EBERHARD KARLS UNIVERSITÄT TÜBINGEN

Developmental Computational Psychiatry lab

Was können die kognitiven Neurowissenschaften zum Verständnis und zur Therapie der Zwangsstörung beitragen?

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German Centre for Mental Health (DZPG)

Max Planck UCL Centre for Computational Psychiatry & Ageing Research

Wellcome Centre for Human Neuroimaging, UCL

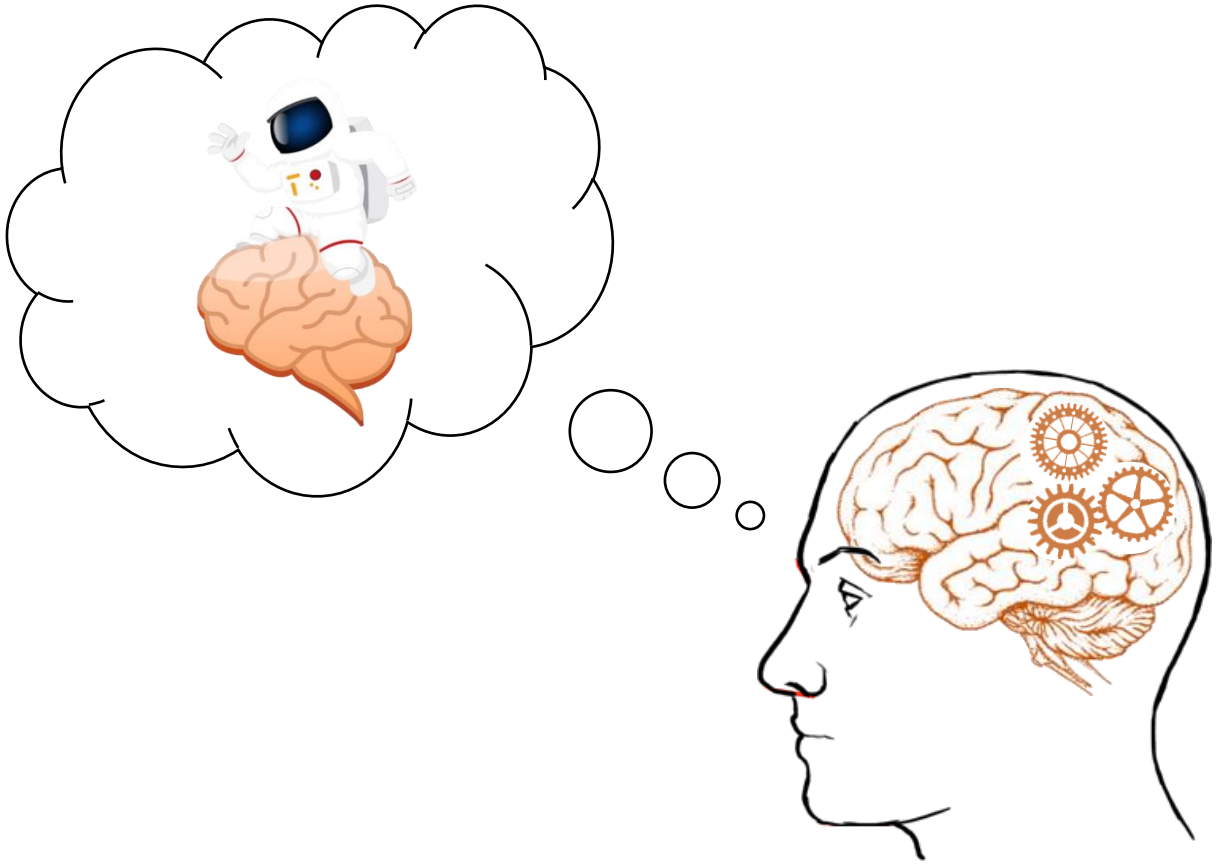
MAX PLANCK UCL CENTRE for Computational Psychiatry and Ageing Research

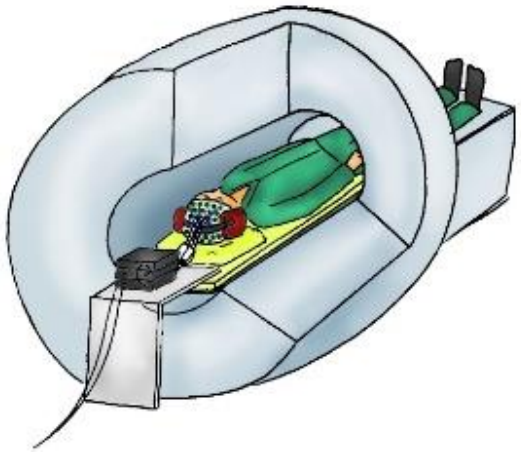
wellcome centre human neuroimaging

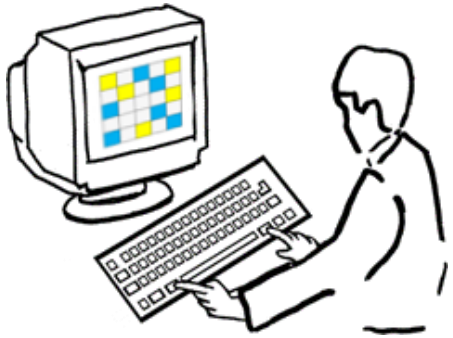
Conflicts of Interest

- Beratertaetigkeit bei limbic ltd.

Was sind kognitive Neurowissenschaften?







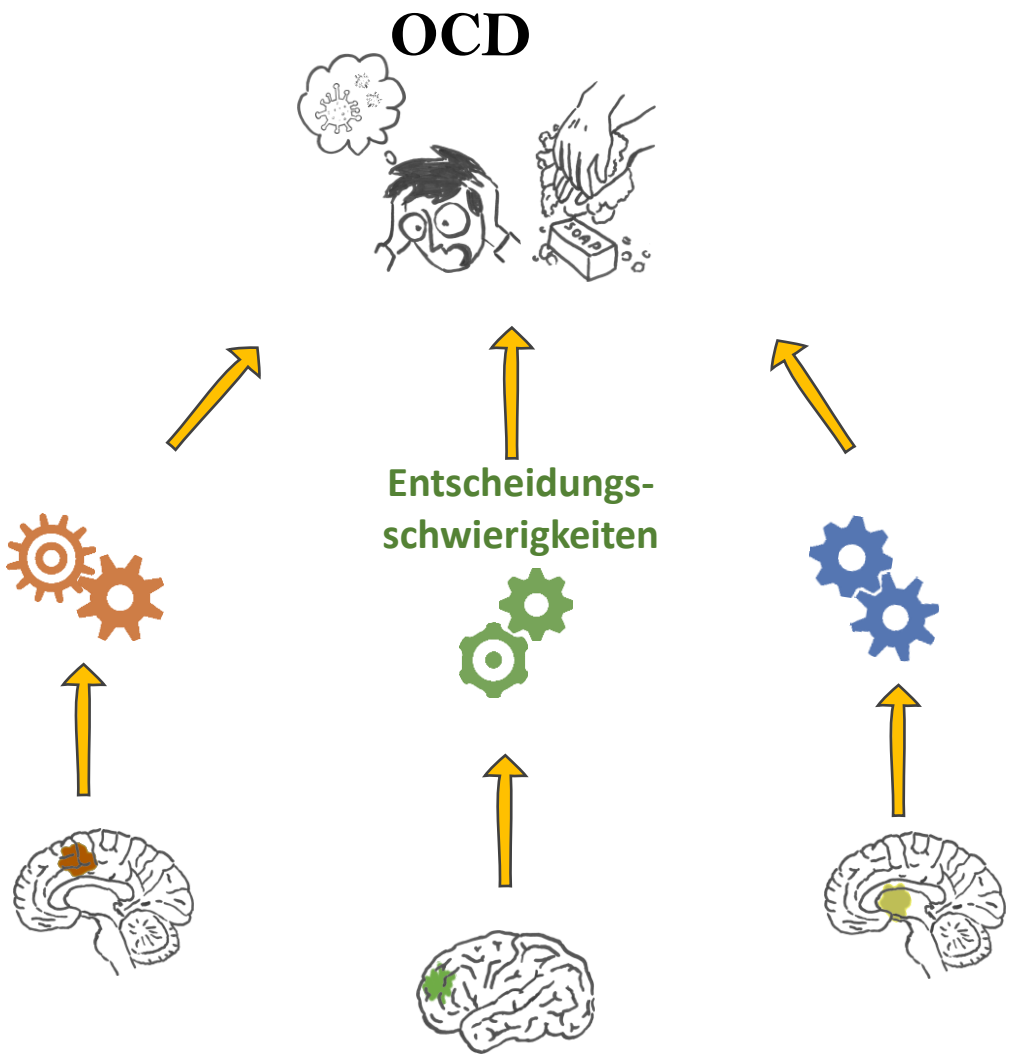
WESHALB IST DAS WICHTIG FUER ZWANGSSTOERUNG?

- **Mechanismen / Ursachen**
- **Neue Interventionen**
- **Therapievorhersage**
- **Verstaendnis / Psychoedukation**

Weshalb ist das wichtig fuer Zwangsstoerung?

- **Mechanismen / Ursachen**
- Neue Interventionen
- Therapievorhersage
- **Verstaendnis / Psychoedukation**

Mechanismen / Ursachen



ENTSCHEIDUNGSSCHWIERIGKEITEN / INDECISIVENESS

- “Stoerung des Zweifelns”
- typisches Symptom bei Zwang
- Teil des Y-BOCS
- “intolerance of uncertainty”

0 = keine Entscheidungsschwierigkeiten
1 = leicht; einige Probleme, Entscheidungen über geringfügige Dinge zu treffen
2 = mäßig; Patient berichtet offen über erhebliche Schwierigkeiten, Entscheidungen zu treffen in Bereichen, in denen andere Menschen nicht zweimal nachdenken müßten
3 = stark; fortlaufendes Abwägen von Pro und Contra bei Nebensächlichkeiten
4 = extrem; unfähig, irgendwelche Entscheidungen zu treffen, mit entsprechender Behinderung.

WHO, 2005
Esquirol, 1836

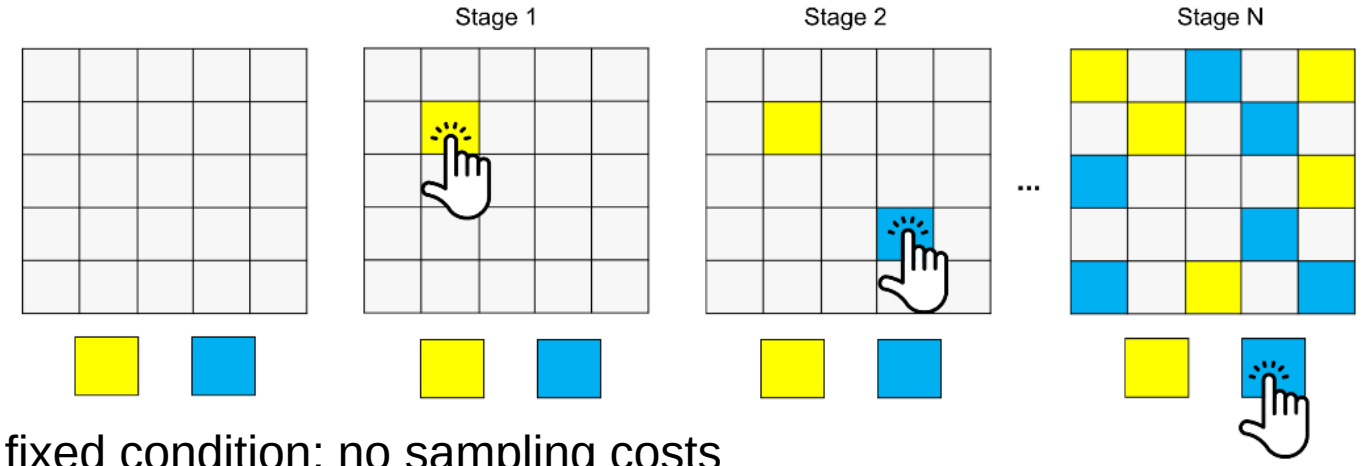
ENTSCHEIDUNGSSCHWIERIGKEITEN

vs

vs

Entscheidungsschwierigkeiten bei Zwang

information gathering task



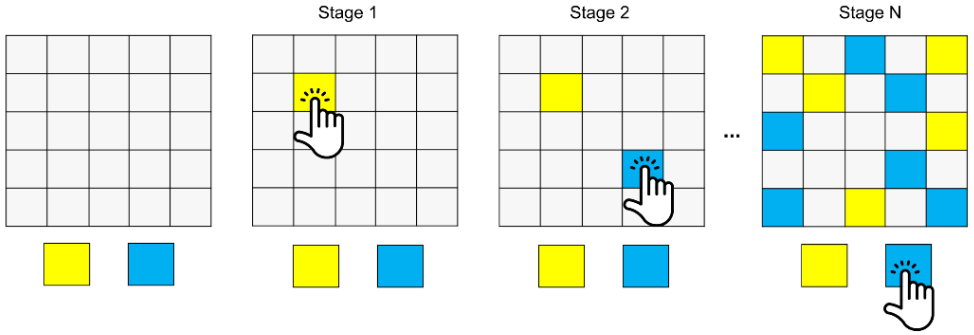
win: 100/250
lose: -100/-100

fixed condition: no sampling costs
decreasing condition: -10 per sample

Hauser et al., 2017, *PLoS Comput Biol*

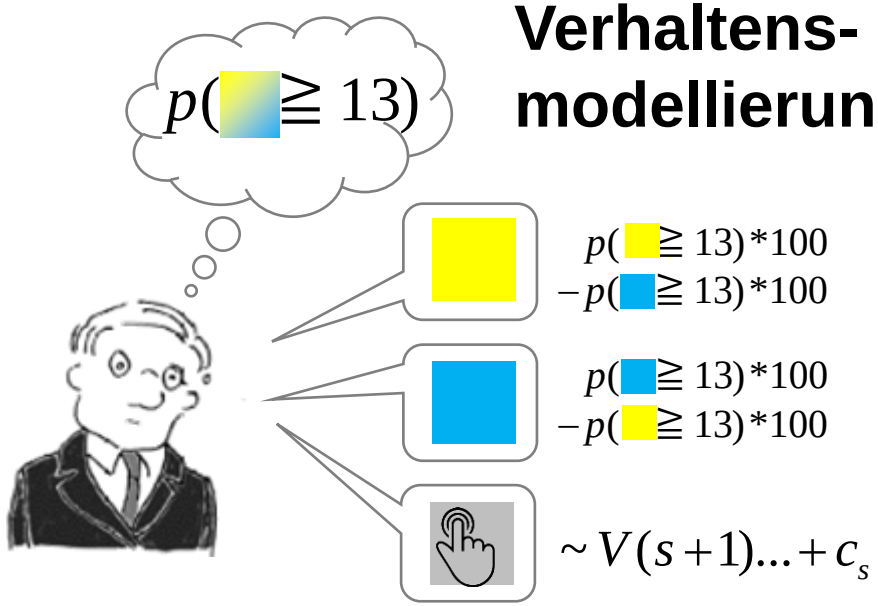
Entscheidungsschwierigkeiten bei Zwang

Verhaltensaufgabe



→ Quantifizierung der Entscheidungsschwierigkeiten

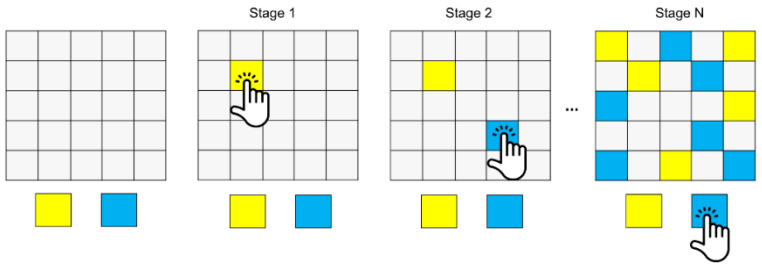
Verhaltens-modellierung



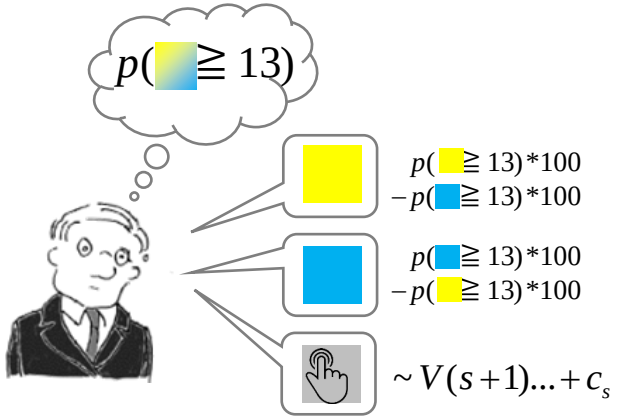
→ Bestimmung der beitragenden kognitiven & Hirnprozesse

Entscheidungsschwierigkeiten bei Zwang

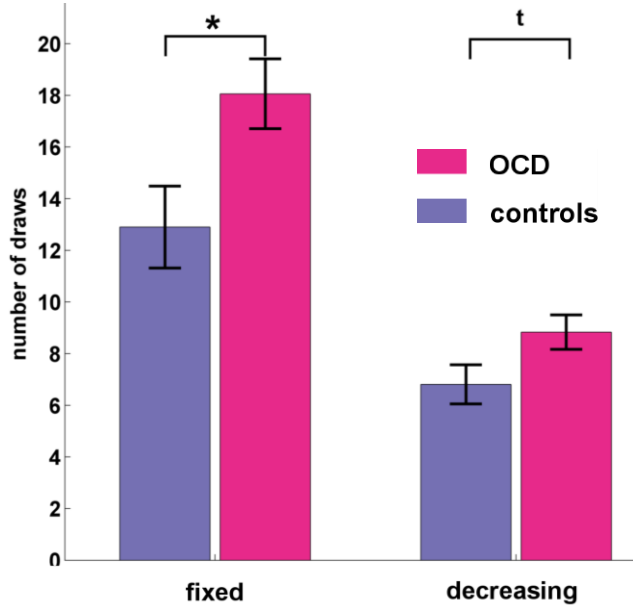
Verhaltensaufgabe



Verhaltensmodellierung



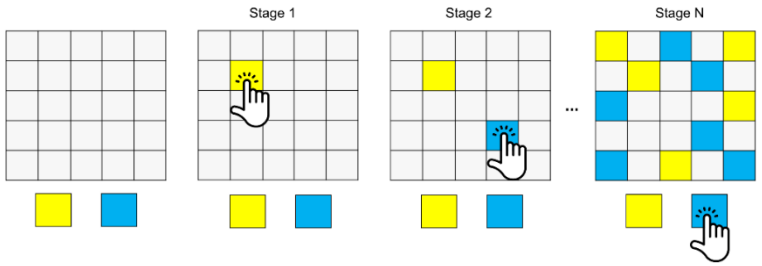
Gruppenunterschiede



Hauser et al., 2017, *PLoS Comput Biol*

Entscheidungsschwierigkeiten bei Zwang

Verhaltensaufgabe



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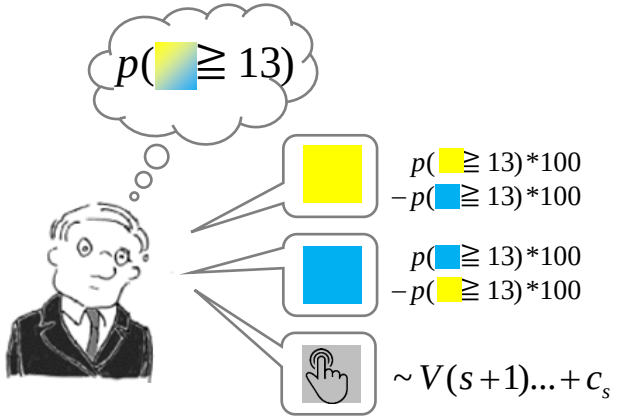

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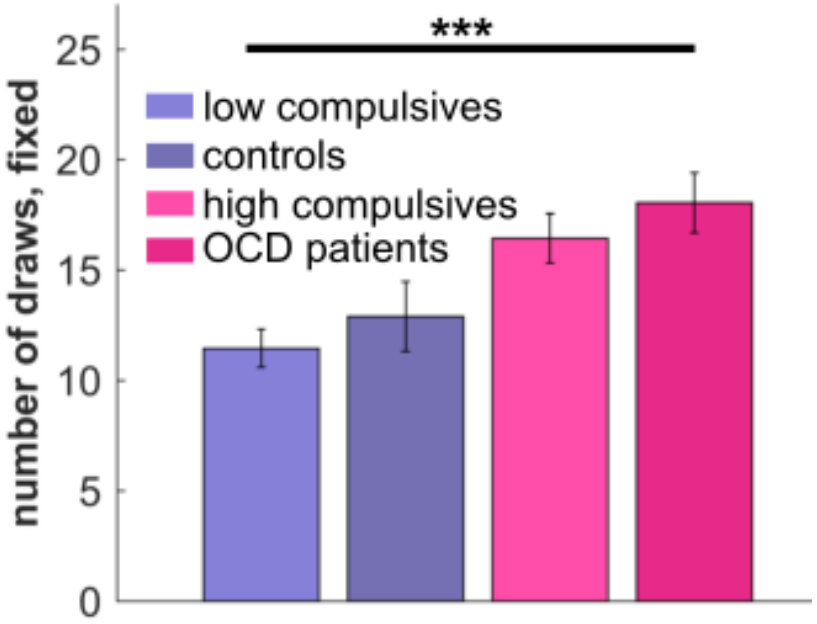
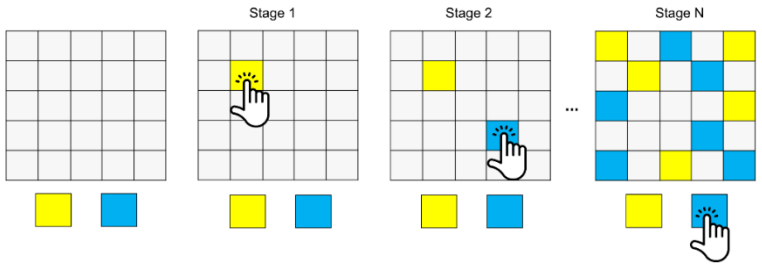


Hauser et al., 2017, *PLoS Comput Biol*
Hauser et al., 2017, *Translat Psych*

Entscheidungsschwierigkeiten bei Zwang

Verhaltensaufgabe



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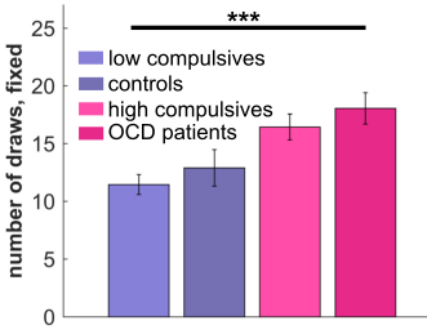
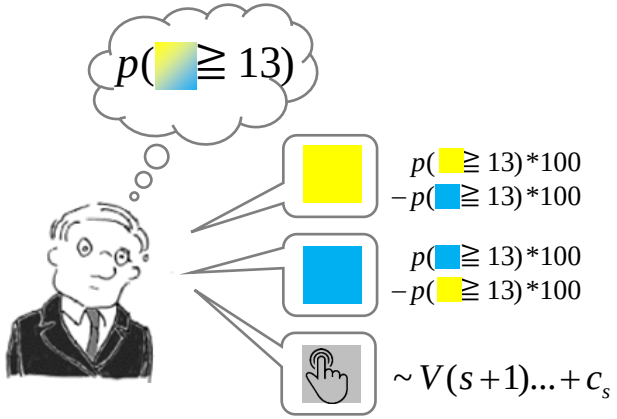
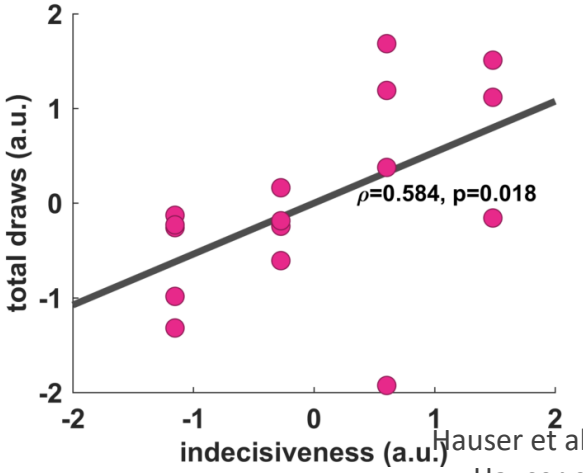


Verhaltensmodellierung



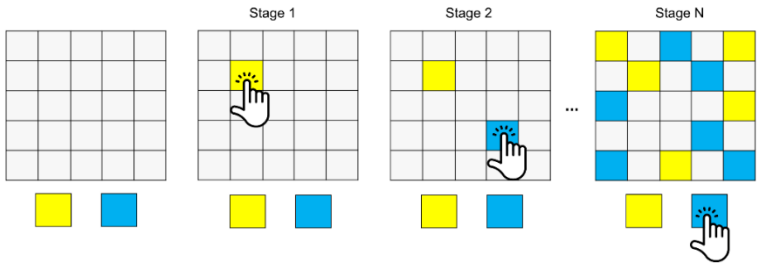
Symptomrelevanz



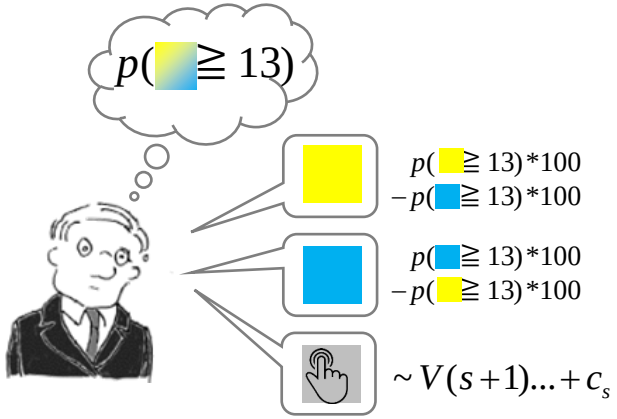
Hauser et al., 2017, *PLoS Comput Biol*
Hauser et al., 2017, *Translat Psych*

Entscheidungsschwierigkeiten bei Zwang

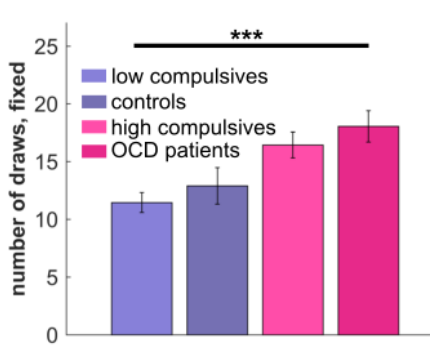
Verhaltensaufgabe

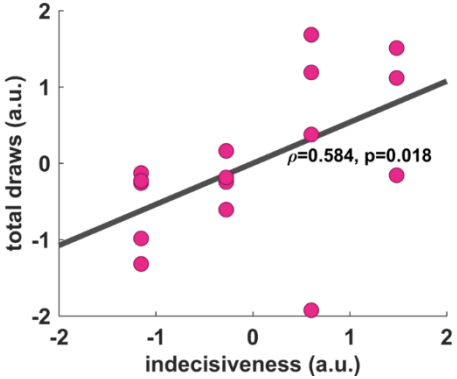


Verhaltensmodellierung

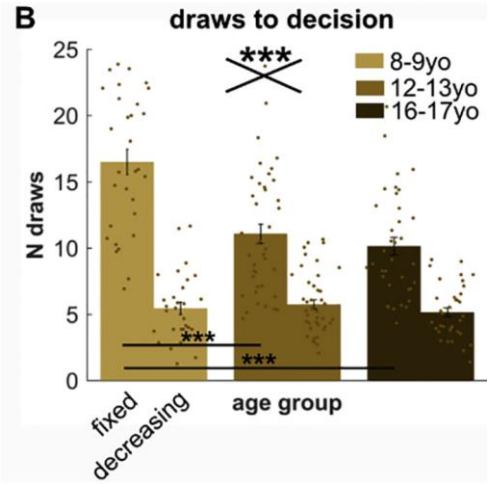


Gruppenunterschiede





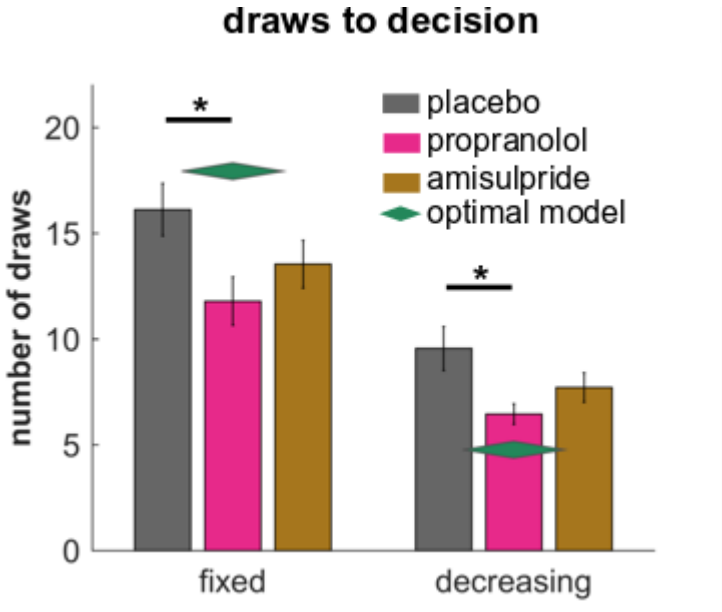
Altersverlauf



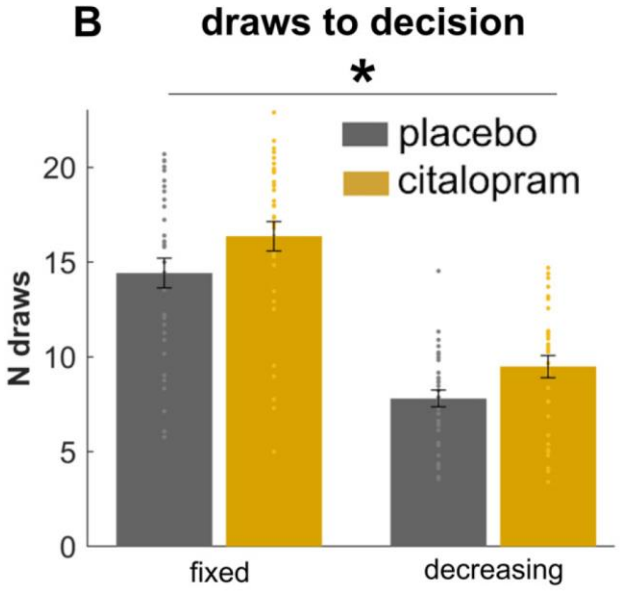
Hauser et al., 2017, *PLoS Comput Biol*
Hauser et al., 2017, *Translat Psych*
Bowler et al,. 2021, *Cognition*

Gehirnprozesse: Neurotransmitter

Noradrenalin

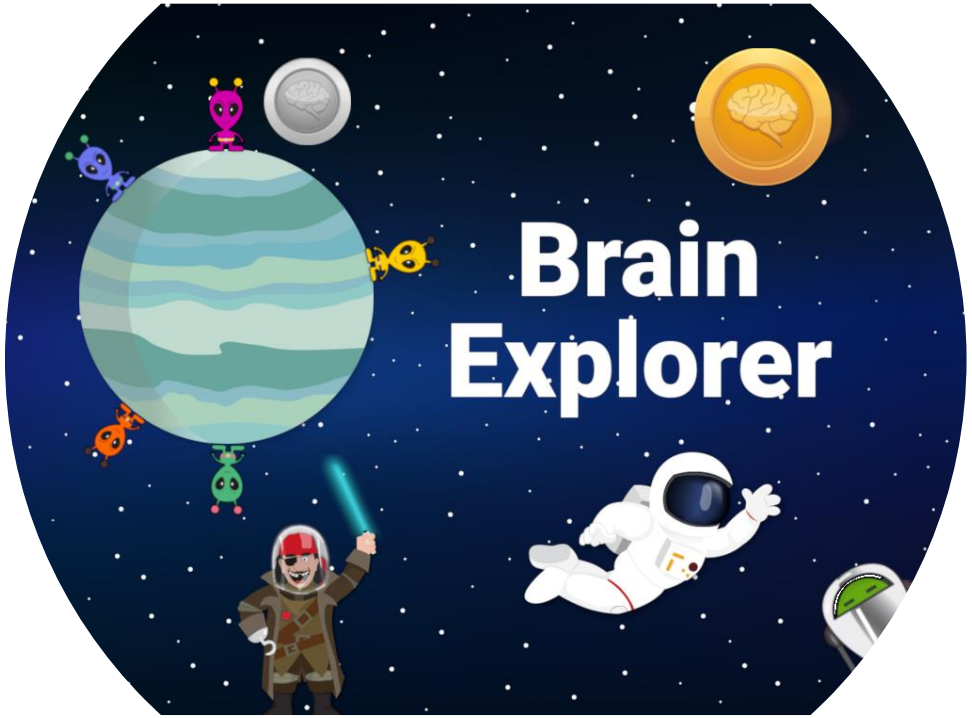


Serotonin



Hauser et al., 2017, *PLoS Comput Biol*
Hauser et al., 2018, *J Neurosci*
Michely et al., 2023, *J Neurosci*

INTO THE WILD…

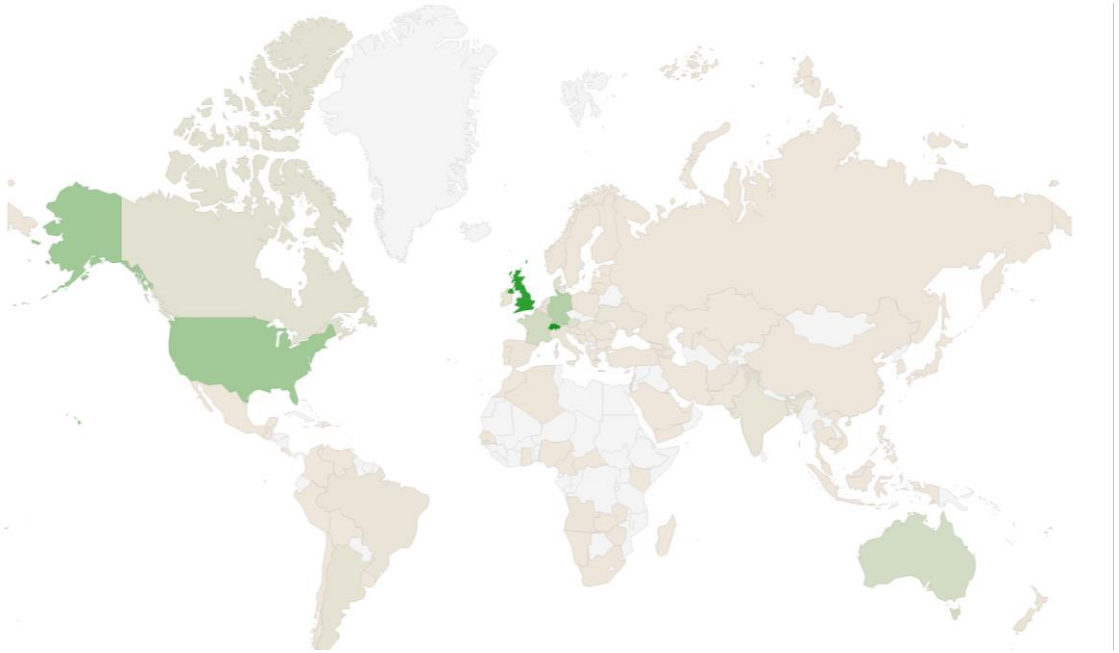


Brain Explorer

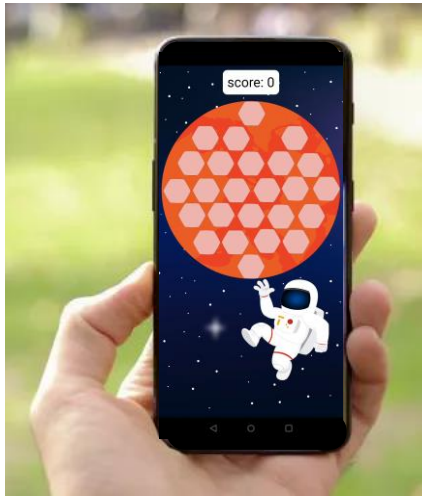
- App for Android & Apple
- multiple cognitive domains
- symptom questionnaires
- multi-lingual
- global
- >10,000 users

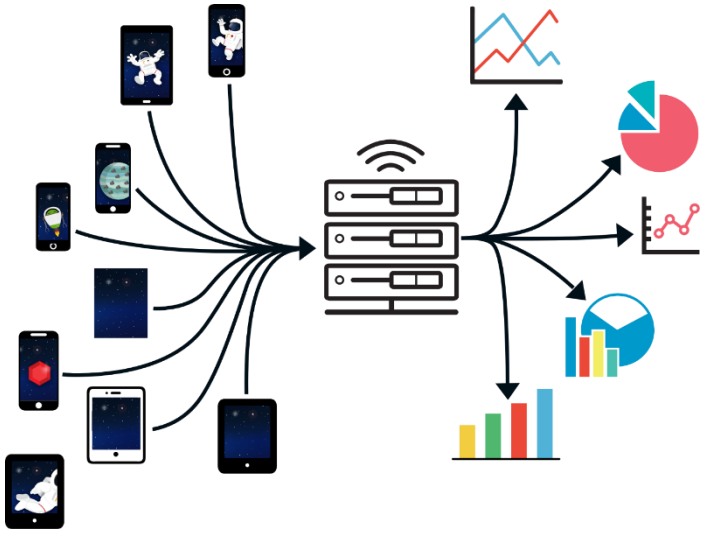
scan me!

www.brainexplorer.net



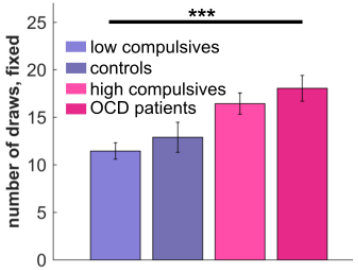
ENTSCHEIDUNGEN IN DER APP



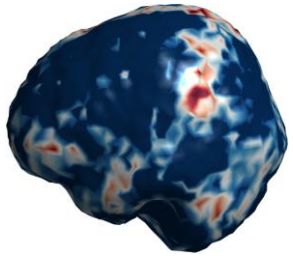


watch this space… and play the games! ☺

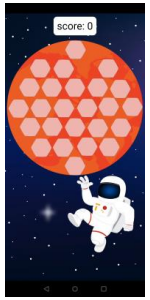
ZUSAMMENFASSUNG



Mittels Verhaltensaufgaben Symptome abbilden & kognitive Mechanismen bestimmen



Gehirnprozesse evaluieren (& neue Behandlungs-Targets entwickeln)



Mittels Smartphone-Apps dieselben Prozesse abbilden

WESHALB IST DAS WICHTIG FUER ZWANGSSTOERUNG?

- Mechanismen / Ursachen
- Neue Interventionen
- Therapievorhersage
- **Verstaendnis / Psychoedukation**

VERSTAENDNIS / PSYCHOEDUKATION

Was können die kognitiven Neurowissenschaften zum Verständnis der Zwangsstörung beitragen?

andere Stakeholders

ocdaction

International OCD Foundation

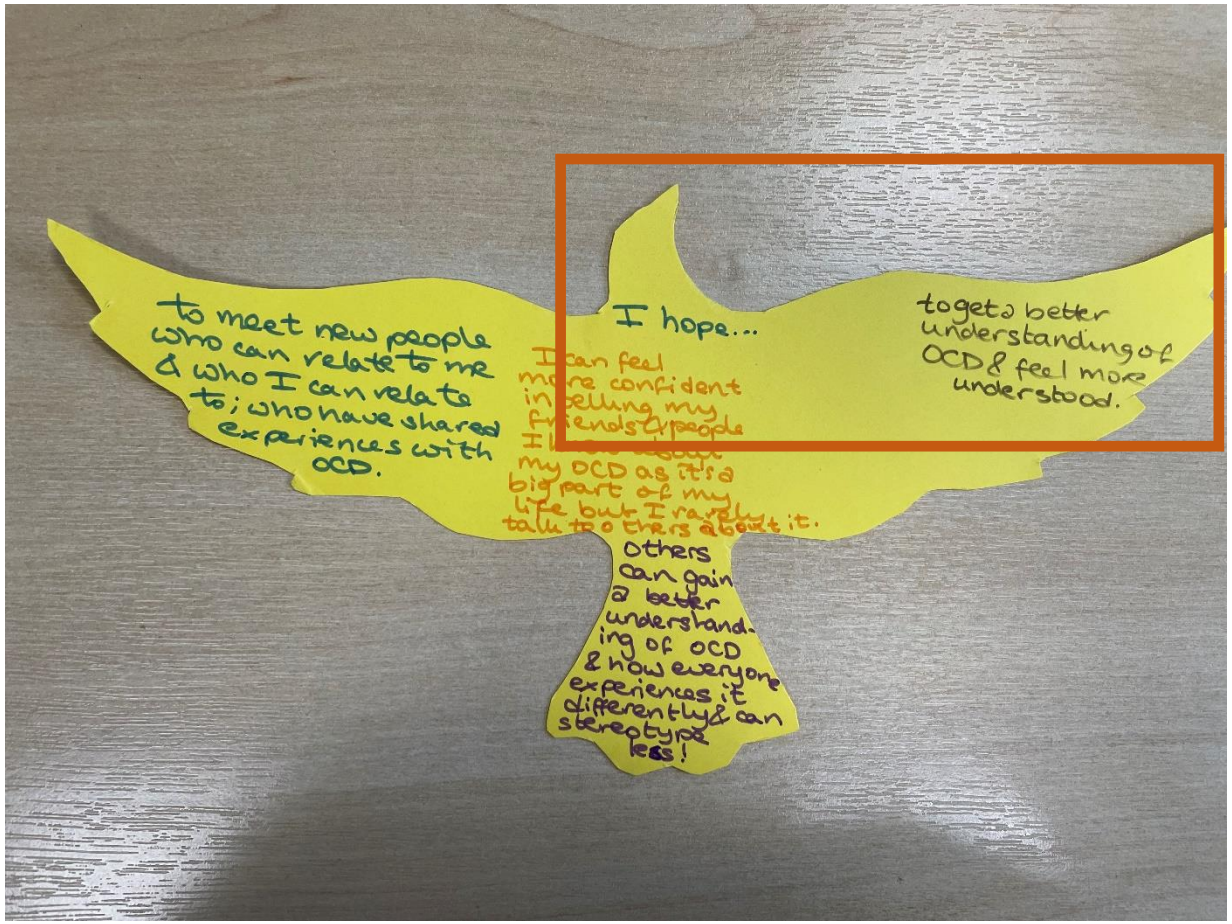
Junge Betroffene

Forscher

Eltern

Gatekeepers

WORKSHOPS



- ✓ design a toolkit (website) about OCD & the brain
- ✓ provide information about brain mechanisms in OCD
- ✓ targeted at young people with OCD & caregivers
- ✓ follow specified community questions
- ✓ co-developed “narrative”
- ✓ co-developed animation

ENDPRODUKT… BALD!

https://www.ocdandthebrain.com/

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for Computational Psychiatry and Ageing Research

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UNIVERSITÄT
TÜBINGEN

wellcome centre human neuroimaging

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Psychiatry lab

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Tricia Seow
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Benjamin Chew
Magda Dubois
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Alisa Loosen
Karen Hoang
Maddy Payne
Sam Hewitt
Aislinn Bowler
Johanna Habicht

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YAE