



# Behavioral Expression of Morphological Processing and its Relation to Reading

Allison Landers<sup>1,2</sup>, Donna Coch<sup>2,3</sup>



<sup>1</sup>Department of Psychological and Brain Sciences, <sup>2</sup>Reading Brains Lab, <sup>3</sup>Department of Education, Dartmouth College

Morphological awareness is important to fluent reading in young readers (e.g., Carlisle, 2000), but has never been investigated in college-aged readers. It appears that readers who are morphologically aware decompose complex words into their constituent morphemes only when the morphemes carry semantic value or high productivity as is the case with free morphemes (e.g., Morris et al., 2007). However, a single experiment has never compared words composed of bound morphemes (*receive*), words composed of free morphemes (*airplane*) and control monomorphemic words (*whiffle*). We designed a new test of morphological awareness for college students and then used a lexical decision paradigm with these three types of stimuli to investigate morphological decomposition.

## METHODS

**Participants.** 48 (24 female) right-handed, monolingual English-speaking 18- to 23-year-old college students (mean 20.86 years, *SD* 1.25)

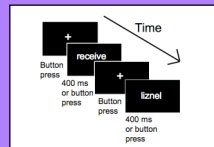
## Behavioral Testing.

**Morphological Awareness Test.** 25 sentences requiring morphological decomposition or production. [e.g., For now though, pain therapists focus heavily on \_\_\_\_\_ (behavior) strategies for managing chronic pain.]

**Standardized Behavioral Tests.** Woodcock Passage Comprehension subtest (WRMT-R), Phonological Awareness composite of the Comprehensive Test of Phonological Processing (CTOPP), both subtests (phonology, orthography) of the Test of Word Reading Efficiency (TOWRE)

## Experimental task.

- 60 bound morpheme words/nonwords, 60 free morpheme words/nonwords, 60 control words/nonwords
- button-press judgment each stimulus (word/not word)



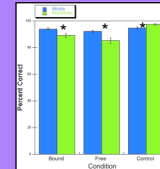
	Bound	Free	Control
Words	<i>receive, submit</i>	<i>airplane, flagpole</i>	<i>whiffle, flavor</i>
Non-words	<i>exceive, promit</i>	<i>flagfly, hillsaw</i>	<i>liznel, lettter</i>

**Data analyses.** Two-tailed t-tests (words vs. nonwords) within 3 conditions, Pearson correlations

## RESULTS

**Accuracy (% correct).** All *ps* < .01

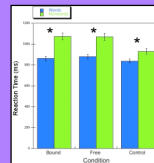
	Bound	Free	Control
Words	94.03	92.10	94.87
	0.71	0.92	0.68
Non-words	89.17	85.20	97.43
	1.28	2.13	0.55



First line: % correct, Second line: SE

**Reaction time (ms).** All *ps* < .01 between condition pairs

	Bound	Free	Control
Words	861.27	881.05	837.58
	20.13	20.40	17.74
Non-words	1074.09	1068.80	931.18
	32.89	33.11	26.87



First line: % correct, Second line: SE

## Correlations.

- Morphological awareness and reading comprehension ( $r = 0.306, p < 0.05$ ); with phonology held constant ( $r = 0.299, p < 0.05$ ); with both phonology and orthography held constant ( $r = 0.293, p = 0.051$ )
- Accuracy for free nonwords and accuracy for bound nonwords, but not for control nonwords ( $p < 0.05$ )
- Morphological awareness and free nonword accuracy, with both phonology and orthography held constant ( $r = 0.291, p = 0.053$ )

## CONCLUSIONS

- Better morphological awareness is associated with better reading comprehension in college-aged students.
- College-aged students appear to decompose complex words into morphemes despite lack of semantic benefit or productivity.
- Both this lexical decision task and the newly created test of morphological awareness are sensitive measures of morphological processing in college students.

## References

- Carlisle, J. F. (2000). Awareness of the structure and meaning of morphologically complex words: impact on reading. *Reading and Writing: An Interdisciplinary Journal*, 12, 169-190.
- Morris, J., Frank, T., Grainger, J. & Holcomb, P. J. (2007). Semantic transparency and masked morphological priming: an ERP investigation. *Psychophysiology*, 44, 506-521.

## Acknowledgements

This research was supported by the David C. Hodgson Endowment for Undergraduate Research.