

Verbale und nonverbale Kommunikation bei Psychosen:

klinische Dimensionen und multimodale Bildgebung

Prof. Dr. med. Sebastian Walther

Universitätsklinik für Psychiatrie und Psychotherapie Bern

Zürich

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Formale Denkstörungen bei Psychosen

„Lieber Gott, verzeih doch mir,
Denn ich bin der Zottelbär,
Lieber Gott, verzottel mich,
Denn ich bin das ich.
Lieber lieber Retter mein,
Rette doch nur Dich allein
Liebste Liebe, wie kann ich sein allein,
Was ich schein',
Lieber Hand ist doch nur lind,
Lieber Gott ich wache bald wieder,
Wenn Du nur gibst die Mutter wieder.
Lieber Gott, was will ich...



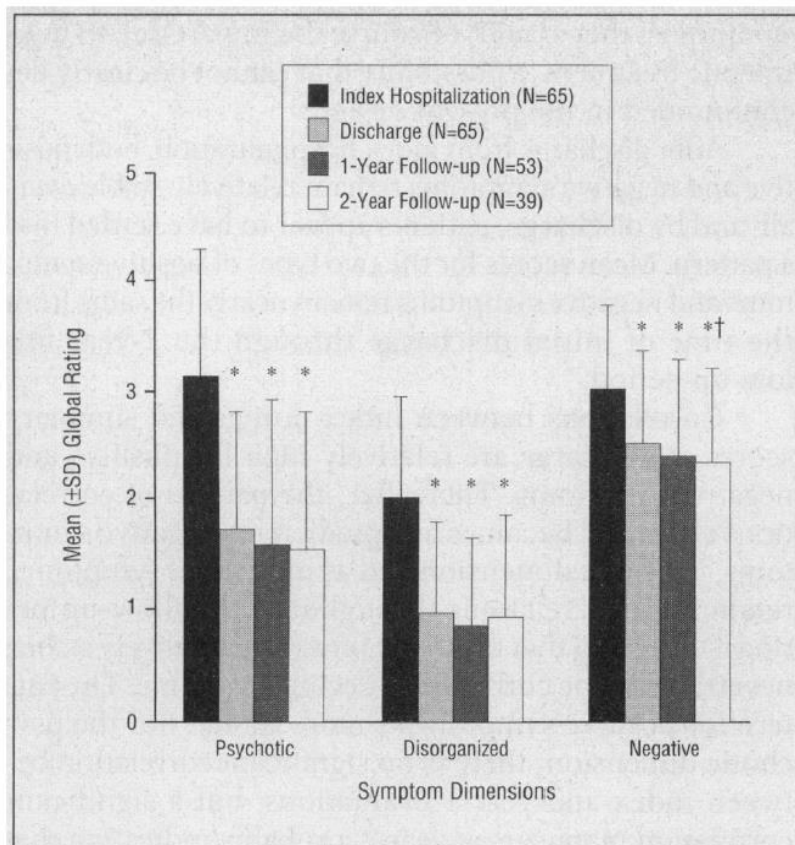
- Assoziative Lockerung
- Neologismen

- Verbigerationen
- Perseverationen
- Stereotypien

- Denkhemmung
- Konkretismus

Veränderungen in Semantik,
Rhythmik und Syntax

Verlauf von formalen Denkstörungen



Faktor-Analysen trennen positive von negativen Denkstörungen

Schwache Korrelation zwischen positiven und negativen formalen Denkstörungen

Longitudinalstudien:

Positive formale Denkstörungen nehmen ab

Negative formale Denkstörungen bleiben eher stabil

Formale Denkstörungen

Multidimensionales und häufiges Problem bei Psychosen

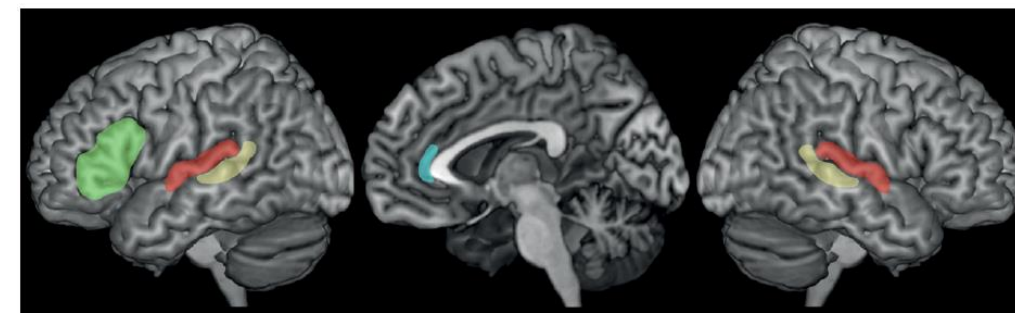
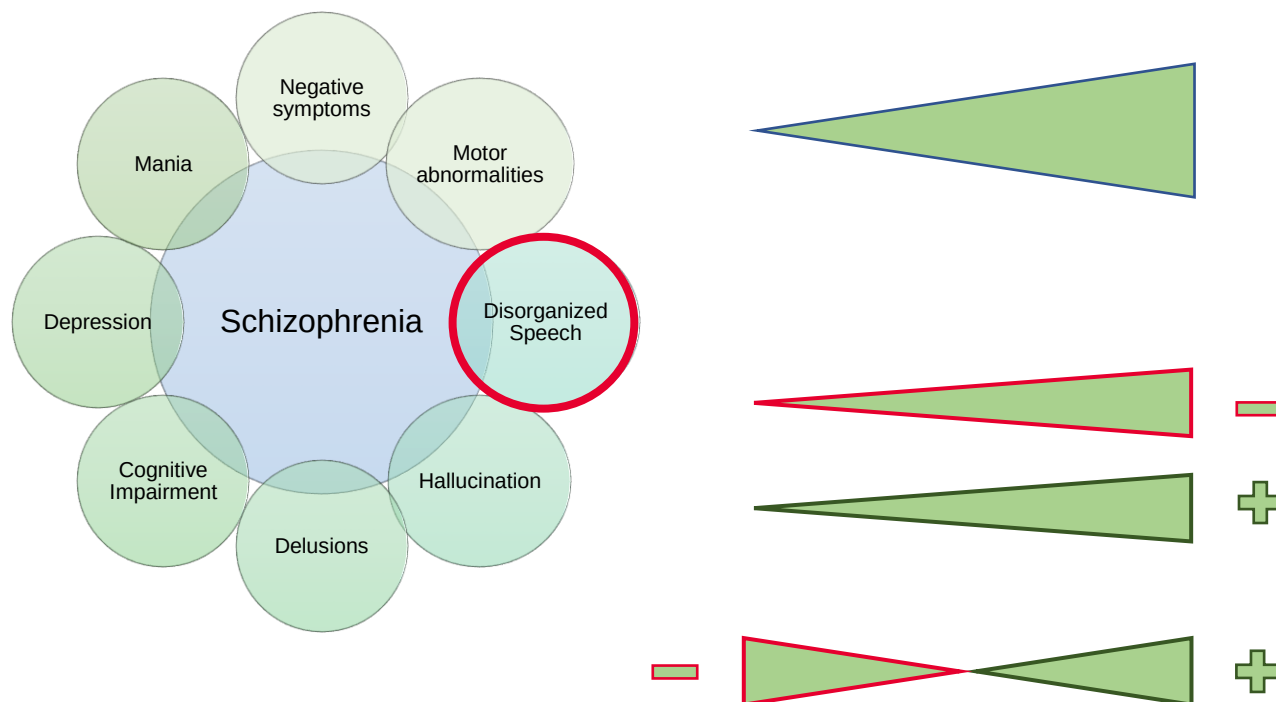
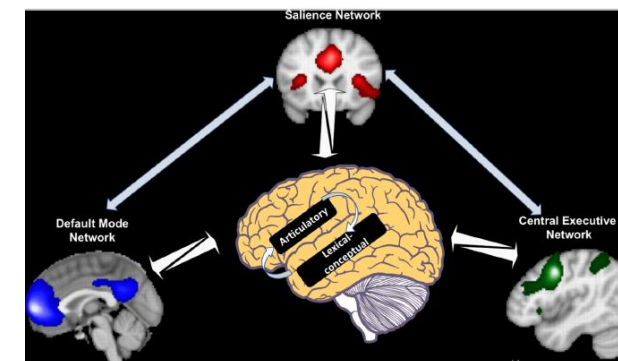
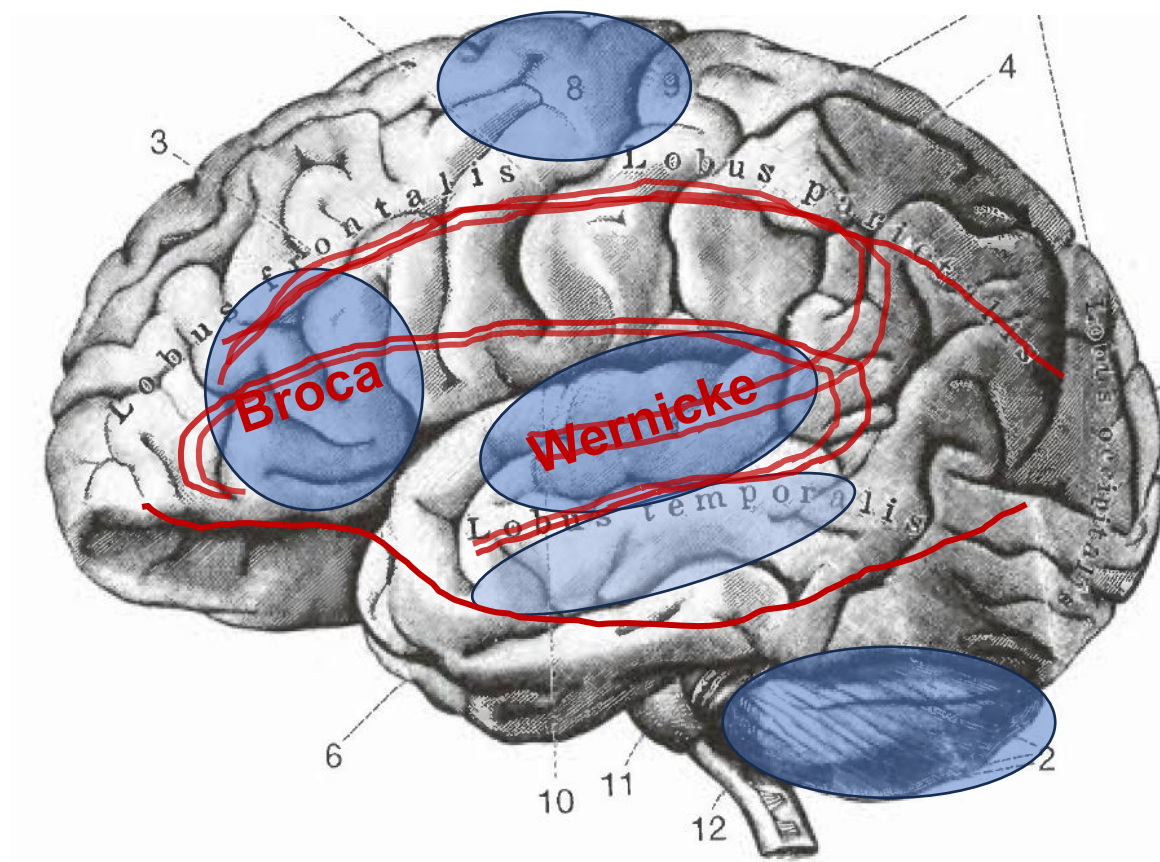


Figure 2: Brain areas involved in formal thought disorder

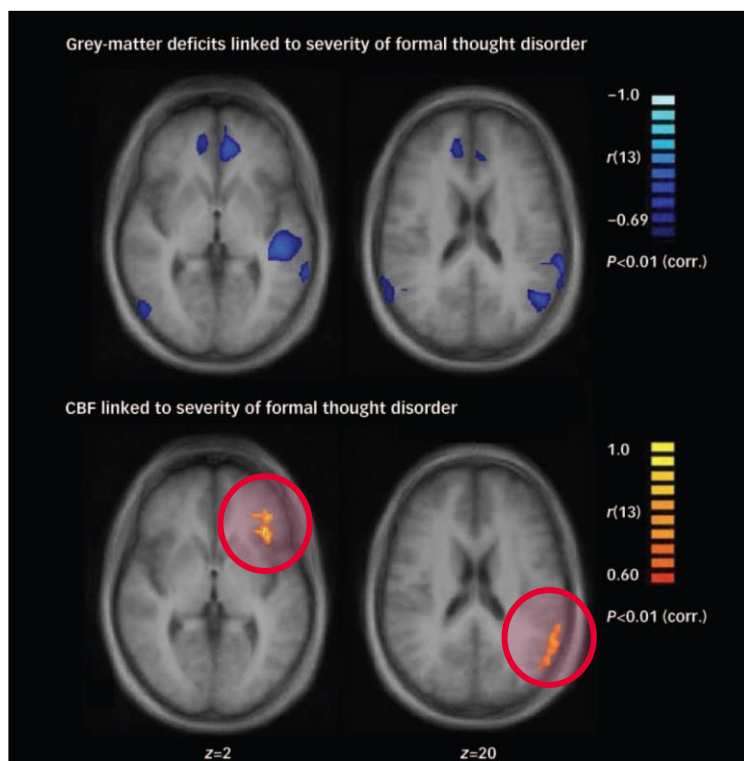


Hirnnetzwerk für Sprache

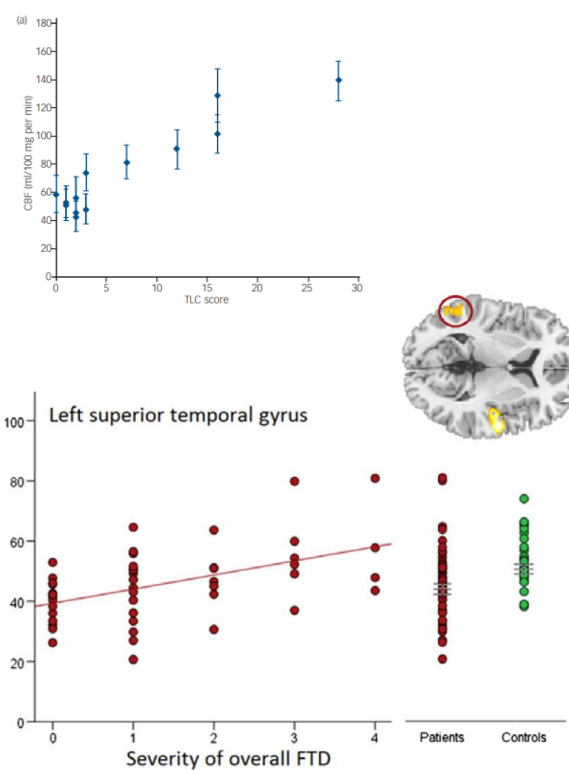


Ruheperfusion und strukturelle Konnektivität

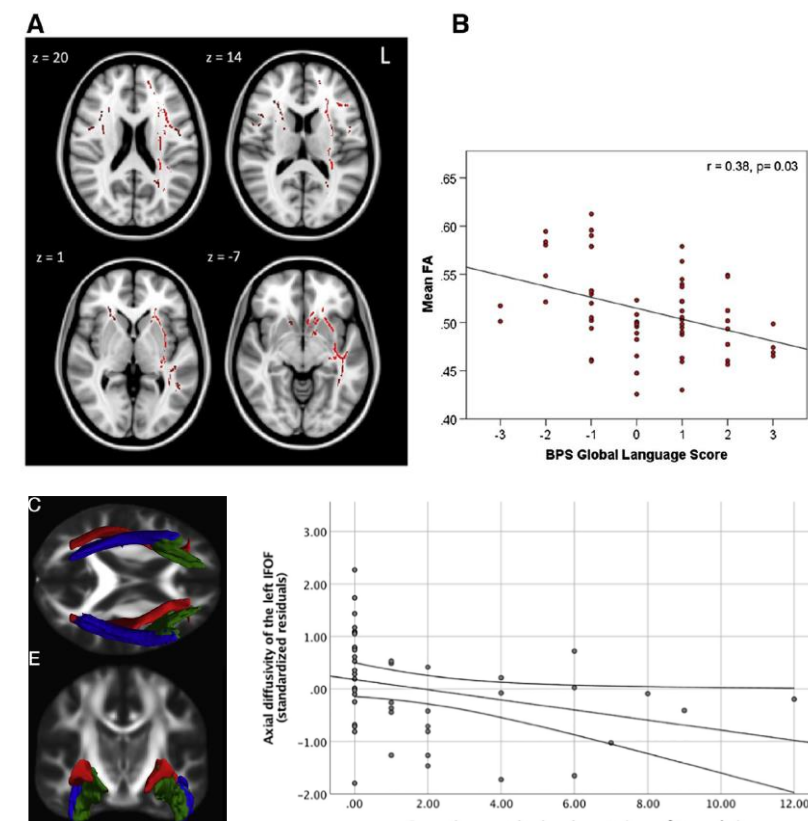
Spezifische Veränderungen im Sprachsystem



CBF im STG



CBF Replikation



axiale Diffusivität im IFOF

Thought And Language Disorder – TALD Skala

Alternative Dimensionen mit subjektiver und objektiver Beurteilung

- Funktioniert unabhängig von der Diagnose
- 30 items
- 4 Faktoren aus 27 Items
 - OP: Logorrhea, Neologisms
 - SP: pressure of thought
 - ON: poverty of speech, concretism
 - SN: rumination, rupture of thought

	Objective	Subjective
Positive	OP	SP
Negative	ON	SN

Table 4
Relation between TLC and TALD sub-scales.

	TALD I Objective Positive	TALD II Subjective Negative	TALD III Objective Negative	TALD IV Subjective Positive
TLC I Disorganisation	.793**	.150*	-.117	-.072
TLC II Linguistic control	.533**	-.032	.098	.222**
TLC III Emptiness	.057	.257**	.723**	-.012

Pearson:
* p < .05.
** p < .01.

Participants

Combined baseline data from two ongoing RCTs in psychosis

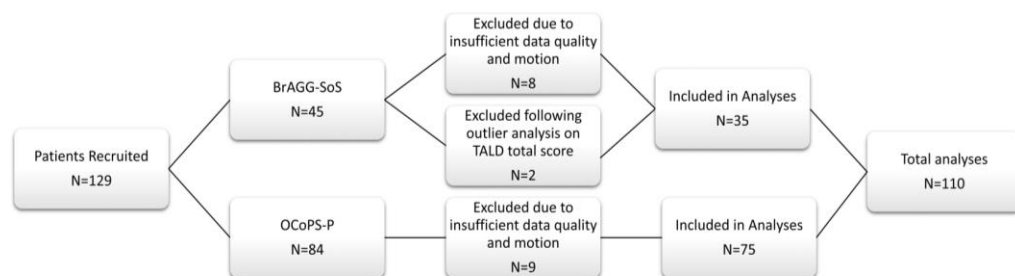


Table 1. Demographic and Clinical Characteristics

	Patients (<i>n</i> = 110)
Demographics	
Age (years)	36.6 ± 12.1
Gender (males %)	52.7 %
Education (years)	13.5 ± 2.9
Medication (OLZ eq mg)	15.2 ± 11.0
Duration of illness (years)	11.9 ± 11.6
Episodes (<i>n</i>)	7.0 ± 11.2
Assessments	
PANSS-total	69.6 ± 20.7
Positive	14.6 ± 5.7
Negative	20.0 ± 7.6
TALD total	15.8 ± 9.0
Objective positive (relative)	0.3 ± 0.4
Objective negative (relative)	1.0 ± 0.9
Subjective positive (relative)	0.8 ± 0.9
Subjective negative (relative)	0.9 ± 0.6

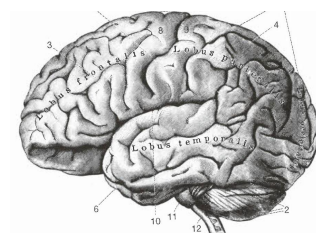
Note: Values represent the mean ± SD.

Note: OLZ eq, olanzapine equivalent; PANSS, Positive And Negative Syndrome Scale; TALD, Thought and Language Disorder.

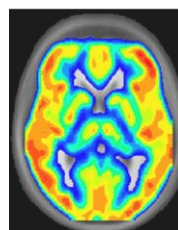


Methods

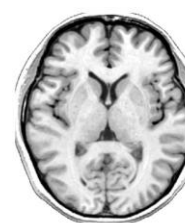
Multimodal Neuroimaging at 3 T MRI



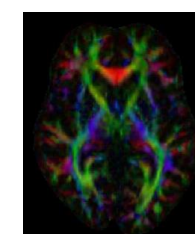
ASL-CBF



T1



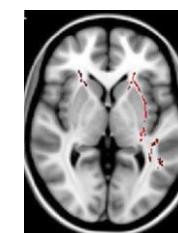
DTI



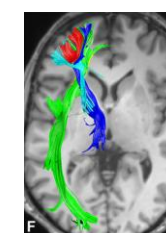
VBM



cortical
thickness



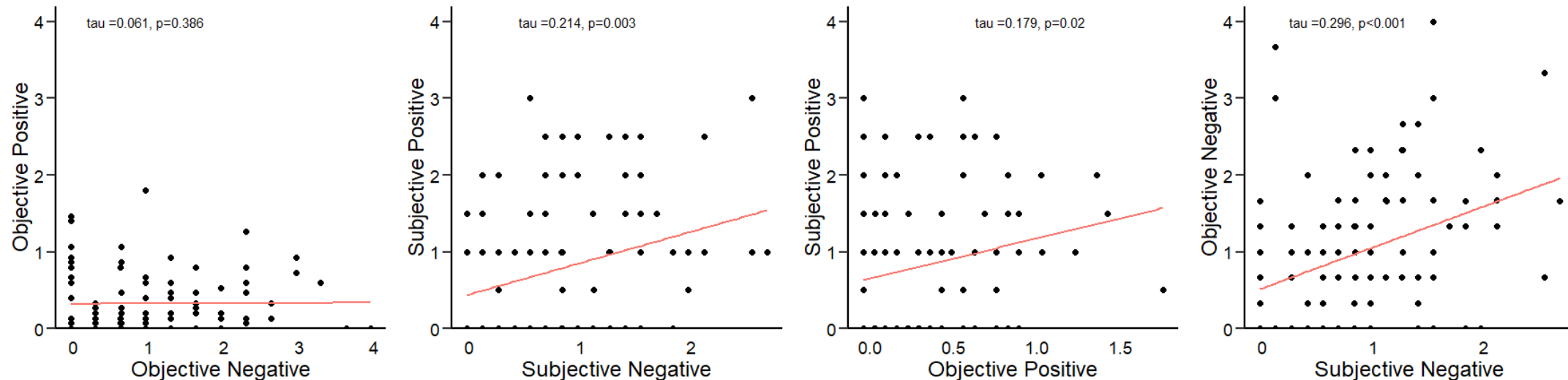
TBSS



Tractography

TALD Dimensionen

Korrelationen zwischen den TALD Dimensionen

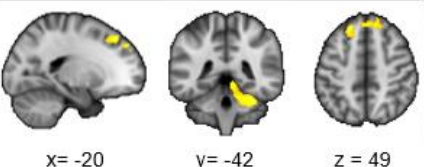
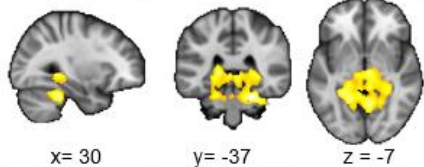
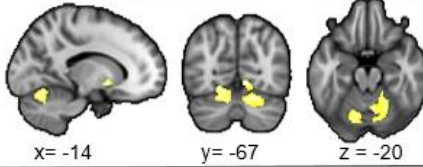
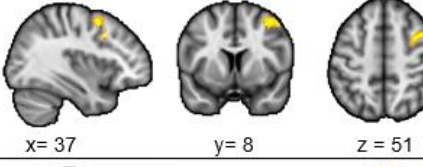
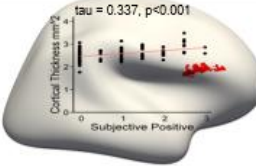
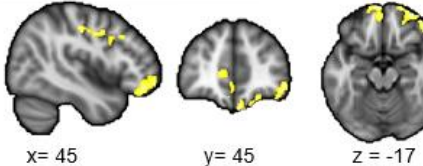
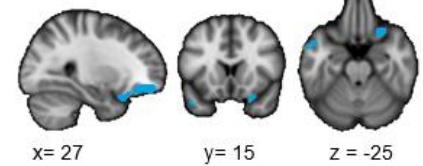


Effects of single dimensions in neuroimaging analyses always corrected for the other dimensions.

No differences in sex or diagnoses.

Graue Substanz (n = 110)

Spezifische Veränderungen für die vier TALD Dimensionen

	CBF	CortTh	VBM
TALD		∅	∅
OP		∅	
ON	∅	∅	
SP	∅		
SN	∅	∅	

Covaried for age, TIV, and OLZ

Increased CBF & GMV subcortical

Increased GMV premotor areas

Increased GMV right IFG

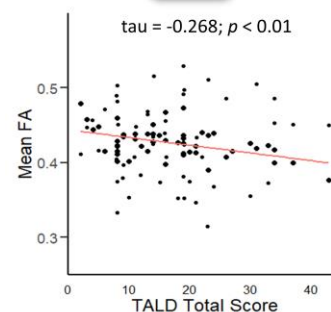
Reduced GMV prefrontal areas

Weisse Substanz Diffusionstensorbildung (n = 71)

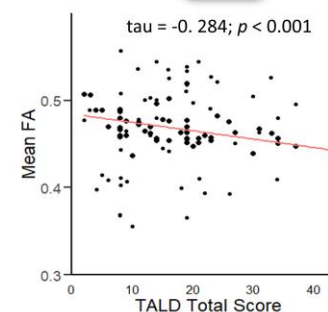
Mehr Desorganisation – weniger organisierte weisse Substanz

A

left superior longitudinal fasciculus II



left inferior fronto-occipital fasciculus



Covaried for age, TIV, and OLZ

TALD total scores

Subjective positive

MD and SP

increased diffusion – higher SP

FA and SP

reduced Diffusion – higher SP

Zusammenfassung formale Denkstörung

Spezifische Veränderungen bei TALD Dimensionen

- Im Einklang mit anderen Studien:
 - Assoziationen in bilateralem Sprachnetzwerk, Cerebellum und Thalamus
 - Unterschied zwischen positiver und negativer FTD
- Neue Erkenntnisse:
 - Multimodale Hirnuntersuchung
 - Korrelate subjektiver formaler Denkstörung
 - Spezifische Effekte einzelner TALD Dimensionen
- Limitation
 - Potentieller Selektionsbias
 - Ausschliesslich Psychose-Patient:innen

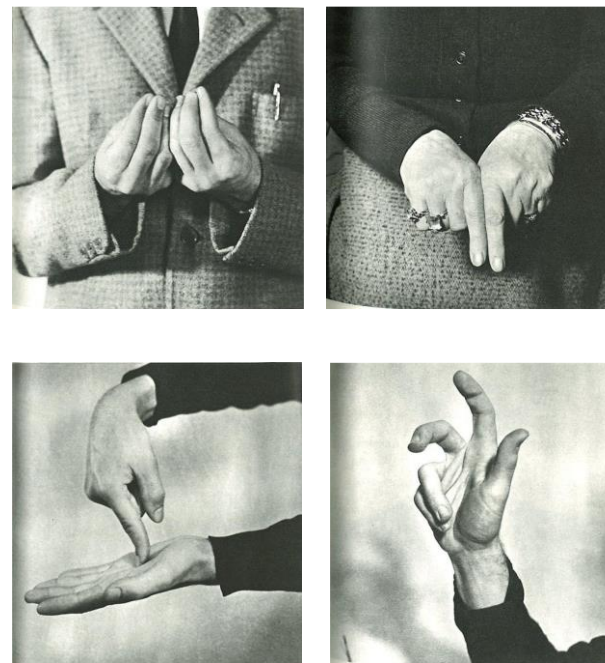
Dimension	Main findings
OP	Motor speech areas 
SP	Executive network 
ON	Premotor areas 
SN	semantic / motor areas 

Gesten und Semantik

CAVE: Kulturelle Unterschiede

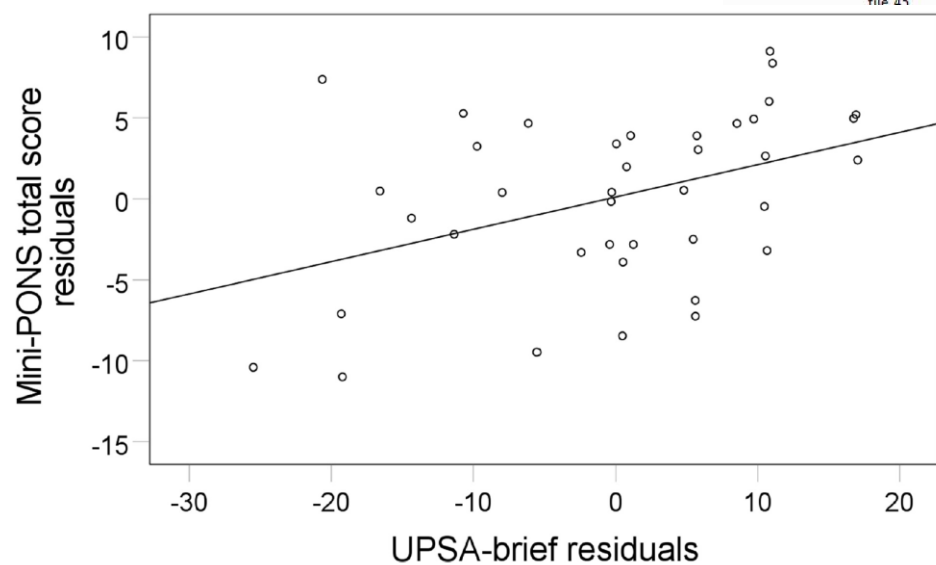
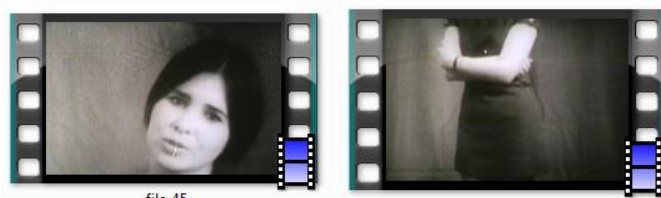


Munari 1963

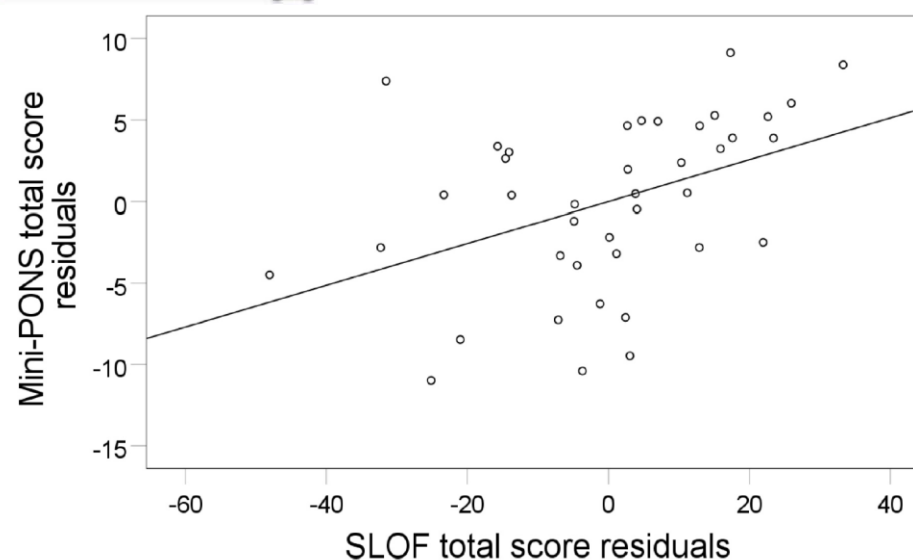


Soziales Funktionsniveau und nonverbale Kommunikation

Perzeption nonverbaler Stimuli bei Schizophrenie



Alltagsfertigkeiten



Soziales Funktionsniveau

Gestenperzeption bei Schizophrenie

- Verkennen von Gesten

(White et al. 2016)

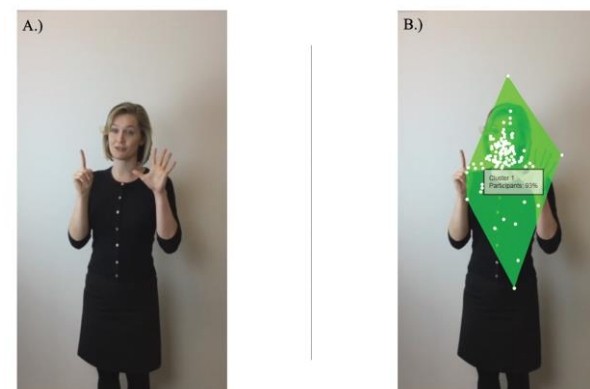
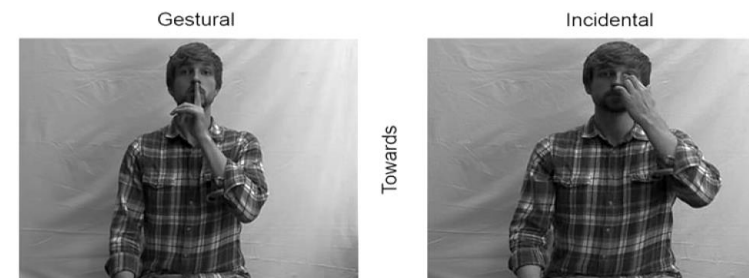
- Weniger Aufmerksamkeit für abstrakte Gesten:

- Weniger Fixationen
- Kürzere Fixationen

(Gupta et al. 2021)

- Fehlinterpretation von Gesten-Bedeutung

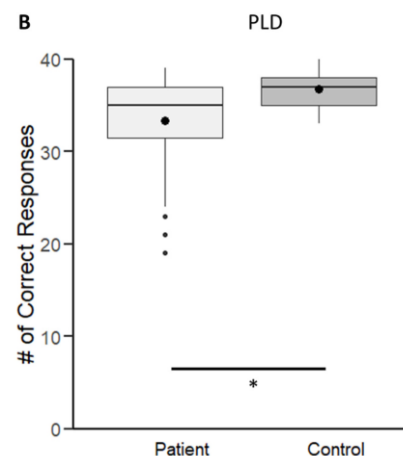
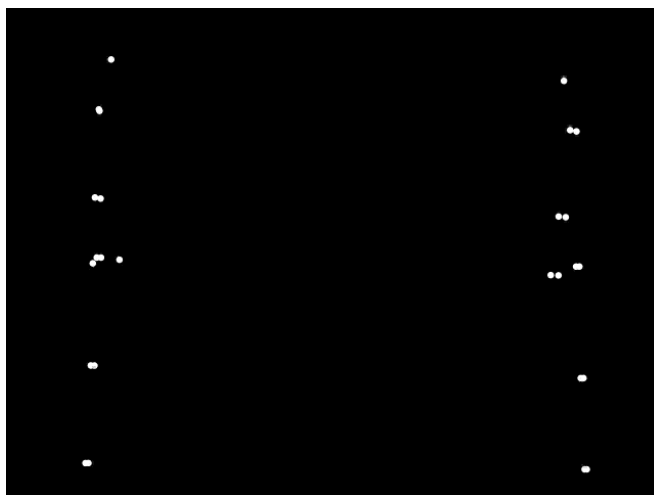
(Bucci et al. 2008)



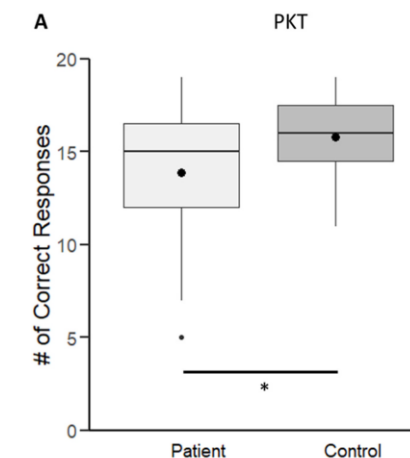
Gesteninterpretation bei Schizophrenie

Verständnis dynamischer und statischer Gesten kompromittiert

Point Light Display



Postural Knowledge Task



Fehlerhafte Gestenproduktion bei Schizophrenie

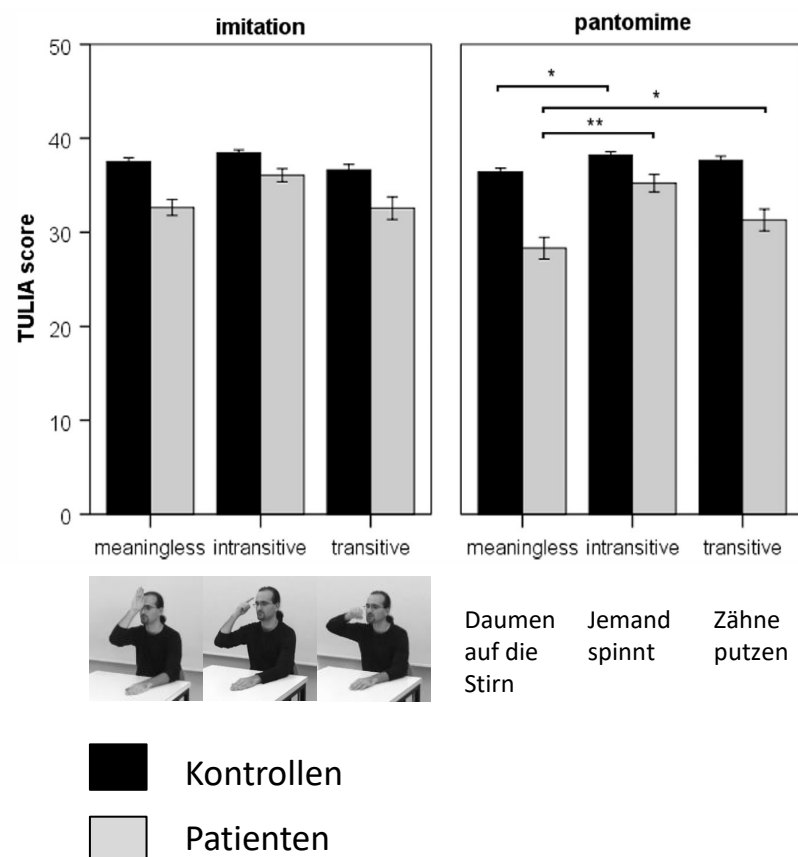
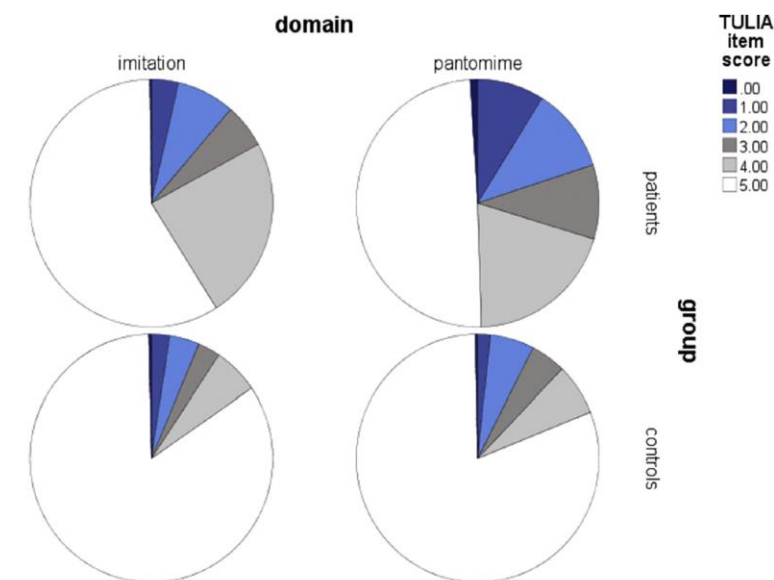


Table 2. Group Comparisons of Task Performance, Mean (SD) With Covariates TONI and Digit Span Backward

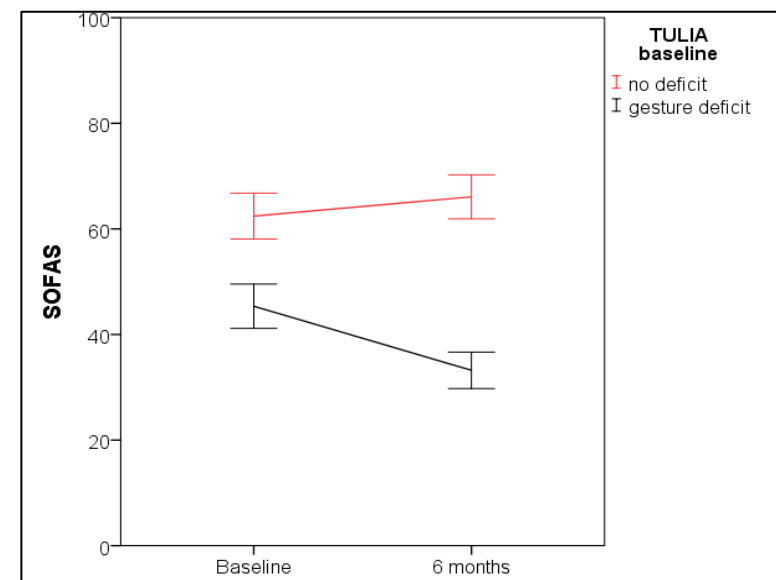
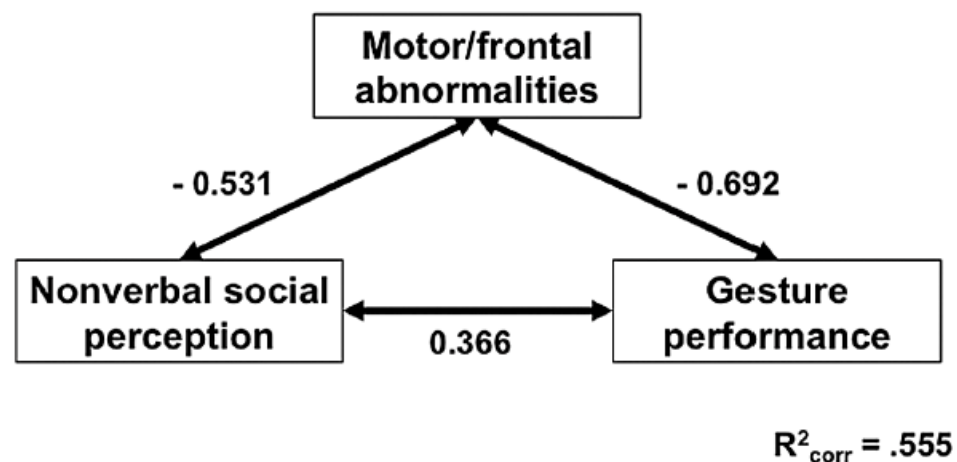
	Controls (<i>n</i> = 44)	Patients (<i>n</i> = 46)	<i>F</i> (<i>df</i> = 3)	<i>P</i>
TULIA	225.67 (7.75)	206.13 (28.12)	13.88	<.001
PKT	27.31 (1.44)	24.41 (4.34)	10.98	<.001
PONS	46.67 (4.42)	41.42 (6.03)	19.88	<.001
Tool Use	71.93 (0.46)	69.59 (4.28)	8.77	<.001

Note: TONI, Test of Nonverbal Intelligence; TULIA, test of upper limb apraxia; PKT, postural knowledge task; PONS, Profile of Nonverbal Sensitivity; *P* values adjusted for multiple comparisons.

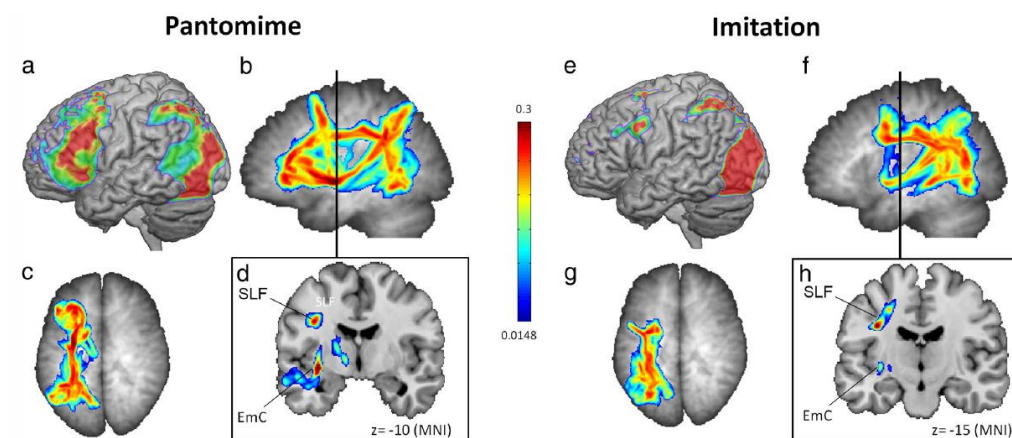
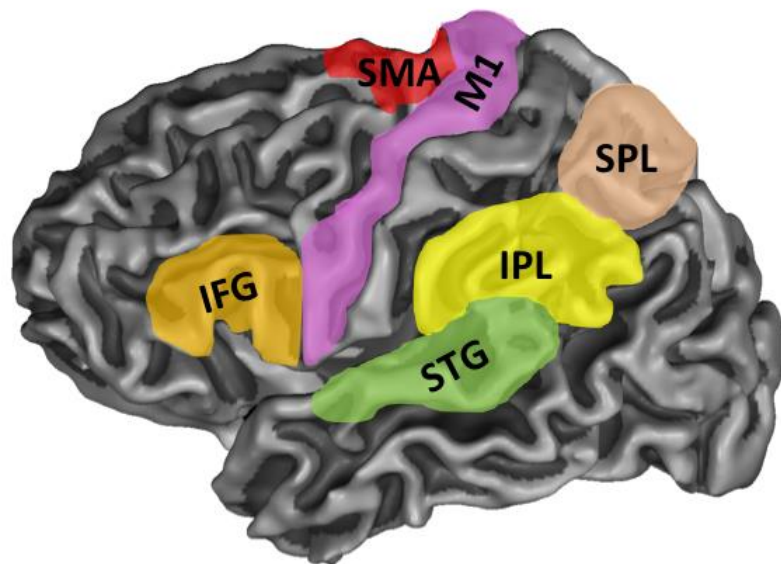


Umfassendes Defizit der nonverbalen Kommunikation

Hinweis auf schlechtes Funktionsniveau



Praxisnetzwerk

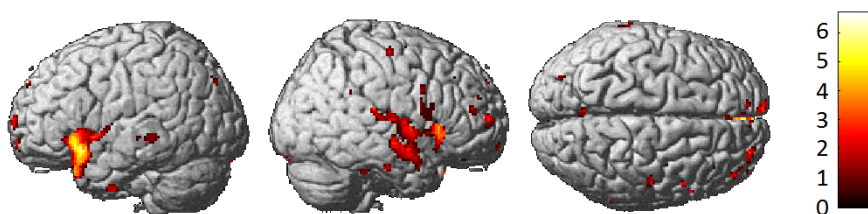


Hirnstruktur bei Gestendefizit Schizophrenie

Weniger Volumen und kortikale Dicke im Praxisnetzwerk

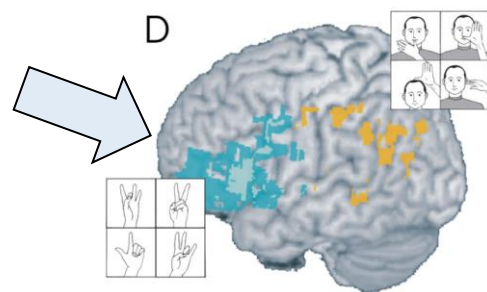


Patienten mit Gestendefizit < Kontrollen

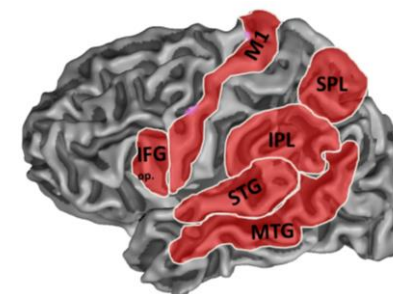


$p_{(FWE)} < 0.05$

Gestendefizit	n = 17
Kein Gestendefizit	n = 28
Kontrollen	n = 44

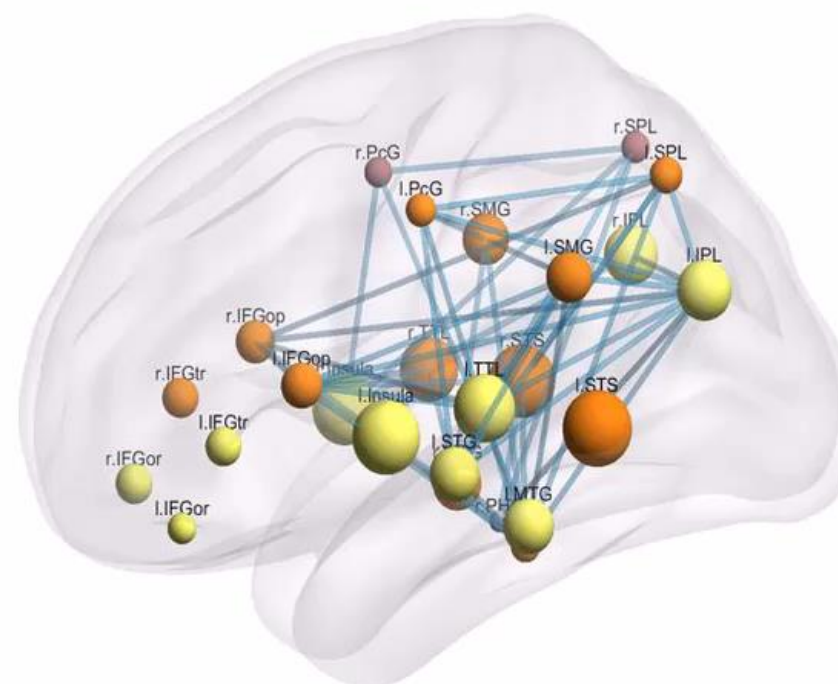
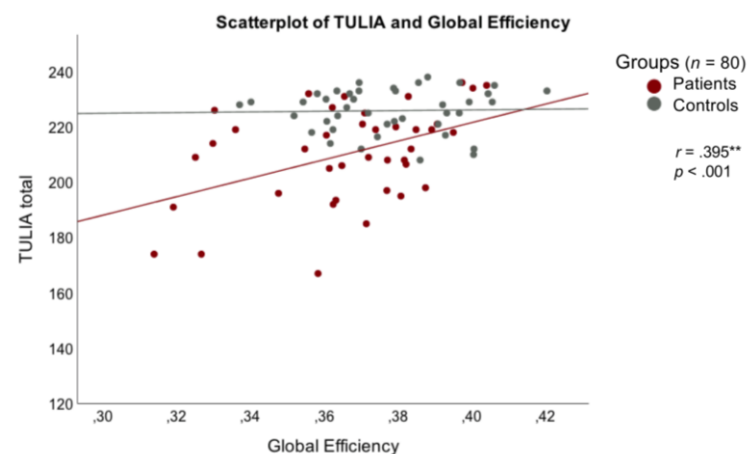


Patienten mit Gestendefizit < Kontrollen



Netzwerkstruktur und Gesten-Produktion

Organisation des Netzwerks ist entscheidend

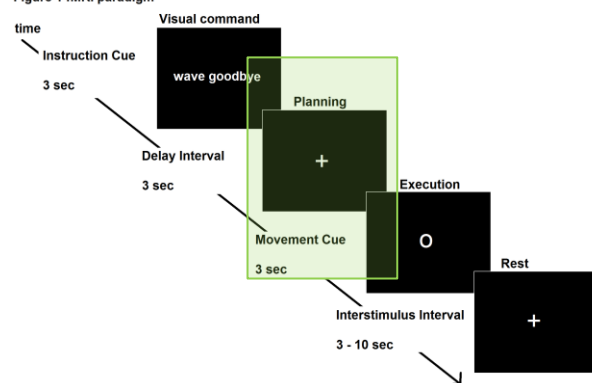


fMRI Task Gesten Planen

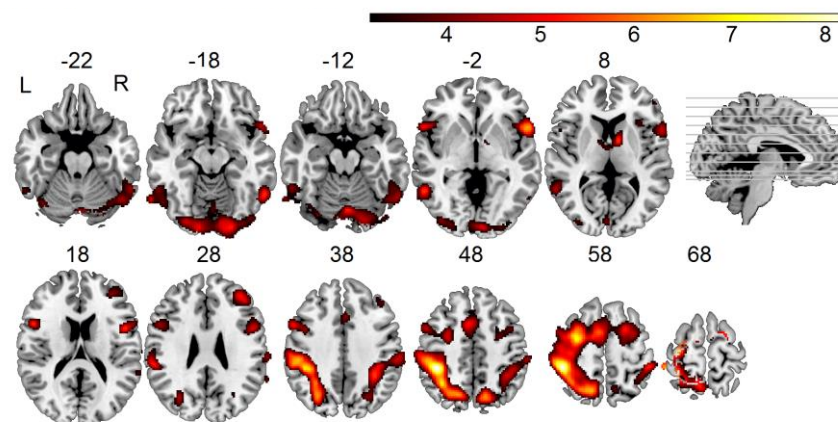
Patienten aktivieren das Netzwerk weniger bei der Planung



Figure 1 fMRI paradigm



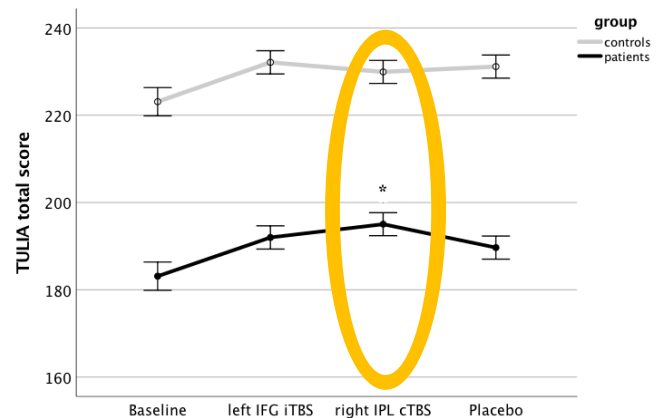
Kontrollen > Patienten



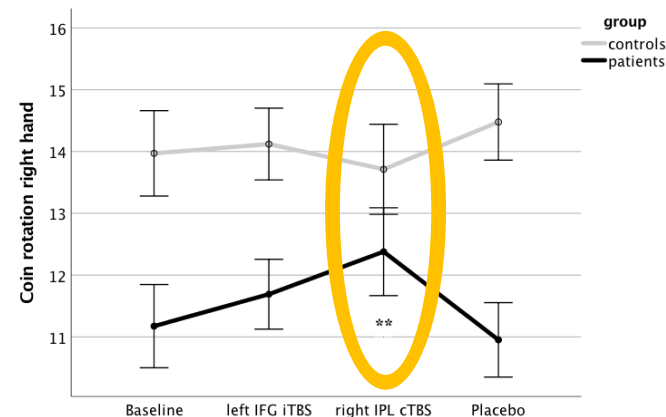
22 Patienten vs.
25 Kontrollen

rTMS auf das Praxisnetzwerk

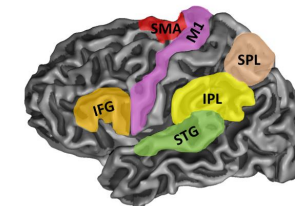
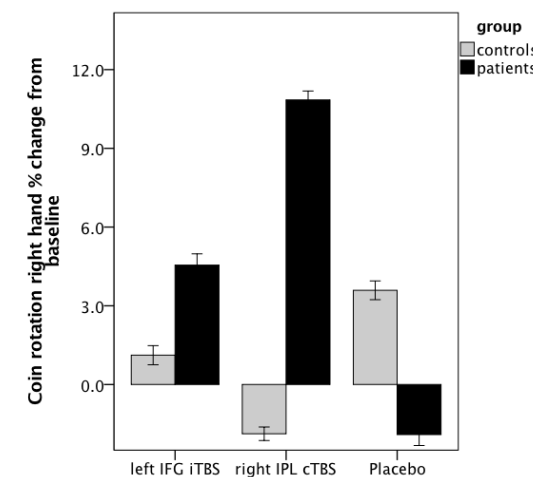
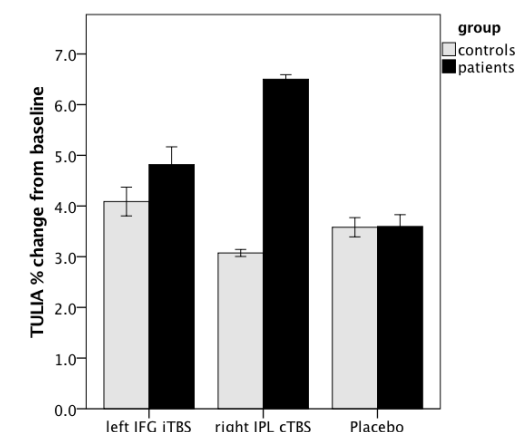
Randomisierte, doppelblinde, Crossover Studie



Group x stim $p = .03$



Group x stim $p = .002$



Ist die Gestenleistung bei Schizophrenie veränderbar ?

Entwicklung von Gestenleistung:

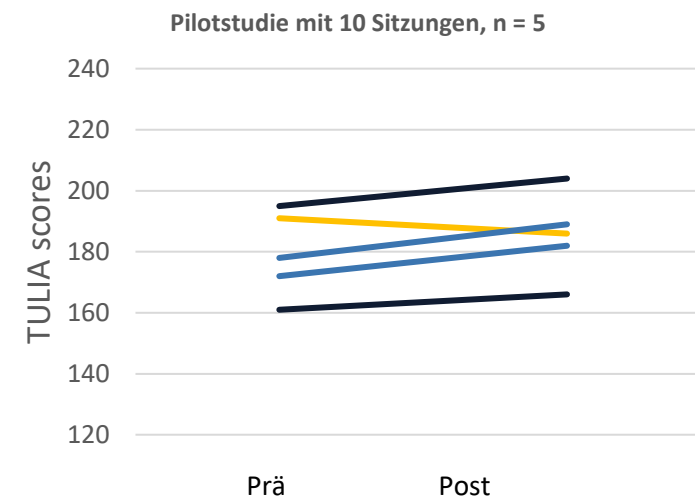
- Spontaner Verlauf 4 Wochen: - 4%
- Nach 10 Sitzungen Gruppentraining: + 3%
- Nach einmaliger rTMS: + 7%



+



?



BrAGG-SoS Studie

RCT zur Kombination Hirnstimulation und Psychotherapie

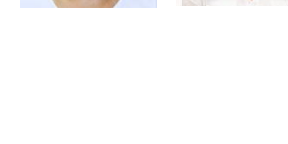
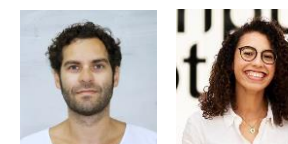
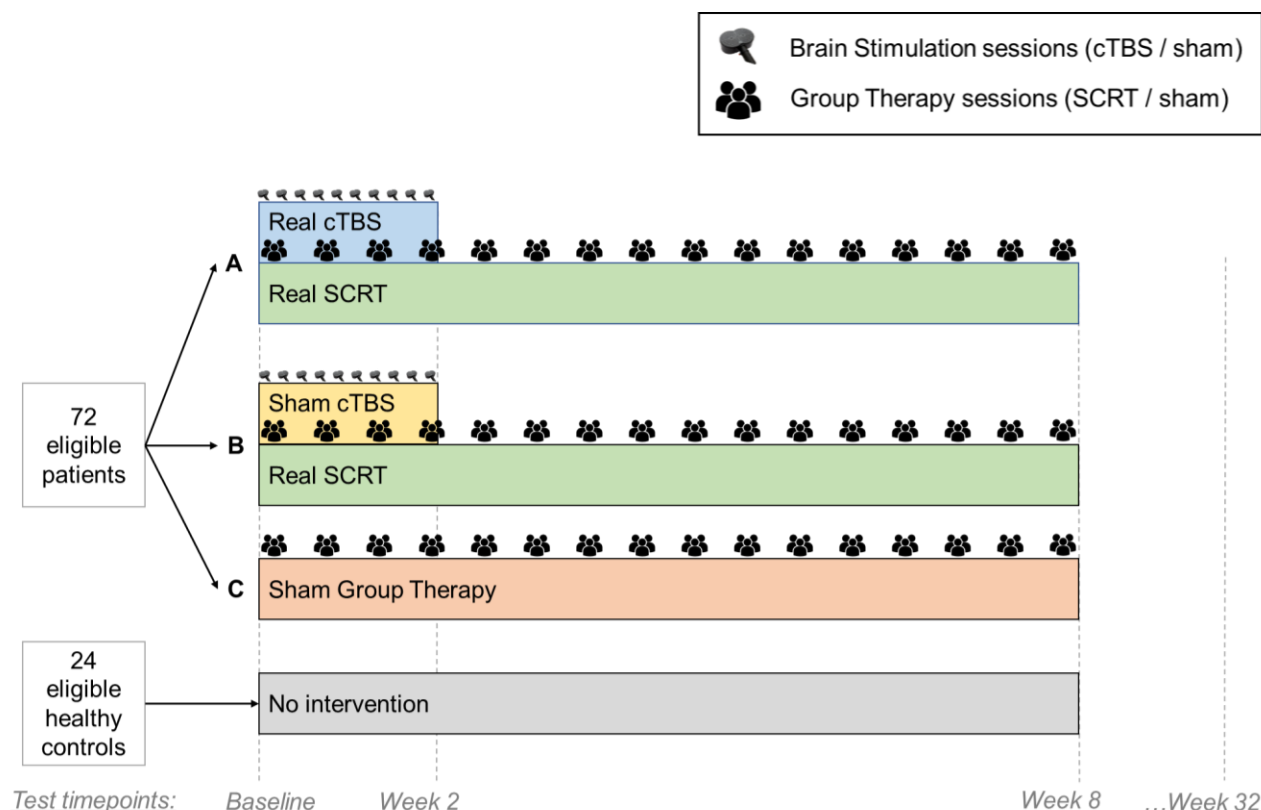
Outcomes

Gestenproduktion und
soziale Kognition

Start 02/2020

Last patient out: 04/2024

100% randomized



Zusammenfassung Gestenstörung

Generalisierte Störung der Gestik bei Psychosen

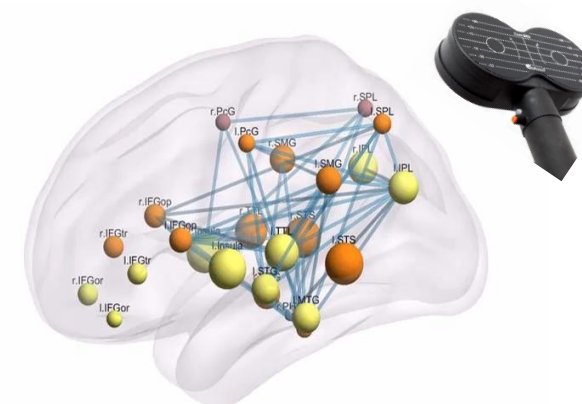
Stark assoziiert mit Funktionsniveau

Praxisnetzwerk strukturell und funktionell verändert

rTMS könnte add-on Behandlung werden (Walther et al. 2020)

Psychotherapie könnte als add-on Behandlung helfen (Riedl et al. 2022)

RCT zur Kombination von rTMS UND Psychotherapie läuft (BrAGG-SoS)



Vielen Dank !

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**UNIVERSITÄT
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