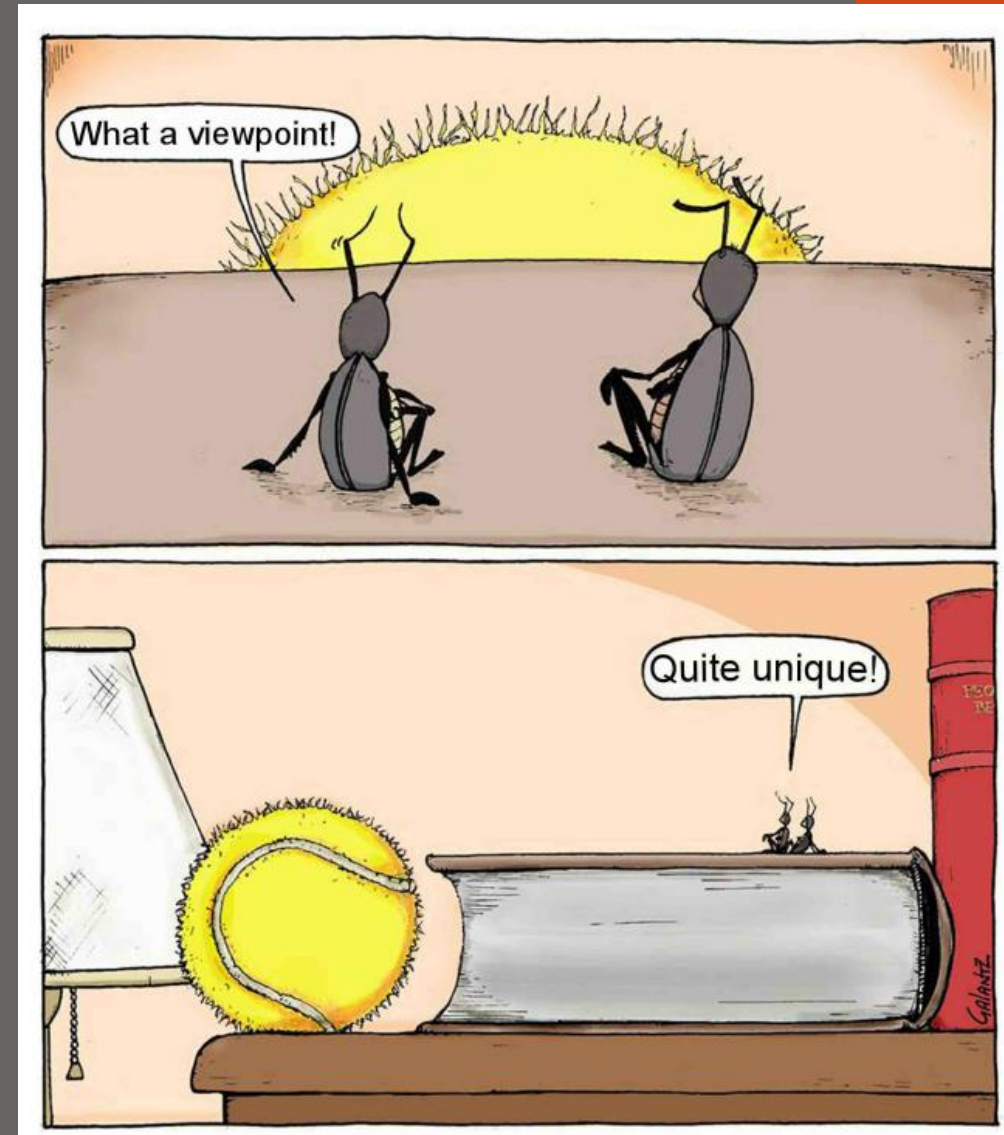


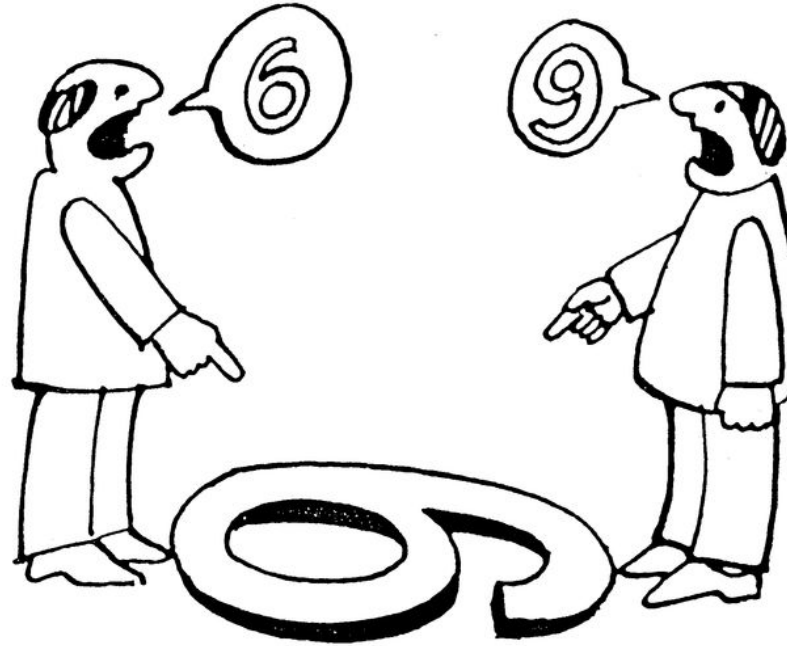
Influences of **emotions**, **sleep deprivation**, and individual differences in **visual perspective taking** support a *multidimensional* account of mindreading.

Henryk Bukowski (UCLouvain, Belgium)

PhD with Pr. Dana Samson (2010-2014).



Not beliefs but visual perspectives

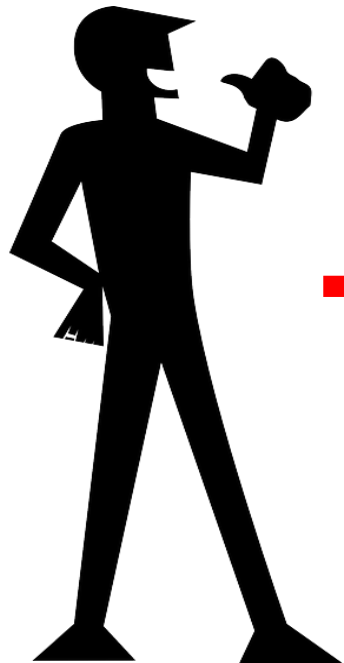


Egocentric perspective

Altercentric perspective

Traditional view of mindreading

- **Assumption** : egocentric perspective is prioritized
- ➔ **Performance** = ease to inhibit egocentric perspective



➔ **One-dimensional theory**

Traditional measure of mindreading

Poor
performance

Good
performance



Clinical depression
(Segrin, 2000)

Hostility (Loudin, Loukas, & Robinson,
2003)

Narcissism
(Watson & Morris, 1991)

Self-esteem (Davis, 1983)

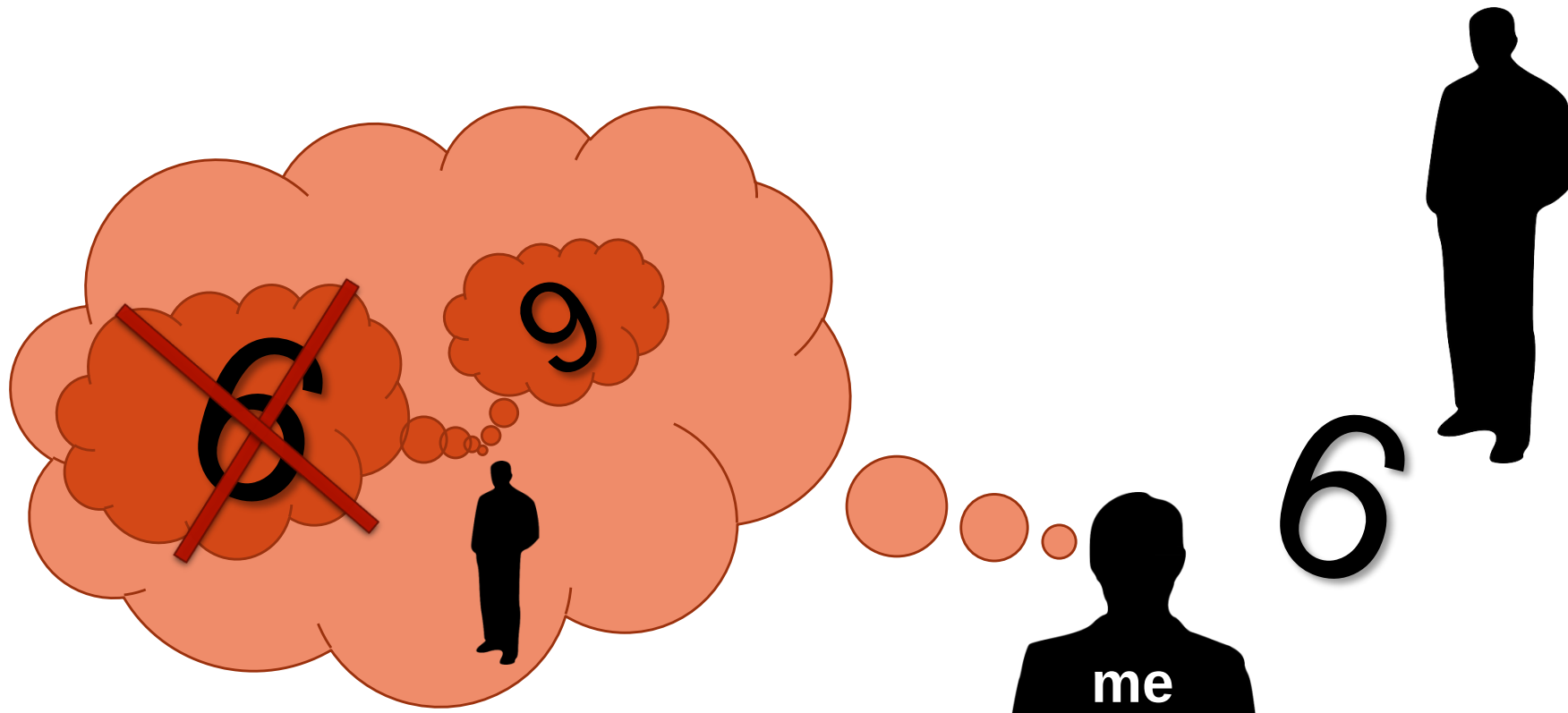
Psychology major (Harton &
Lyons, 2001)

→ **One-dimensional scale**

Can we do better?
Go for (at least) 2
dimensions!

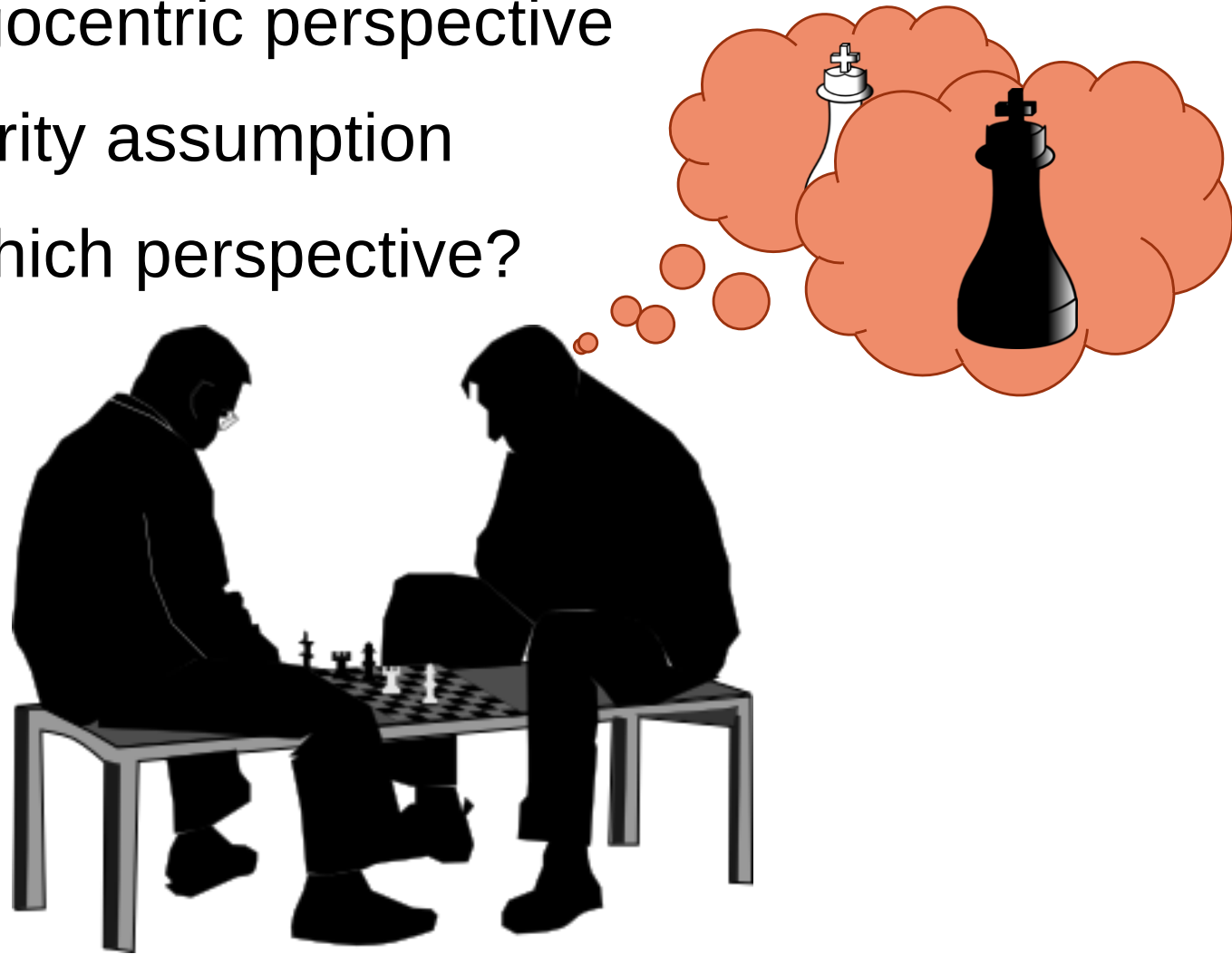
Dimension 1: Perspectives conflict handling

- Ability to suppress the irrelevant conflicting perspective
→ monitoring, shifting, inhibition + self/other distinction



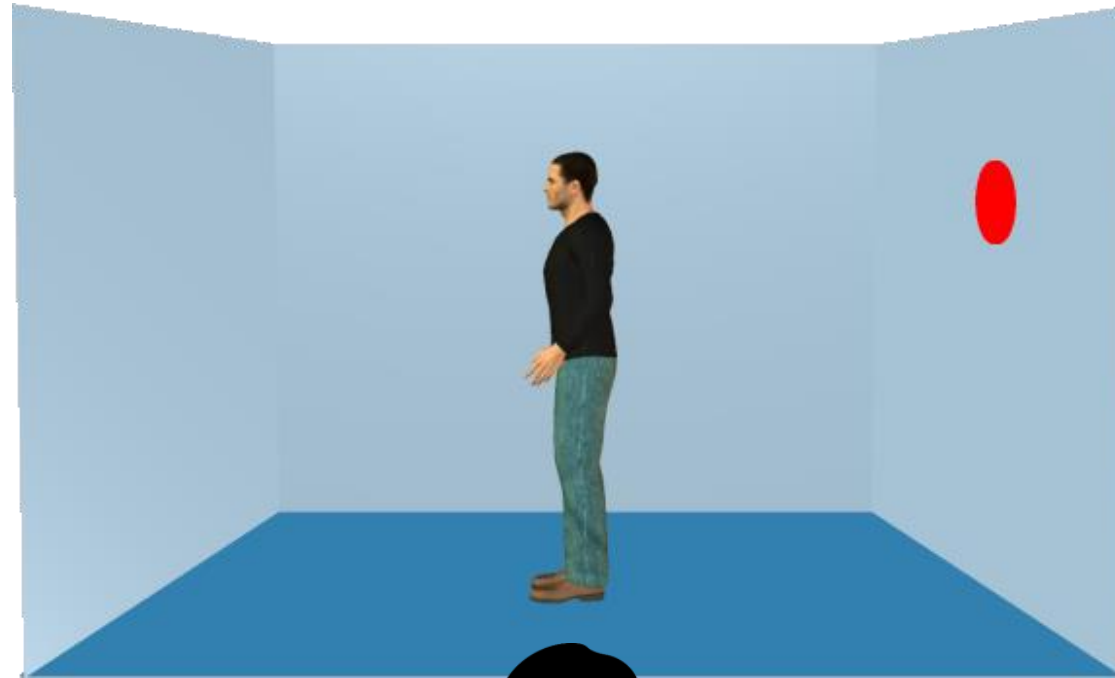
Dimension 2: Priority between perspectives

- Altercentric vs. egocentric perspective
→ Against self priority assumption
- Better at taking which perspective?



My measure: Level-1 visual perspective-taking

Does HE see 1 disc ?



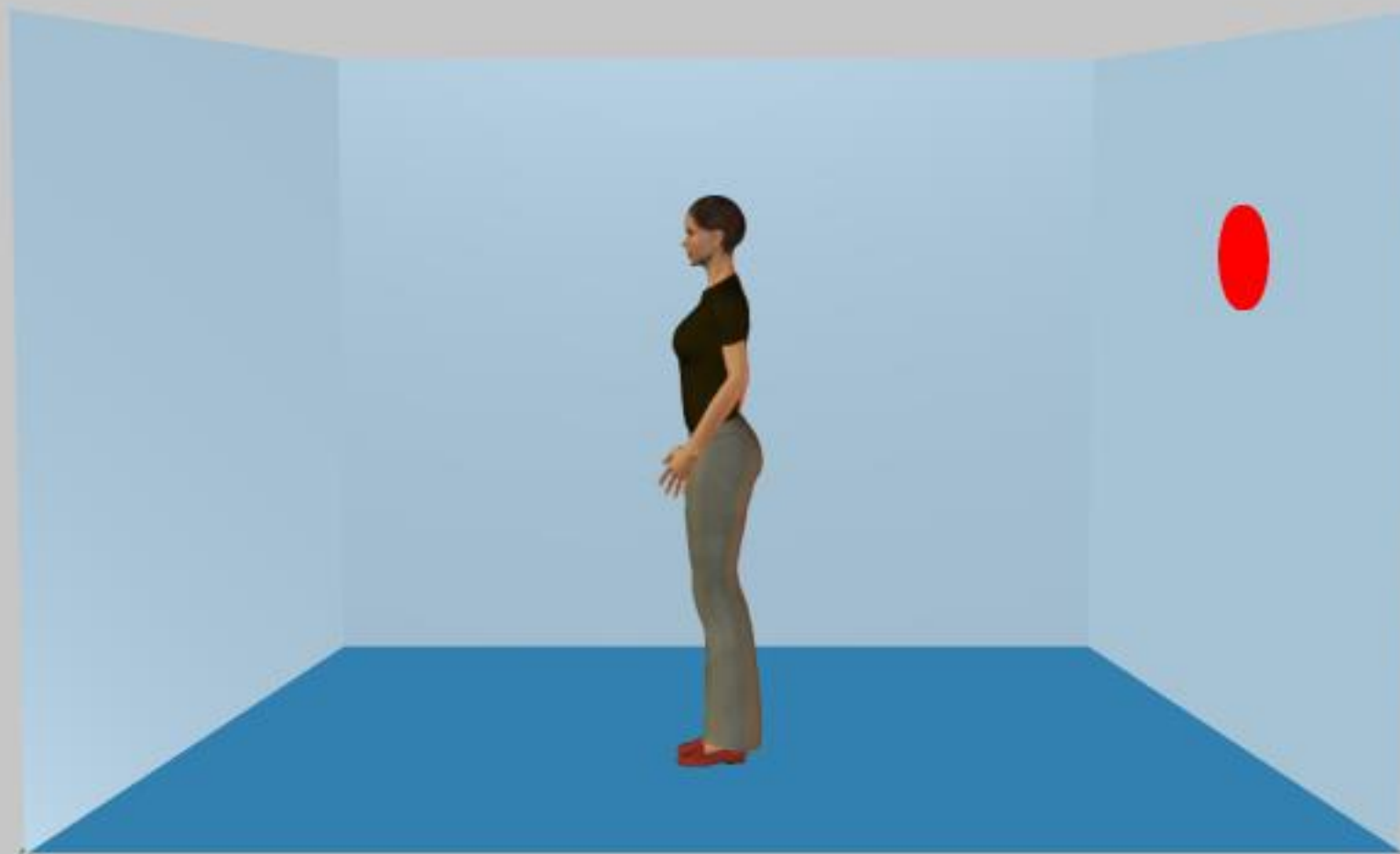
Participant

Samson, Apperly, Braithwaite,
Andrews, & Bodley Scott, 2010

+

SHE

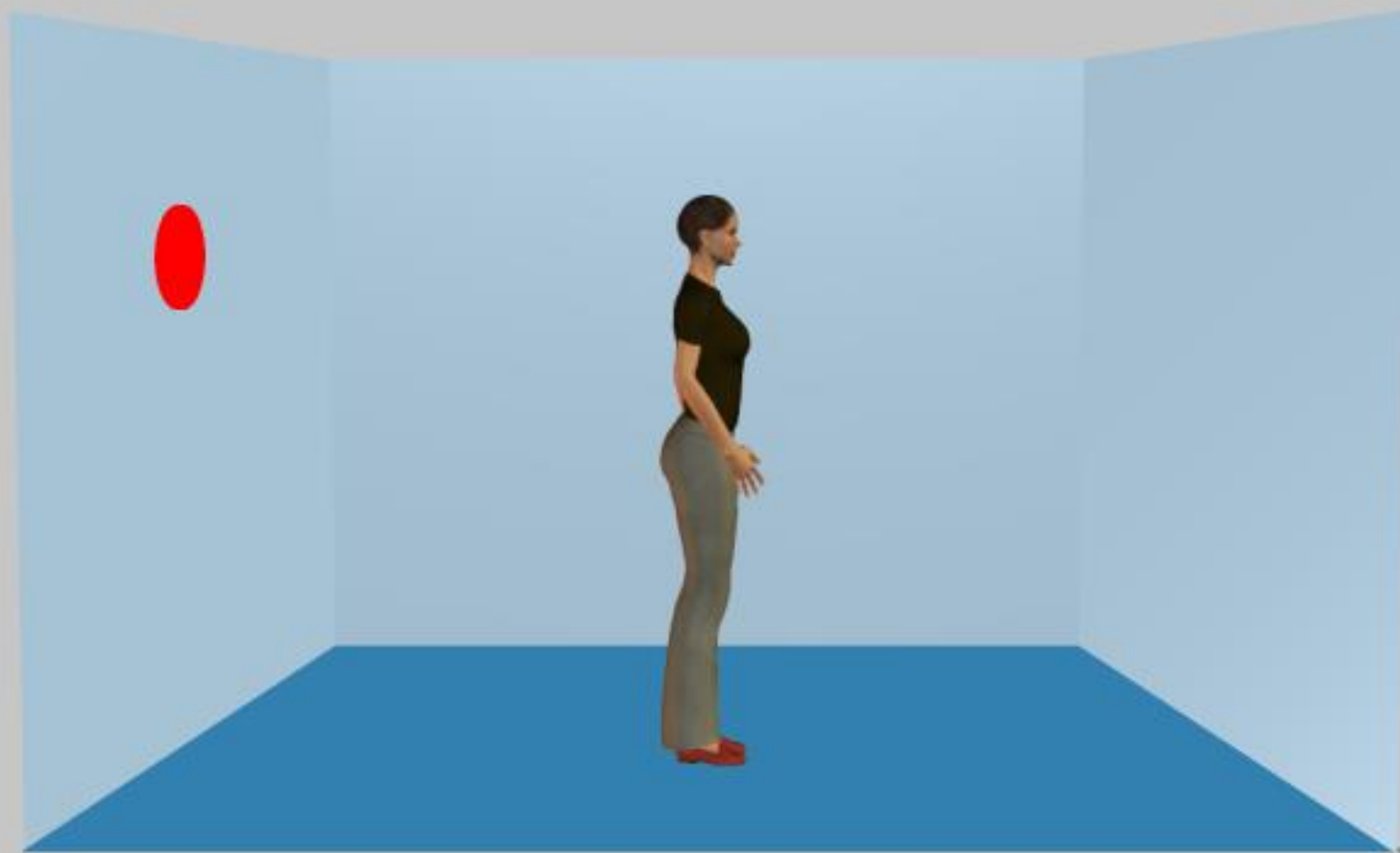
1



+

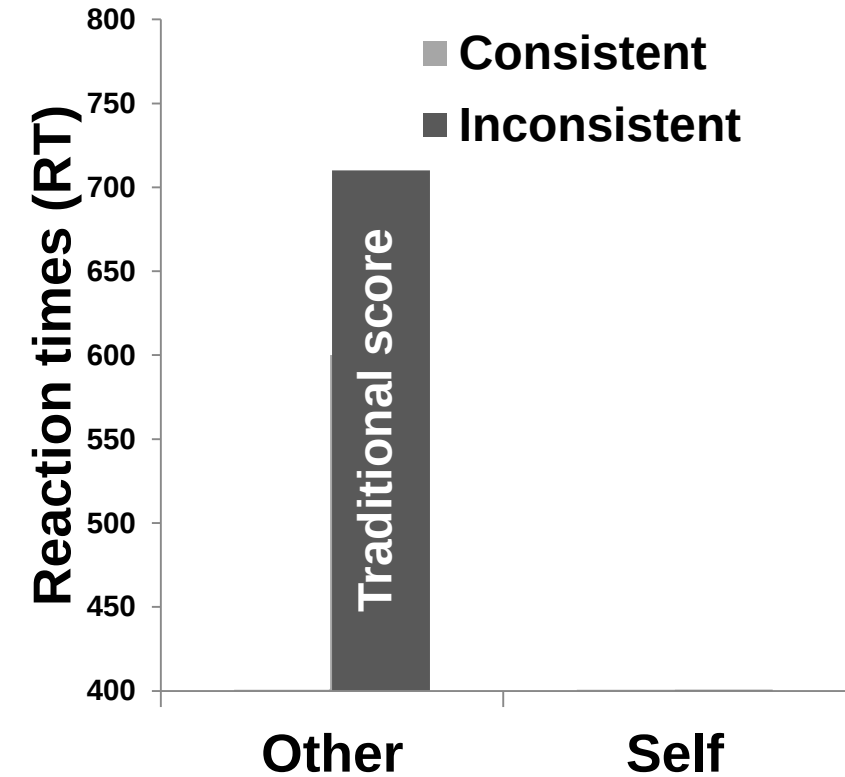
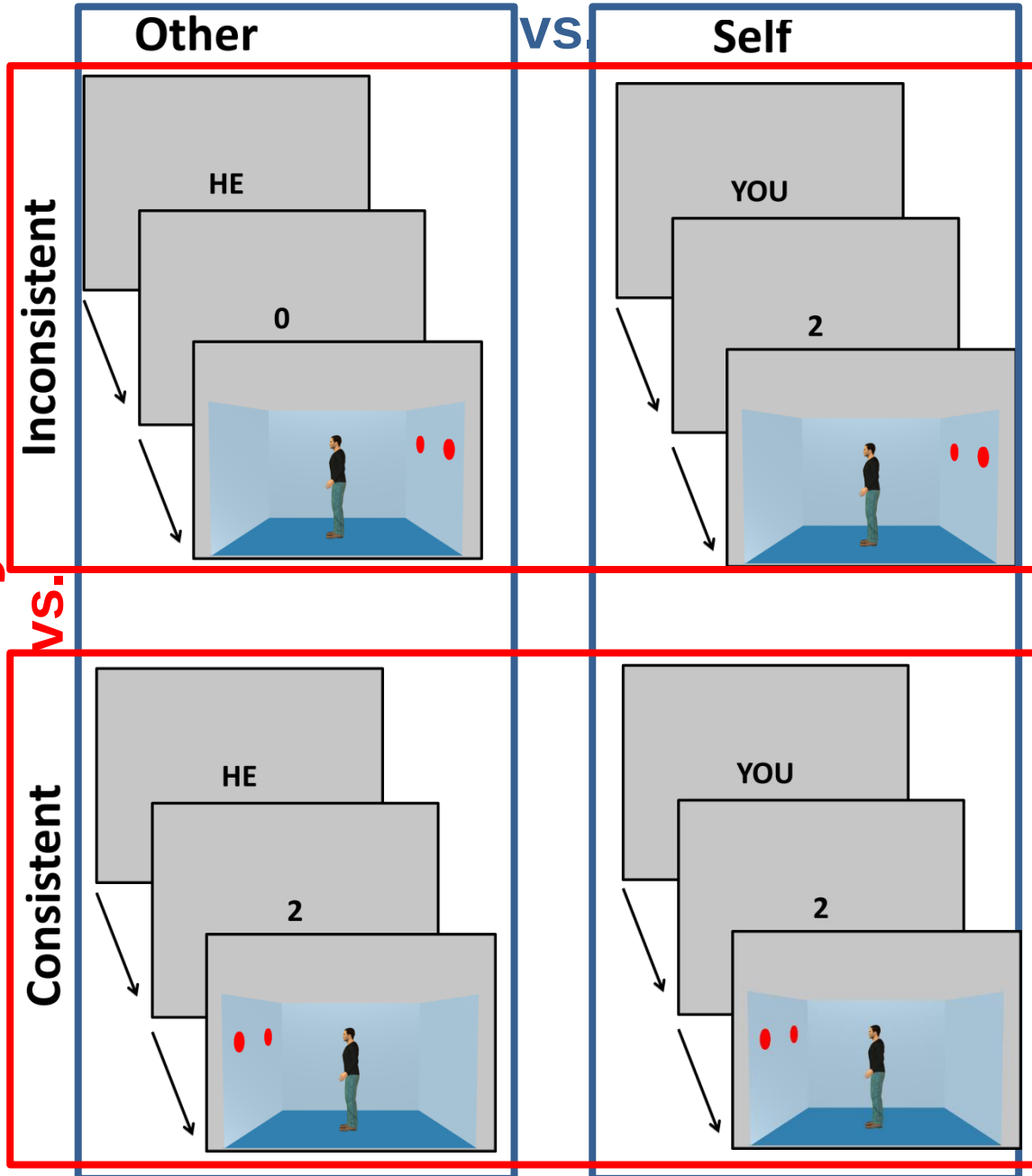
YOU

1



Perspective target contrast

Consistency contrast vs.



Egocentric bias

Altercentric bias

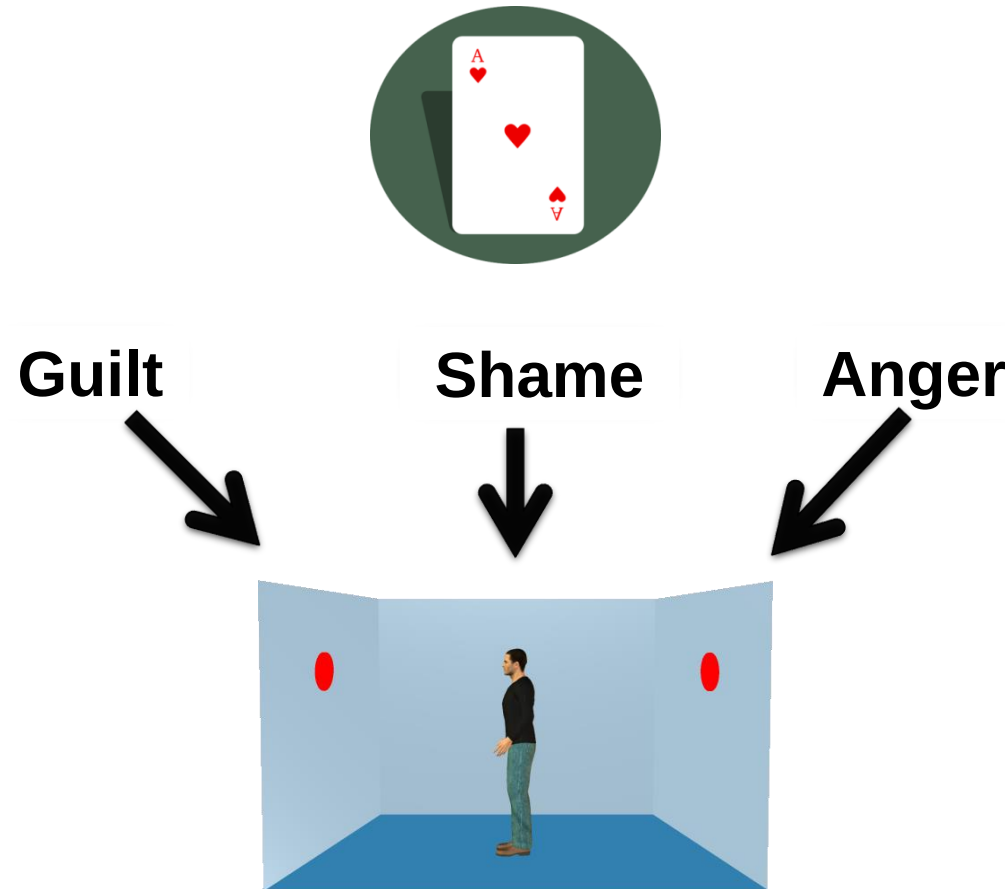
Dim 1 = Main effect of Perspective

Dim 2 = Main effect Consistency

The hypothesis: One dimension but not the other is specifically influenced by:

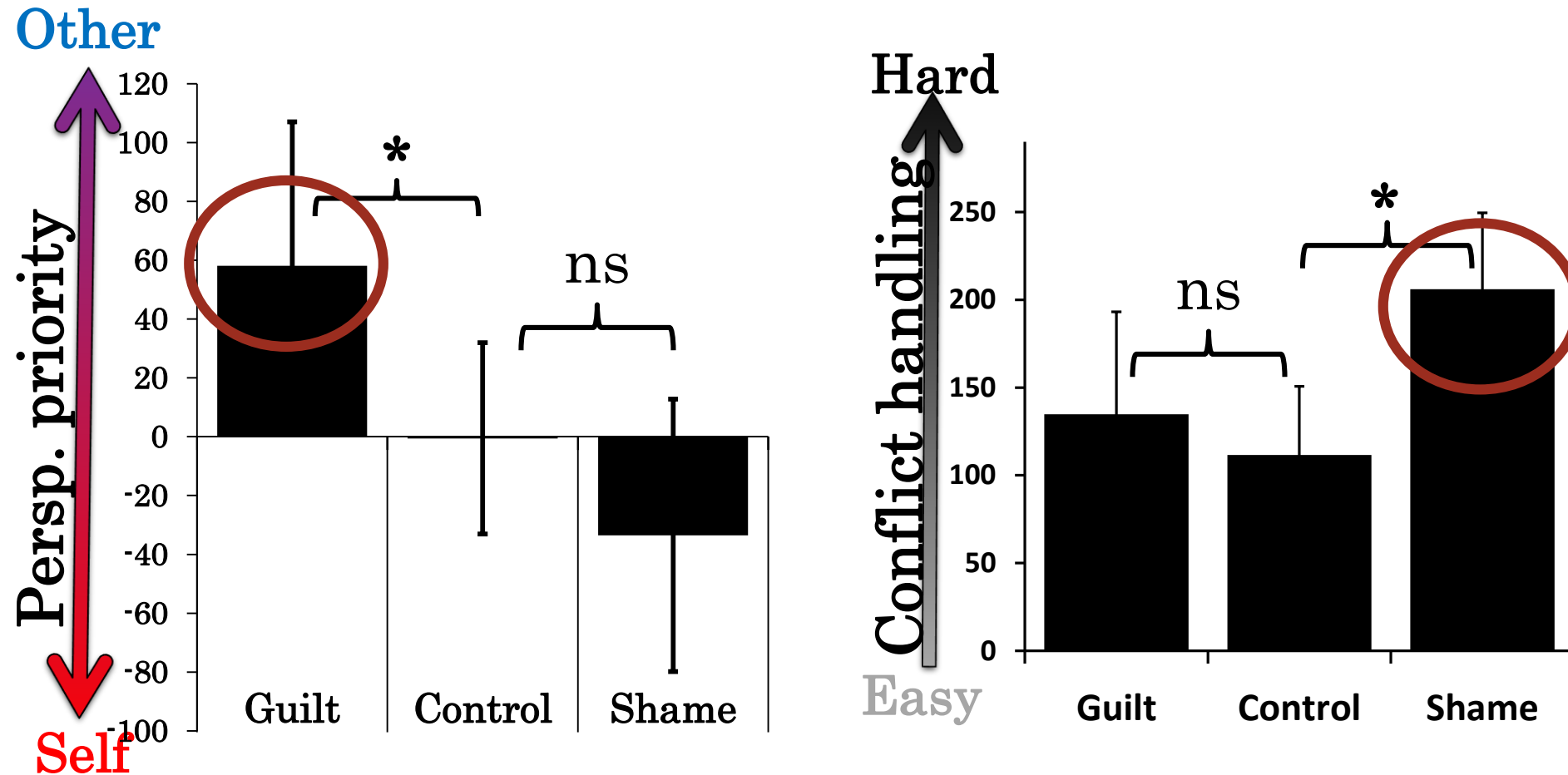
1. **social emotions**
2. **mindreading habits**
3. **sleep privation**
4. **inter-individual variability**

Influence of social emotions



Conflict handling ?
Perspective priority ?
Both ?

Influence of social emotions



Note: Score = Inverse Efficiency Index (IES) = Reaction Time / (1 – Error Rate)

Influence of social emotions

Guilt



Priority between perspectives

Shame



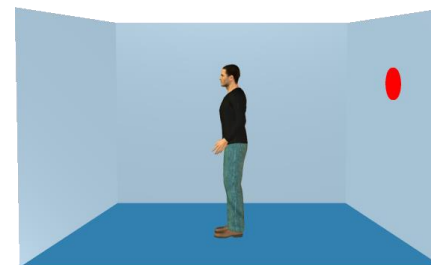
Conflict handling

Mindreading habits

Interpersonal Reactivity Index (Davis, 1982)



Credit: WikiHow



Conflict handling ?
Perspective priority ?
Both ?

Perspective taking

“I try to look at everybody's side of a disagreement...”

Empathic concern

“I often have tender [...] for people less fortunate than me.”

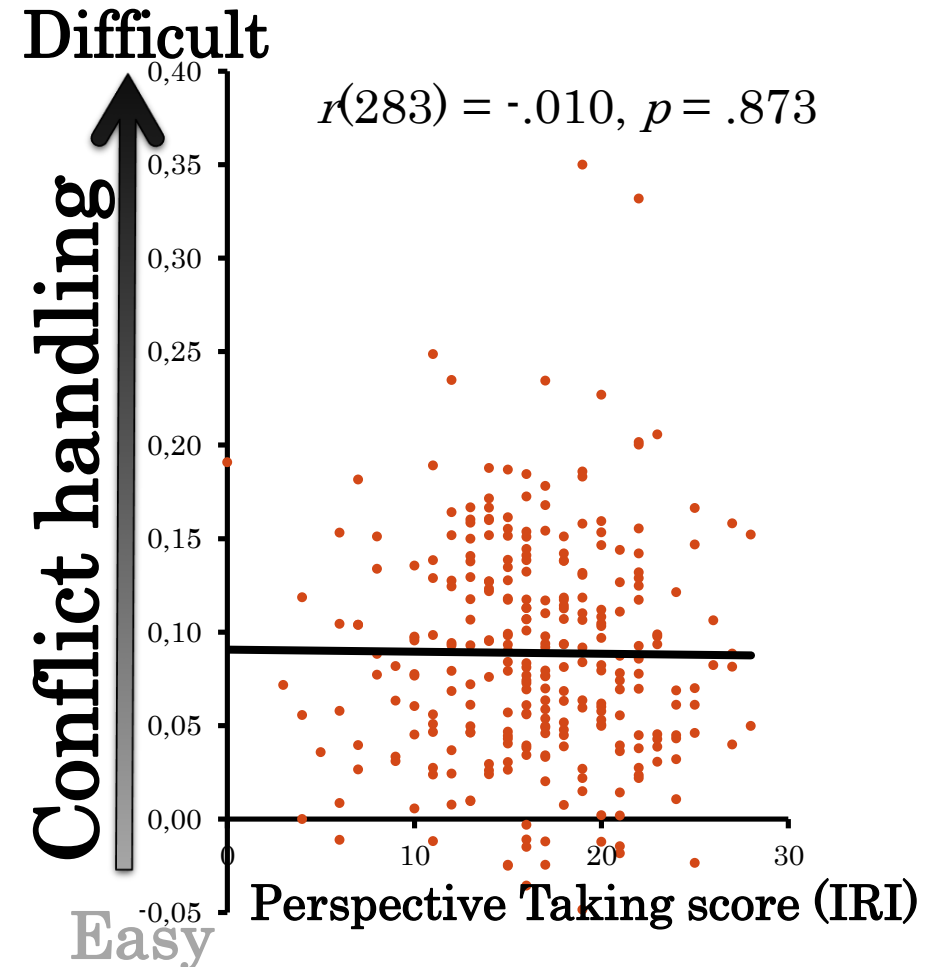
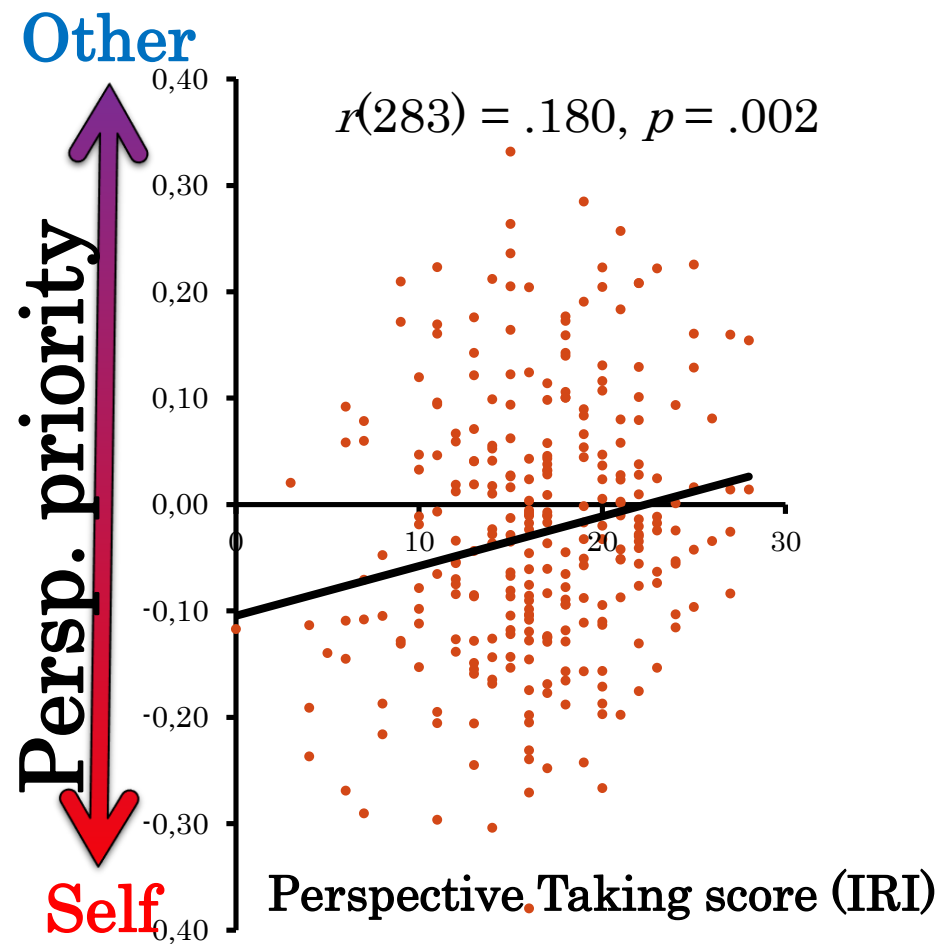
Personal distress

“In emergency situations, I feel apprehensive and ill-at-ease.”

Fantasy

“I daydream [...] about things that might happen to me”

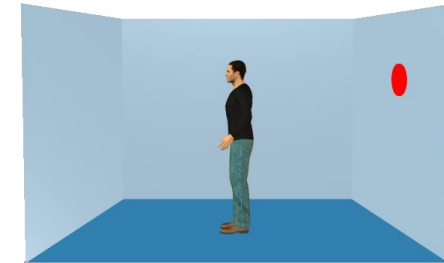
Perspective taking habits



Empathic concern, Personal distress, Fantasy → no significant correlations.

Note: VPT performance = $IES = RT / (1 - ER)$

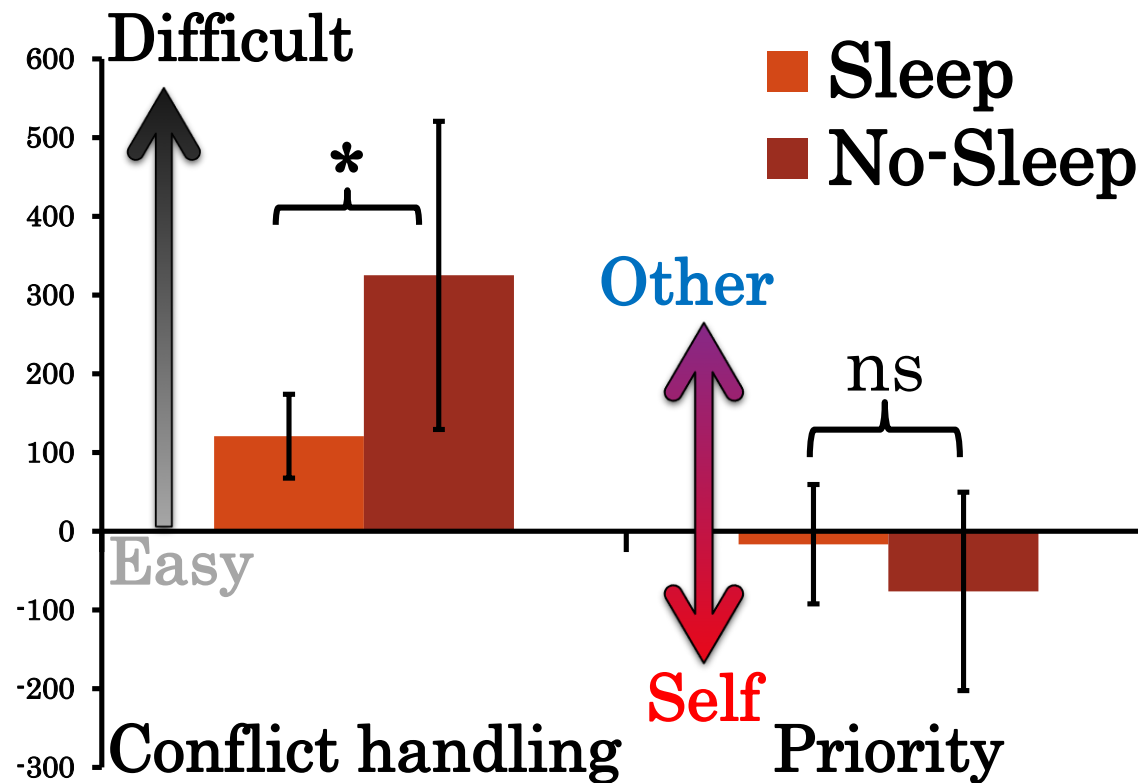
Effect of sleep deprivation



Participants tested twice:
(1) Morning after **no-sleep** night
(2) Morning after **full sleep** night

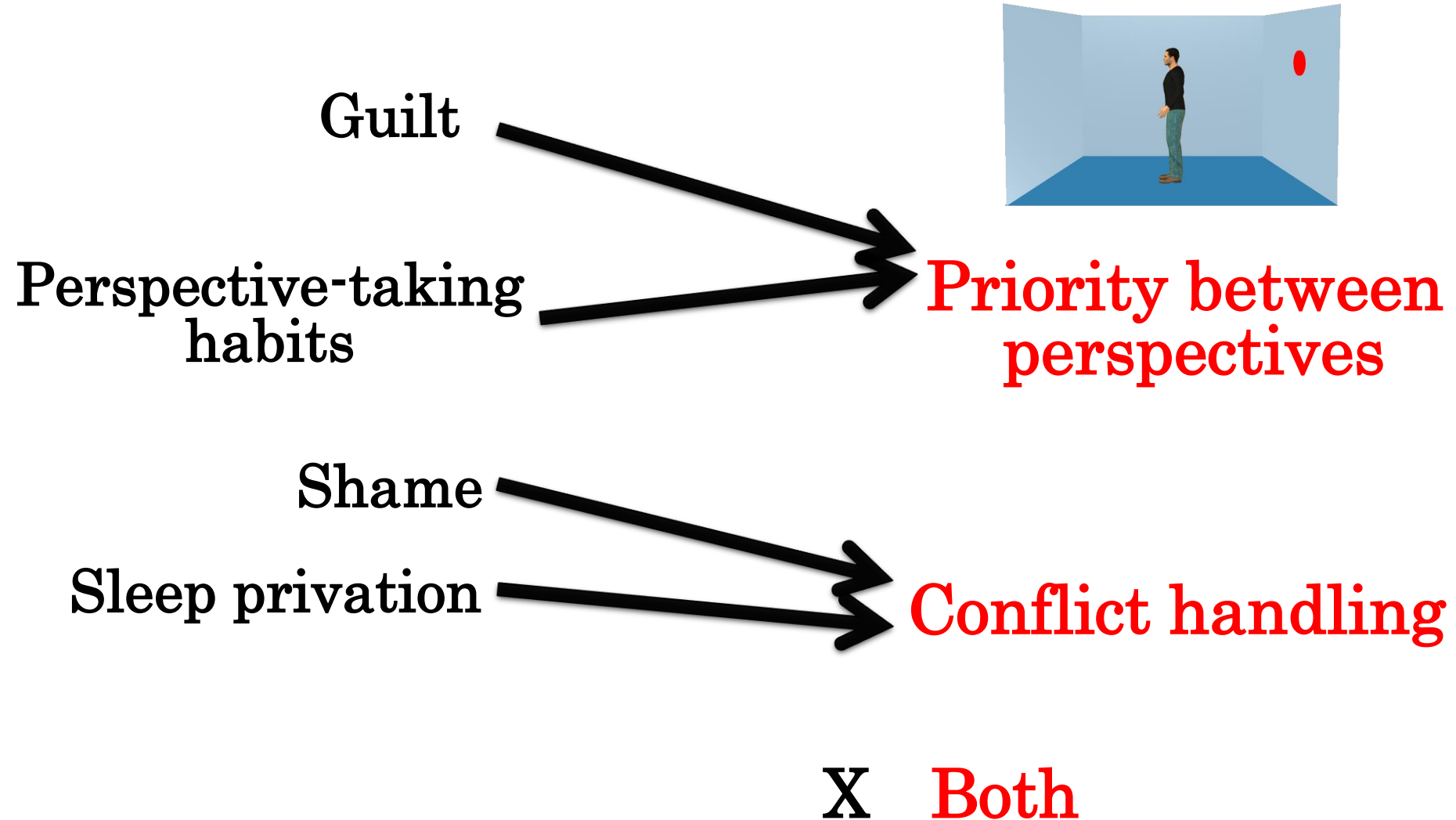
Conflict handling ?
Persp. priority ?
Both ?

Effect of sleep deprivation



Note: VPT performance = $IES = RT / (1 - ER)$

Effects on perspective taking so far...

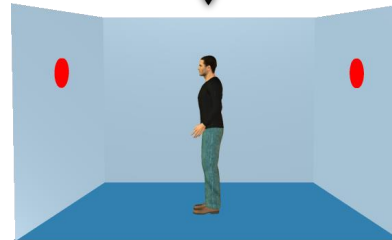




177 participants in neutral
emotional state

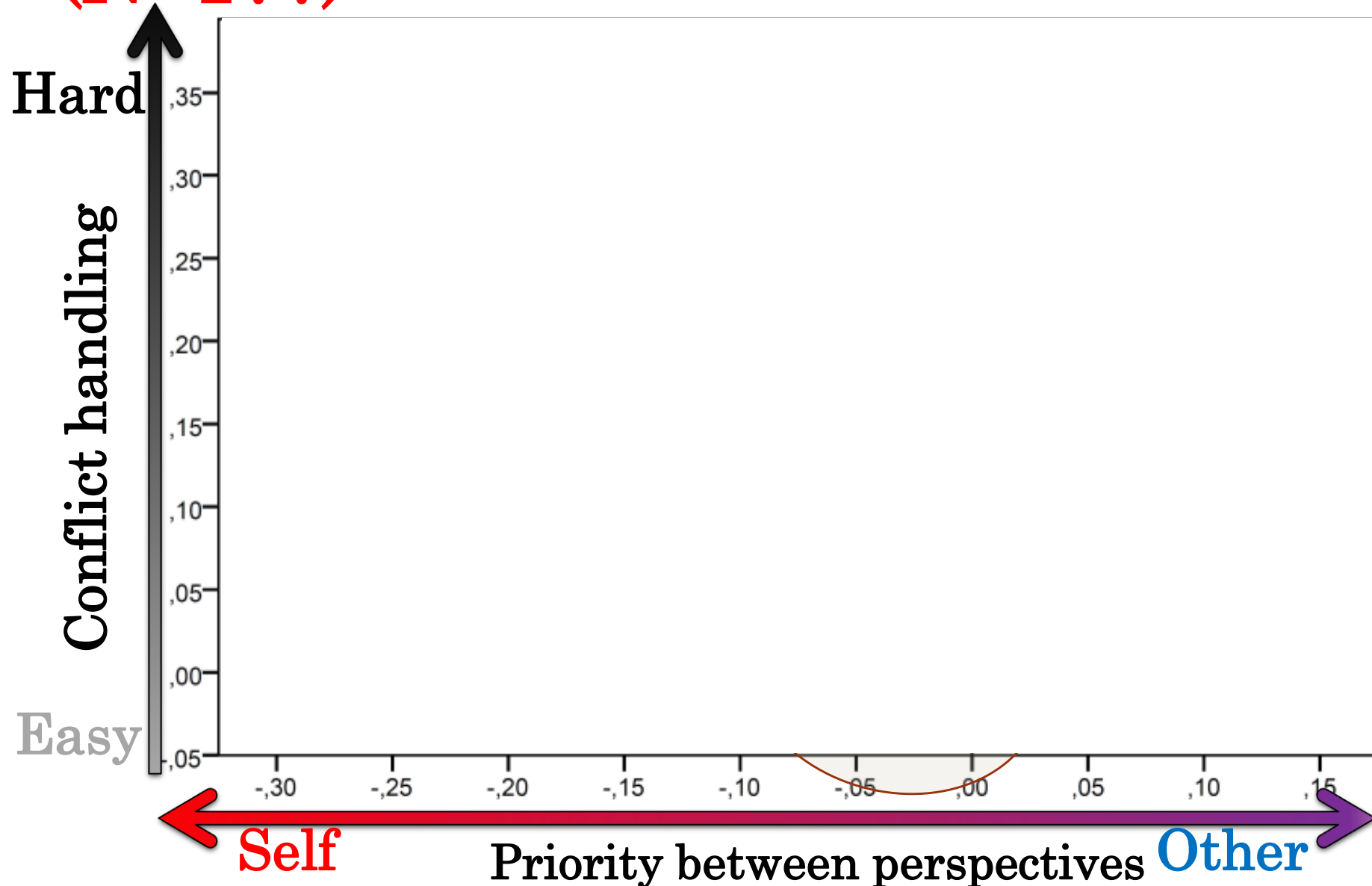


Inter-individual variability



Conflict handling ?
Perspective priority ?
Both ?

Inter-individual variability (N=177)



Score = IES

Bukowski & Samson, 2017

Summary

- Egocentric perspective is **not** prioritized **all the time & for everyone**
- Perspective-taking performance can be measured along two dimensions assumed to reflect:
 1. **The capacity to handle conflicting perspectives**
 2. **The priority between egocentric & altercentric perspectives**
- All factors studied did not influence **overall** perspective-taking performance but **one specific dimension**
 - A **multidimensional** approach in perspective-taking is possible and **useful**

BUT If you don't expect multidimensionality, you won't look for it !
To capture multidimensionality, stop using the usual tasks/analyses!

What about the dual-system?

- Our new dimension highlights that sometimes the altercentric perspective is very salient and even more salient than the self-perspective !
- Efficient mindreading = the information pertaining to the other person's perspective is MORE salient than the self-perspective
- Flexible mindreading = the information pertaining to the other person's perspective is LESS salient than the self-perspective; perspective selection is required.
- ➔ There might be a continuum between efficient and flexible mindreading.



BACK UP SLIDES

Conclusion: Let's deconstruct

- We all know that mindreading encompasses many mechanisms... but we still measure it with a single score !
- I demonstrated the feasibility and usefulness of using multidimensional scores.

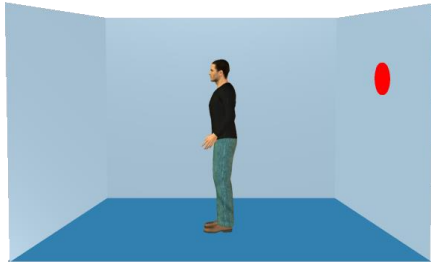
LIMITS:

- We ignored the *inferential process* (how the mental state is created) and the *attribution process* (how mental state is attributed to Self or. Other)
- Conflict handling: We merged cognitive control and self-other distinction
- Priority between Self & Other: Extremely context-specific (cues, mindset)

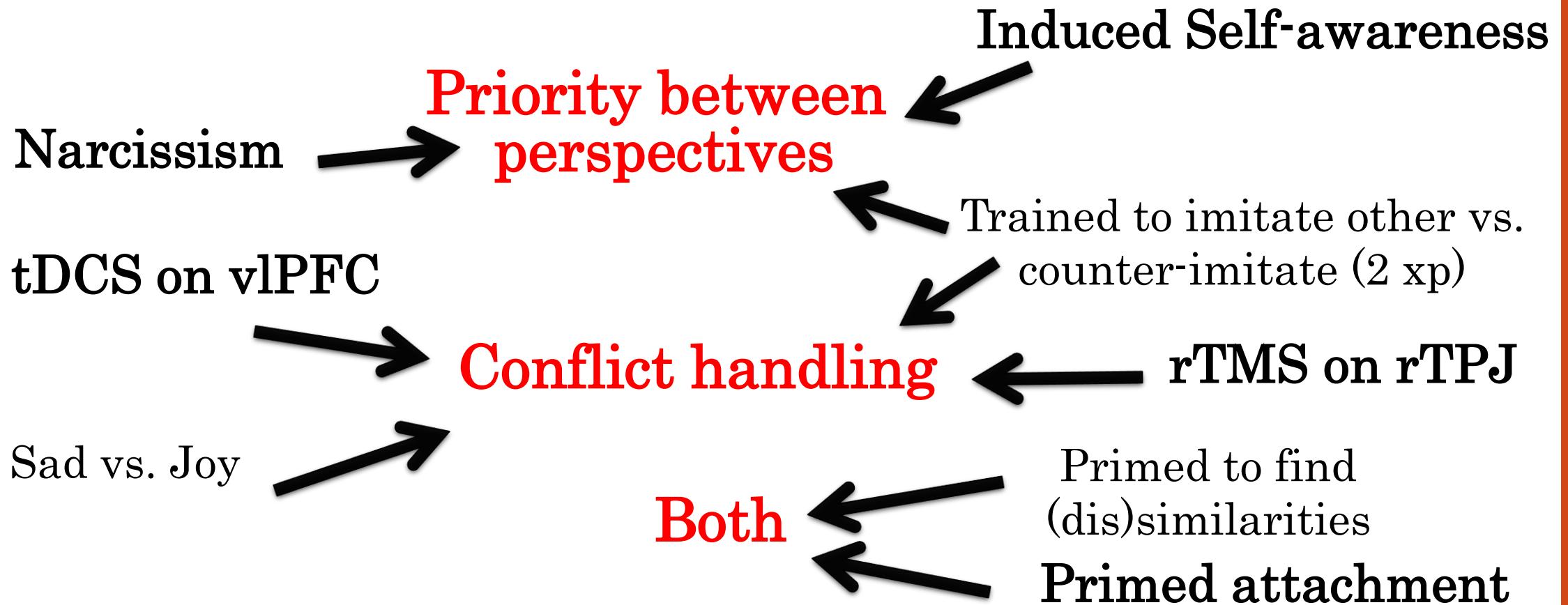
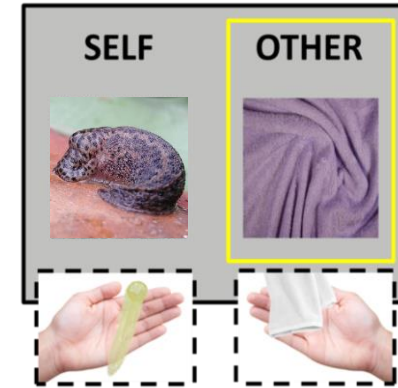
FUTURE:

Isolate the **Self-Other attribution** score

Study impact of **Self-knowledge** (autobio memory, self differentiation, insight, self-awareness)



Unpublished results



Study 1: Influence of social emotions

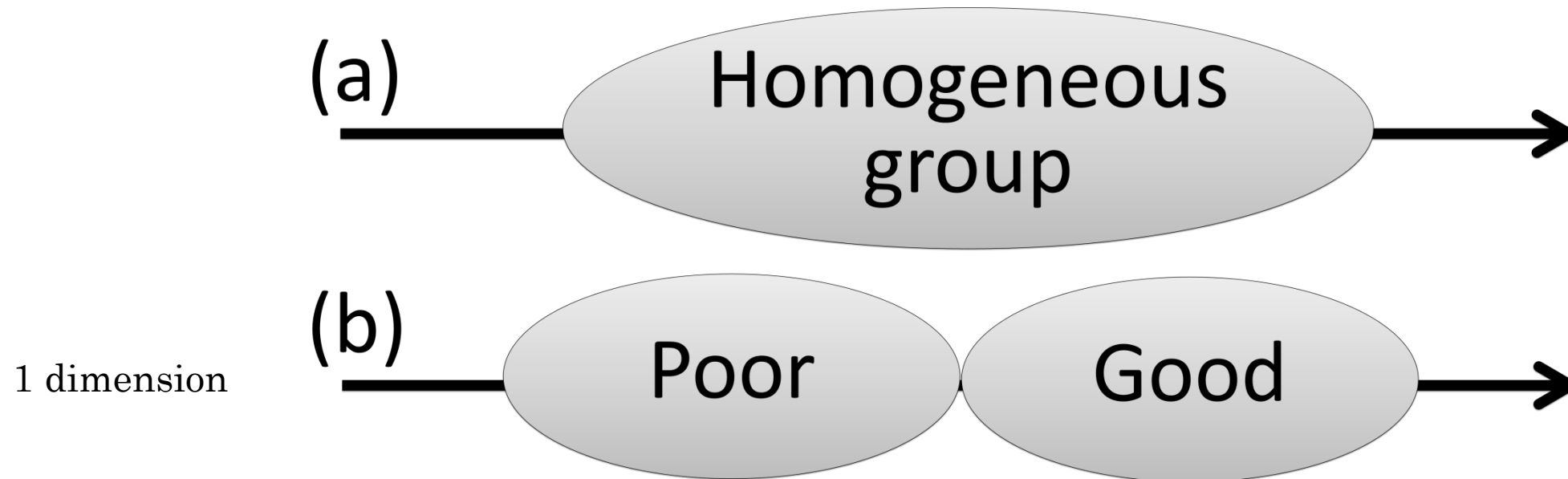


- See also “The Unfair Card Game: a promising tool to assess externalizing behavior in preschoolers”

What about the dual-system?

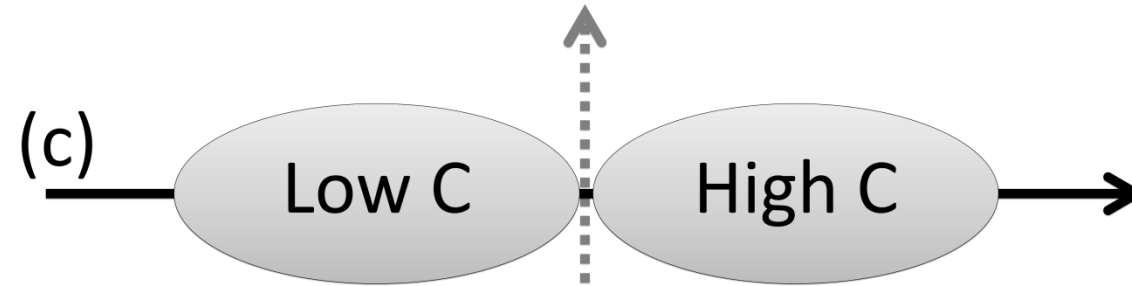
- Does it explain empirical observations?
- **Does it explain it better than previous model?**
- **Is it useful to explain individual differences and disorders?**
- **Do we possess a measure of both systems?**
- **Is there space for further deconstruction of mindreading?**

Cluster hypotheses 1/2

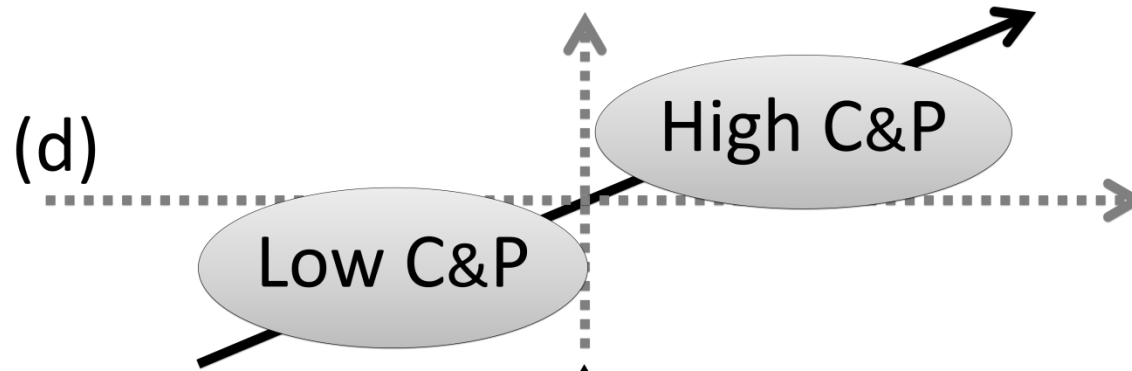


Cluster hypotheses 2/2

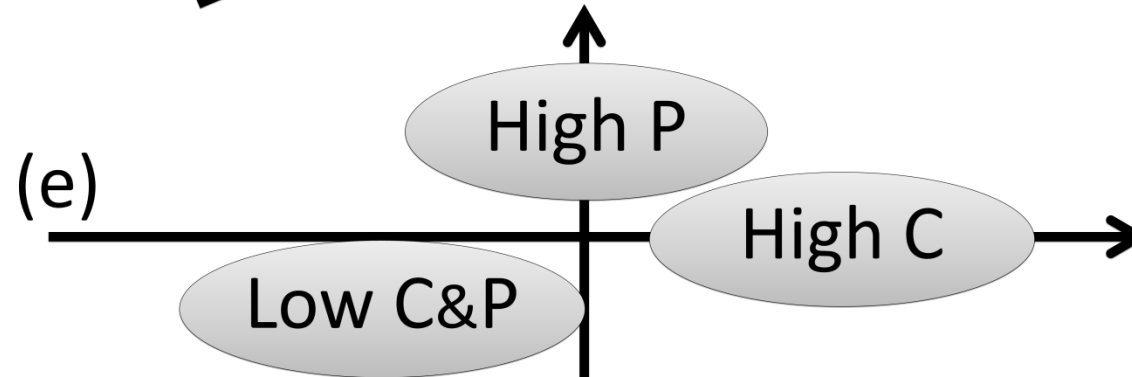
1 dimension



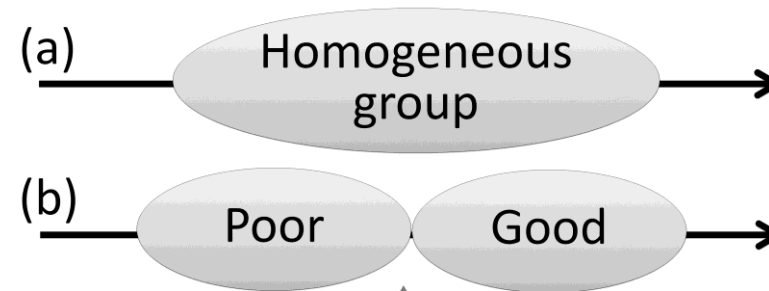
1 dimension



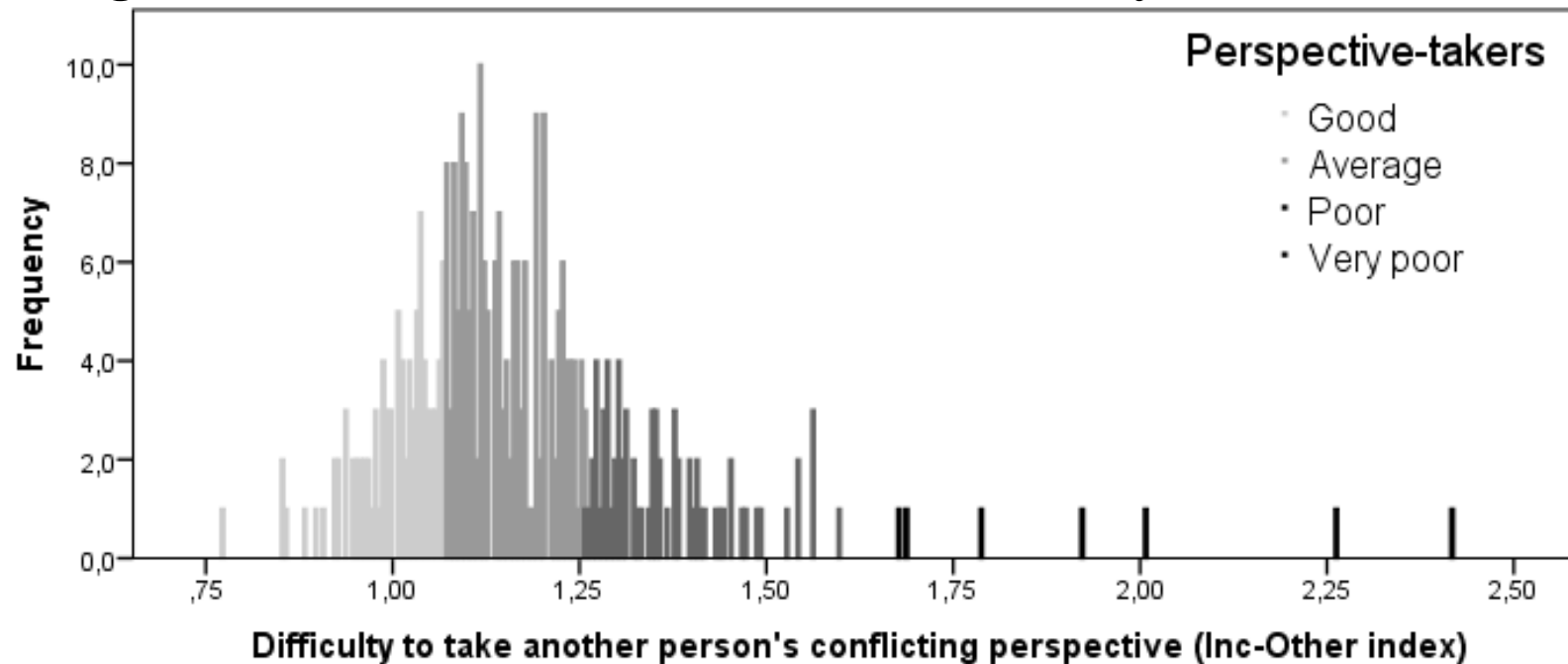
2 dimensions !



Results: Clustering



- One-dimensional:
 - ➔ Significant inter-individual variability (➔ b)

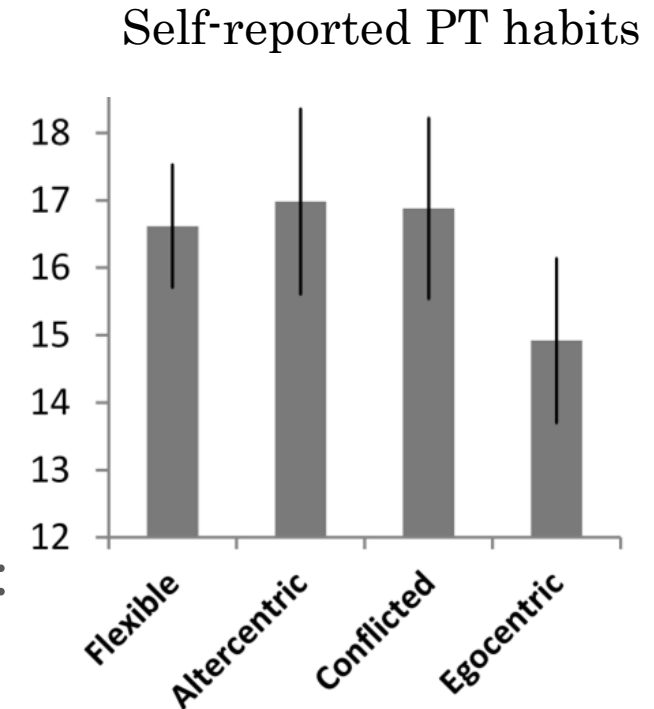


Method

- N = 346 participants, 6 experiments with the VPT task & IRI
 - Guilt, Anger, Shame, Sadness, Happiness, Control conditions
- Clustering methods:
 - Applied to one-dimensional measure of PT : Inc-Other index
 - Applied to two-dimensional measure of PT : C & P indexes
- Regression analyses:
 - Which measure of PT predicts best self-reported PT habits?
 - One- vs. Two-dimensional measure of PT?
- Tests of Independence (χ^2):
 - How profiles of two-dim. PT are distributed across emotion conditions?
 - Profiles of two-dim. PT overlap with one-dim. PT?

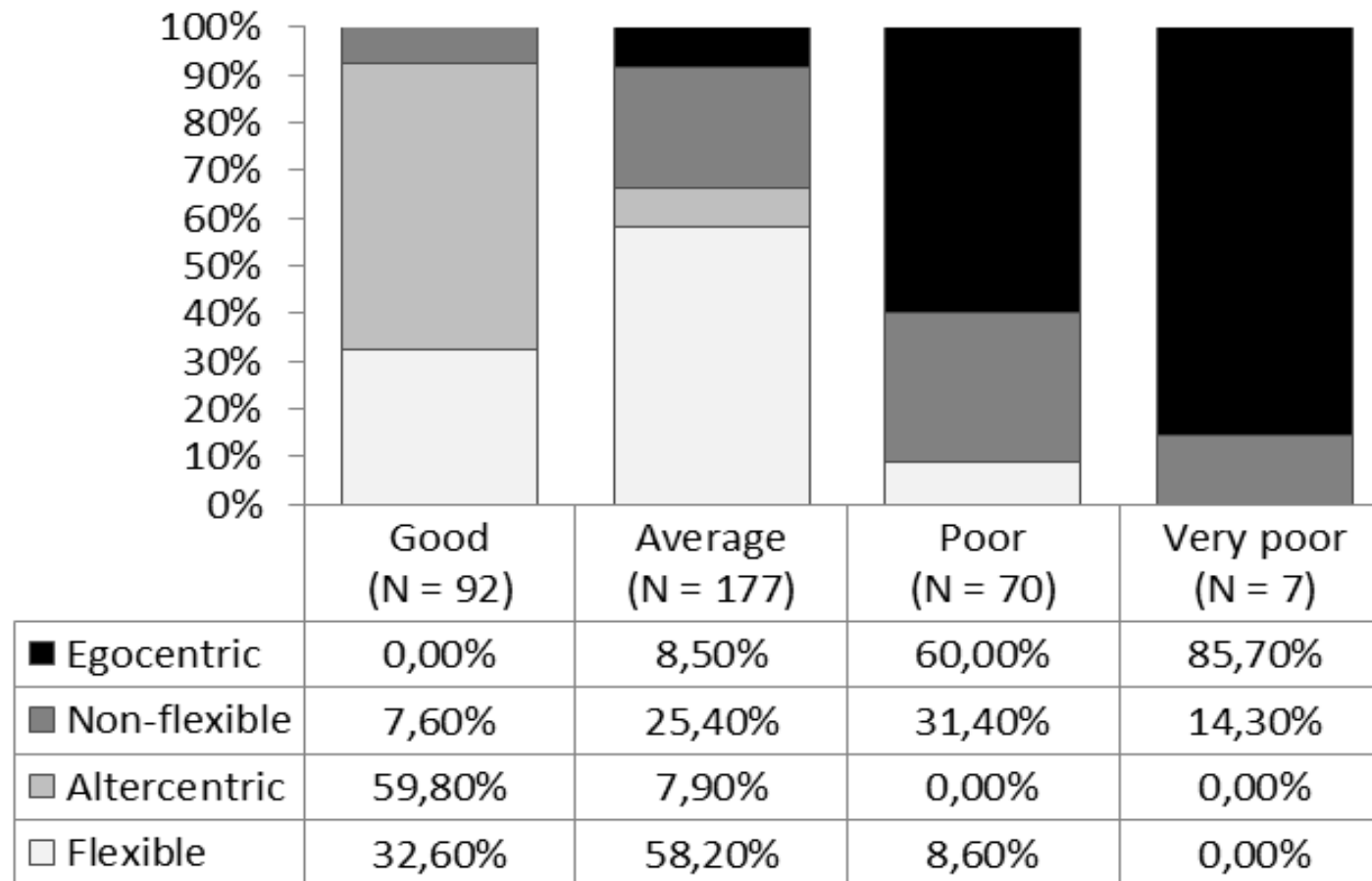
Results: Regression of PT habits

- Which measure of PT predicts best self-reported PT habits?
 - Model 1:
 - Gender ($p = .736$)
 - Inc-Other index ($p = .073$)
 - → $R^2 = .012$, $p = .181$
 - Model 2:
 - Gender ($p = .560$)
 - Consistency index ($p = .672$)
 - Perspective index ($p = .002$)
 - → $R^2 = .034$, $p = .021$
 - → Decomposition into 2 dimensions:
 - → x3 explanatory power
 - → find a more predictive factor



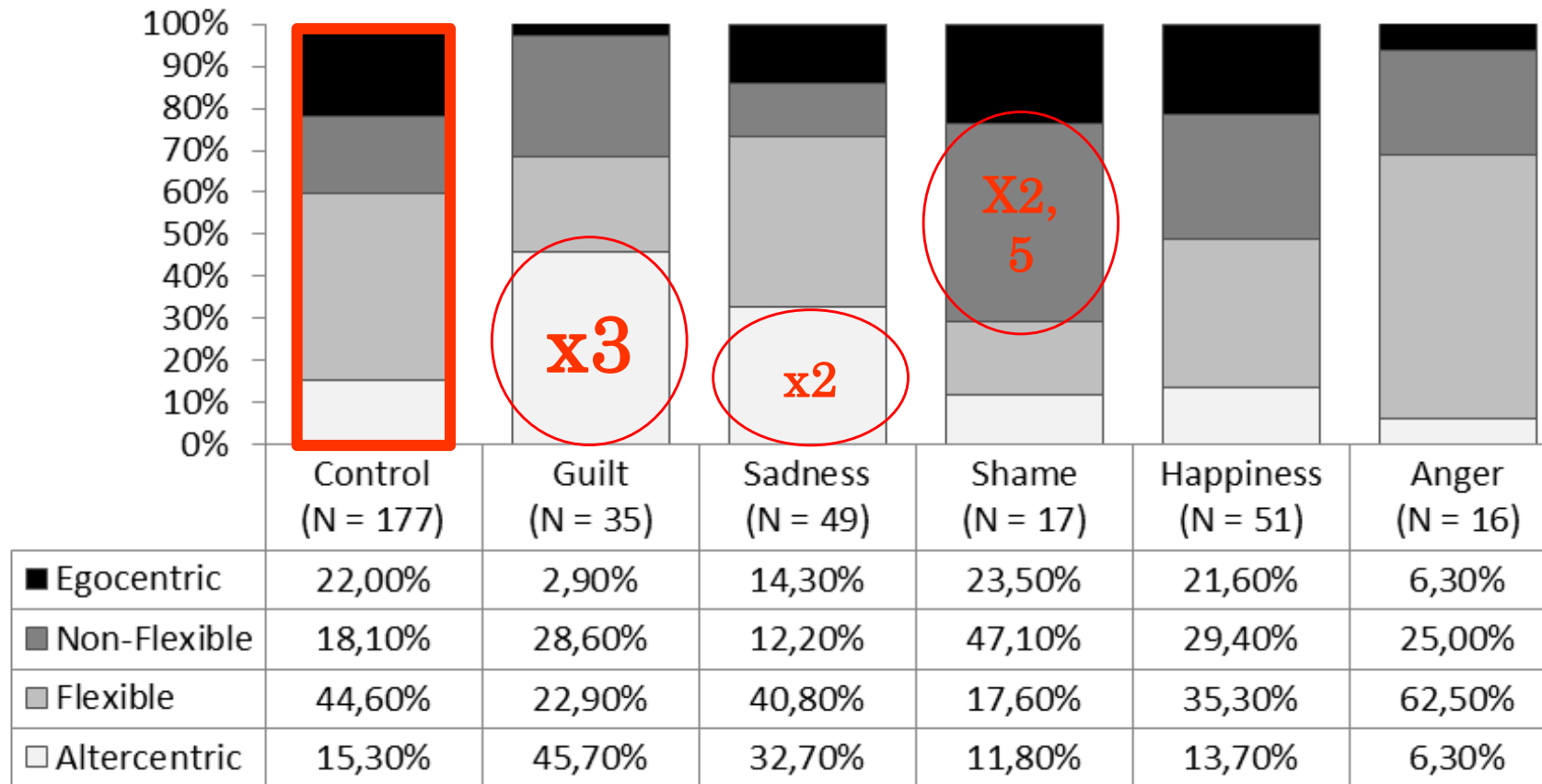
Results: Test of independence

- One-dim. profiles of PT = two-dim. Profiles of PT?
 - Good = 2 profiles dissociated
 - Poor = 2 profiles dissociated
 - ➔ Beyond good versus poor perspective takers!



Results: Test of independence

- Profiles of PT across emotion conditions?



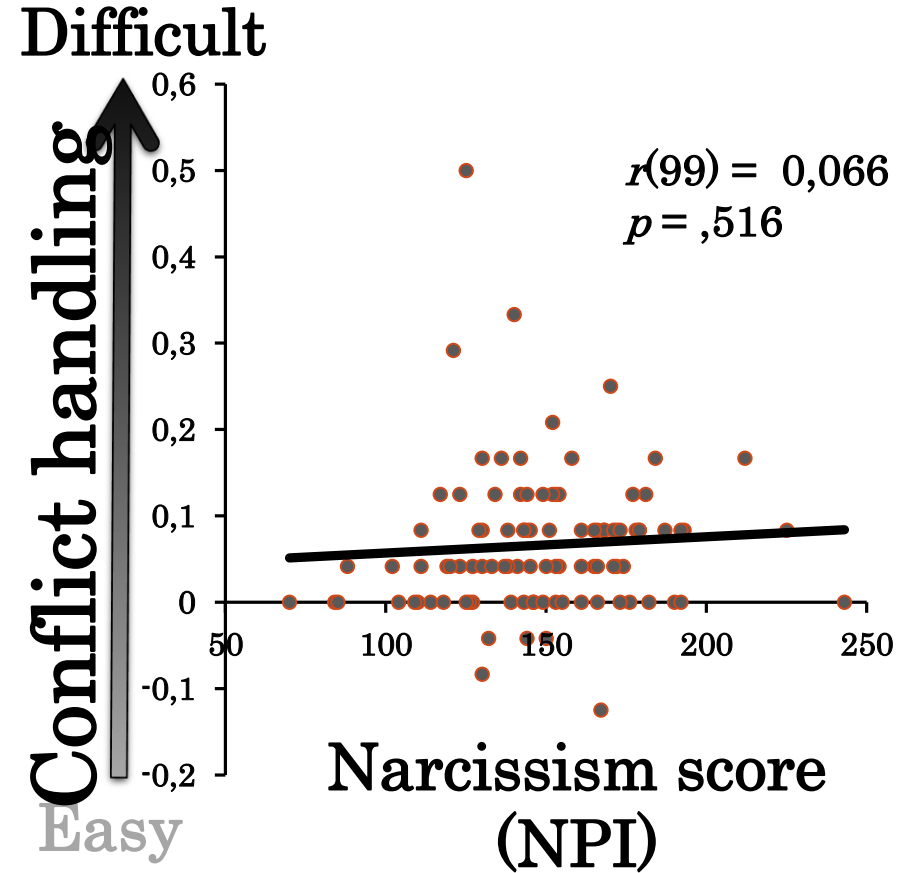
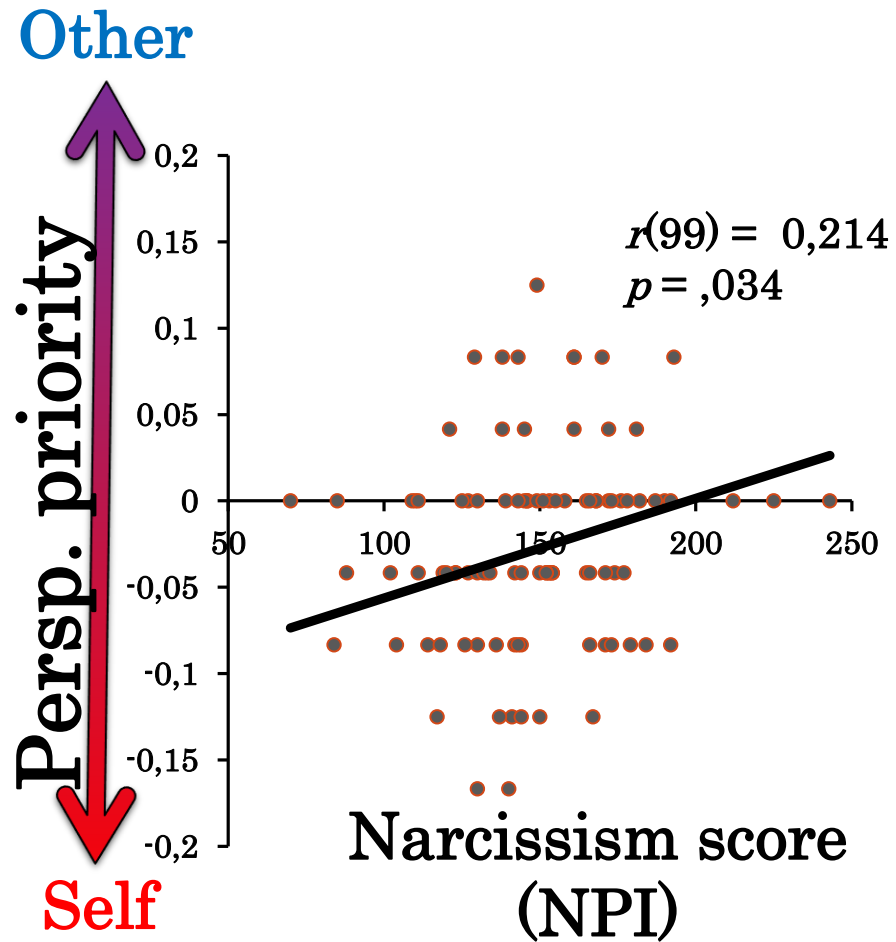
Discussion

- Individuals cluster along two dimensions instead of one!
 - Dissociating PT in two-dimensions predicts better PT habits
 - Traditional “good” and “poor” profiles of perspective-takers can be subdivided in more subtle profiles
 - Different distributions of profiles across emotions
- ➔ A two-dimensional scaling is possible and enriches our understanding of inter-individual differences in perspective-taking.

Multidimensional approach is useful?

- Automatic imitation is negatively correlated with narcissism
 - Hogeveen & Obhi, 2013 → N = 18
 - Obhi, Hogeveen, Giacomin, & Jordan, 2013 → 23
- We found no correlation with N = 97
- IF grouped in 4 profiles of perspective-takers...
 - ... the egocentric perspective-takers (N = 29) replicate previous findings to a even stronger extent

Narcissism

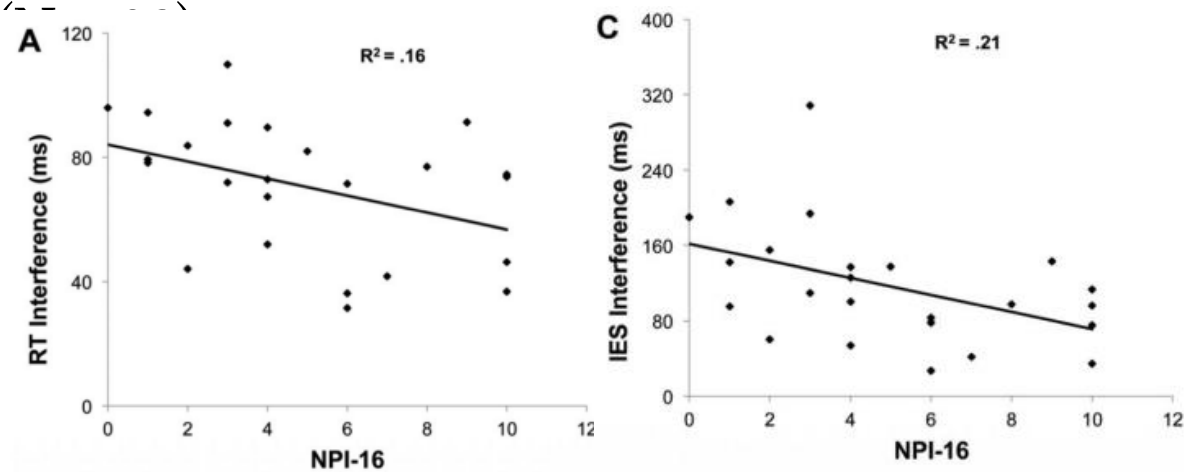


Note: VPT performance = $IES = RT / (1 - ER)$

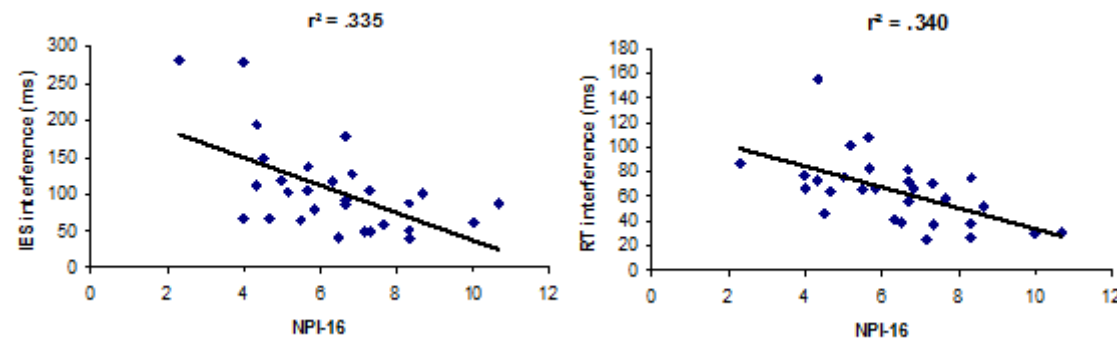
Automatic Imitation Is reduced In Narcissists but only in Egocentric Perspective-Takers

Obhi, Hogeveen, Giacomini, & Jordan, 2013

We could



“Egocentric” perspective-takers ($N = 29$)



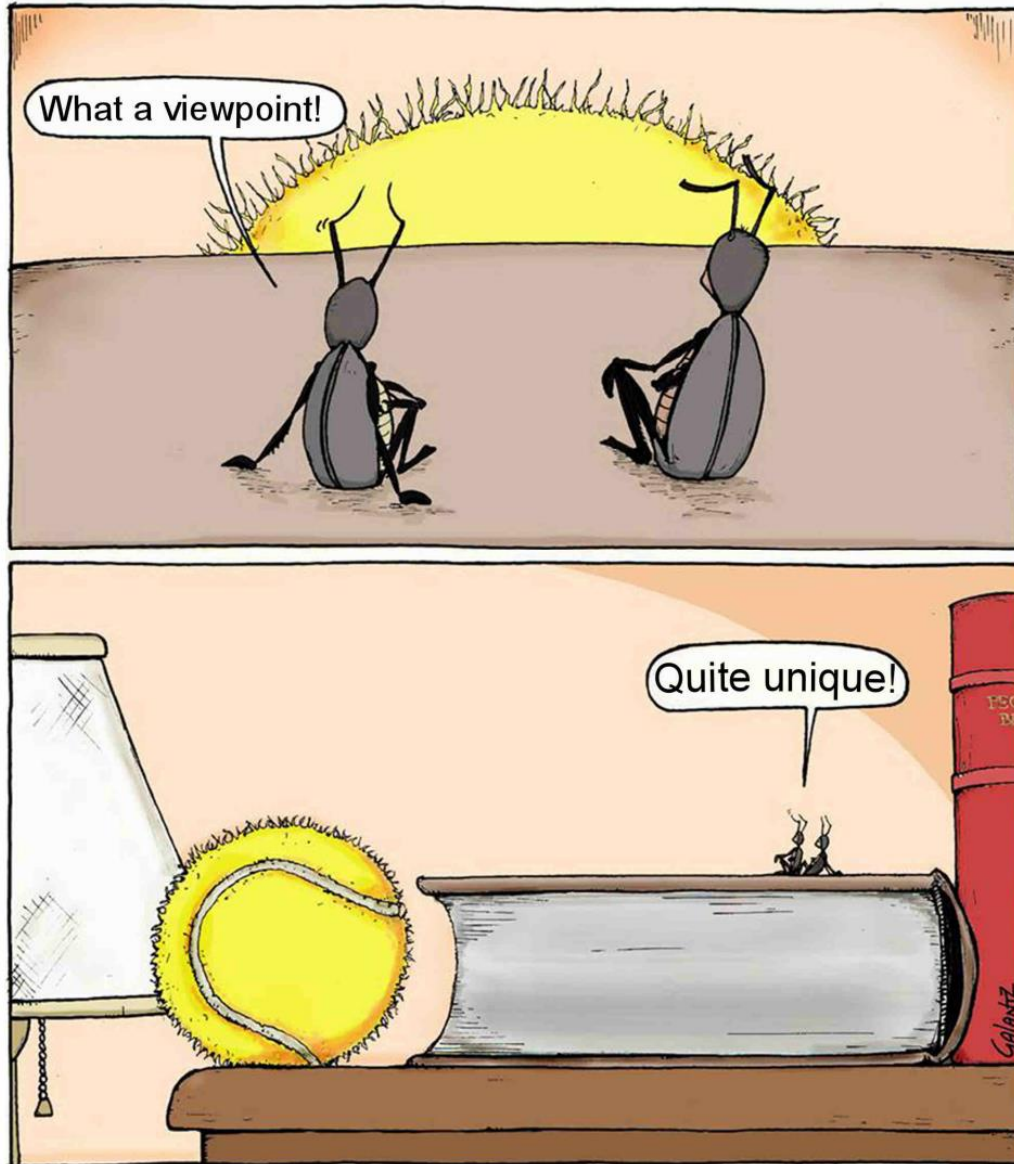
Empathy unpublished results

- rTMS (cTBS) on right TPJ → influence Self-Other conflict handling
- Primed attachment → influence both dimensions: ego vs. alter bias
- Primed to find similarities → influence both dimensions: ego vs. alter bias
- Trained to imitate other vs. counter-imitate → influence Conflict, then Perspective
- Induced self-awareness → influence Perspective priority

Mentalizing unpublished results

- Narcissism trait → influence Perspective priority
- Sad vs. Joy → influence Conflict handling
- tDCS on vlPFC → influence Conflict handling

A dynamic and multidimensional approach



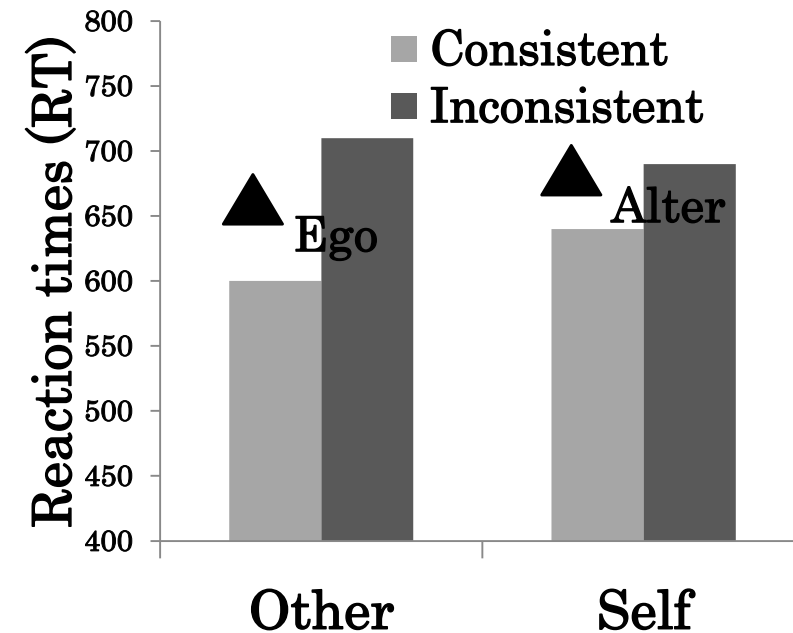
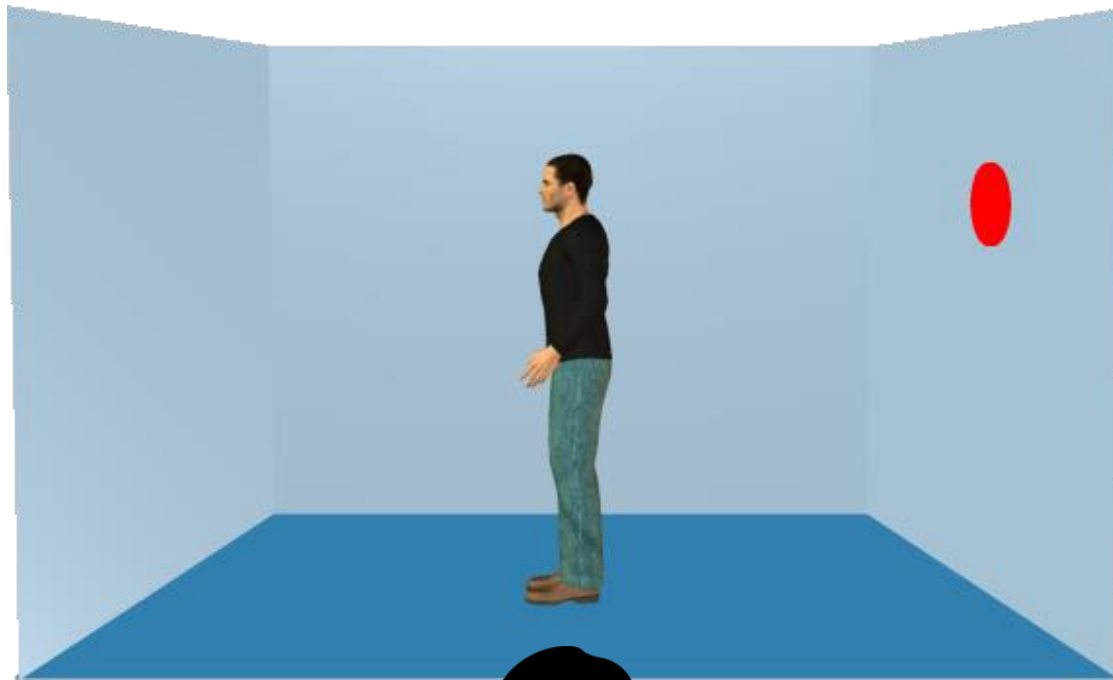
- Soc Psych tradition: **Anchoring** (rely on most available info = egocentric info) and **Adjustment** (correction based on contextual cues)
- → emphasis on the **selection/inhibition** of relevant/irrelevant perspective

Self-Other Distinction (SOD)

- Broad definition:
 - Our repertoire of representations is easily and interchangeably used to represent other people's characteristics and their mental life.
 - Self-other distinction (SOD) allows to clearly set apart self- and others' representations.
- SOD *failure* outside social cognition:
 - Self-ownership of body → feeling of ownership for non-self body parts
 - Self-agency → feeling of being the agent/cause of non-self actions
 - Self-recognition → erroneous recognition as self-voice, face, body shape, ...
- SOD *failure* in social cognition:
 - Motor domain → **automatic imitation** of others' movements
 - Affective domain → personal distress and biased **empathy**
 - Cognitive domain → biased **mentalizing/Theory of Mind**

Mentalizing: Visual perspective-taking

“Does HE see 1 disc?”



Samson, Apperly, Braithwaite,
Andrews, & Bodley Scott, 2010

$$\text{SOD} = \blacktriangle_{\text{Ego}} + \blacktriangle_{\text{Alter}}$$

Dot paradigm design

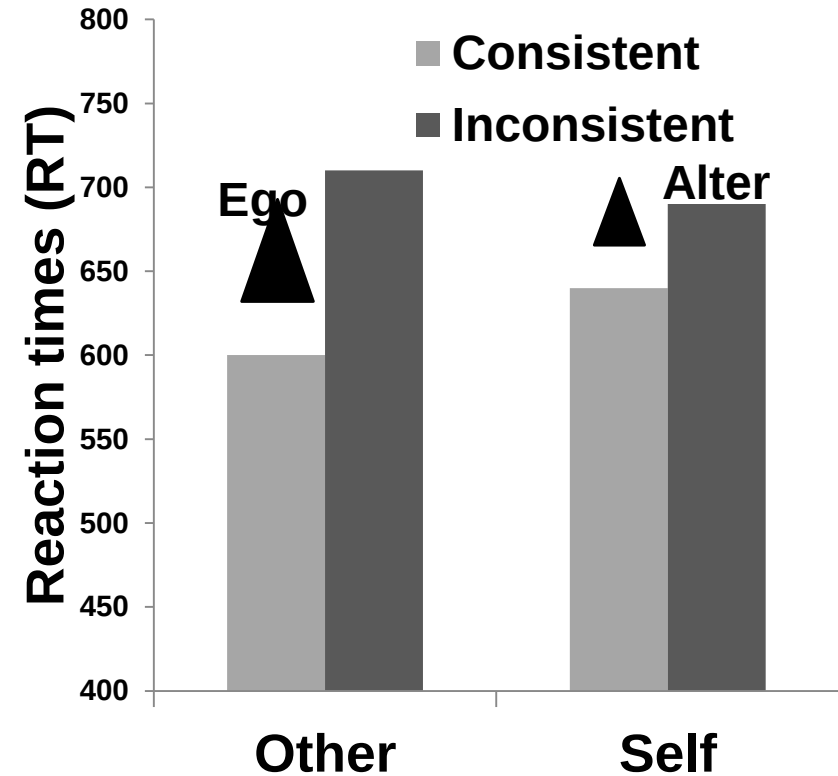
50% Other-perspective judging
50% Self-perspective judging

50% Consistent perspectives
50% Inconsistent perspectives

50% Match « yes » response
50% Mismatch « no » response

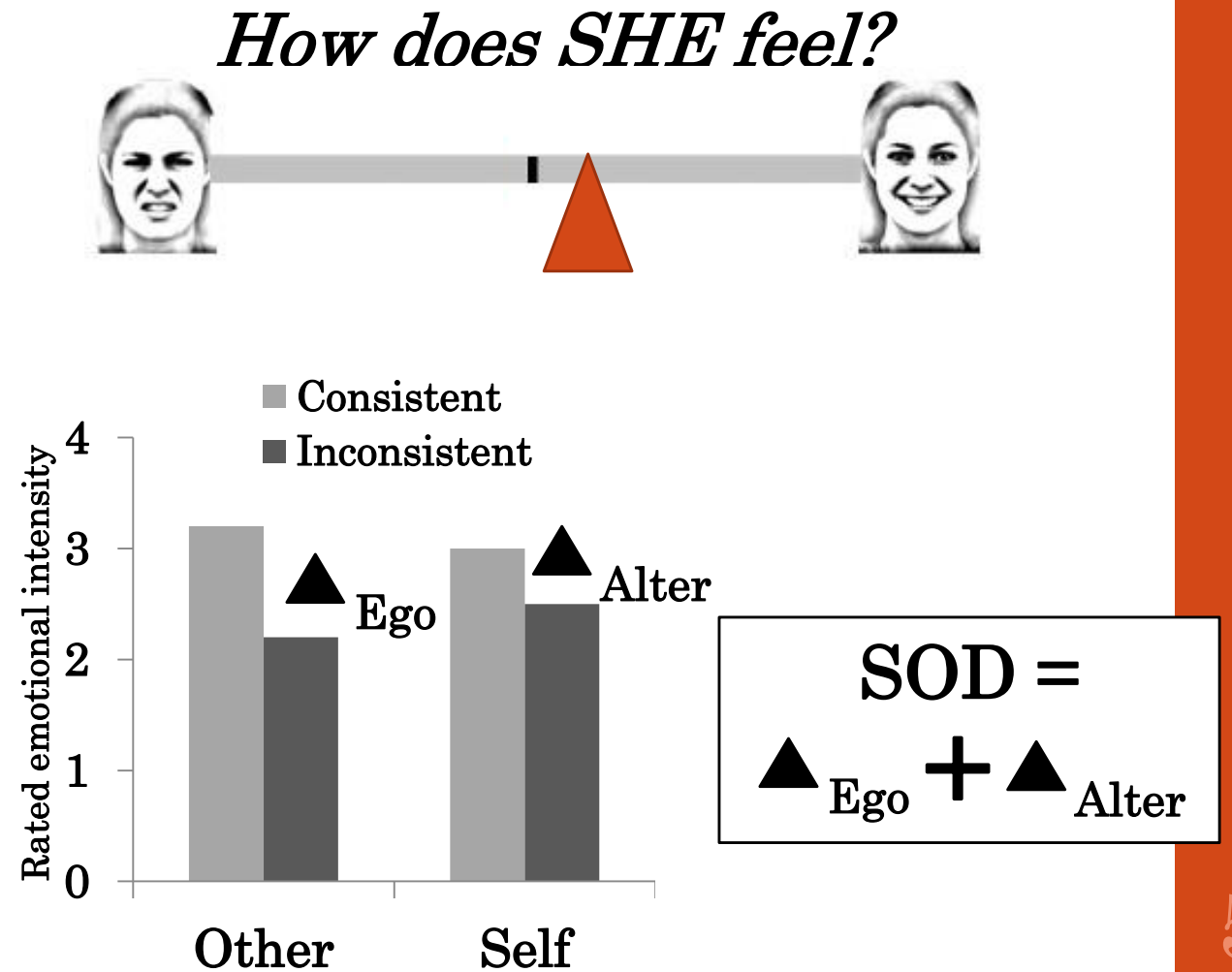
Practice + 4 Blocks of 52 trials = 22 min
(24 trials per condition cell)

Practice + 2 Blocks of 52 trials = 12 min
(12 trials per condition cell)



Small or no Main effect of Perspective
Strong Main effect of Consistency
Interaction Perspective x Consistency
Egocentric bias > Altercentric bias

Visuotactile empathy



Dim 1 = Priority between perspectives

		Other judgment	vs.	Self judgment
Congruent	vs.	YOU 		YOU 
		OTHER 		OTHER 
Incongruent	vs.	YOU 		YOU 
		OTHER 		OTHER 

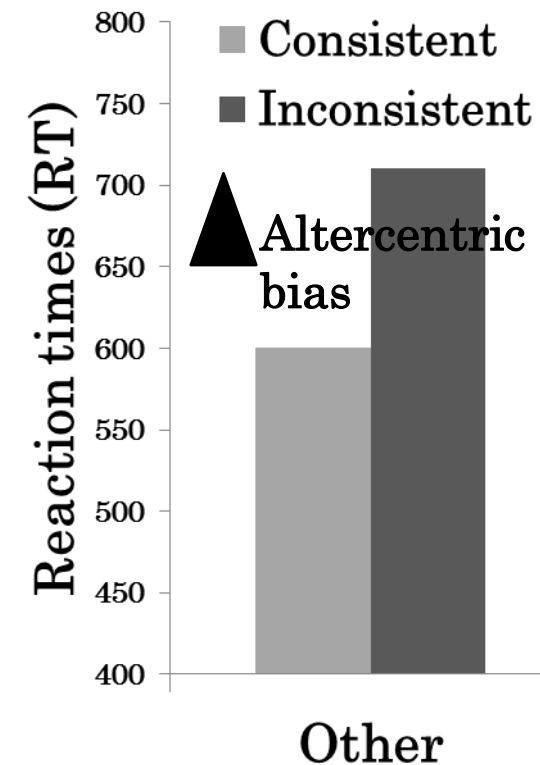
Automatic imitation

When you see
« 1 », raise
your index
finger

Consistent



Inconsistent



SOD =

▲ Alter