

Reduced hemispheric asymmetry in the use of weak sentential context in schizotypy

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Introduction

- ▶ Schizotypy in the general population is associated with a decreased sensitivity to sentential context
- ▶ Increases in measures of disorganized thought often correlate with decreased activation of weakly related information in sentence comprehension
- ▶ Changes in comprehension associated with schizotypy often mirror language-related symptoms in schizophrenia
- ▶ Reduced hemispheric asymmetry may be one factor contributing to language disturbances in both schizotypy and schizophrenia

Research Questions

1. Is increased schizotypy related to disrupted use of context, particularly in weak contexts?
2. Is increased schizotypy associated with reduced hemispheric lateralization?

Method

As soon as they reached the sand he stopped to take off his

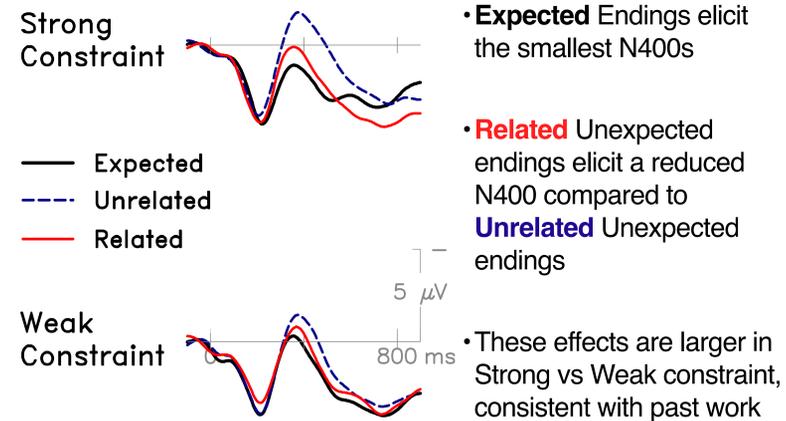
SHOES / **SNEAKERS** / WATCH. Strong Constraint

John felt some remorse so he decided to return the

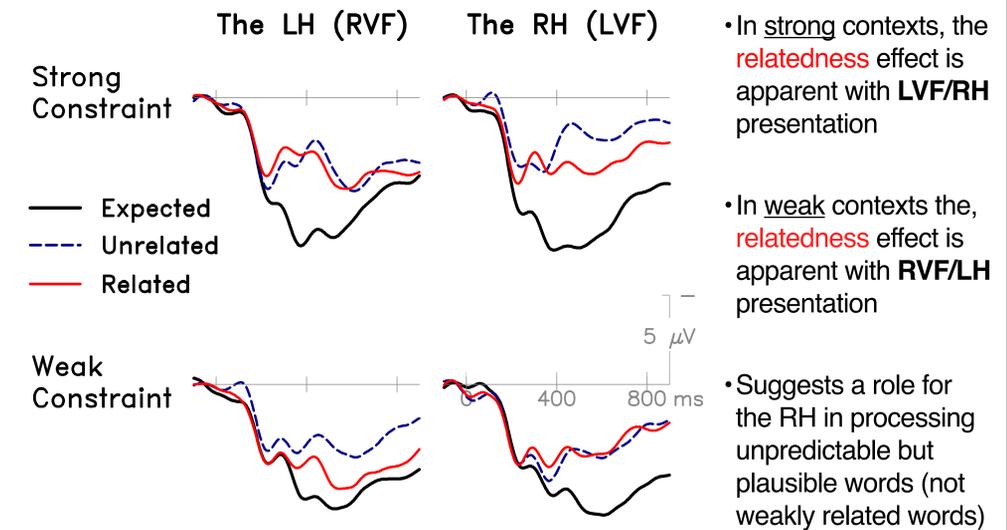
MONEY / **CASH** / WATCH. Weak Constraint

- ▶ Sentences varied in constraint as determined by cloze probability and were completed by **expected**, **unexpected but related**, or **unexpected and unrelated** endings
- ▶ EEG was recorded from 26 sites as participants read for comprehension word-by-word (200 ms duration, 500 ms SOA) and completed a memory task at the end of the experiment
- ▶ Sentence-final words were lateralized in the right and left visual fields (RVF/LVF) with the inner edge 2 degrees from fixation in order to bias processing to the contralateral hemisphere (LH/RH); ERPs were created for these critical words and N400 amplitudes were measured 300-500 ms (displayed at Midline Parietal)
- ▶ Participants were recruited from a healthy student population; each completed the Schizotypal Personality Questionnaire (SPQ), a non-diagnostic self-report measure of schizotypal traits
- ▶ Relevant SPQ subscales (related to disorganized thought) were correlated with N400 asymmetry scores of interest

Central Presentation

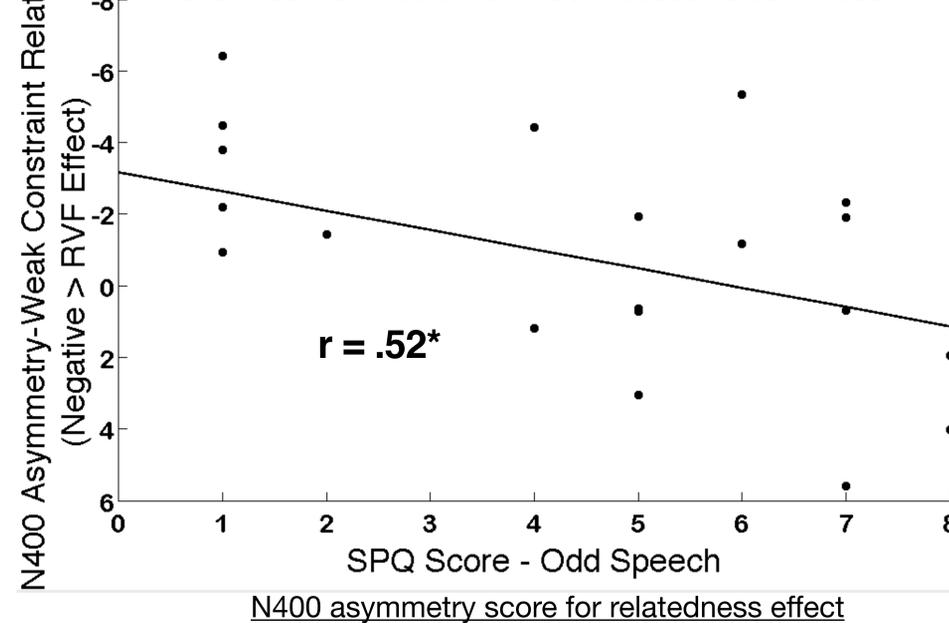


Lateralized Presentation



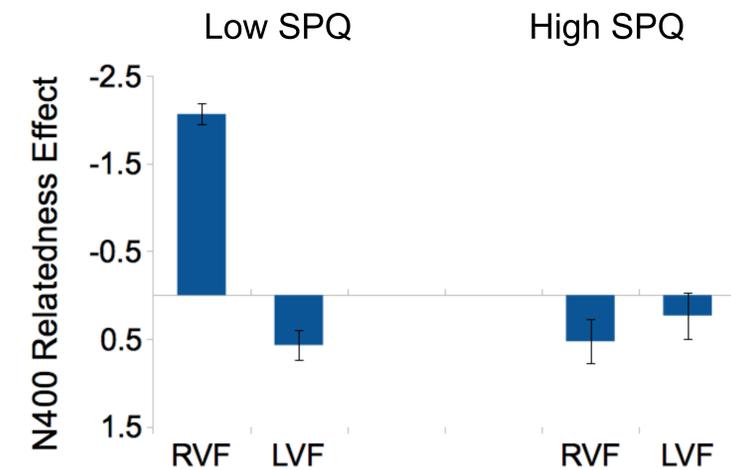
Hemispheric Asymmetry in Schizotypy

SPQ Odd Speech Scores vs. asymmetry of the weak constraint N400 relatedness effect



1. Relatedness effects are assessed by subtracting the ERP to **related** endings from the ERP to **unrelated** endings
2. Asymmetry score is the raw difference between RVF & LVF relatedness effects
3. Therefore: $N400 \text{ asymmetry} = (RVF \text{ Unrel.} - RVF \text{ Rel.}) - (LVF \text{ Unrel.} - LVF \text{ Rel.})$

Weak constraint relatedness effects as a function of VF and SPQ group



- SPQ scale of Odd Speech significantly correlated with asymmetry of relatedness effect in weak contexts
- Reduced asymmetry for high SPQ resulted from decreased facilitation for RVF related endings in weak contexts, rather than increased facilitation for LVF related endings

Discussion

- ▶ Increased SPQ (Odd Speech/Disorganized Thought) led to reduced hemispheric asymmetry in N400 relatedness effects
- ▶ The reduced asymmetry was driven by decreased LH N400 facilitation for weakly related information
- ▶ Though not significant in this sample, there was a tendency for high SPQ to exhibit increased LH N400 facilitation for strongly related information, which would also lead to more symmetric N400 patterns
- ▶ Future work will examine the extent to which disrupted lateralization/specialization leads to altered comprehension patterns in schizotypy and schizophrenia, e.g by diminishing the possibility of engaging multiple mechanisms in parallel