Possible mechanisms of bilingual advantage on creativity

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Bilinguals are purported to be more creative than monolinguals, but the mechanism for this bilingual advantage is still unresolved, with several different accounts proposed. Others have challenged the existence of bilingual advantages in general. We examine existence as well as hypothesized semantic network difference based mechanisms for the relationship between bilingualism and creativity here by measuring creativity and fluency for monolinguals (n = 42) and bilinguals (n = 29). The fluency measure allowed us to analyze the structure of individuals' semantic networks (average shortest path length, clustering coefficient, and modularity). We found no differences in creativity between monolingual and bilingual participants, with a Bayesian test showing substantial evidence for the null hypothesis. We did find that aspects of semantic network structure predicted creativity. These findings suggest that, contrary to previous work, the bilingual advantage does not exist in the realm of creativity.

The Bilingual Advantage and Creativity

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Introduction

Are bilinguals more creative than monolinguals? Are bilinguals more creative in their second language?

The **Bilingual Advantage** is the advantage bilinguals are purported to have in several cognitive domains. For example, there is evidence that bilinguals are more creative than monolinguals.[1]

However, there is some skepticism about the existence of the bilingual advantage in domains of executive functioning[2], due to unmatched participant samples, small sample sizes, and low reproducibility.

We investigated whether bilinguals were more creative than monolinguals, and if so whether thinking in their second language gave bilinguals a creative advantage because their semantic networks are structured differently from monolinguals, especially when measured in their second language[3].

Hypotheses

H1: Bilinguals will be more creative than monolinguals.

H2: Bilinguals will be more creative in their second language as opposed to their first.

Null Hypothesis: Bilingualism does not provide any advantage on creativity.

Methods

LEAP-Q: Bilingualism Assessment[4]

- Monolinguals N = 25
- ES Bilinguals (English-Spanish Bilinguals) N = 13
- SE Bilinguals (Spanish-English Bilinguals) N = 28

Guilford's Alternative Uses Task: Creativity Assessment[5]

Please list non-standard uses for the following object:

A tire:

On a Bike ✗	A Door Stop ✓
A Tire Swing ✓	
As a Chair ✓	

Raven's Progressive Matrices - Short Version: IQ Measure[6]

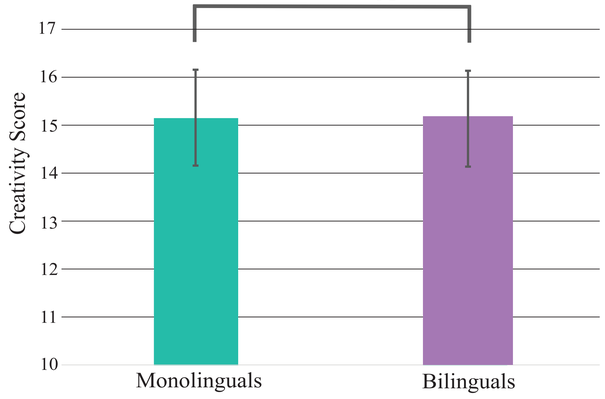
Fluency Task and U-INVITE: Semantic Network Structure[7]

List as many possible animals as you can in 3 minutes.

Results

Bilinguals are not more creative than monolinguals.

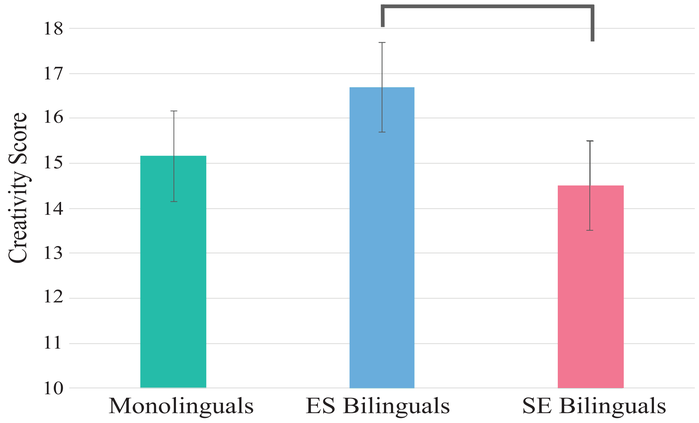
$BF_{01} = 3.866 \pm 0.002\%$



H1 ✗ H2 – Null ✓

Bilinguals are not more creative in their second language.

$BF_{01} = 2.069 \pm 0.010\%$



H1 – H2 ✗ Null ?

Creativity and intelligence were correlated at trend ($r(90) = 0.185$, $p = 0.077$).

Bayesian analysis: $BF_{01} > 3.00$ is substantial evidence that two means are the same

Conclusions

The bilingual advantage does not exist in the realm of creativity.

Acknowledgements

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References

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