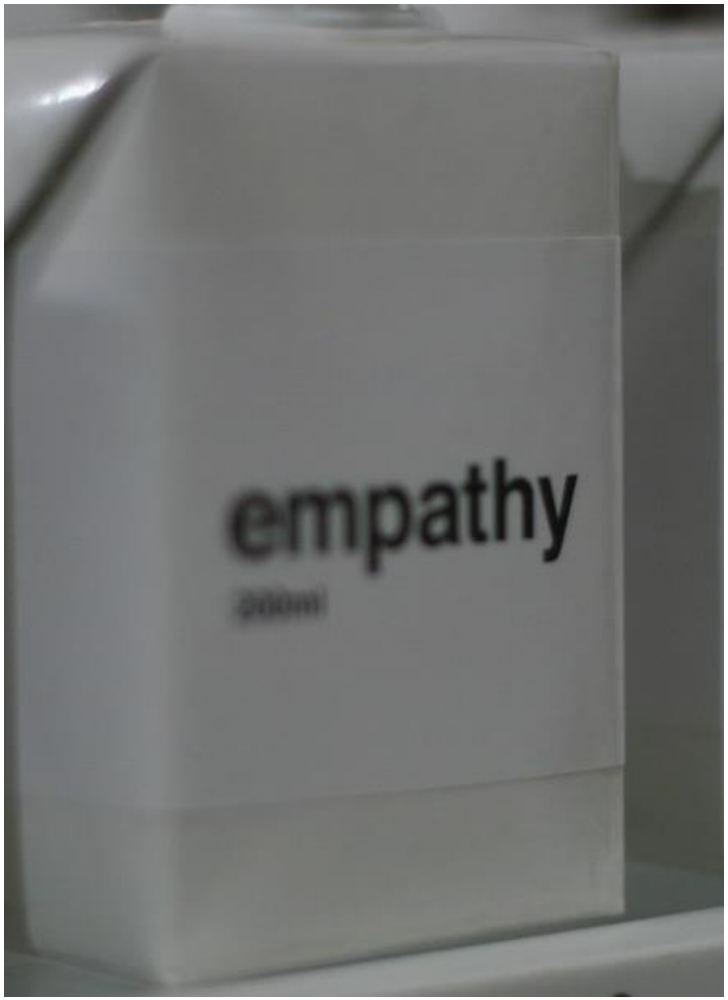
#CYBERPSYCHOLOGY

Exploring

the multiples facets of empathy

through interactive psychometrics



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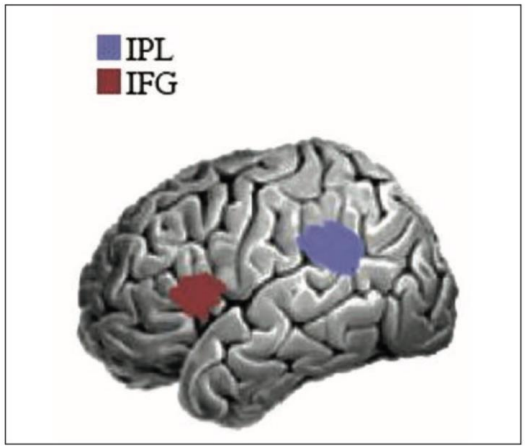
Empathy, a multidimensional concept

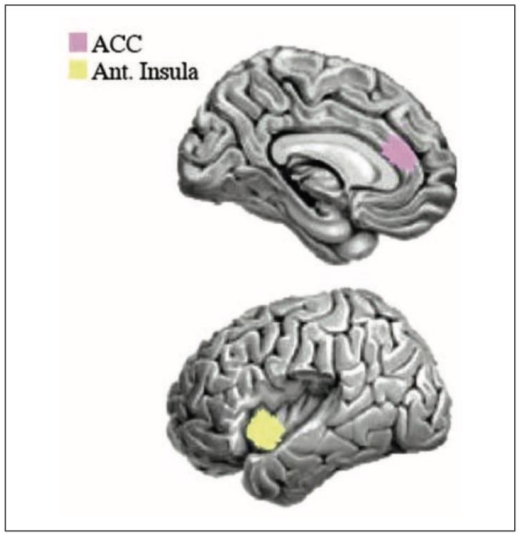
Cognitive

Ability to attribute **independent mental** states to self and others (Frith & Happé, 1999)

Affective

Experience the emotions and feelings of others with a **minimal distinction** between self and other (Decety, 2010)





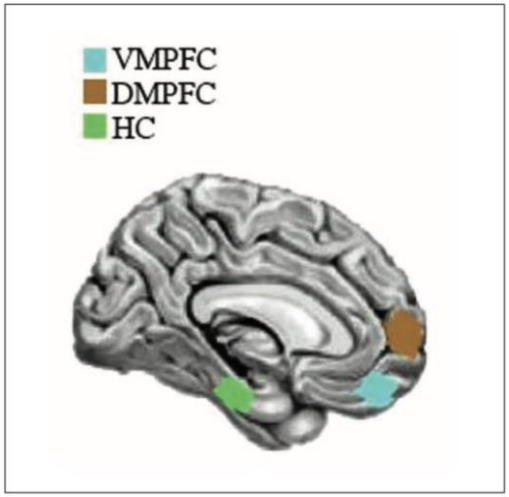


Figure from Shamay-Tsoory, 2011

Motor synchrony, the bedrock of empathy?

Spontaneous ?

Discovery and debate about mirror neurons network (Gallese et al., 1996; Bekkali et al., 2020)

Driven by social cues ?

Mimicry is modulated by social context (e.g., power, need for social inclusion)

(Dalton et al., 2010; Richardson et al., 2019)

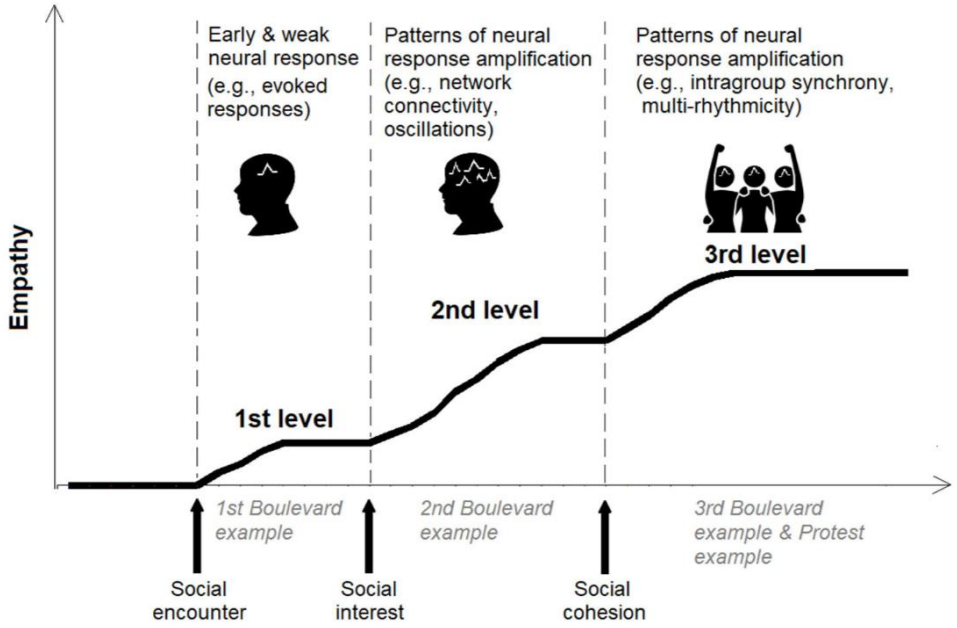


Figure from Levy & Bader, 2020

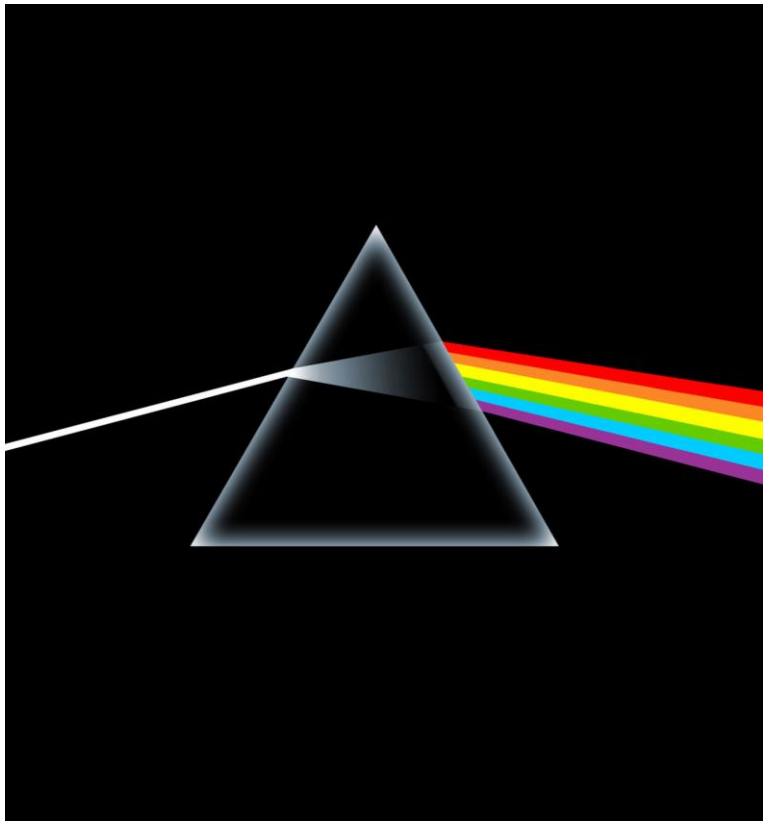
”Dark side” of empathy

Require self-regulation

Driven by motivational aspects

⇒ Role of emotion regulation and self-other distinction

(Decety & Sommerville, 2003; Zaki, 2014).



Optical dispersion
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Robot Touch GIF
by GIF Maker

Goal
of the study

Does a virtual agent could help us to disentangle the relationship between facets of empathy and their association with self-regulation?

Research questions and hypotheses

1. How facets of empathy are associated with motor synchronization and self-other distinction ?

⇒ **Positive association between cognitive facets and motor synchronization and positive association between affective empathy and self-other overlap (Decety, 2010; Novembre et al. 2014; 2019)**

2. How emotion dysregulation influences these associations ?

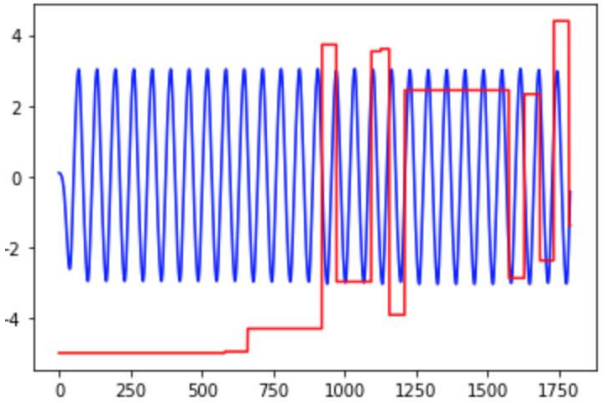
⇒ **Emotion dysregulation modulates the effect of empathy on motor synchronization and self-other overlap (Decety & Sommerville, 2003; Zaki, 2014)**

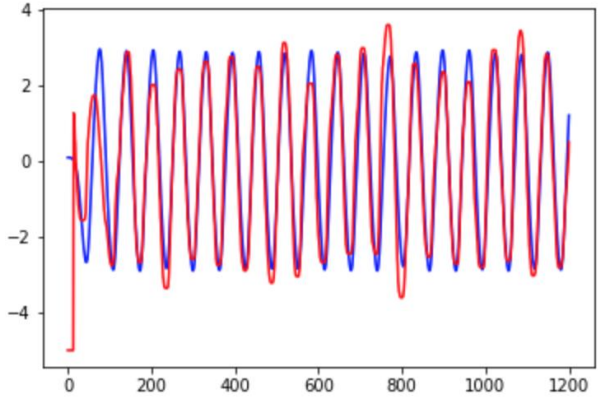
Method (*N* = 150)

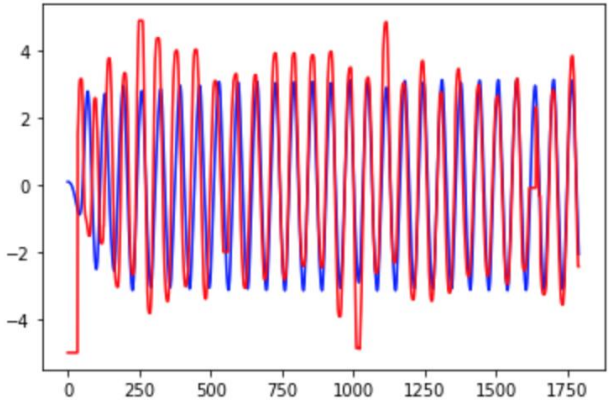
1. **Self-report**
   Questionnaire of Cognitive and Affective Empathy (QCAE; Reniers et al., 2011); Difficulties in Emotion Regulation (DERS; Gratz & Roemer, 2004)

2. **Motor coordination**
   Movements synchronization with a cooperative or competitive virtual agent (Dumas et al., 2014)

3. **Agent perception**
   Perception of similarity and closeness with the virtual agent







Population

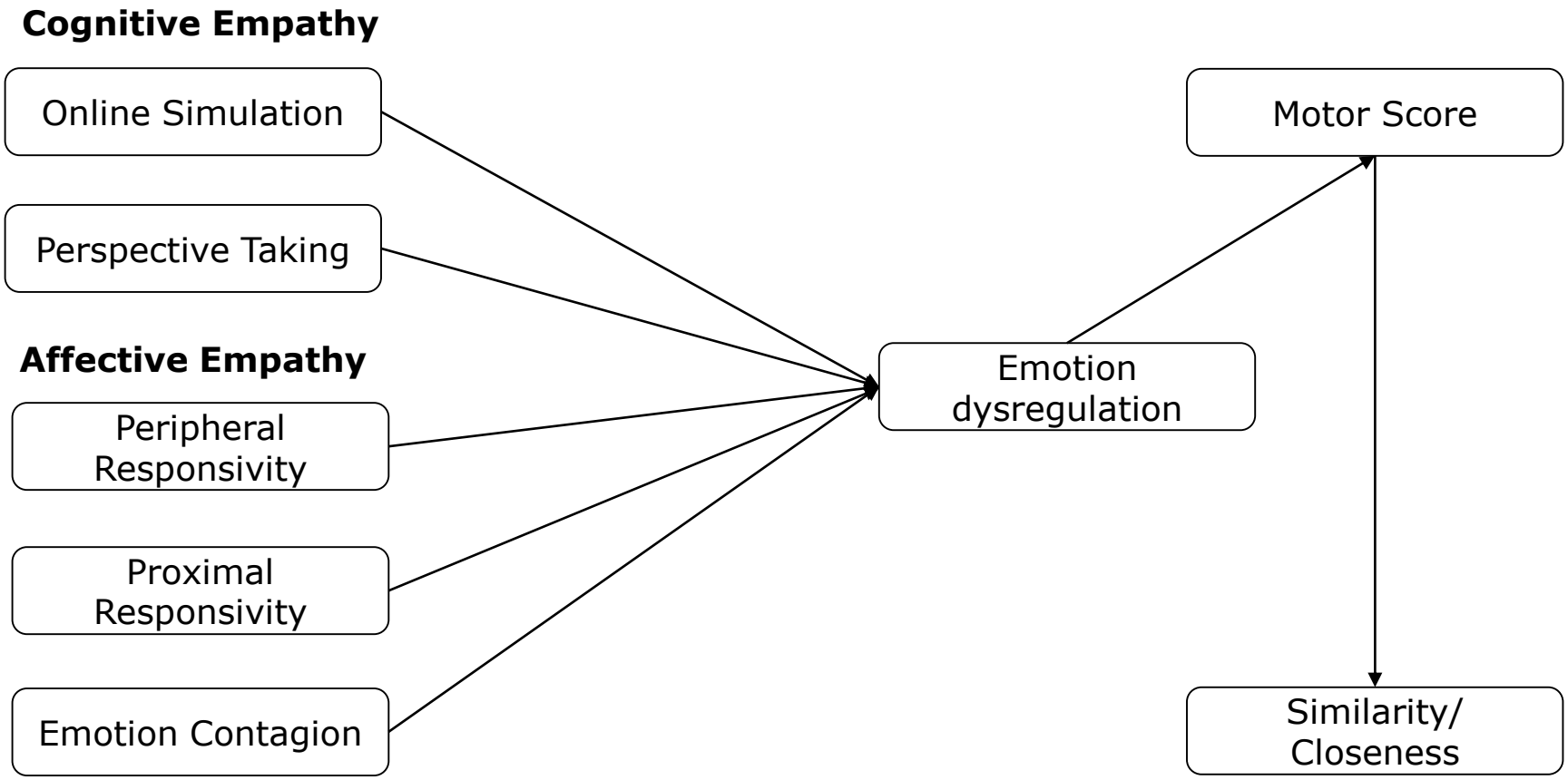
	Cooperation (*N* = 79)	Competition (*N*=71)
Age	**35.67 ± 10.45**	**36.82 ± 10.79**
Gender	**45 men (34 women)**	**44 men (27 women)**
Nationality	**66 US (13 others)**	**64 US (7 others)**
- Cognitive empathy		
Online Simulation	**26.68 ± 5.48**	**26.32 ± 5.81**
Perspective Taking	**30.37 ± 6.04**	**29.70 ± 6.32**
- Affective empathy		
Peripheral responsivity	**9.95 ± 2.57**	**10.35 ± 2.44**
Proximal responsivity	**11.58 ± 2.79**	**11.39 ± 2.44**
Emotion contagion	**10.90 ± 2.94**	**11.15 ± 2.65**
Emotion dysregulation	**89.30 ± 30.59**	**91.24 ± 27.60**

Correlations

	α	Motor score	OS	PT	Per	Prox	EC	Dys
- Cognitive empathy								
Online Simulation (OS)	*0.87*	**0.28***	1.00					
Perspective Taking (PT)	*0.89*	0.14	**0.69***	1.00				
- Affective empathy								
Peripheral Responsivity (Per)	*0.67*	**0.45***	0.10	-0.06	1.00			
Proximal Responsivity (Prox)	*0.73*	0.16	**0.63***	**0.62***	0.04	1.00		
Emotion Contagion (EC)	*0.78*	< 0.01	**0.28***	**0.25***	-0.20	**0.49***	1.00	
Emotion dysregulation (Dys)	*0.94*	**-0.53***	**-0.34***	**-0.23***	**-0.37***	-0.14	0.14	1.00
Similarity - Closeness (S/C)		**-0.36***	-0.06	0.11	**-0.33***	0.02	0.15	**0.30***

Path modelling - SEM

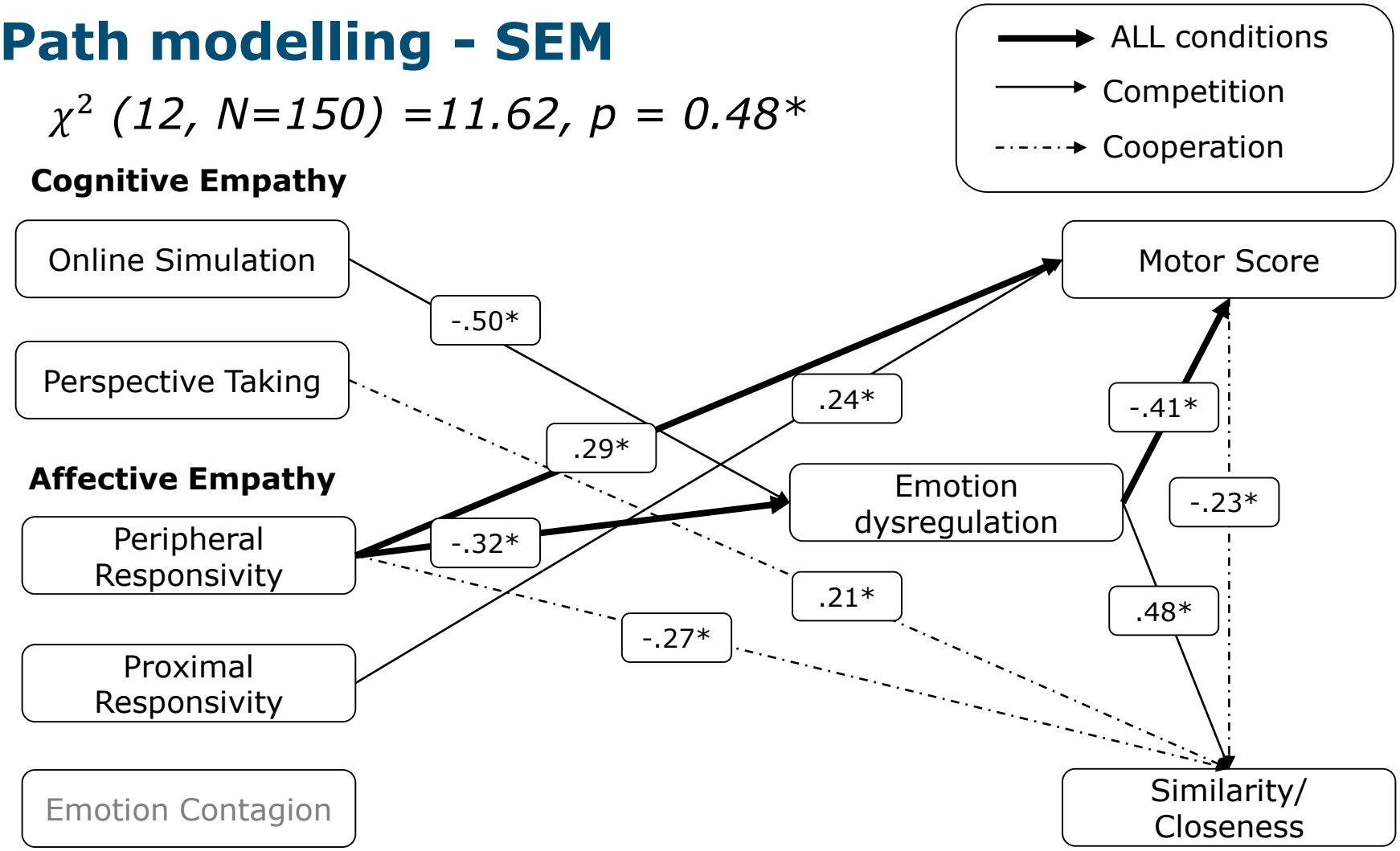
χ^2 *(22, N=150) =63.35, p < 0.01**



**In SEM, the null hypothesis = model fits the data*

Path modelling - SEM

χ^2 *(12, N=150) =11.62, p = 0.48**



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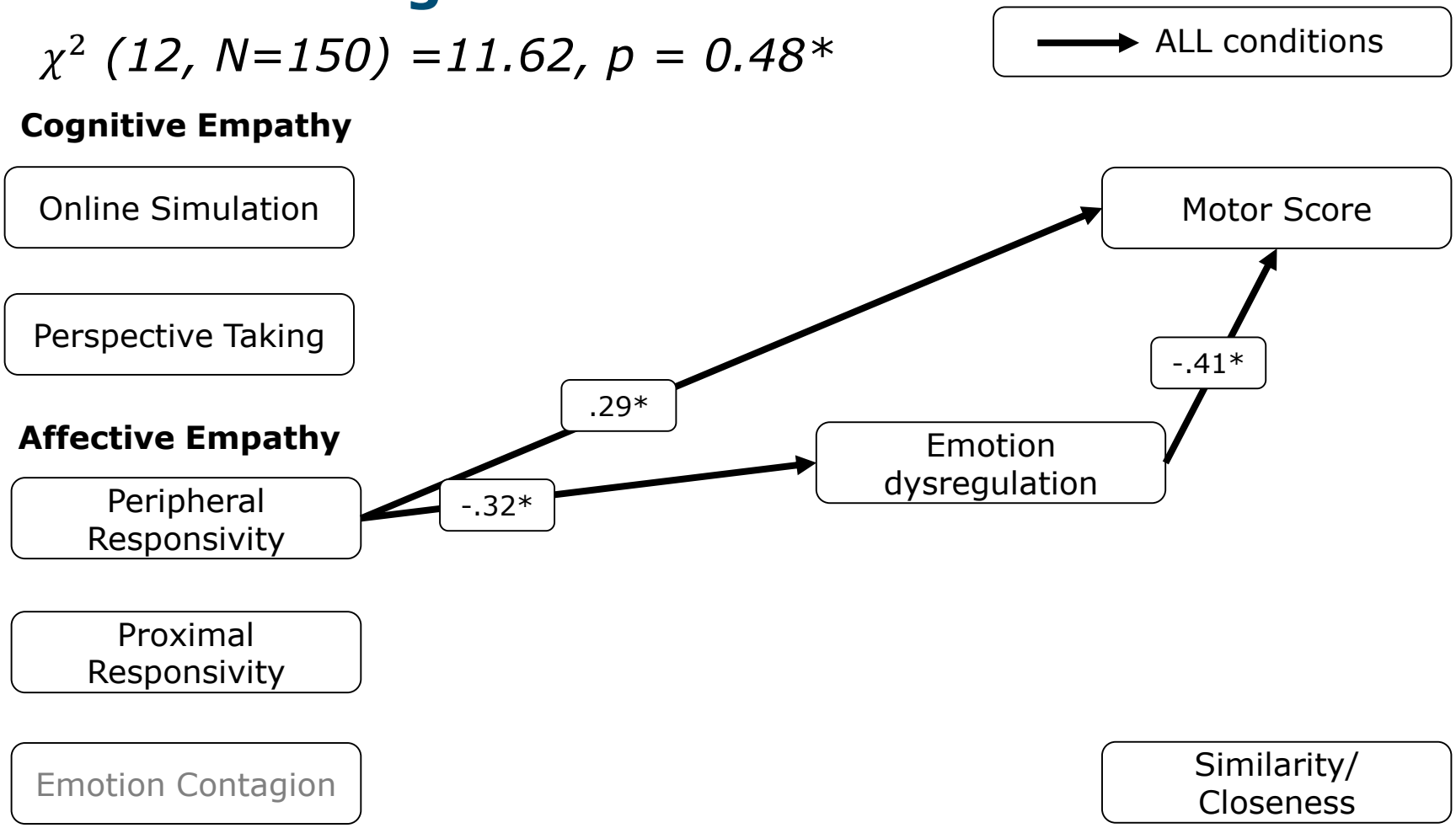

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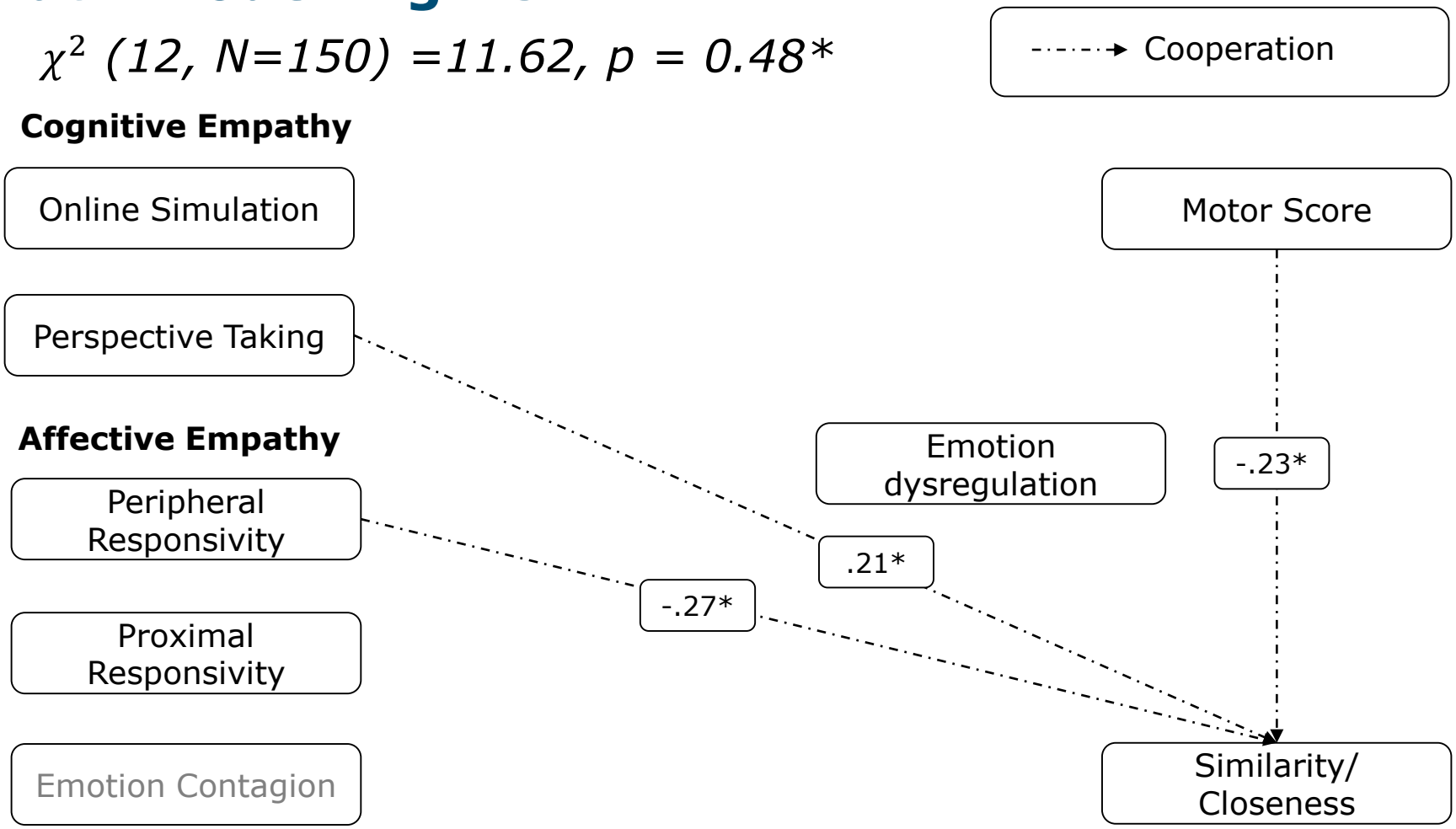

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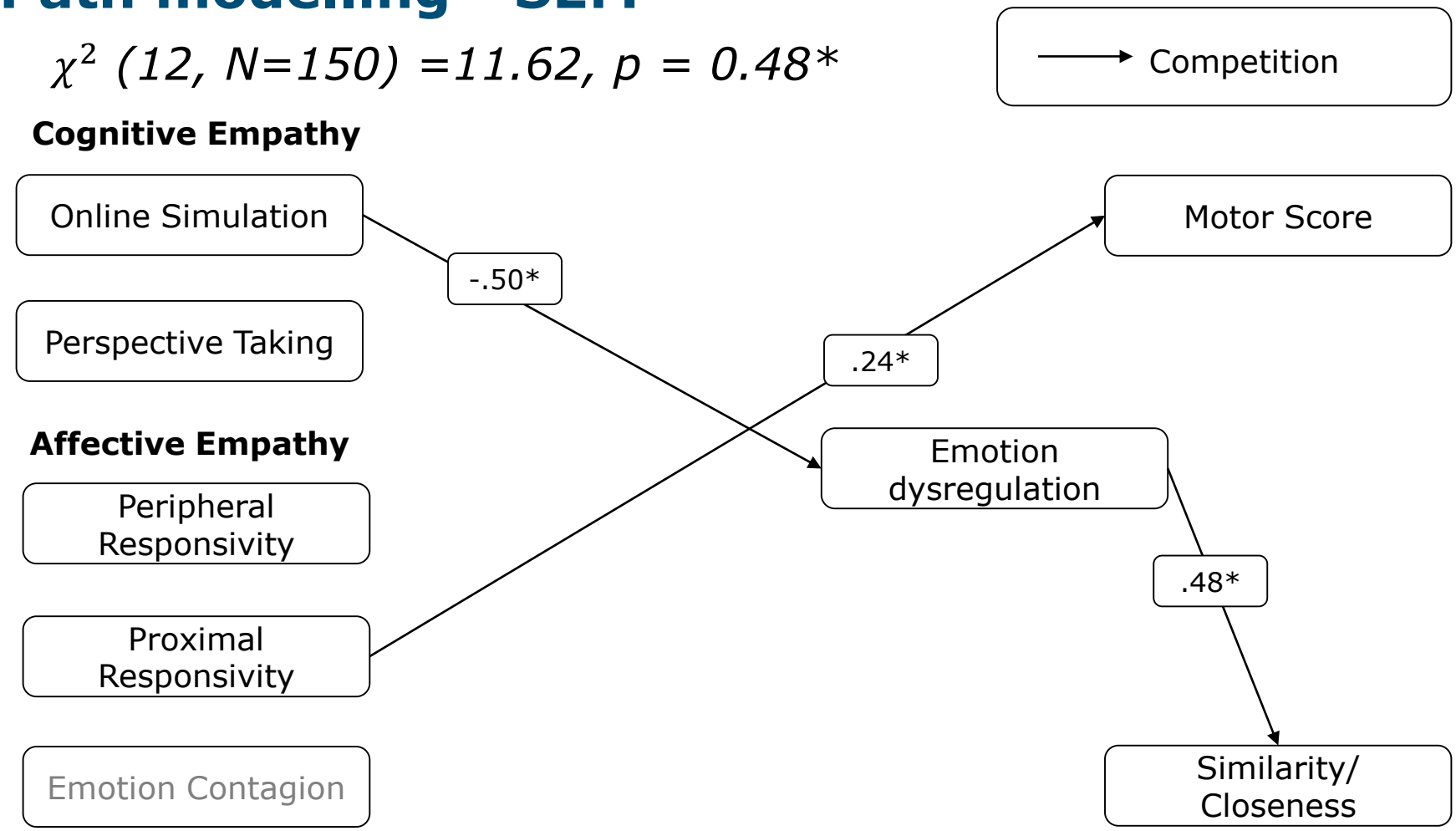


**In SEM, the null hypothesis = model fits the data*

Discussion

1. How facets of empathy are associated with motor coordination and self-other distinction ?

⇒ Affective and cognitive facets of empathy influences motor coordination and self-other distinction and these associations are influenced by virtual agent behavior

2. How emotion dysregulation influences these associations ?

⇒ Emotion dysregulation is an important predictor of motor coordination and self-other overlap that need to be considered in empathic processes

Conclusion

Virtual agent,
a powerful experimental tool

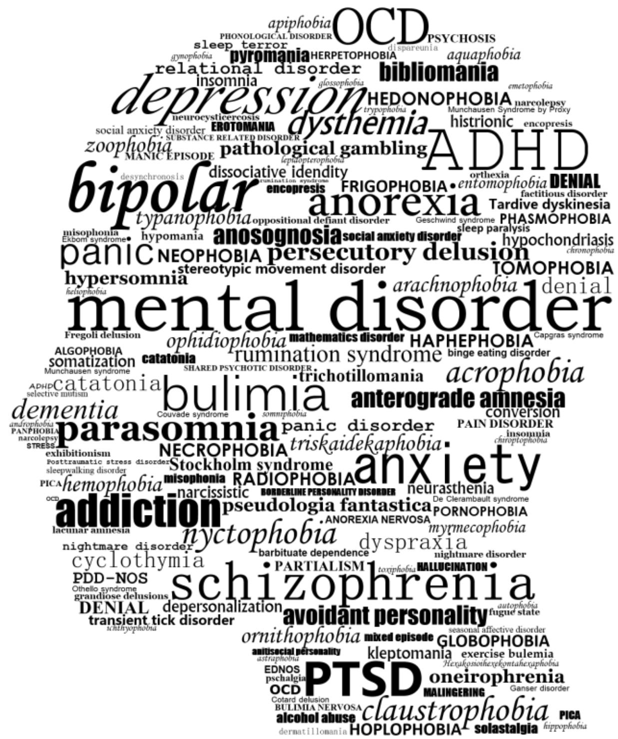
Using virtual agent allows to control and investigate the dynamical aspects of social interactions

Work in progress

On-going data collection, extended to sub-clinical populations (e.g., ASD, schizophrenia)

Limitations

Difficulty to control population and experimental conditions during online data collection



Mental Disorder Silhouette
Wikimedia Commons

#CYBERPSYCHOLOGY

Thank you !

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