

The Effects of Language and Emotional Context on Learning



BASQUE CENTER ON COGNITION, BRAIN AND LANGUAGE

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Introduction

- People remember things with emotional impact better (e.g., emotional content (1), context (2))
- Recognition performance is the same in a foreign and a native language, but there are some differences when information is interrelated as well as in recall (e.g., 3, 4)
- People are less emotional in a foreign language (e.g., 5, 6, 7, 8)

Participants

Experiment 1



Experiment 2

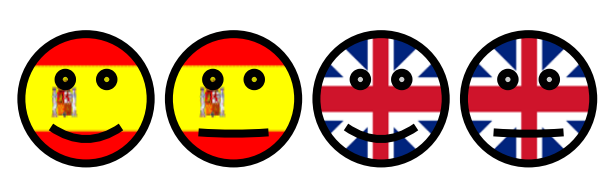


Young adults
 30.5 (9.2) yrs old
 Native Spanish speakers
 B2-C1 level of English

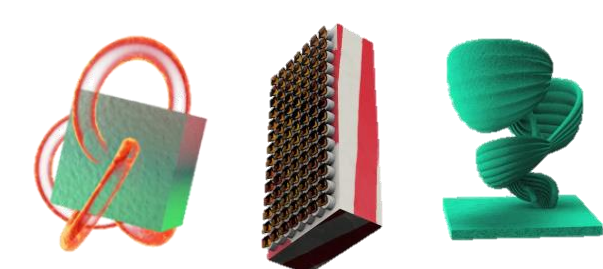
Experiment 1

Do language and emotional context (as opposed to content) affect vocabulary learning?

Stimuli



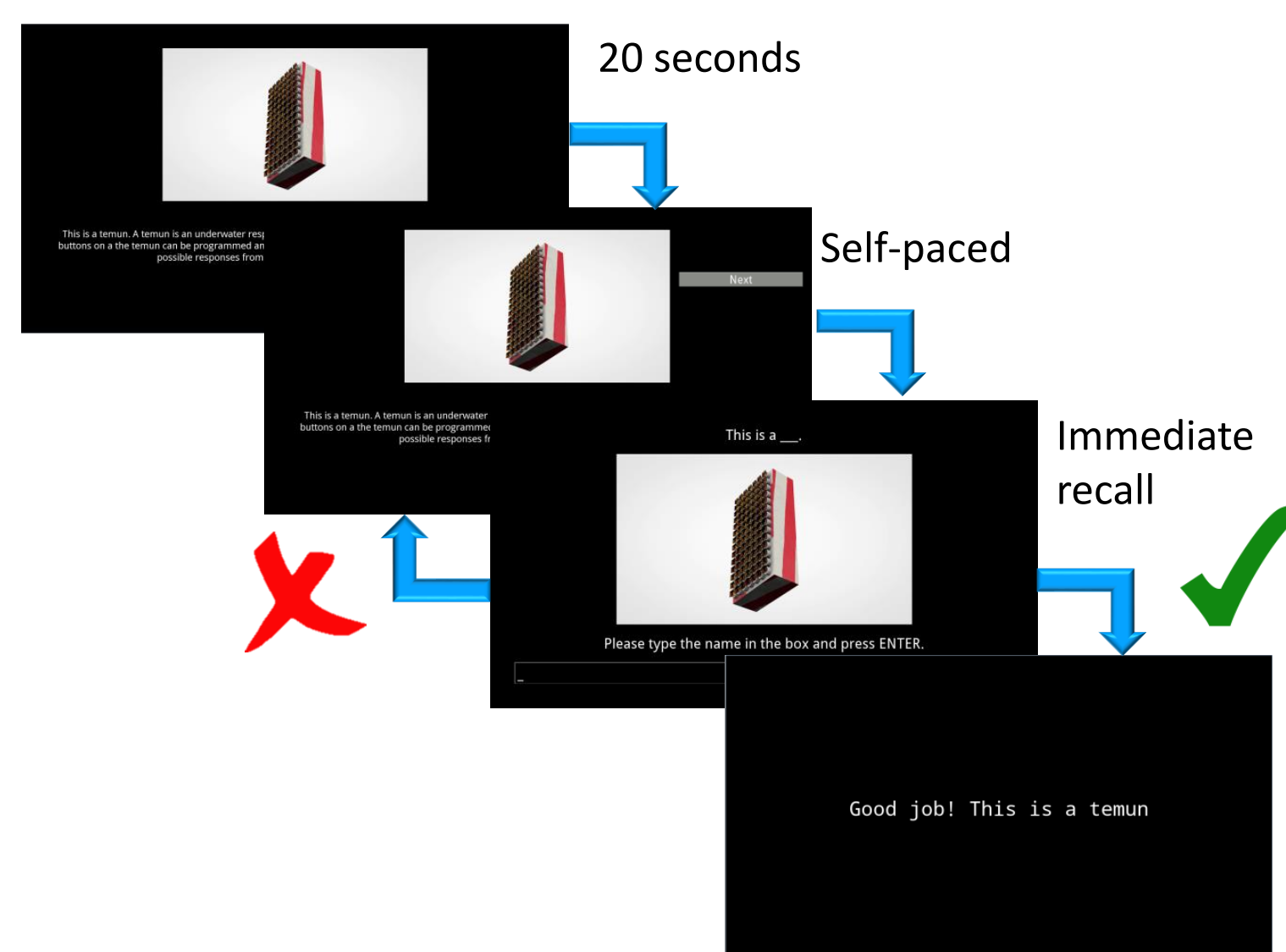
- 46 objects
- 92 names
- 46 objects & 46 foils



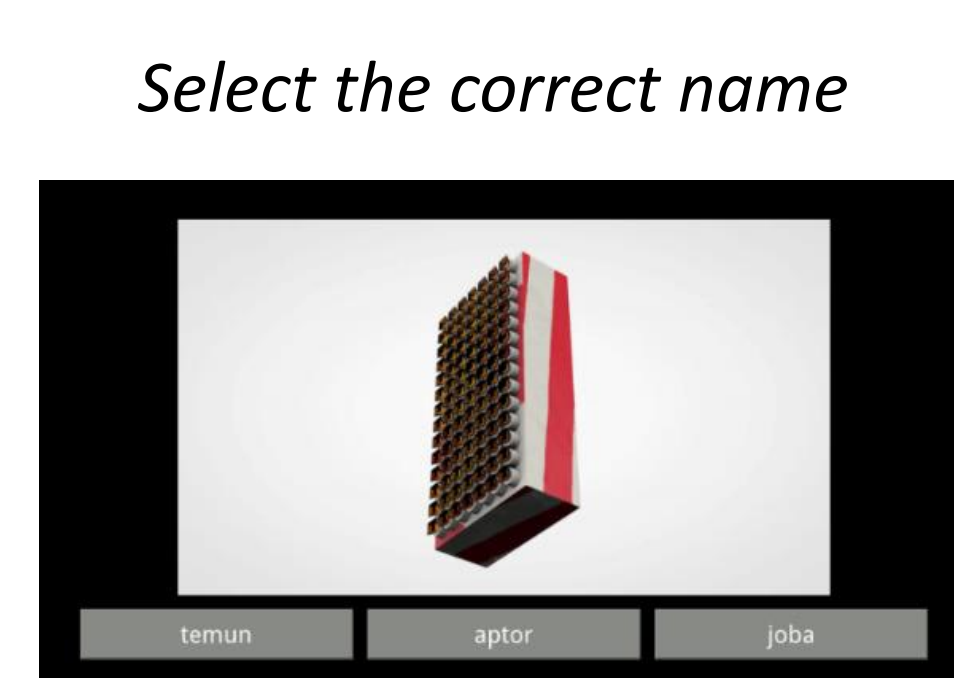
Neutral
 This is a **chefio**. The **chefio** is a type of maze that is used in research laboratories. The **chefio** has both closed and open parts so that people can search inside and orient outside. The **chefio** is a laboratory object.
 Esto es un **chefio**. El **chefio** es un tipo de laberinto para laboratorios de investigación. El **chefio** tiene partes cerradas y abiertas para que la gente busque por dentro y se oriente al salir. El **chefio** es un objeto de laboratorio.

Positive
 This is a **chefio**. The **chefio** is a type of maze used at birthday parties for children. The **chefio** has both closed and open parts providing the enjoyment and thrill of independence as well as safety of seeing their mother. The **chefio** is a game for children.
 Esto es un **chefio**. El **chefio** es un tipo de laberinto para fiestas de cumpleaños infantiles. El **chefio** tiene partes cerradas y abiertas para dar el goce y la emoción de la independencia, así como la seguridad de ver a su madre. El **chefio** es un juego infantil.

Learning Phase: Self-Paced Reading



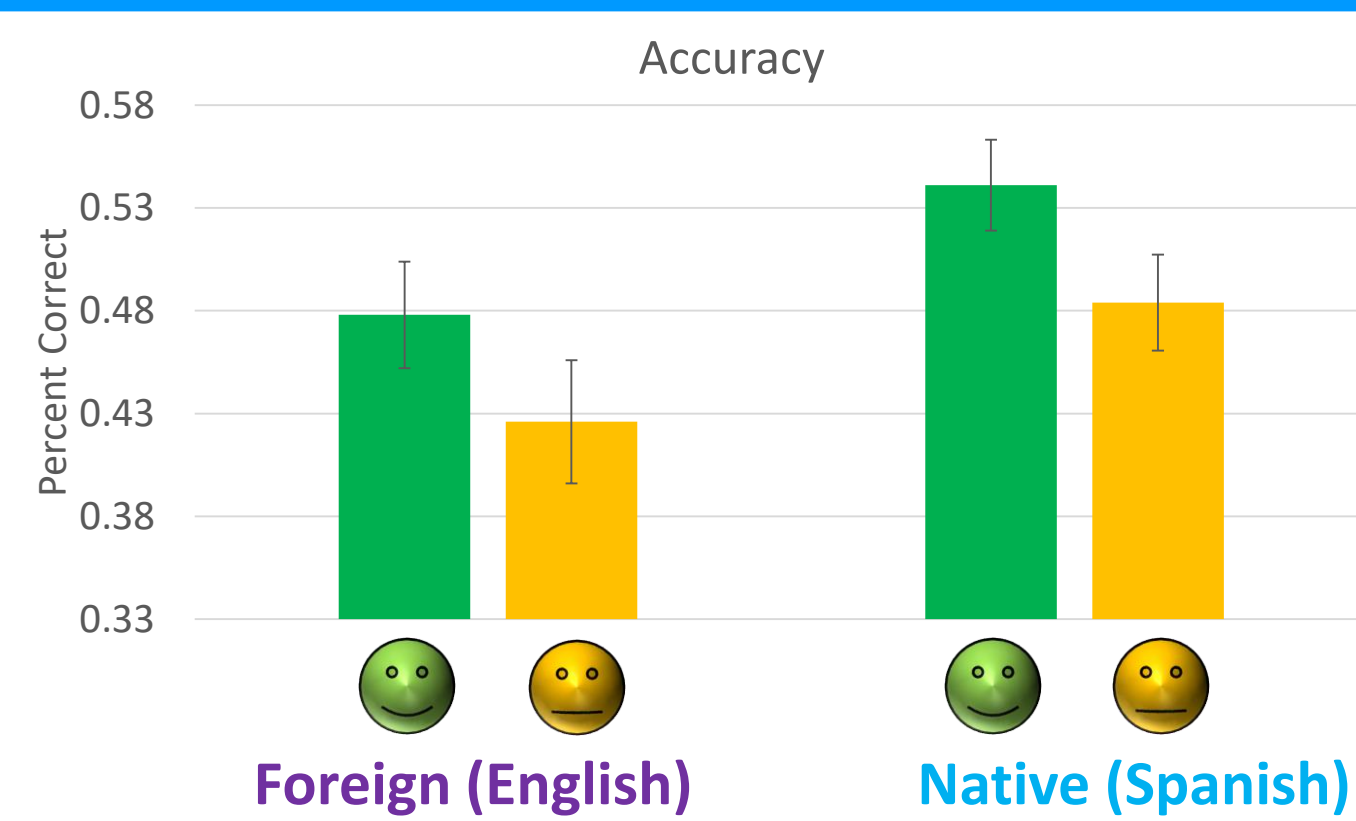
Testing Phase: Name Matching



Results

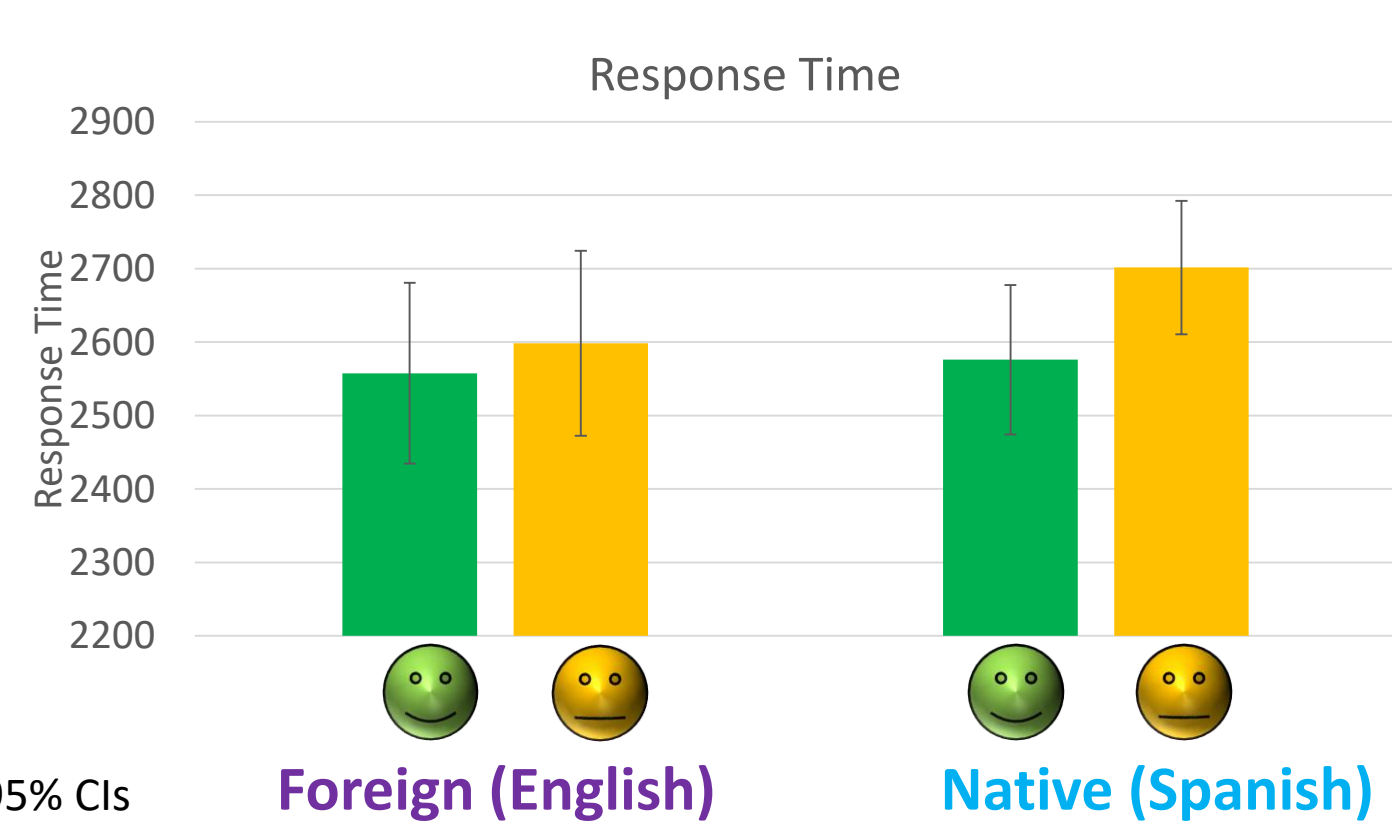
Accuracy

- **Positive > Neutral**
 $F(1, 41) = 5.93, p = .02, \eta^2 = .13$
- **Native > Foreign**
 $F(1, 41) = 4.64, p = .04, \eta^2 = .10$
- **No interaction**
 $p = .92, BF_{01} = 3.31, \text{error}\% = .02$



Response Time

- **Positive < Neutral**
 $F(1, 41) = 5.48, p = .02, \eta^2 = .11$
- **No effect of language**
 $F < 1$
- **No interaction**
 $F < 1$

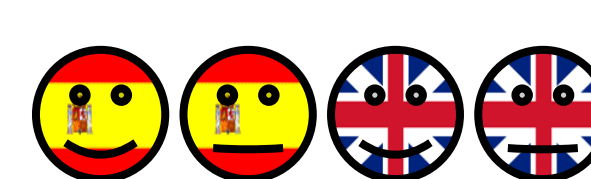


Note: Error bars are 95% CIs

Experiment 2

Do language and emotional context affect learning of new concepts?
 Do we see the same effects as in Exp. 1 in the auditory modality?

Stimuli



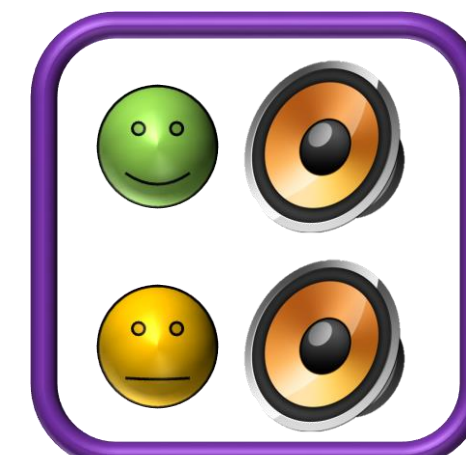
- 2 countries
- 50 "facts" each



Neutral
 The population of Tecamer is defined politically as left wing, although they are considered generally quite moderate in their political, economic, and social opinions.
 La población de Tecamer se define con inclinaciones políticas de izquierdas, aunque éstos se consideran por lo general bastante moderados en sus opiniones políticas, económicas y sociales.

Positive
 The population of Tecamer is defined politically as left wing and supports freedom, tolerance, and social inclusion as well as equal opportunity, leading many campaigns against discrimination.
 La población de Tecamer se define con inclinaciones políticas de izquierdas y apoya la libertad y tolerancia e inclusión social así como la igualdad de oportunidades, por lo que lideran muchas campañas contra la discriminación.

Learning Phase: Passive Listening



Testing Phase: Multiple Choice

What is the oldest monument in each country?		
	Mufelo	Tecamer
The opera in the capital	<input type="radio"/>	<input type="radio"/>
The roman bridge	<input type="radio"/>	<input type="radio"/>
The national museum	<input type="radio"/>	<input type="radio"/>
The temple in the capital	<input type="radio"/>	<input type="radio"/>

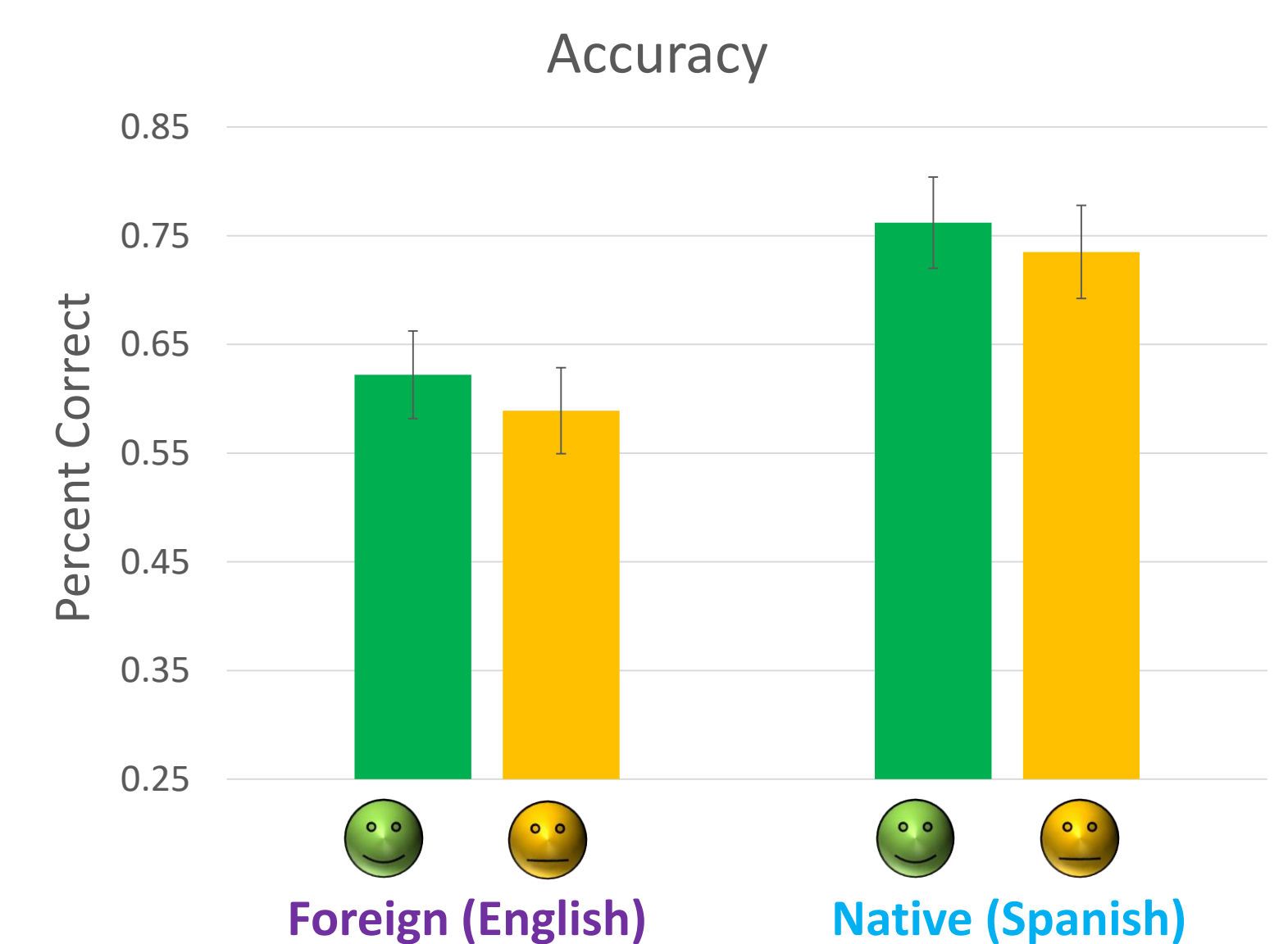
What was the most famous historical character in each country?		
	Mufelo	Tecamer
A scientist	<input type="radio"/>	<input type="radio"/>
An athlete	<input type="radio"/>	<input type="radio"/>
A singer	<input type="radio"/>	<input type="radio"/>
A politician	<input type="radio"/>	<input type="radio"/>

Results

Accuracy

- **Native > Foreign**
 $F(1, 70) = 26.83, p < .001, \eta_p^2 = .277$
- **Positive > Neutral**
 $F(1, 70) = 8.54, p = .005, \eta_p^2 = .109$
- **No interaction**
 $p = .75, BF_{01} = 4.09, \text{error}\% = 2.79$

Note: Three participants were removed from the Spanish condition and one from the English condition due to low performance



Note: Error bars are 95% CIs

Conclusions

- People learn new words and concepts better in their native language
- The **emotional context** affects our ability to learn new words and information
- The emotional impact in a native and foreign language is the same
- These effects are present in both the visual and auditory modalities

Are the foreign language effect and the decreased emotionality found in the foreign language due to the process of learning? Do they disappear when concepts are learned in a context that is equally emotional as the one in which we learned our native language?

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