Individual Differences In Learning Ambiguous Foreign Language Vocabulary

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What affects our ability to learn foreign language words?

Learning a foreign language may be more challenging for some individuals than for others. Previous research has indicated that both learner and word characteristics might account for such differences in learning difficulty.

Word characteristics

- Some word-types are easier to learn than others (e.g., concrete words, de Groot & van Hell, 2005).
- Translation-ambiguous words create difficulty in learning over translation-unambiguous words (e.g., Degani & Tokowicz, 2010)

Learner characteristics

- Phonological Short Term Memory (PSTM) and Working Memory (WM) make independent significant contributions to learners' vocabulary learning (Martin & Ellis, 2012).
- There is an association between linguistic abilities in the L1 and those abilities in a FL (Prior et al., 2014).
- Multilingual speakers are better at word learning than monolingual speakers (e.g., Kaushanskaya, Yoo, & Van Hecke, 2013).

The Current Study

How do word characteristics and learner characteristics interact to explain variability in foreign vocabulary learning?

Word characteristics

Two different word types were included:

	Unambiguous Translation	Ambiguous Translation
Arabic Lexical Form	زهرة	ملعقة / كف
Meaning Representation		
Hebrew Lexical Form	פרח	כף

- **Unambiguous Translation**: unambiguous Arabic words with a single translation in Hebrew
- **Ambiguous Translation**: ambiguous Hebrew words with two Arabic translations, each corresponding to a different meaning

Learner characteristics

Cognitive resources:

- **PSTM:** Non Word Repetition (e.g., Yoo & Kaushanskaya, 2012)
- **Verbal WM:** Number-Letter Sequencing (e.g., Crowe, 2000)

Linguistic Background:

- **Level of proficiency in Hebrew - participants' dominant language:** Letter-Category Fluency (Kavé, 2005) and self-report in the Language History Questionnaire (Marian et al., 2007)
- **Degree of multilingualism:** Self-report in the Language History Questionnaire

Method

Participants

**53 participants:** 30 native Hebrew speakers & 23 multilingual Russian-Hebrew speakers

Stimuli

96 Arabic words:
- **24** in the ambiguous condition
- **48** in the unambiguous condition
- **24** fillers

Each participant learned **64** Arabic words

Arabic word learning

2 sessions using 2 types of trials:

Cycle 1: repeat Arabic word after hearing it

**Cycle 2**: attempt to produce Arabic word before hearing it (Kang, Gollan & Pashler, 2013)
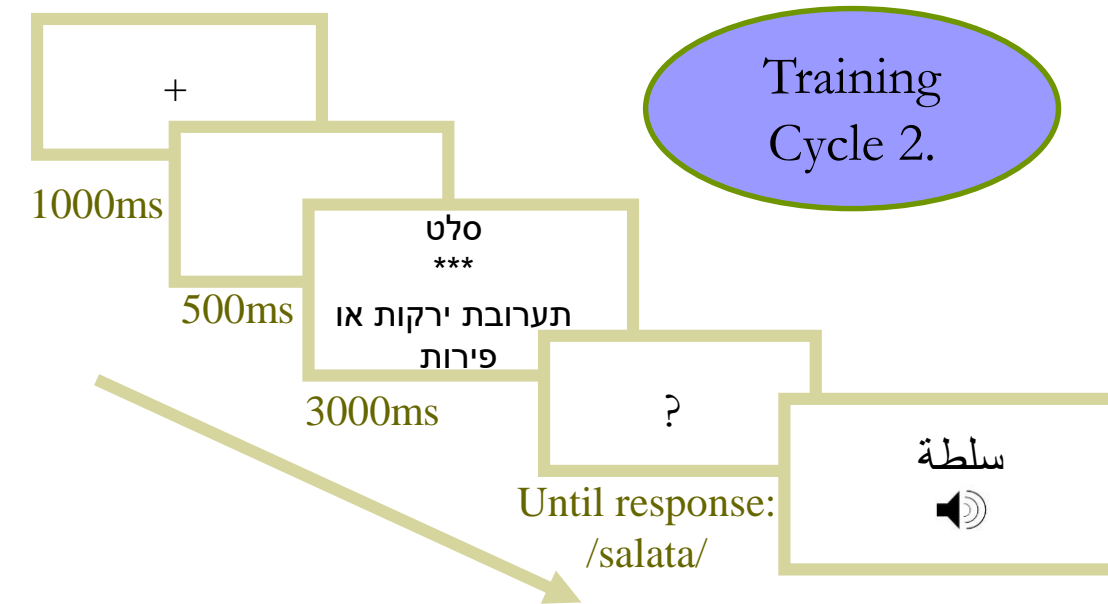
Training Cycle 2.

Overall Procedure

Session 1	Session 2	Session 3	Session 4
Hebrew Semantic Relatedness	Training Cycle 2	FL-Heb Translation Production	FL-Heb Translation Production
Training Cycle 1	Ravens	Auditory SL	Number-Letter Sequencing
Training Cycle 2	FL-Heb Translation Production	Translation Recognition	Translation Recognition
Non-word repetition	Phonemic & Semantic Fluency	Heb-FL Translation Production	Heb-FL Translation Production
FL-Heb Translation Production			Hebrew Semantic Relatedness
Language History Questionnaire			Arabic Meaning Recognition

Tests

Translation Production - timed production of an Arabic translation to a Hebrew word (Heb-FL), or of a Hebrew translation to an Arabic word (FL-Heb).

Meaning Recognition - timed judgment whether a Hebrew definition corresponds to an Arabic word (yes/no).


FL-Heb Translation Production

Heb-FL Translation Production

Meaning Recognition
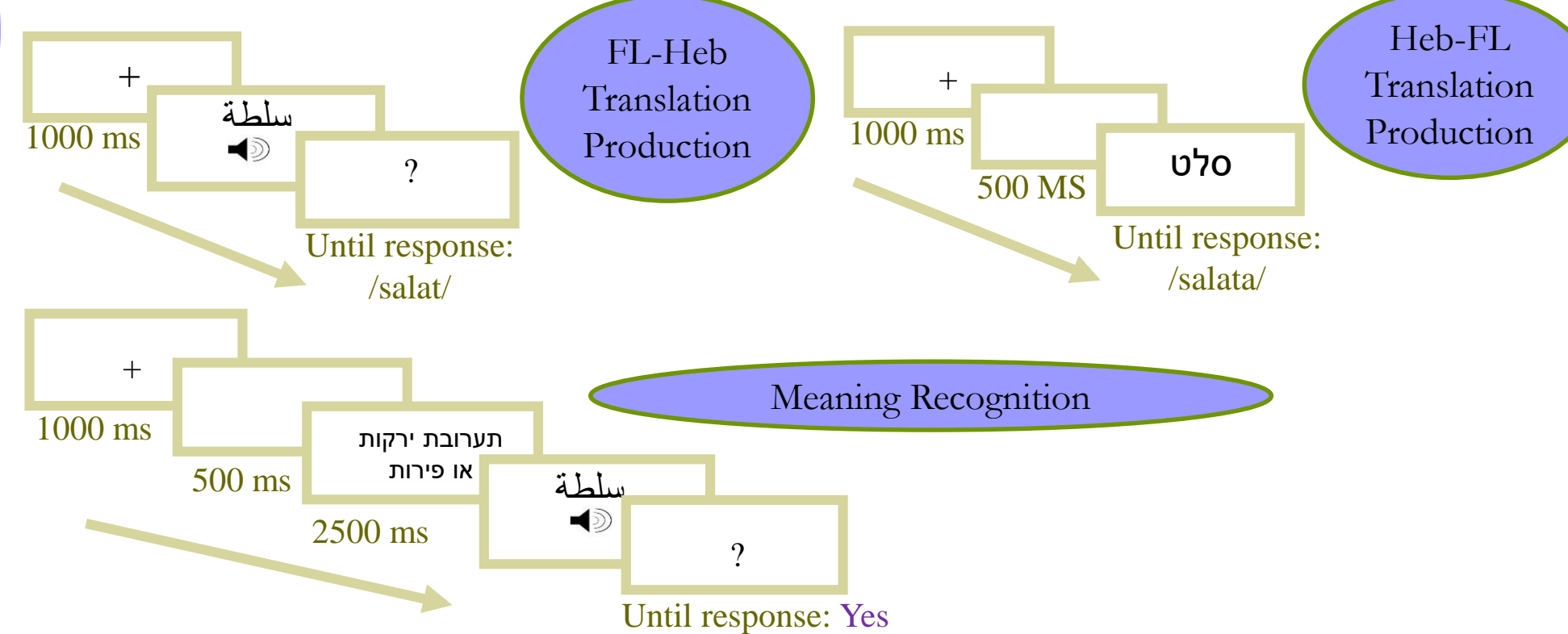
Individual Differences [examples]:

Task	Instructions	Expected Response
Non-Word Repetition	"דוז-מל"	"דוז-מל"
Number-Letter Sequencing	"ד-מ-7-1"	"7-1-ג-מ"
Phonemic Fluency	מילים ממתחילות ב"ג"	"גינה, גולם, גר, גור, גיר....."
Semantic Fluency	מילים בקטגוריה "בעלי חיים"	"ארנב, כלב, חתול, פיל..."

Results

Translation Ambiguity Effect:

Translation-unambiguous words were learned better than translation-ambiguous words.

Response accuracy (right) and RT (left) as function of ambiguity type
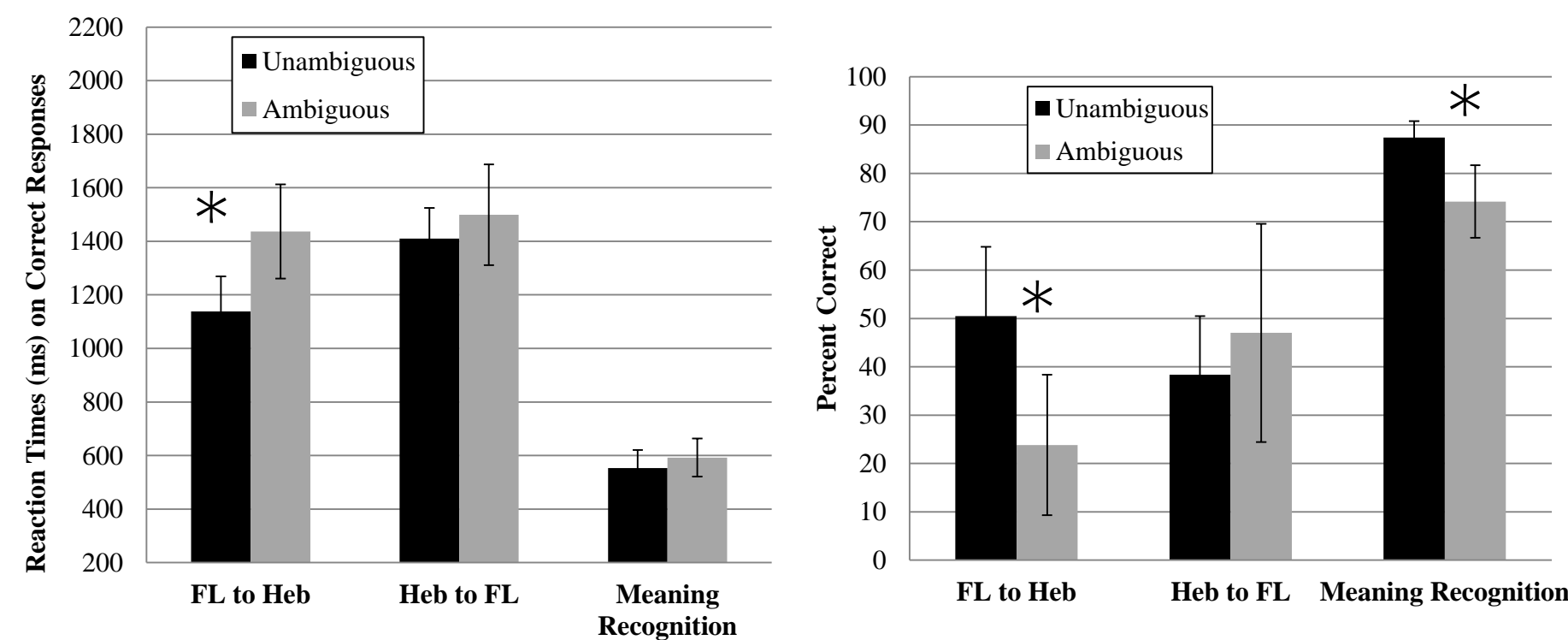

Cognitive Resources Effects:

- Overall increased PSTM was associated with enhanced accuracy in the Heb-FL task.
- In both the FL-Heb and the Heb-FL tasks, increased PSTM was associated with larger ambiguity costs.

Ambiguity type effect as function of PSTM in the accuracy (panel A) and RT (panel B) of the FL-Heb test, and in the accuracy of the Heb-FL test (panel C).
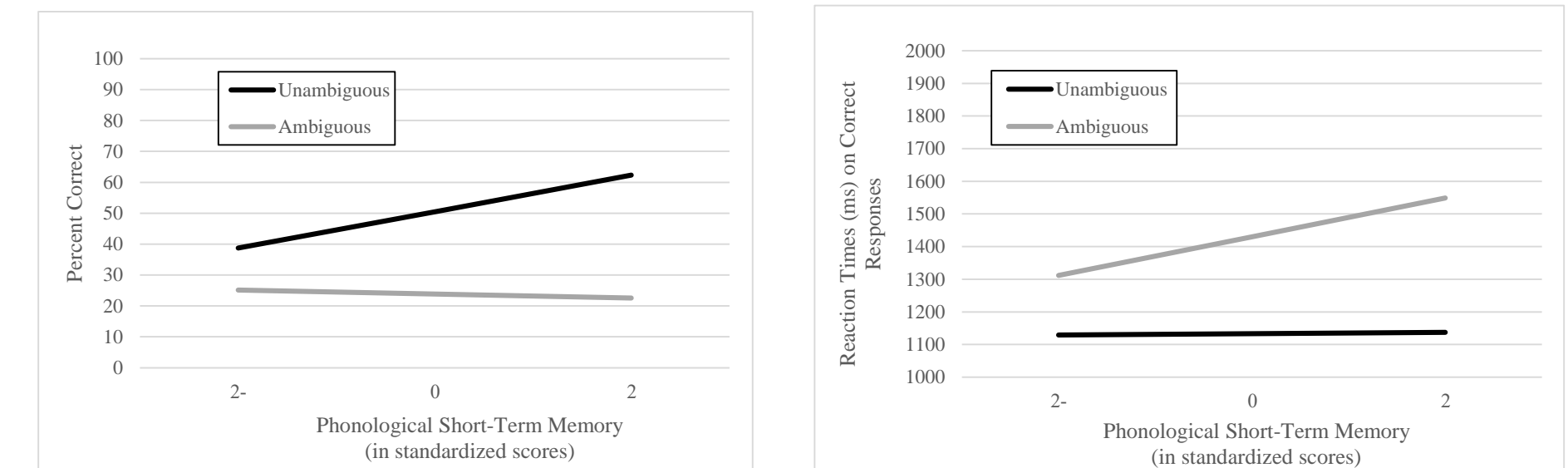
Panel A – Accuracy FL-Heb test

Panel B – RT FL-Heb test
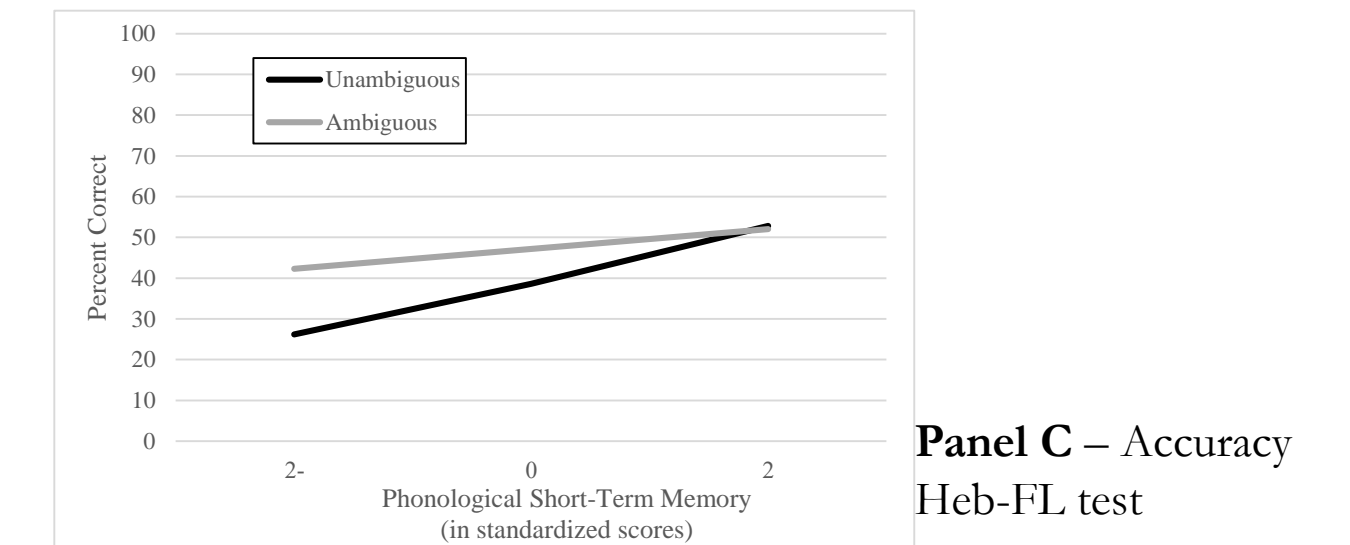
Panel C – Accuracy Heb-FL test

Linguistic Background Effects:

- Hebrew proficiency was associated with improved performance in the meaning recognition test.
- Individuals with higher Hebrew proficiency experienced a larger translation ambiguity disadvantage in the accuracy of the FL-Heb test.

Summary

- Translation ambiguity disadvantage for FL words presented auditorily (effect can be traced to the phonological level).
- Overall learning facilitation and modulation of individuals' sensitivity to translation ambiguity by enhanced PSTM – possibly a Fan-type effect (e.g., Anderson, 1974).
- Positive association between learners' proficiency in Hebrew and FL learning., supporting the existence of positive transfer only when the to-be-learned language is typologically similar to the L1 (the Typological/Contrastive Approach [Odlin, 1989]).
- No correlation between learners' proficiency in languages other than Hebrew (degree of multilingualism) and learning, thus, multilinguals may not *always* be better at FL learning.
- Larger translation-ambiguity cost for individuals with higher Hebrew proficiency.

Future Directions

- Examining a joint contribution of ambiguity and other individual differences (e.g., executive functioning).
- Examining a wider range of multilingualism (monolingual to highly multilingual speakers), when operationalizing multilingualism as a continuous variable.
- Examining the replicability of the found effects among learners achieving a greater level of proficiency in the FL (learning to criterion).

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