Differential Processing of Accidental Events in Bilinguals

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INTRODUCTION

- Loftus & Palmer (1974) first showed a relationship between word choice and memory in their historic experiment demonstrating that the post-event presentation of descriptive words can influence how people recall the speed and severity of car accidents. This study considers whether the findings of Loftus & Palmer are generalizable to language background, rather than remaining specific to word-choice within a language. The project proposed the existence of linguistic, grammatical schema dictated by the syntax in one's language that shape how people encode certain event types.
- Due to syntactic differences in how the English and Spanish languages describe accidental events, it is proposed that the two languages result in differential salience of the responsible agent and the action during processing of accidental events. Spanish uses *non-agentive* language, emphasizing the verb and not requiring mention of the responsible noun. English requires mention of the noun as the subject of sentences describing the same events; such *agentive syntax* would only be used during intentional events in the Spanish language.
- SER (Sensory Experience Rating) measures the extent to which a word evokes sensory experiences in readers, on a 1-7 scale (Juhasz, Lai, & Woodcock 2015; Juhasz & Yap 2013) . The study considered that high SER words might have greater salience to readers, so stimuli from both word type categories (noun and verb) included high and low SER target words. A score of 4 was the delineating value between high and low SER, and the stimuli categories were: HN (high SER noun), LN (low SER noun), HV (high SER verb), and LV (low SER verb)
- This project aimed to assess differential encoding of and memory for verbs and agentive nouns during reading of accidental events on the basis of language background (monolingual English or Spanish-fluent bilingual). It additionally determined whether SER overrides the word type effects to show whether word-choice or general language background is more influential on stimulus encoding during reading about accidents.

METHOD

Participants

- Participants were Wesleyan University undergraduates (n = 40) receiving either monetary compensation or Psyc105 course credit. (Monolingual: n = 21; Spanish-fluent bilingual: n = 19)*

Stimuli

- Target nouns and verbs were selected from SER lists and were fitted into sentences describing accidents. Each sentence frame was used in four variations of a passage that used all combinations of HN, LN, HV, and LV.

Procedure

- Participants read passages and answered memory questions through Qualtrics. Four questions were presented after every fourth passage until 16 questions were completed.
- Demographic information was collected; surveys were followed by a debriefing.

Data Analysis:

- Two-way ANOVAs and independent t-tests were used to assess the relationship between the effects of word type, SER, and language background on recall

* One non-Spanish speaking participant spoke Arabic fluently; Arabic syntax uses agentive and non-agentive language in a format similar to English, so the data was included in the monolingual group. Spanish-conversational participants were not considered to be fluent for purposes of the study.

RESULTS

Word Type Recall by Language

Language Group	Word Type	Mean	Standard Error
English	Noun	.577	.045
	Verb	.439	.043
Spanish	Noun	.447	.048
	Verb	.553	.045

Variable Effects and Interactions

Analysis Type	Source	F	Significance p =
Repeated-Measures ANOVA	Word Type	0.164	.688
	Word Type * Language	8.761	**.005**
	SER	0.087	.770
	SER * Language	1.878	.179
Between-Subjects ANOVA	Language	.027	.871
	Language (Nouns Only)	4.126	**.049**
	Word Type * Language	417.489	**<.001**
	SER * Language	229.273	**<.001**

Tests were performed at the 95% confidence level. Recall rate was calculated as the proportion of target nouns and verbs that were successfully included, per participant, in open-ended responses to 16 memory questions from the reading passages.

The analysis of SER compared high and low SER target noun recall, while word type analysis utilized data from all target words (nouns and verbs of high and low SER ratings). The between-subjects analysis labeled "Language (Nouns Only)" refers to the analysis for a simple main effect of language on the recall of high and low SER nouns, which excluded all responses to verb stimuli.

There was a significant interacting effect between word type and language background on recall, both within and between language groups. The monolingual group (English background) demonstrated better recall for agentive nouns compared to verbs and remembered nouns at a higher rate than the bilingual group (Spanish background).There was no significant main effect of SER on recall.

Additionally, Spanish speakers demonstrated greater variation in the proportion of correct target nouns and verbs than did the monolingual participants.

Summary and Conclusions

The study has complex implications for the world of eye-witness testimony, suggesting language background may influence how one remembers events. The findings support the hypothesis that language background affects word-type recall during reading, in the predicted direction. Agentive nouns in accidental events may be more salient to English speakers, making, better equipping them to recall the responsible party in accidents. Meanwhile, Spanish speakers may primarily encode relevant verbs and better recall details about the intensity and level of intentionality behind accidents. The evidence further suggests that the syntactic functions of words, rather than word-specific characteristics such as SER, contribute to stimuli salience and recall.

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