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### Scoring Morphology in Measures of Spelling and Written Morphological Awareness: A Scoping Review

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## INTRODUCTION

- Ample evidence suggests that morphological awareness is an essential contributor to vocabulary, reading comprehension, word recognition, and spelling (e.g., Goodwin & Ahn, 2013; Bowers & Kirby, 2010)
- There currently are no norm-referenced measures of morphological awareness, but researchers have developed a variety of tasks to help SLPs assess children's morphological awareness (Apel & Werfel, 2014)
- Morphological awareness can be assessed orally as well as in written tasks, such as spelling
- Spelling reflects quality and precision of representations across linguistic domains, including morphology (Perfetti, 1992; Perfetti & Hart, 2002)
- There are a variety of scoring methods used for spelling tasks and the insights we glean about these skills, specifically morphology, may vary with the scoring method used (Murphy & Justice, 2019; Treiman, Kessler, & Caravolas, 2019)

## PURPOSE

- The purpose of our study was to conduct a scoping review to investigate methods of scoring morphology in measures of spelling and written morphological awareness in school-aged children (preschool to grade 8)
- Results of this scoping review may inform the development of future assessments of morphological awareness in school-aged children

## METHODS

- **Research Databases:** Education Research Complete, ERIC, PsychINFO
- **Search Terms:** "morphological awareness", "morphological awareness" AND spelling, "morphological awareness" AND assess' OR evaluat' OR measur' OR test' OR screen', "morphological awareness" AND writ\*, spelling AND morph\*
- **Inclusionary Criteria:**
  - Peer-reviewed studies
  - Published in English and English is the primary language of assessment
  - Published in the last 20 years (1999-2019)
  - Incorporated direct assessment of school-aged children (preschool to grade 8) of typical and atypical language and literacy development
  - Assessed spelling and/or written morphological awareness
  - Described scoring methods for spelling and/or morphological awareness assessments

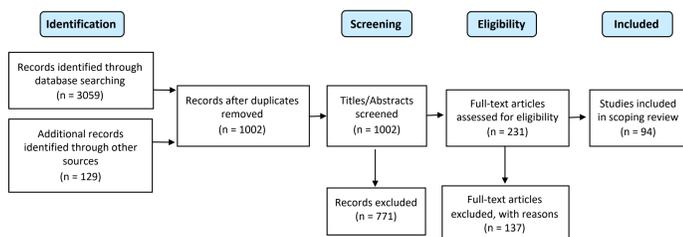


Figure 1. Flowchart of the literature selection process

## RESULTS

Type of Task	Description of Task	Example
Judgment	Judgment tasks require students to make decisions, without manipulating the structure of the word or set of words, by applying their morphological knowledge (Kirby et al., 2012).	Students chose from among four derivationally related suffix options that signaled parts of speech. For example, "Did you hear the ____?" (a) announce, (b) announcing, (c) announced, (d) announcement." (Spencer et al., 2015).
Production	Production tasks test a student's ability to spell words by applying knowledge of morphology and morphological rules.	For each item, the examiner said the word, used it in a sentence, and repeated the word (e.g., <i>sweeter, brightly, reopen</i> ). The students then were asked to write the word (Apel, Diehm, & Apel, 2013).
Decomposition	In decomposition tasks, students must identify the correct base of a given derivation or inflection.	Students saw the word 'farmer' and the sentence 'My uncle works on a ____?'. The administrator said the word 'farmer' twice, then read the sentence and asked the children to write the appropriate word in the blank (farm) (Goodwin et al., 2012).
Production & Decomposition	Production and Decomposition tasks combine multiple components of morphological awareness.	Students were given one-morpheme (base) words followed by a written sentence (e.g., "Farm: My uncle is a ____"). The experimenter read the word followed by the sentence and then participants were instructed to write the missing word in the blank (e.g., farmer). Following, students were asked to spell a base word first from dictation. Then, the examiner read a written sentence and asked the students to fill in the missing word using their spelling of the base word (Apel et al., 2012).

Scoring Method	N (123)	Type of Task	Example
Dichotomous Scoring (correct/incorrect)	81	Judgment Production Decomposition Production & Decomposition	Dichotomous scoring was used, with a correct answer earning a score of 1 and an incorrect answer earning a score of 0 (Nagy et al., 2003).
3-Point Scale	11	Production Decomposition Production & Decomposition	Participants earned 2 points for responses that were correct. One point was earned for partially correct responses that had a correct base but incorrect spelling and/or other inflectional morphology errors. Zero was earned when responses had the incorrect base (Goodwin et al., 2012).
Multilinguistic Analysis	15	Production Decomposition	Spelling Sensitivity Score-Elements (SSS-E): Target words were divided into elements and coded as correct (3), legal (2), illegal (1), or omitted (0). Spelling Sensitivity Score-Words (SSS-W): Spelling of entire target words were coded as correct (3), legal (2), illegal (1), or containing an omission (0) then divided by total number of words in the sample (Masterson & Apel, 2010).
Combination of Scoring Methods	16	Production	The total number of words spelled correctly was calculated and turned into a percentage correct. For each spelled verb, the inflected ending was either (1) spelled correctly with the preserved morphological unit; (2) included but spelled incorrectly with a phonetically accurate form; (3) omitted; or (4) other – additional letters beyond the base word, but no phonetic similarity to the inflected morpheme. Spellings were coded on whether they correctly applied the orthographic pattern to add the ending (no change, doubling rule, or silent-e rule) (Walker & Hauerwas, 2006).

### SUMMARY OF TASKS

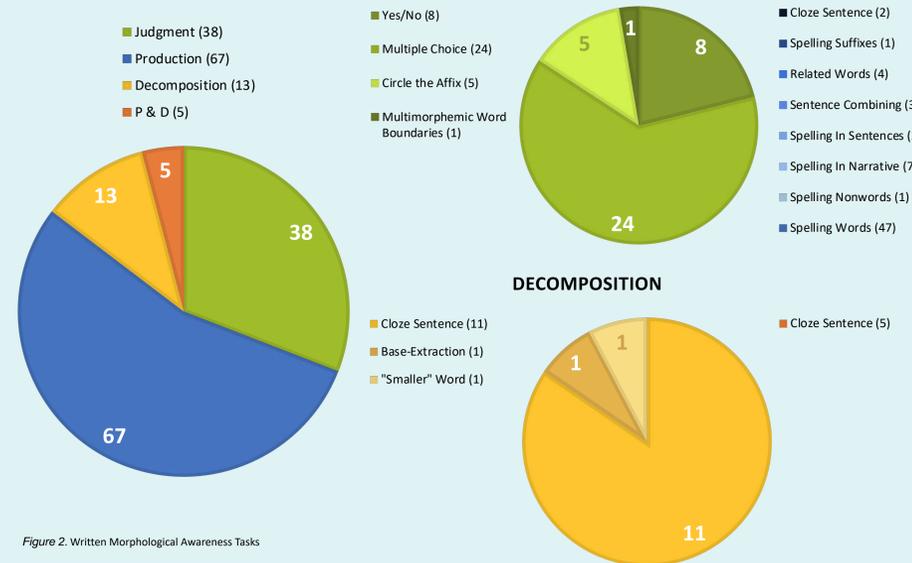
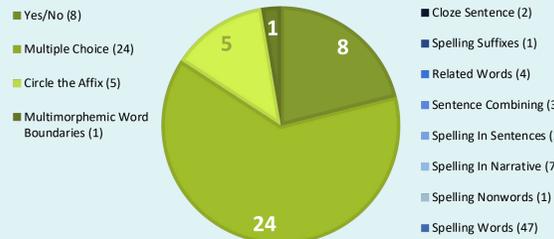
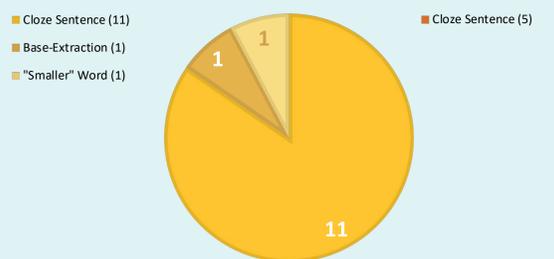


Figure 2. Written Morphological Awareness Tasks

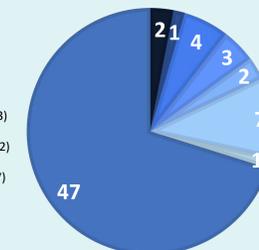
### JUDGMENT



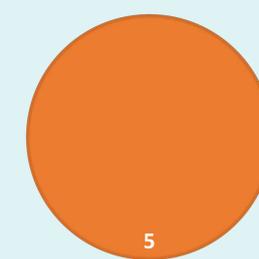
### DECOMPOSITION



### PRODUCTION



### PRODUCTION & DECOMPOSITION



### SCORING METHODS

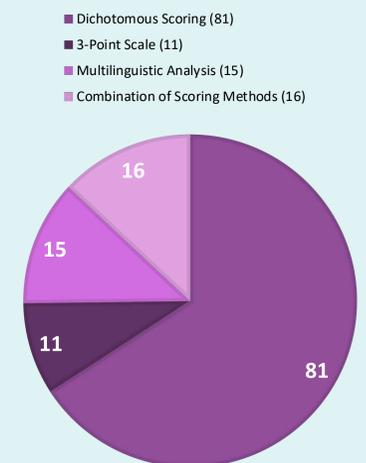


Figure 3. Scoring Methods

## KEY FINDINGS

- Production tasks, specifically spelling multimorphemic words, represent the most common written morphological awareness task found in the literature
- Dichotomous scoring represents the most common scoring protocol across all measures of written morphological awareness in the literature
- Spelling and written morphological awareness tasks are typically paired with one or more oral morphological awareness tasks
- 17 out of 94 studies utilize two different types of written tasks to measure children's morphological awareness
- Multilinguistic scoring protocols are used in decomposition cloze tasks, spelling words in isolation and in narrative tasks only

**AUTHOR DISCLOSURES: LUGO, MURPHY, & DIEHM REPORT NO FINANCIAL OR NON-FINANCIAL CONFLICTS OF INTEREST RELATED TO THE CONTENT OF THIS POSTER**

## DISCUSSION

- Judgment tasks are often used with younger school-aged children, but may serve as a misleading measure of morphological awareness due to guessing
- Inconsistencies exist across multilinguistic scoring protocols regarding base and suffix boundaries, suffixing rules (e.g., CoST; Daffern, Mackenzie, & Hemmings, 2015)
- Dichotomous and some multilinguistic scoring protocols used in production tasks do not provide a quantitative measure specifically for morphological accuracy (e.g., POMAS; Silliman, Bahr, & Peters, 2016)
- Using multiple scoring protocols to analyze production and decomposition tasks may provide a more comprehensive analysis of children's morphological awareness

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