Spirituality and Error Processing

Angelica M. Mamani
Patrick Steffen
Michael Larson

Follow this and additional works at: https://scholarsarchive.byu.edu/fhssconference_studentpub

Part of the Psychology Commons

The Annual Mary Lou Fulton Mentored Research Conference showcases some of the best student research from the College of Family, Home, and Social Sciences. The mentored learning program encourages undergraduate students to participate in hands-on and practical research under the direction of a faculty member. Students create these posters as an aide in presenting the results of their research to the public, faculty, and their peers.

BYU ScholarsArchive Citation
https://scholarsarchive.byu.edu/fhssconference_studentpub/229
INTRODUCTION

Hundreds of articles have been published in psychology journals investigating spirituality and its uses in therapy and as a coping mechanism. However, little research has been done on the effect of spirituality and neurological processes.

Inzlicht et al. (2009) asserted that both belief in God and high religious zeal were correlated with smaller ERN amplitudes. However, in Inzlicht’s study only those who were highly zealous spiritually and if the participants believed in God. Nothing about the components of spirituality were examined.

In order to fully assess the components of spirituality, the Spirituality Assessment Inventory (SAI) was administered and the various subscales analyzed.

Hypothesis

We suggest that individual components of spirituality will significantly correlate with the ERN more than the holistic belief in God.

METHODS

**Task**

- Eriksen Flanker Task
  - Direction indication only
  - 50% congruent (e.g., < < < <)
  - 50% incongruent (e.g., > > > >)
  - 3 blocks of 300 trials each

**EEG Acquisition**

- 128 channel sensor net
- Horizontal and vertical EOG
- Cz referenced
- .10-100Hz bandpass
- 250Hz sampling rate
- Impedance < 50 kΩ
- Average re-referenced

**ERP Reduction**

- BESA artifact/EOG correction
- 15Hz low-pass filter
- ERN: Frontocentral electrode sites

**Statistical Analysis**

- Differences between congruent and incongruent trials were examined using median subject-level paired-sample t-tests
- Pearson’s product-moment correlations were utilized to determine the relationships between empathy and behavioral indices of error (i.e., processing slowing, ERN, and PP).

Statistical Analysis

- Subsequent partial correlations controlled for the potential contribution of negative ERN effects in error processing.
- Multiple regression analyses with the error variable as the dependent variable were used to determine the unique correlates of empathy and ERN amplitude.

CONCLUSIONS

- In the first analysis no relationship was found between the positive spirituality subscales, e.g., Realistic Acceptance, Awareness, Impression Management, and smaller ERN amplitudes.
- Two of the negative subscales of the SAI, Disappointment and Instability, demonstrated correlations with smaller ERN amplitudes. The third, Grandiosity, did not exhibit a relationship with ERN amplitudes in any significant way.
- The Disappointment and Instability subscales are both associated with a lower sense of self-efficacy or internal control. The positive subscales are more associated with a greater sense of self-efficacy and resiliency to negative outcomes. Grandiosity as a subscale measures the degree to which an individual believes they can influence God, implying that higher grandiosity scores correlate with a greater sense of control or power.

ACKNOWLEDGEMENTS

- Supported by the College of Family, Home, and Social Sciences at Brigham Young University and special thanks to the EEG Lab staff for all of the dedicated work.

RESULTS

- ERN amplitude is negatively correlated with the Disappointment subscale of the SAI (r = .308*, p < .05).
- There was an even stronger relationship between the Instability subscale of the SAI and the ERN, (r = .335*, p < .05).
- No correlation was found between the Grandiosity, Impression Management, Awareness, or Realistic Acceptance (r = -.170, r = -.065, r = -.078, r = -.098 respectively).

SUMMARY TABLE

<table>
<thead>
<tr>
<th></th>
<th>ERN</th>
<th>SAI Aware</th>
<th>Real Accept</th>
<th>Disappointment</th>
<th>Grandiosity</th>
<th>Instability</th>
<th>SAI ImpressMgmt</th>
<th>STAI Trait</th>
<th>STAI State</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ERN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SAI Aware</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Real Accept</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Disappointment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grandiosity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SAI ImpressMgmt</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STAI Trait</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STAI State</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** *Correlation is significant at the 0.05 level (2-tailed).**