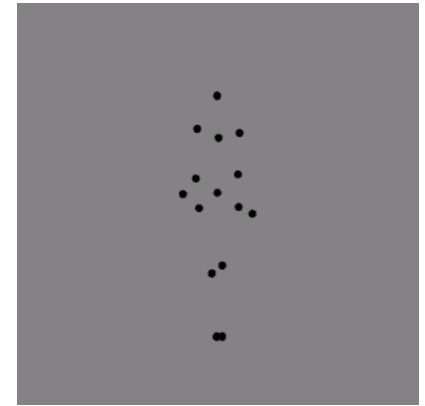


**+
male scent**

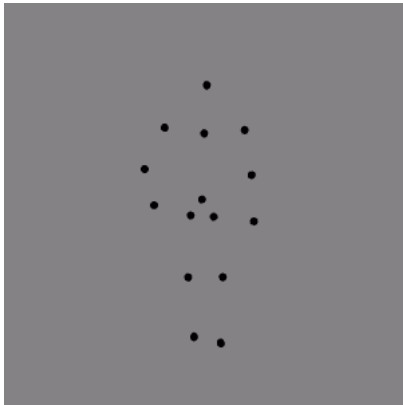
make this



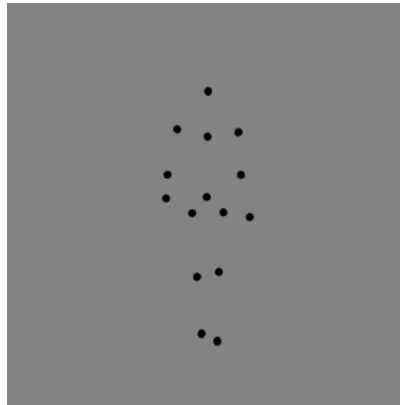
look like this



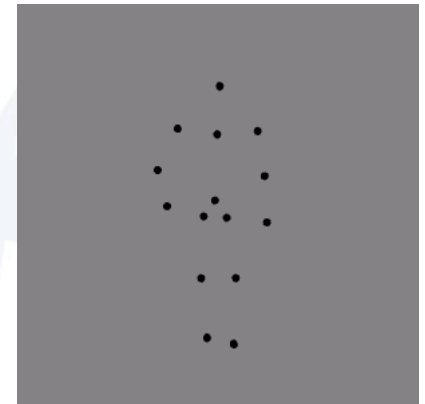
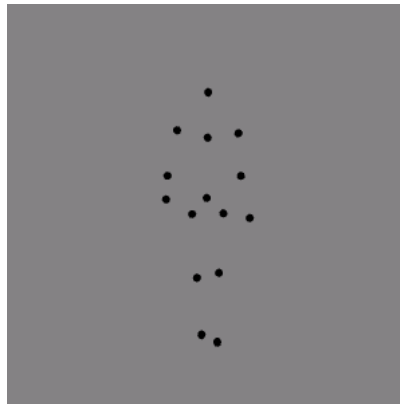
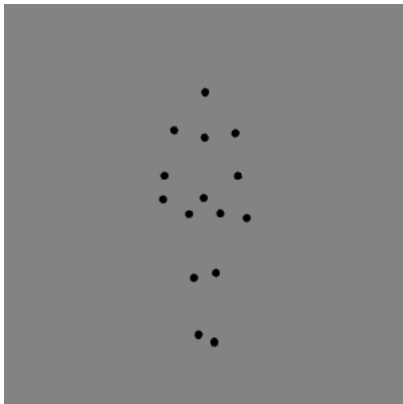
**Adapting to
this**



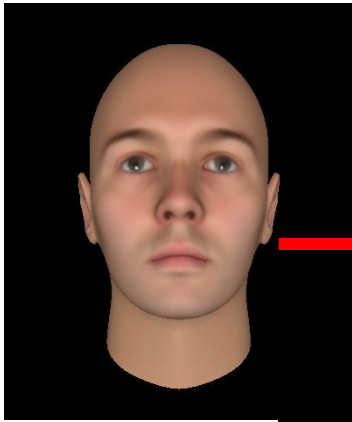
make this



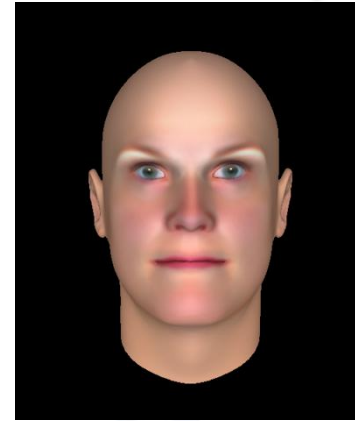
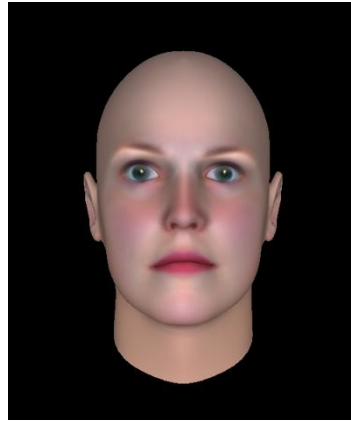
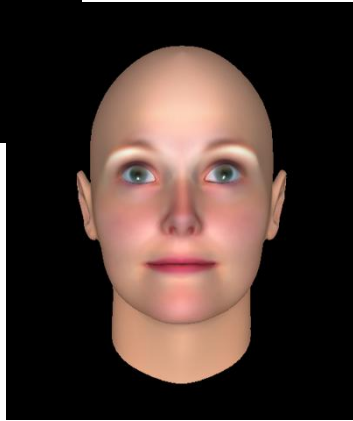
look like this



**+
female footsteps**



increasing dominance, identity constant



changing
Identity,
dominance
constant

