Morphemes Matter:
Assessing Morphological Awareness

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Morphological Awareness

The ability to consciously consider and manipulate the smallest units of meaning in <u>spoken and written</u> language, including base words and affixes

A quick review

- A **morpheme** is the smallest unit of meaning in language (e.g., dog)
- A **base word** is a morpheme that can stand alone (e.g., dog)
- An **affix** is a morpheme that must be bound to a base word (e.g., dog**s)**
- Both base words and affixes are morphemes because they carry meaning

Affixes

- ➢ **Inflectional morphemes** provide information about time or quantity without changing the meaning or class of the word.

  "walk**ed**, walk**ing**, walk**s**"

  "cat**s**"

  "bigg**er**, bigg**est**"

suffix	grammatical change	original word	suffixed word
-s	plural	dog	dogs
-en	plural (irregular)	ox	oxen
-s	3rd person singular present	like	he likes
-ed	past tense past participle	work	he worked he has worked
-en	past participle (irregular)	eat	he has eaten
-ing	continuous/progressive	sleep	he is sleeping
-er	comparative	big	bigger
-est	superlative	big	the biggest

Affixes

➢ **Derivational morphemes**, which can be prefixes or suffixes, change the meaning and/or the word class

"teach, teach**er**"

"fair, **un**fair

Morphological Awareness

> Transparent Derivations: the semantic link between the base word and the derived word is clear, or *transparent*.
>> Derivational forms do not affect spelling of the base word "friend, friendly"

>> Derivational forms alter the base word orthographically OR phonologically
"silly, silliness", "magic, magician"

Morphological Awareness

➢ <u>Opaque Derivations</u>: The semantic connection between the base and derived form is less clear because BOTH phonological <u>and</u> orthographic properties of the base word change

"busy, "busily", "admit, admission"

Suffix	Meaning	Examples
-able	capable of, worthy of being	lovable, learnable & fixable
-ar	of or relating to	beggar & liar
-en	to become or cause to be	weaken, sharpen & lengthen
-er	comparative; more	hotter, bigger & smarter
-er	person connected with	teacher, painter & shipper
-ess	female	princess, waitress & actress
-est	comparative; most	smartest, fastest & quickest
-ette	small	dinette, diskette & barrette
-ible	capable of , worthy of being	gullible, durable, divisible

-ful	full of	joyful, fearful, beautiful
-ish	relating to	childish, bookish, selfish
-less	without; not having	tireless, ageless, careless
-like	resembling or characteristic of	childlike, doglike, homelike
-ly	resembling; similar to	fatherly, scholarly & motherly
-ment	action or process	government, development, experiment
-ness	state or quality of: condition	kindness, goodness & happiness
-or	person connected with	doctor, actor & editor
-ship	state or quality of: condition	friendship, hardship & citizenship

The case of roots or 'bound morphemes' (e.g., 'spect', 'form')

- Not a focus of assessment or intervention because:
  - Roots typically are not a meaningful morpheme in themselves (i.e., they do not serve as a unit of oral language),
  - Most individuals are not aware of specific roots in words unless instruction on those specific roots has occurred
  - There is no resource that provides grade-level information for these elements, as they do not "stand alone."
  - There is no research that supports the use of roots as a means to improve morphological awareness

Why Do We Care About Morphological Awareness?

- Written English is a **morphophonemic system**
  - English **spelling relies on morphemes as much as it does phonemes** to produce written words and convey their meaning (e.g., Moats, 1995; Treiman, 1998)
- **Affixed words outnumber root words 4 to 1 (third grade on).**
- **Correlations among, and direct effects of MA on, reading/spelling are significant** (Bratlie et al., 2021; Crosson et al., 2021, Lee et al., 2022);
- **MA is sometimes THE unique predictor for some literacy skills** (e.g., Apel et al., 2012; Deacon et al., 2018; Kirby, Deacon, Bowers, Izenbergy, Wade-Woolley, & Parrila, 2012;Lee et al., 2022; Roman, Kirby, Parrila, Wade-Woolley, & Deacon, 2009).

Why Do We Care About Morphological Awareness?

- **Morphological awareness intervention improves MA and literacy skills, particularly in younger children and children considered "at-risk"** (e.g., Apel, Brimo, Diehm, & Apel, 2013; Apel & Diehm, 2014; Bowers, Kirby, & Deacon, 2010; Goodwin & Ahn, 2013; Kieffer & Lesaux, 2012; Kirk & Gillon, 2009; McCutcheon et al., 2022;)

- **MA is a powerful tool for helping students think about sounds, patterns, and meaning**

- MA is typically is overlooked in curricula, yet it **is expected that students demonstrate the skill (e.g., Common Core State Standards; Gabig & Zaretsky, 2013)**

- Extant research confirms that **even children in kindergarten demonstrate some implicit, if not explicit, MA abilities**. Thus, early MA instruction/intervention seems warranted

Why Do We Care About Morphological Awareness?

- **Students with dyslexia have significant MA deficiencies** (Georgio et al., 2022)

- **Students from linguistically-diverse backgrounds benefit from MA instruction**, and **may demonstrate weaknesses** in MA (Braitle et al., 2022; Kieffer & Lesaux, 2012)

- To assess MA, we need to know about development

Morphological Awareness Development

- No researcher has systematically investigated the full scope of morphological awareness longitudinally; Apel and colleagues have examined morphological awareness skills from 1st to 6th grade

- Although some experts initially suggested that students first demonstrate awareness of morphemes during the mid-elementary school years (e.g., Adams, 1990; Anglin, 1993), others have shown that young students demonstrate at least implicit awareness of morphology as early as kindergarten and first grade (e.g., Berko, 1958; Treiman, Cassar, & Zukowski, 1994).

- Morphological awareness begins developing relatively early in childhood and continues to strengthen over the elementary (and later) school years (e.g., Berninger, Abbott, Nagy, & Carlisle, 2010; Carlisle, 2004;).

Morphological Awareness Development

- When examining MA skills in 1st through 6th grade students, most pronounced growth in MA occurred within the first three grades, but that growth continued to occur across the remaining three grades (Berninger et al., 2010).

- More discreet development noted among K through 2nd and 1st through 2nd on tasks measuring base to derived words (farm-farmer) and conscious knowledge of written affixes, respectively (Apel, Diehm, & Apel, 2013).

Morphological Awareness Development

- Children in grades 2-6 were more successful completing morphological awareness tasks when the items on the tasks were transparent (i.e., no phonological or orthographic changes; e.g., friend > friendly) vs. those that were orthographically and phonologically opaque (e.g., admit > admission; Apel, Henbest, & Petscher, 2022)

- Although steep growth in MA occurs in the early elementary-age years, growth does occur beyond the elementary-age grades (Berko, 1959; Carlisle, 1995; Berninger et al., 2010)

- Middle school students are less accurate on items that are phonologically opaque compared to items that are completely transparent (Goodwin et al., 2013)

Morphological Use

- Morphological use or production as it occurs in a communicative context
- It is learned implicitly; requires **no conscious attention** to morphemes
- Is measured via a language sample analysis taken within a communicative context
- Difficulty with morphological use (e.g., tense marking) is a clinical marker for spoken language impairments

Morphological Awareness

- The ability to consciously consider and manipulate the smallest units of meaning in language, including base words and affixes
- **Requires conscious attention** to how morphemes operate in a language
- Is measured outside of a communicative context via tasks that require an individual to consciously think about and manipulate morphemes in a number of different ways
- Lack of morphological awareness has consequences for literacy achievement
- Requires instruction

Why Assess Morphological Awareness?

- For students struggling with morphological awareness, they likely will not be receiving the intervention they need, given that little morphological awareness instruction regularly occurs in classrooms (e.g., Moats, 2009).
  - Assessment will guide educators and specialists in identifying deficits that might typically be overlooked.

Why Assess Morphological Awareness?

- With a well-informed assessment protocol, a more prescriptive intervention can be developed
  - Identifying particular weaknesses in morphological awareness may explain difficulties in morphological problem solving that then can be specifically remediated to improve comprehension at the <u>word</u>, <u>sentence</u>, and <u>passage</u> levels.
  - Improvements in students' morphological understanding for how to spell more complex, multi-morphemic words would lead to higher level, more-literate style written compositions.

Apel (2014)'s Four-Component Definition of Morphological Awareness

Awareness of:

1) what morphemes sound like (spoken language) and look like (written language) (e.g., plural 's' sounds like /s/,/z/, /əs/, /əz/and looks like 's', 'es')

2) the meaning of affixes and the alterations in meaning (e.g., unlike) and sometimes grammatical class they bring to base words (e.g., exploration) (spoken and written)

3) the spelling of written morphemes including how the addition of morphemes can affect base word spellings (e.g., pat > patted; admit > admission)

4) the relation of base words to their inflected and derived forms (e.g., "Does mother come from moth?") ("Does pleasure come from please?") (spoken and written)

Standardized Tests for Assessing Morphological Awareness

- To date, there are no standardized tests designed to assess the four components of morphological awareness (Apel, 2014)

- One such test is currently in development, the *Morphological Awareness Test for Reading and Spellings* (*MATRS*). Technical Report: https://psyarxiv.com/ty2pe/

- Some commonly used standardized tests have subtests which measure morphological awareness
  - In practice, we have been using these subtests to measure the other aspect of morphology: morphological use and comprehension (Simple View of Reading)

Morphological Awareness Assessment

- Norm-referenced "language" tasks that measure MA
  - There are subtests of certain norm-referenced measures that can inform you about certain morphological awareness skills
    - *Process Assessment of the Learner – Second Edition* (*PALS-2*; Berninger, 2007)
      - Students shown printed words and asked to identify those containing affixes
  - *Test of Language Development-Primary 4* (Hammill & Newcomer, 2008a)
    - Subtest: Morphological Completion:
    - Students are asked to complete a sentence with an affixed word given its base form (e.g., Carla has a dress, Denise has a dress. They have two ____[dresses]).

Morphological Awareness Assessment

- Norm-Referenced
  - *Clinical Evaluation of Language Fundamentals (*Semel, Wiig, & Secord, 2013*)*
    - Subtest: Word Structure
    - This man sings. He is called a _____[singer].
  - *Test of Language Development – Intermediate 4* (Hammill & Newcomer, 2008b)
    - Subtest: Morphological Comprehension
    - Students are asked to read a sentence and must judge whether the sentence sounds grammatically correct (e.g., "Those boys is happy.")

Morphological Awareness Assessment

- Current Norm-Referenced Measures
  - Bottom line:
    - tasks names do not reflect their true function
    - measures that are available are highly limited in scope
    - most assess inflectional morphology more than derivational morphology
    - range of affixes assessed is highly constrained in number and types

So How Do We Assess Morphological Awareness?

- As a starting point: we may choose to administer a subtest from a standardized test that measures morphological awareness (gives us a number), but that won't give us the whole picture…

So How Do We Assess Morphological Awareness?

- To **assess as a means to inform treatment**, we need to assess using criterion-referenced tasks that **measure all four components** of morphological awareness, which require children to think about:

1) what morphemes sound and look like

2) the meaning of affixes and the alterations in meaning and sometimes grammatical class they bring to base words

3) the spelling of written affixes including how the addition of morphemes can affect base word spellings (juncture)

4) the relation of base words to their inflected and derived forms

Morphological Awareness Test for Reading and spelling (MATRS)

Tasks that assess each of the four components of morphological awareness

Apel, Petscher, & Henbest (2021)

1) What morphemes sound and look like (*MATRS*)

Sounds like (spoken language)	**Looks like (written language)**
SEGMENTING	**AFFIX ID**
Instructions:	Instructions:
This is a listening task. I need your help listening to the meaningful "parts" that you hear in words. I will say a word and you will tap this block (show block) for each meaningful part you hear in the word.	This activity has lots of silly words you've never seen before. These words have real add-ons (prefixes or suffixes) at the beginning or end of the word. You use and have seen many of these add-ons (prefixes or suffixes) before.
How many meaningful parts do you hear in the in the word…..teacher, dogs, recycle	Your job is to find these real add-ons (prefixes or suffixes) and circle them.
	meckness
	retage
	gretting
	(Apel et al., 2013)

2) The meaning of affixes and the alterations in meaning and sometimes grammatical class they bring to base words *(MATRS)*

AFFIX MEANING TASK (spoken and written)

Instructions:

This activity has lots of silly words you've never seen or heard before. You will hear and see a made-up word in a sentence and then circle a new made-up word that best fits the description in the sentence. Don't worry that you have not heard of the words before or are not sure what they mean; just choose the answer you think is best.

If wame means horse then which word means without a horse?
a) wameful
*b) **wameless***
c) wamely
d) wamer

(Apel, Petscher, & Henbest, 2021; Mitchell & Brady, 2014)

SUFFIX CHOICE (written only)

Instructions:

For this activity, you will read the sentence and find the correct word to fill in the blank.

Yesterday, I _____ french fries with my hamburger.

a) ordered

b) orderly

c) orders

d) ordering

3) The spelling of written affixes including how the addition of morphemes can affect base word spellings (MATRS)

SPELLING MULTI-MORPHEMIC WORDS (spoken and written)

Instructions:
I will say each word, say it in a sentence, and then say the word again. Then, I want you to spell the word on your paper.

Rarity: The coin he found on the beach was a *rarity*.

Direction: The driver needs to go the other *direction* to get to the store.

Hardly: I *hardly* know what to do now.

SUFFIX SPELLING (spoken and written)

Instructions:

For this activity, you will read the sentences as I read them aloud and then you will find the correct spelling of the add-on (ending or suffix) to complete the word.

1. The couple were engaged in a heated argu____.

a) ment

b) ement

c) mint

4) The relation of base words to their inflected and derived forms (MATRS)

SPOKEN RELATIVES (spoken only)

Instructions:

For this activity, I will say a word and then you will say it. Then I will say a sentence that is missing a word. Use the first word I give you to think of the missing word in the sentence.

Act. When he grows up, he wants to be an _____. (actor)

Eating The baby shook his head because he did not want to _____. (eat)

WRITTEN RELATIVES (written only)

Instructions:

For this activity, you will see a word. Read the word, and then you will read the sentence that is missing a word. Use the word you read before the sentence to help you think of the missing word to fill in the blank line. You then will write that word on the blank line.

Achieve. When she realized how much needed to be done, she realized the goal was not_____ (achievable)

Drivable. I had to ____ my car to the market. (drive)

Factors Affecting Task Performance

- Transparency
  - Task items that represent transparent relations between base words and their inflected or derived forms are easier to complete than items that represent a shift phonologically and/or orthographically (e.g., Apel, Henbest, & Petscher, 2022; Apel & Thomas-Tate, 2009; Carlisle, 2000).

Factors Affecting Task Performance

- Word frequency
  - Later elementary (fourth and sixth) and middle school students are able to read derived words better when those words' frequencies and/or frequencies of their base words are relatively high; word frequency may affect students' performance on a morphological awareness task (e.g., Carlisle & Stone, 2005; Goodwin, Gilbert, & Cho, 2013)
    - Students may be using their base word knowledge to decode and understand the derived words. For elementary students, average family frequency (the number of words that share the same base word), appears to affect derived word reading (Carlisle & Stone), likely reflecting the influence of using base word knowledge to read derived words.

How do I choose which words, affixes, and tasks?

- Consult grade-level texts/curriculum
- Consult classroom vocabulary expectations
- Use Grade-level word generators: https://learningbydesign.com/word-study-products/instruction/word-list-maker/
- Consider child's grade-level/abilities
  - Written language abilities
  - Spoken language abilities
- Consider affix type
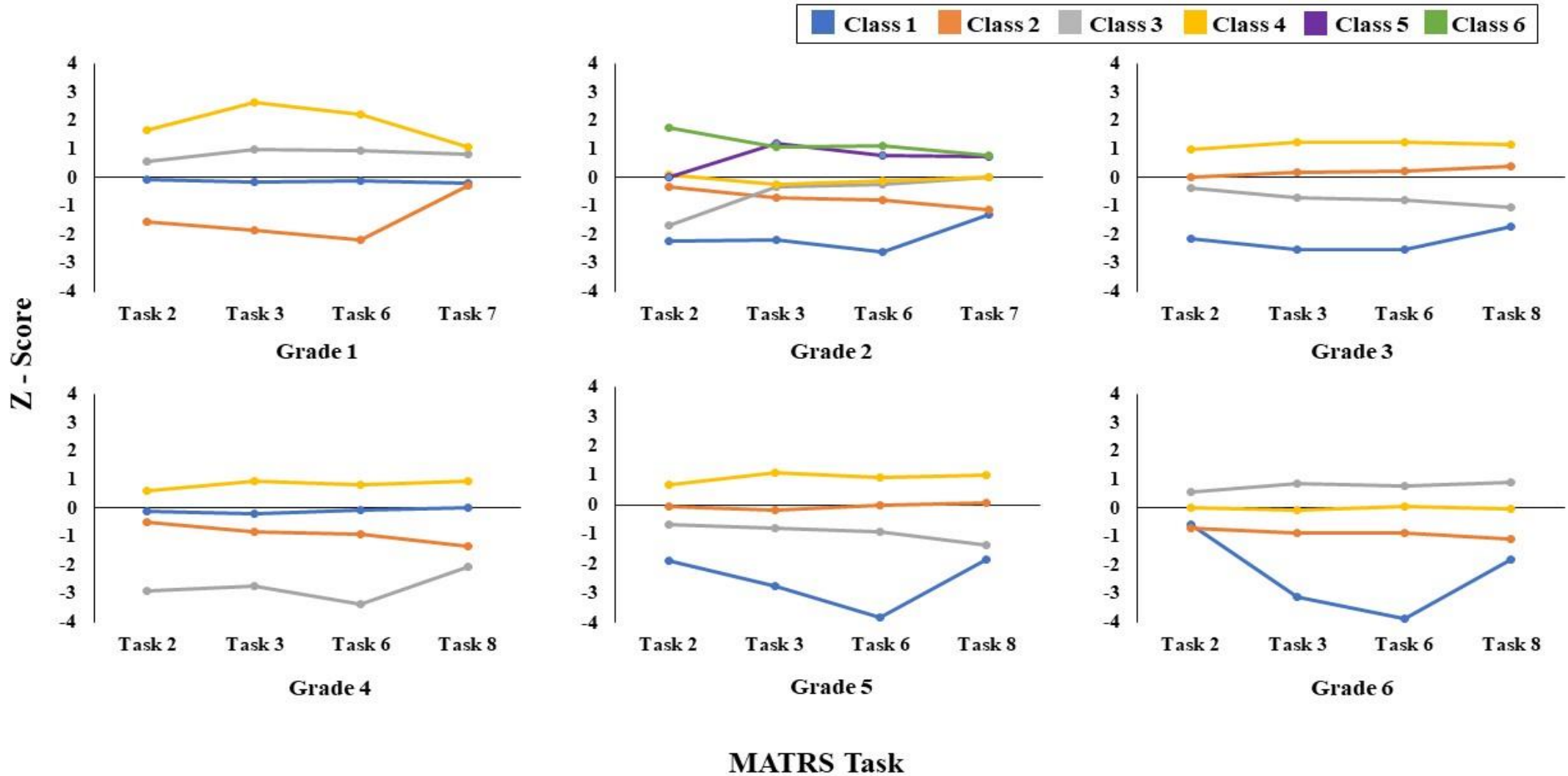- Consider transparency

Common prefixes:

- re-, in-, dis-, im-

Common suffixes:

- -tion, -y, -ly, -ant, -less, -er, -ment, -ful, -ness, -able, -ous, -ish, -ist,
- -ive, -ic, -ary, -ern, -ship, -ent, -ing, -or, -al, -en, -ity, -ward

(Baumann et al.; 2002; 2003)

That's a lot of tasks...do I need to give all of them?
(Apel, Henbest, & Petscher, 2022)

Final Thoughts on Morphological Awareness

- Morphological awareness is a powerful tool for literacy (and vocabulary) development

- Typically, morphological awareness is not addressed in the general education classroom. If it is addressed, it often occurs via worksheets; no discovery teaching occurs.

- Assessment across the four different aspects of morphological awareness can help one a) determine whether a problem(s) exists and what type instruction/intervention is needed.

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