

Using Concepts as Experimental Tools: Mental Imagery & Hallucinations



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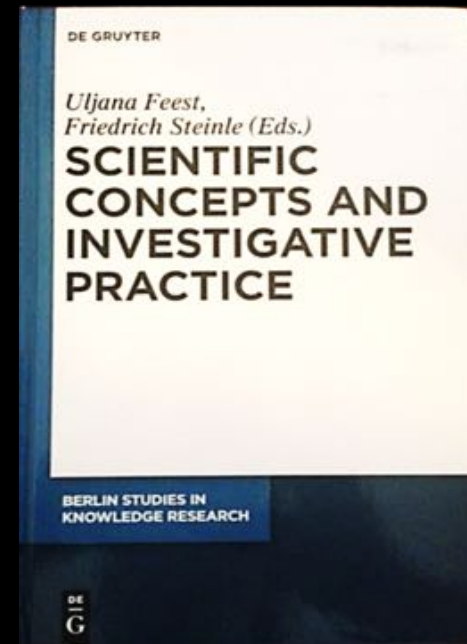
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The Use of Concepts in Experiments

✓ Focus on:

- Concepts as dynamic bodies of knowledge, accumulated by communities & *used* to individuate phenomena for further investigation



≠ Not a traditional focus on:

- the meaning or reference of concepts
- the uses of concept in individual cognition

Concepts as Experimental Tools

- Concepts as tools that intervene in experiments
- Conceptual structures act, in concert with humans, similarly to material instruments
- Concepts as dynamic human-nonhuman couples acting in ways that generate data



Sensory-like Mental Phenomena (SLMP)

Mental Imagery



SLMP resembling perception

Hallucinations



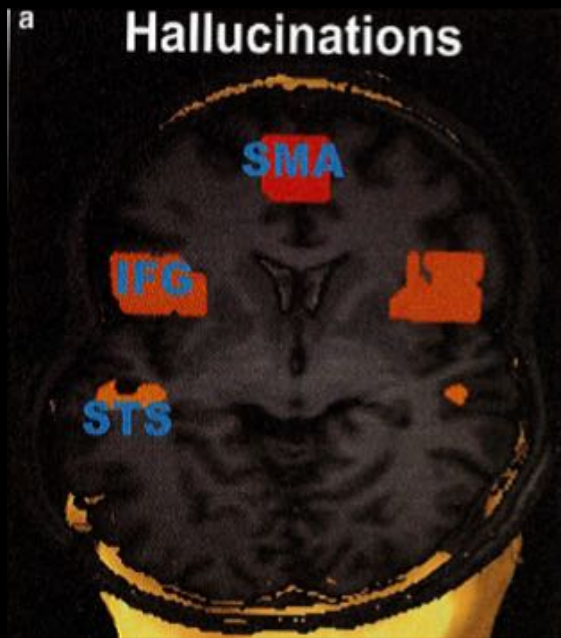
SLMP with compelling sense
of perception

Differentiating Types of SLMP

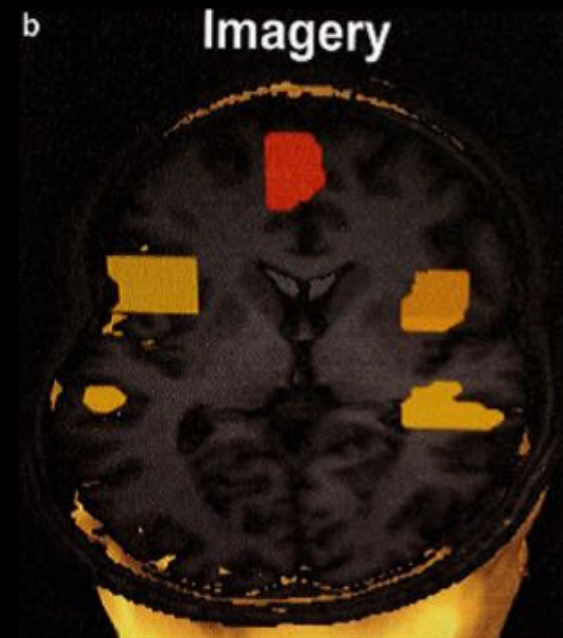
SLMP Characteristics	Typical Mental Imagery	Typical Hallucinations
Perceptual Similarity	Low (indistinct → vivid)	High (abnormally vivid)
Location	Internal	External
Volitional control	High (deliberate & manipulable)	Low (spontaneous & persistent)
Attribution	Self	Non-self
Insight	Maintained	Lacking

SLMP-Neuro-Correlates

Correlations between:
SLMP experiences &
patterns of neural activity



“Fig. 2.1:
Similar activation
patterns seen in
hallucinations a), and
auditory imagery b)”

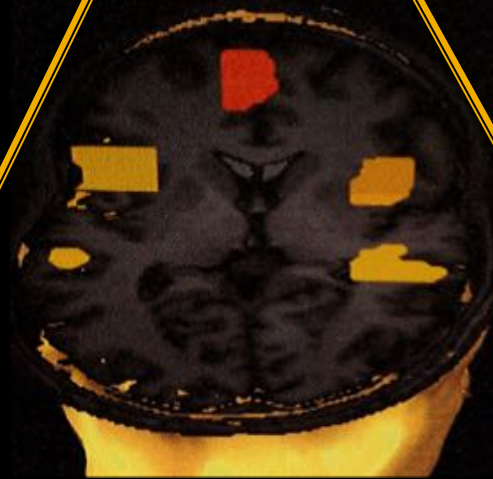


Investigate: **Mental imagery or Hallucinations**

Report:

Equivalent

SLMP-Neuro-Correlate



Indicates:

Function

or

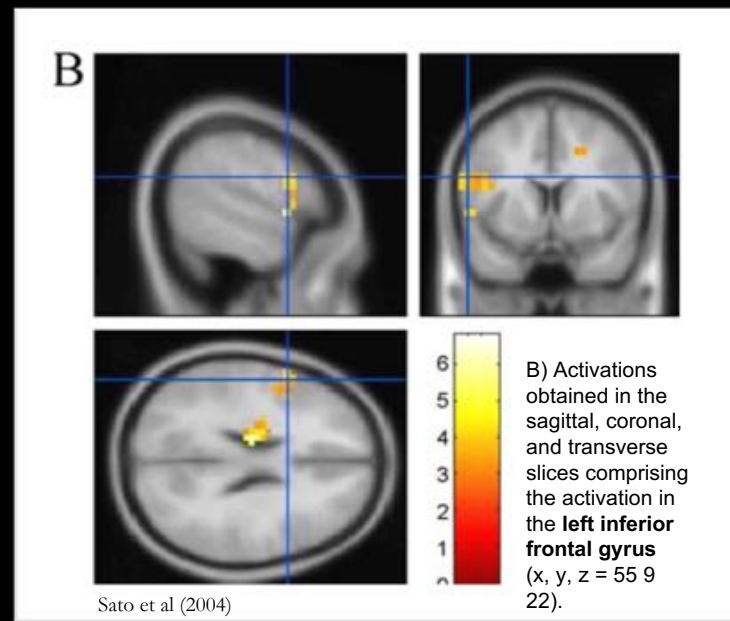
Dysfunction

Investigate:

Mental imagery or Hallucinations

Report:

Increased activity within the left IFG during auditory-verbal SLMP



Indicates:

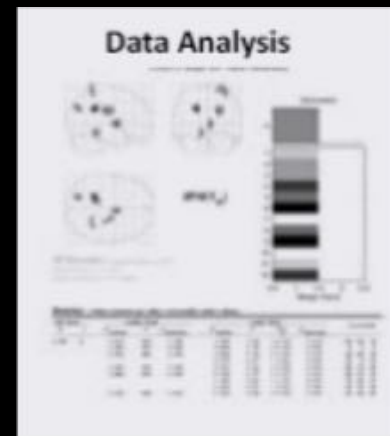
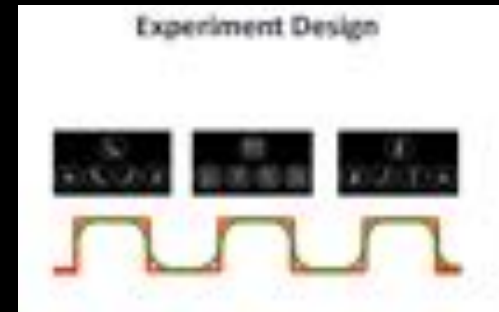
Language **functions** share space with auditory-verbal imagery

OR

Language **dysfunction** explains characteristics of auditory-verbal hallucinations

Concepts Used *During* Experiments

- Contributing to design & implementation
- Aligning interpretations of experimental data



Mental Imagery

- Subjects consisted of 'healthy' volunteers
- Active tasks assumed to require imagery (with typical characteristics)
 - > Self-reports unnecessary yet valuable

Hallucinations

- Subjects selected by diagnosis and/or typical characteristics
- Passive tasks (requiring careful justification)
 - > Self-reports discarded when inconvenient

Concepts Specify Conditions for Measurement

Mental Imagery and Hallucinations: Concepts as Experimental Tools

1. Concepts **used as tools** in neuroimaging experiments;
2. Interdependent associations **structure** the uses of concepts as tools **for** investigating discrete goals;

Mental imagery used as a tool
for investigating the role of SLMP
in ordinary neurocognition



Hallucinations used as a tool
for investigating SLMP as
symptoms of pathology

Historical Interdependence

Ordinary SLMP:

Subservient to reason when:

- Vivid
- Internal location
- Voluntary & manipulable
- Self-attributed
- Insight maintained

Mental Imagery

required for
memory & imagination

Pathological SLMP:

Disrupts reason when:

- Abnormally Vivid
- External location
- Involuntary & uncontrollable
- Misattributed
- Lack of insight

Hallucinations

an **over-excitation** of
memory or imagination

Mental imagery

required



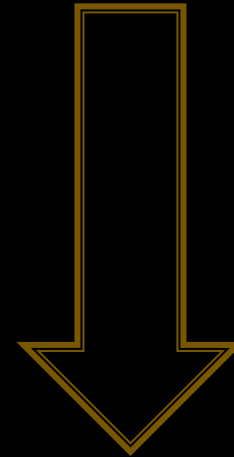
unnecessary



**one
among many**

Hallucinations

**dysfunctional
mental imagery**



**wide range
of disrupted functions**

Differentiating Types of SLMP

SLMP Characteristics	Typical Mental Imagery	Typical Hallucinations
Perceptual Similarity	<p style="text-align: center; font-size: 2em;">Variable</p>	
Location		
Volitional control		
Attribution		
Insight		

Concepts as Experimental Tools

The structured uses of concepts,
as goal-directed tools,
act in experiments
to provide the
field of possibilities
for generating knowledge



Investigating Mental Imagery

- Puzzling location for SLMP-Neuro-Correlate
- Location explained by **effort required** to generate SLMP

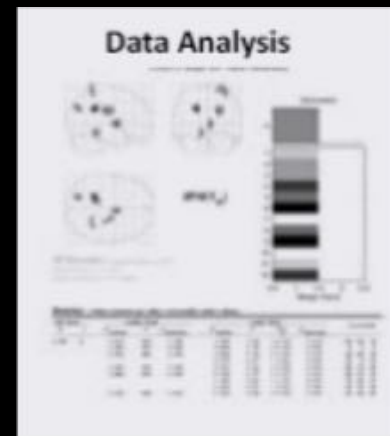
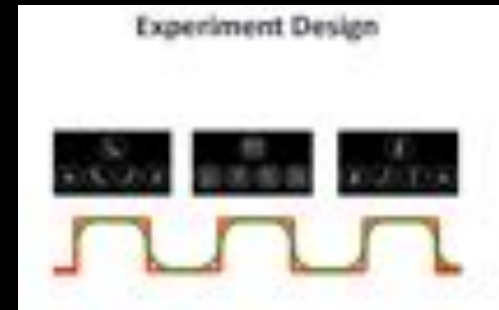
Investigating Hallucinations

- Mismatch in reported hallucinations & timing of SLMP-Neuro-Correlate
- Mismatch explained by **untrustworthy subjects**

Passive Response to Unexpected Findings

Concepts Used *During Experiments*

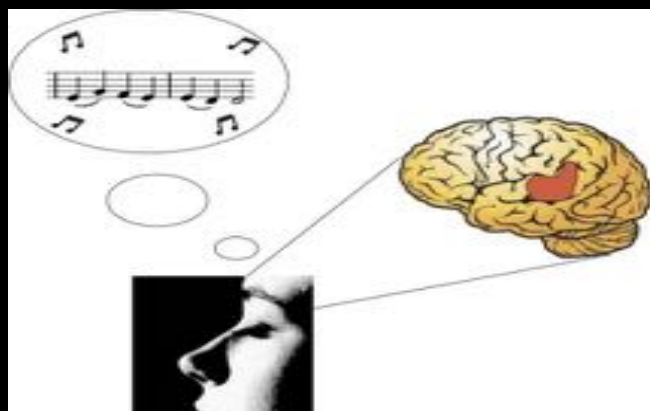
- Participating in design & implementation
- Aligning interpretations of experimental data



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