

Implicit versus explicit language learning: Differential effects of working memory and learning styles

Sarah Grey^{1,2}, Christine Schoetensack³, Kimberley Bell³, Padraic Monaghan³, Patrick Rebuschat³

Fordham University; Pennsylvania State University, Lancaster University



Introduction

It is not yet known which types of learning conditions, such as more or less explicit, lead to the most optimal learning outcomes when learning a new language as an adult¹.

The effect of complex potential interactions between individual differences (IDs), such as working memory, and different types of learning conditions are also largely unknown².

Different aspects of grammar, such as word order and case, may be differentially sensitive to particular types of learning conditions and IDs¹.

This study measured individuals' working memory and learning styles, and tested adult language learning of syntactic word order and grammatical case under two learning conditions: explicit and implicit.

Questions:

1. Do explicit and implicit language learning conditions promote learning of syntactic word order and grammatical case?
2. Are learning outcomes for explicit and implicit learning groups similar?
3. Is working memory related to learning outcomes, for word order or case?
4. Are learning styles related to learning outcomes, for word order or case?

Artificial Language

Lexicon	Category	English equivalent	Symbol
pleck	noun	pleck-piece	
neep	noun	neep-piece	
blom	noun	blom-piece	
vode	noun	vode-piece	
neim	adjective	square	
trois	adjective	round	
praz	verb	switch	
nim	verb	capture	
yab	verb	release	
li	subject marker		
lu	object marker		

Linguistic Structures

Word Order & Case:

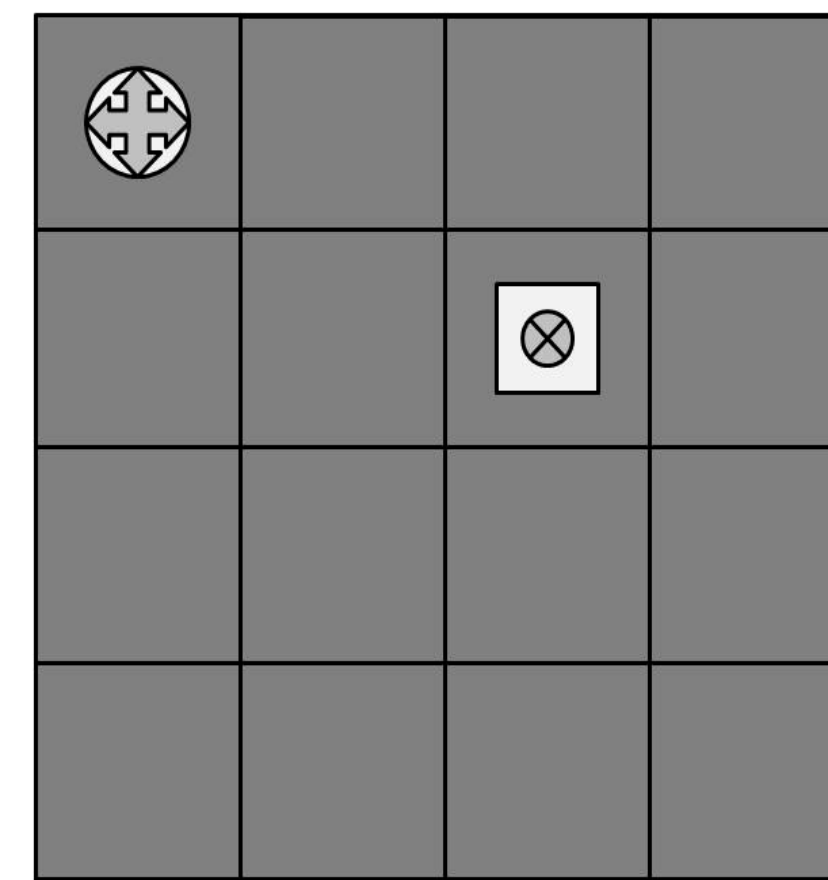
Subject-object-verb (SOV)

Neep **li** blom **lu** praz

Object-subject-verb (OSV)

Blom **lu** neep **li** praz

"Neep-piece switches with the blom-piece"

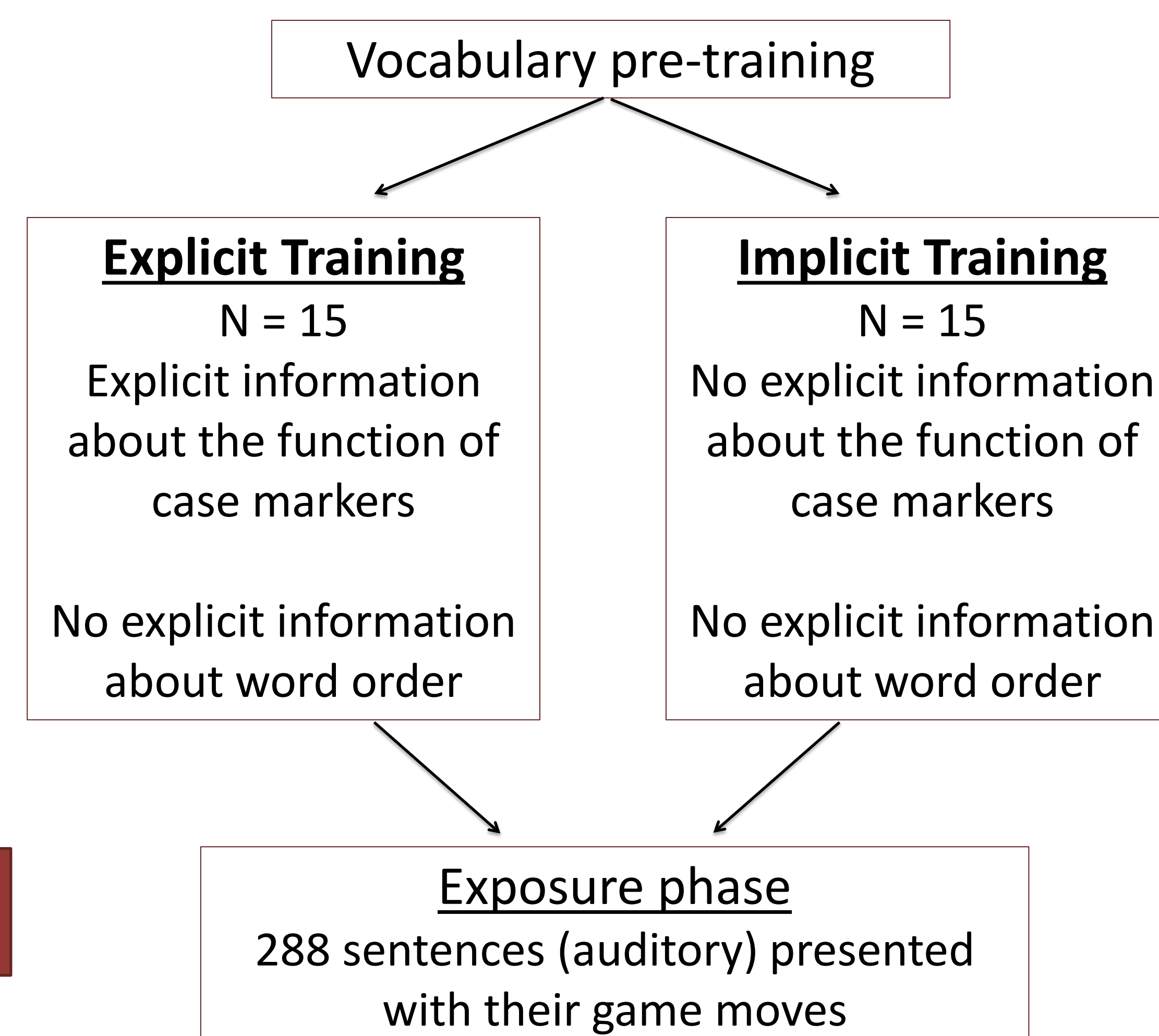


Learning Conditions

Participants

30 native speakers of English (19 female)

Mean age = 21.2 (SD = 1.9)



Tests of Learning

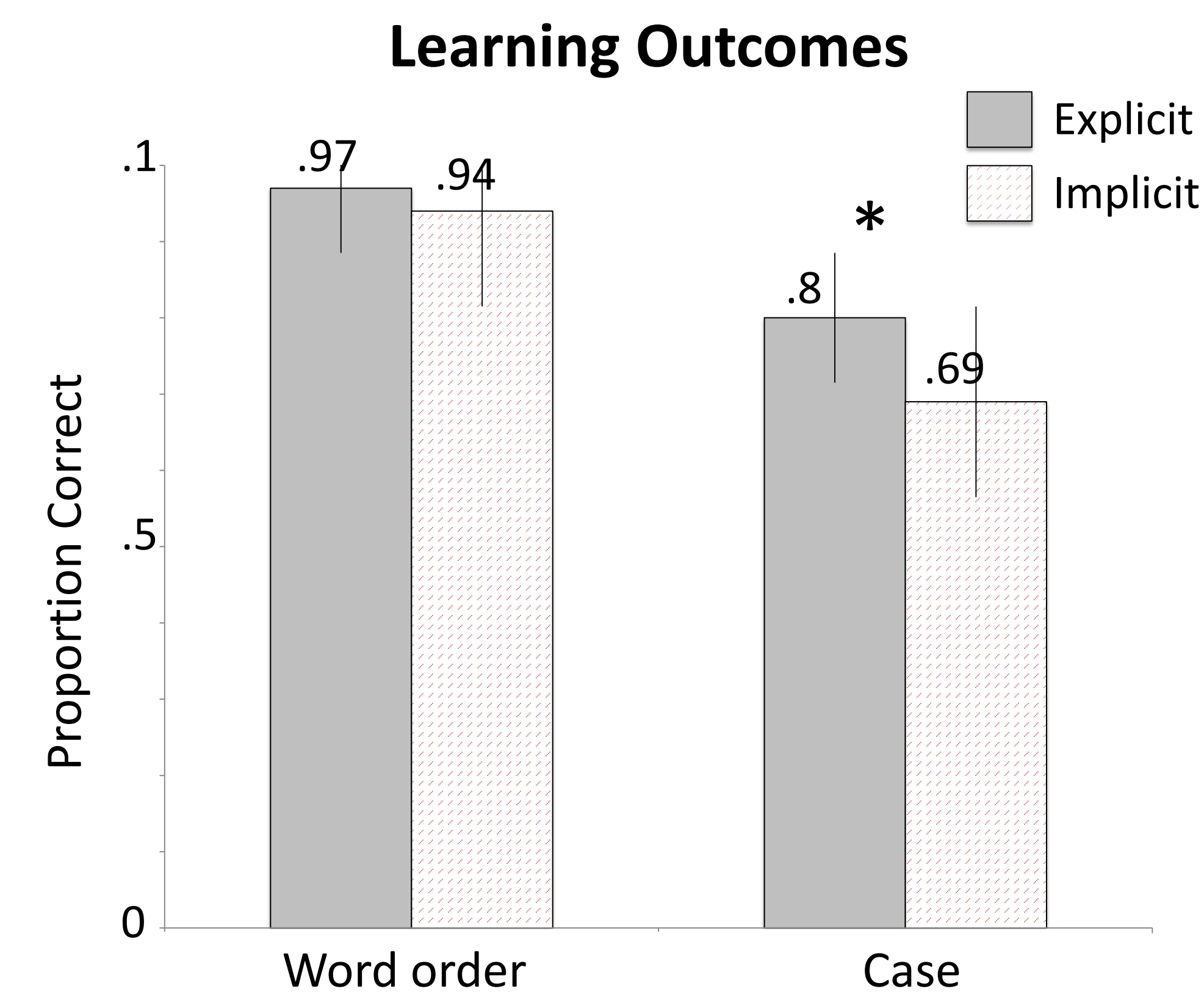
Word order test	Grammatical case test
Grammaticality judgment	Scene-match decision
48 items; 24 of which were ungrammatical word order structures	48 items; 24 of which were mis-matching scene-sentence pairs

Individual differences

Working memory: 1. Nonword repetition test, phonological working memory; 2. Automated O-span (Aospan) test, complex working memory span³

Learning styles: 1. Index of Learning Styles⁴; 2. Learning Styles Survey⁵

Results

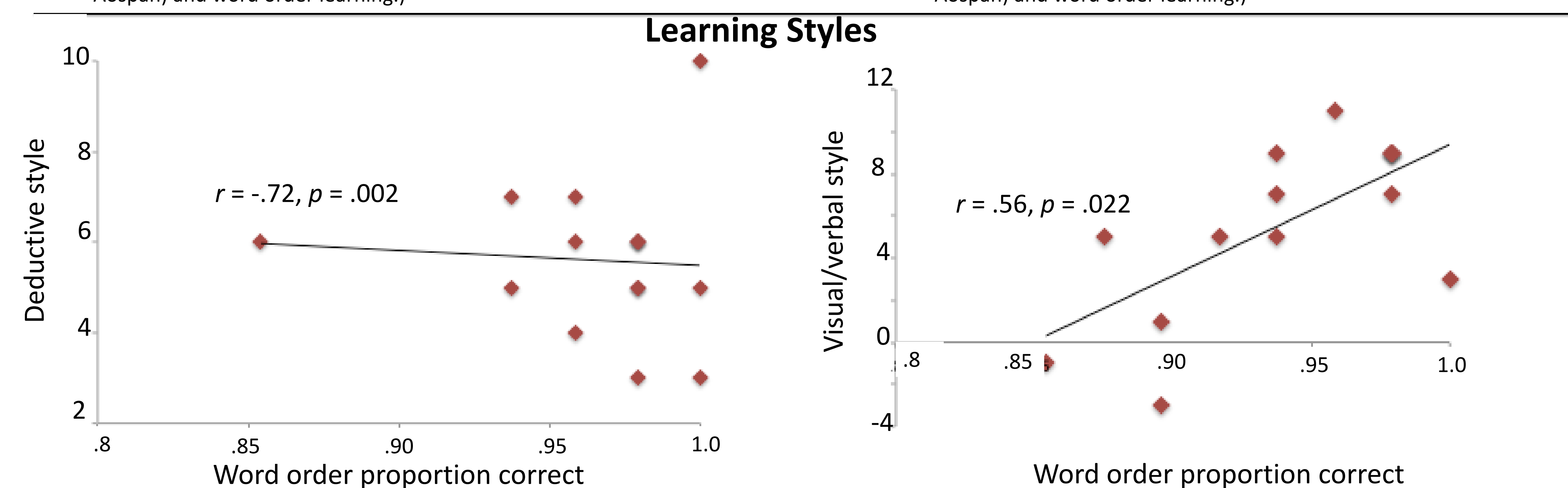
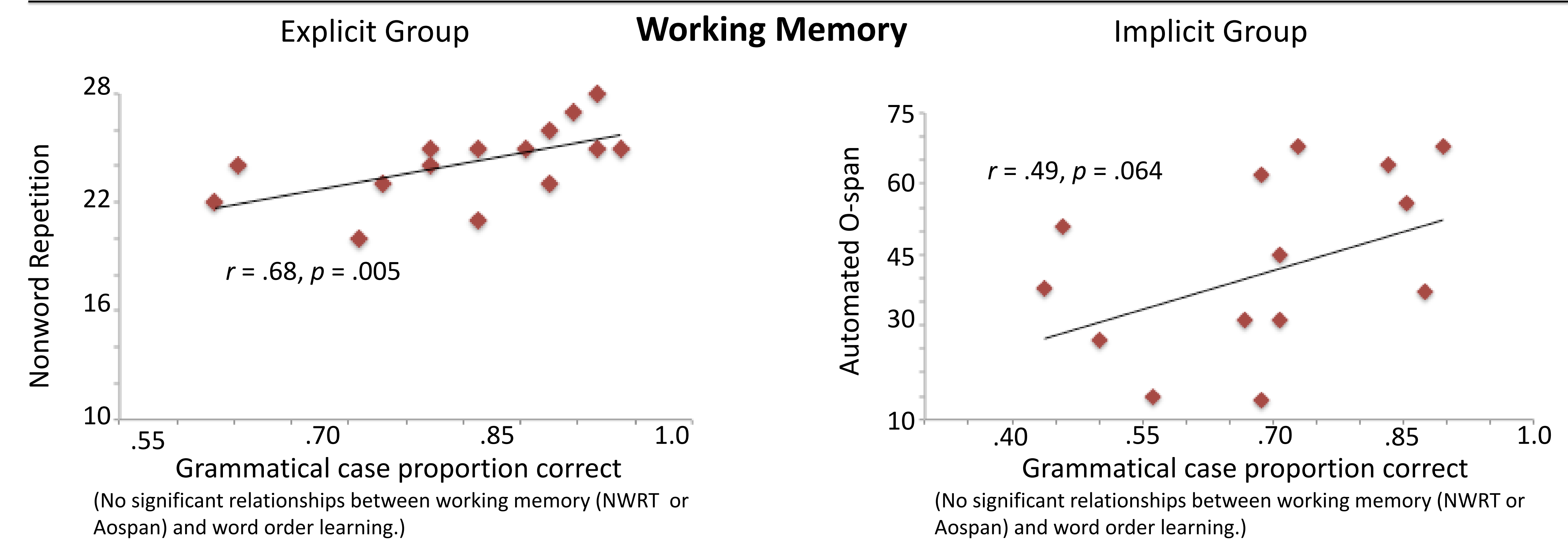


Word order performance was significantly above chance in both Explicit ($p = .015$) and Implicit ($p = .038$) learning conditions.

Grammatical case performance was significantly above chance in both Explicit ($p < .001$) and Implicit ($p < .001$) learning conditions.

No difference between Explicit and Implicit conditions on Word order performance ($p = .106$).

The Explicit group performed significantly better than the Implicit group on the grammatical case test ($p = .020$).



Conclusions

- Results provide new insight into the effects of explicit and implicit conditions on adult language learning.
- The study demonstrates that different aspects of language (word order and grammatical case) are affected differently by these learning conditions.
- Additionally, the results show that learning outcomes in these conditions are modulated distinctly by working memory and learning styles.

- Taking such IDs in cognitive capacities and styles enables us to understand how these processes are involved in language learning.

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