

# A funny thing happened on the way to talking: Enhanced automatic semantic activity immediately preceding language production in schizophrenia

## preceding language production in schizophrenia

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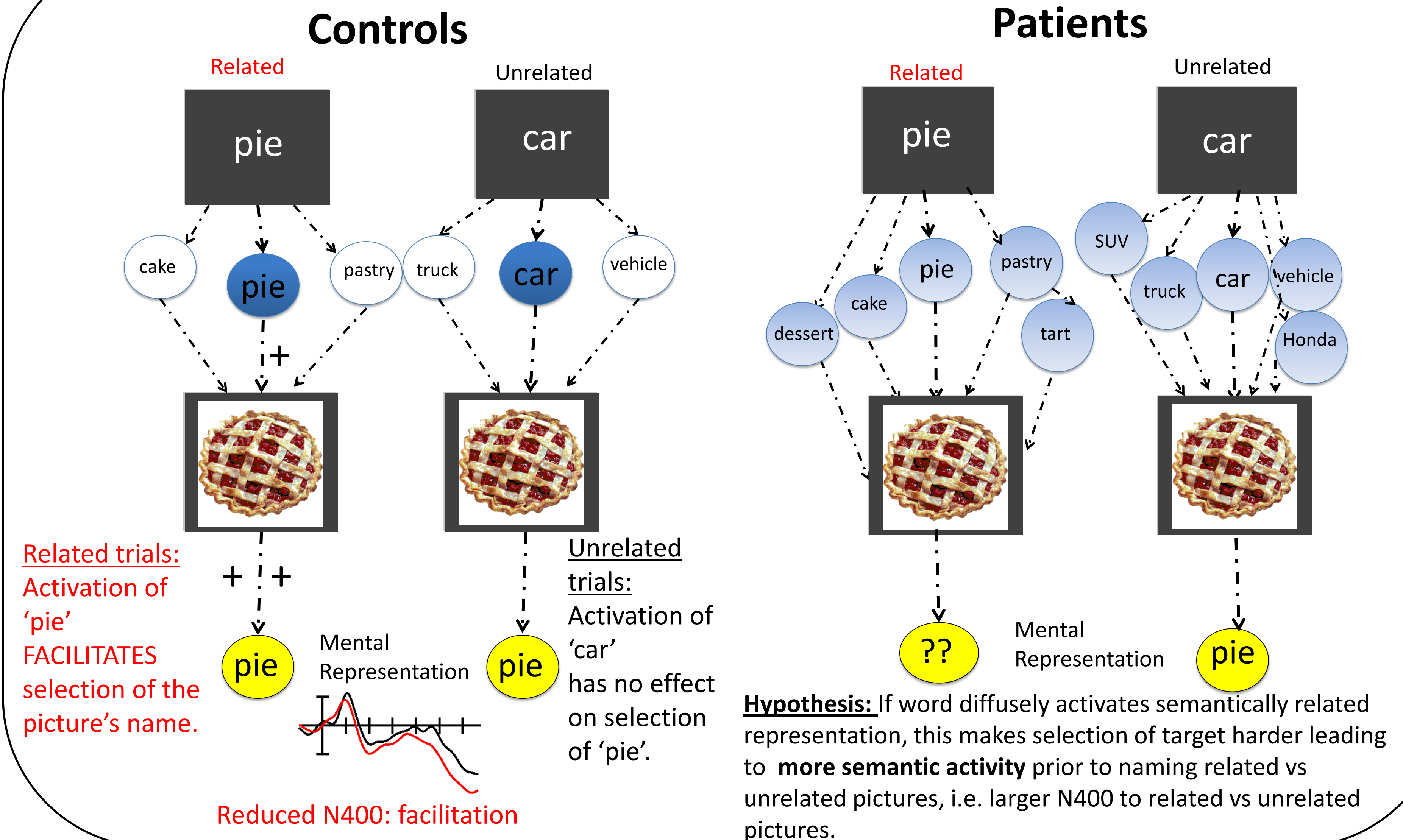
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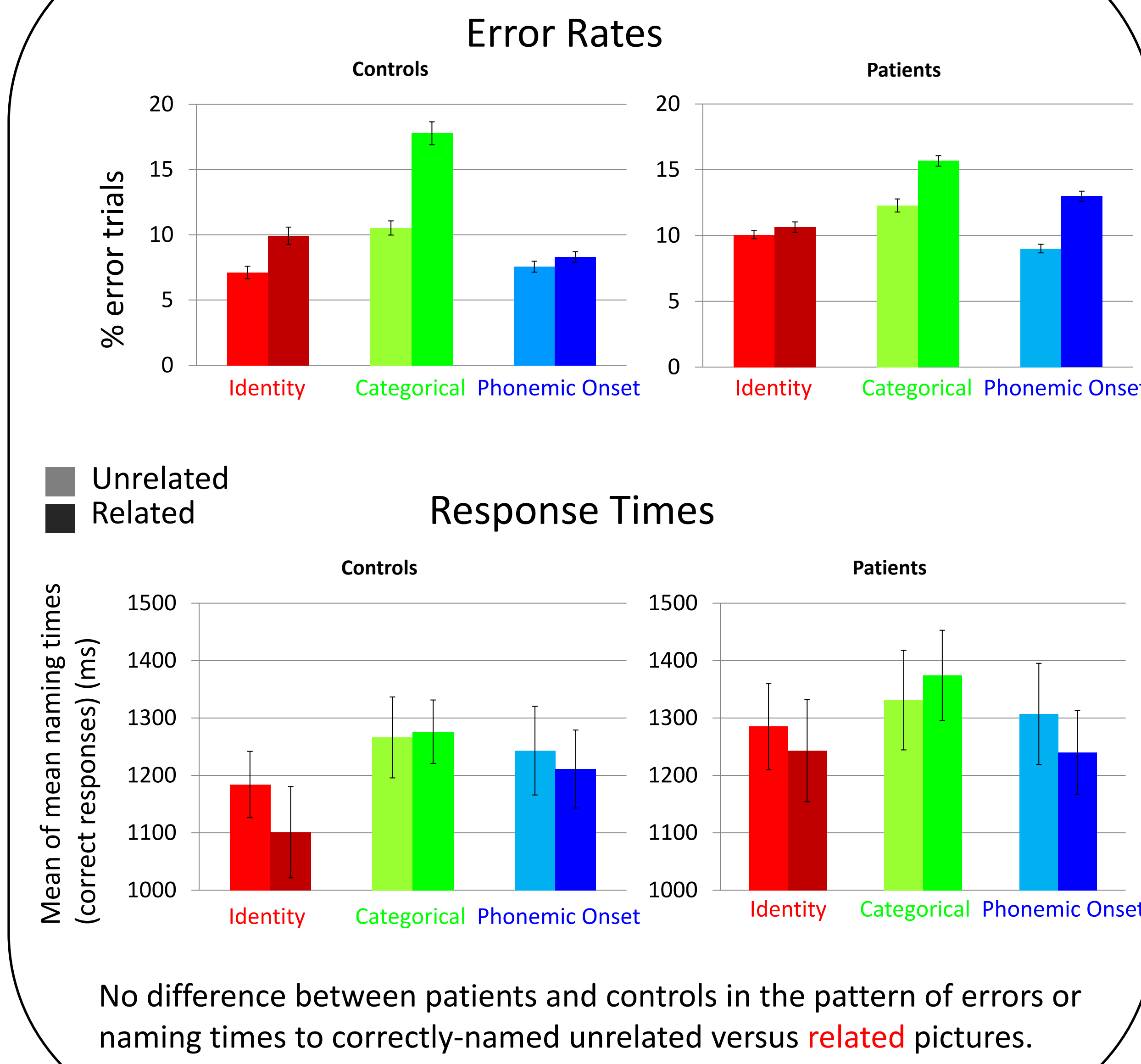
### Background

- ‘Loosening of semantic associations’: a fundamental mechanism explaining multiple aspects of psychotic thought in schizophrenia?
- Supported by semantic priming and language comprehension studies: enhanced neural activity in patients to semantically associated words (1,2).
- BUT thought disturbances in schizophrenia are assessed through language production.
- Production is more difficult to study than comprehension because speech-induced artifact can interfere with extraction of the neural signal.
- We developed a novel paradigm that directly captures neural activity during initial access of a word’s semantic representation, just prior to its production (3).

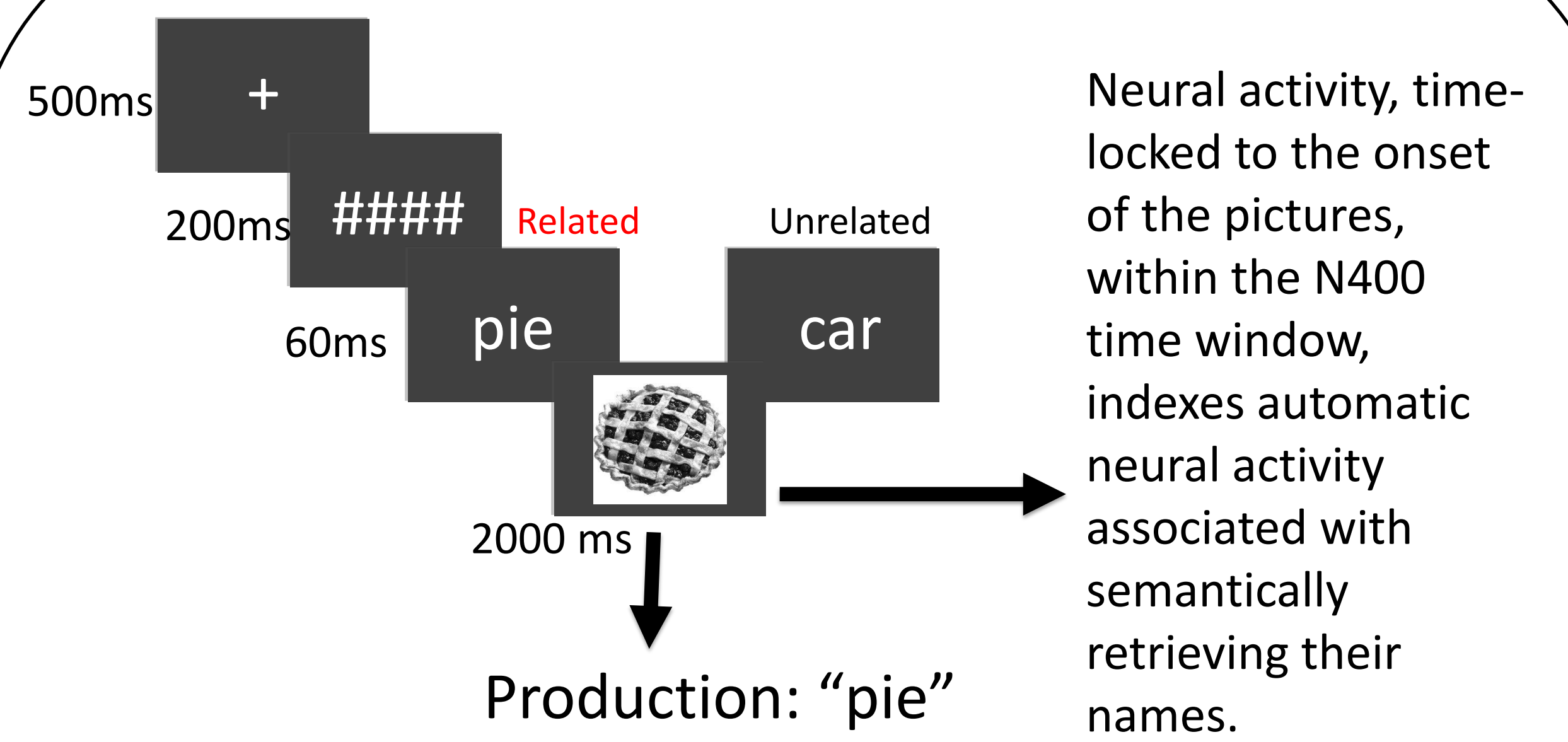
### Logic of Predictions



### Behavioral Results



### Methods



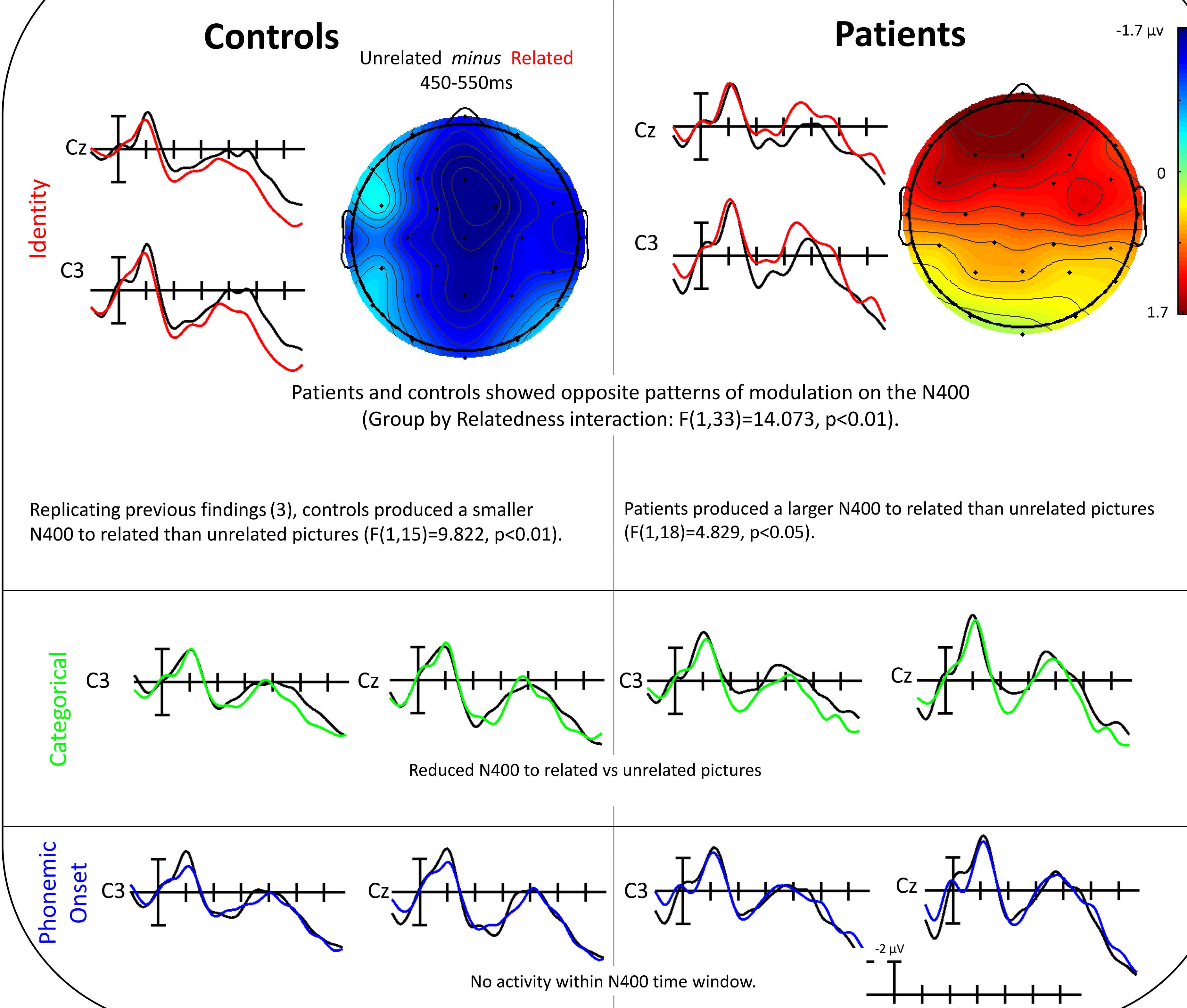
Word-Picture Relationship	Context Word	Picture Target	Length	# Phonemes	# Syllables	Log Freq.
<b>Identity</b>	Related	socks	5.8(2.2)	4.6(1.7)	1.7(0.8)	7.9(1.9)
	Unrelated	waffle				
<b>Categorical</b>	Related	cake	5.7(1.8)	4.7(1.5)	1.7(0.7)	8.1(1.3)
	Unrelated	hurricane				
<b>Phonemic Onset</b>	Related	log	6.0(2.0)	4.9(1.8)	1.8(0.8)	7.9(2.0)
	Unrelated	chalk				

Participants	Gender (M/F)	Race(W/AA/Other)	Age (years)	Education (years)	Hollingshead Index	Premorbid IQ
Controls	12/4	9/4/3	46.75	13.31	3.06	111.18
Schizophrenia patients	15/4	13/2/4	44.24	12.71	2.94	94.78

CPZ equivalent (mg): 326.15  
 Duration of illness (years): 22.07

PANSS total: 53.67  
 PANSS hallucinations: 2.6  
 PANSS delusions: 2.73  
 PANSS disorganization: 2.47  
 SANS total: 41.4

### ERP Results



### Conclusions

- Enhanced automatic neural activity at the earliest stage of selecting the meaning of a word, prior to its production in schizophrenia.
- Detected even in non-thought disordered patients, and even when behavioral measures of production are normal.
- May predispose to multiple thought abnormalities in schizophrenia.

#### References

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- Kuperberg GR, Deckersbach T, Holt DJ, Goff DC, West WC. Increased temporal and prefrontal activity in response to semantic associations in schizophrenia. *Archives of General Psychiatry* 2007; 64: 138-151.
- Blackford T, Holcomb P, Grainger J, Kuperberg GR. A funny thing happened on the way to articulation: N400 attenuation despite behavioral interference in picture naming. *Cognition*. 2012; 123(1): 84-99.

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