

Article

Vocabulary Instruction: A Critical Analysis of Theories, Research, and Practice

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Abstract: Much is known about the impact of vocabulary instruction on reading skills, word knowledge, and reading comprehension. However, knowledge of the underlying theories that guide vocabulary instruction and their potential impact on teachers' performance and/or students' achievement has not been investigated. In this content analysis, articles published in *The Reading Teacher* and *Journal of Adolescent and Adult Literacy* between 2007 and 2017 were dissected to identify and code embedded word-learning strategies, grade levels addressed, target student populations, and desired outcomes (receptive or productive vocabulary). Our primary goal was to examine the embedded word-learning strategies within the articles, and to identify the theories on which they were built. Findings showed that a combination of theories guided most strategy recommendations: Social constructivism and sociocultural theories, schema and psycholinguistic theories, motivation theory, and dual coding theory. We also parallel-coded our findings with a recent review of literature on vocabulary instruction by Wright and Cervetti (2017), and found that they corresponded with the original coding. Follow-up quantitative studies can use the salient theories detected in this content analysis to investigate whether knowledge of underlying theories has an impact on teachers' performance and student vocabulary and reading comprehension achievement.

Keywords: vocabulary; content analysis; practitioners; teachers; elementary; middle school; high school; reading theories

1. Introduction

A well-developed vocabulary has long been recognized as essential for success in reading [1], and literature has repeatedly affirmed that vocabulary size is one of the strongest predictors of reading development [2–5]. Vocabulary can contribute to reading comprehension through multiple avenues. First, larger vocabularies enable readers to access richer semantic resources to activate relevant background knowledge and integrate new information with existing knowledge, which leads to better comprehension [6]. Second, vocabulary has been found to predict the acquisition of critical aspects of metalinguistic awareness. For example, young children with large vocabularies tend to outperform their peers on measures of phonological awareness [7], which facilitates the development of decoding skills through the ability to isolate and manipulate smaller sound units, and to map sub-syllabic sounds to graphemes in written text. Vocabulary size is also predictive of morphological awareness (i.e., understanding of principles that guide the way morphemes are combined to form words) [8,9], which in turn will contribute to expansion of vocabulary [10,11]. Finally, just as the relationship between vocabulary and morphological awareness is reciprocal [12], so is the relationship between vocabulary and reading: Learners with large vocabulary repertoires tend to read more

often, which contributes to the expansion of their vocabulary [6,13]. Therefore, initial gaps in word knowledge may grow exponentially if no intervention is provided.

For young children, early vocabulary development is critical. Most children acquire oral vocabulary through parent–children conversations, interactions with peers and siblings, and shared storybook readings [14]. Research has shown that vocabulary knowledge assists with critical literacy skills, such as letter–sound knowledge [9], decoding [8], and morphological awareness [15], when formal reading instruction begins. In the case of early second language (L2) acquisition, lack of L2 vocabulary may hinder the development of basic reading skills and text comprehension in the target language. In the US, for example, English language learners (ELLs) begin school trailing significantly behind their peers in word knowledge [16]. Research has highlighted the necessity of repeated exposure to vocabulary words, explicit instruction on learning strategies, and sufficient time to engage with new words to close vocabulary gaps between students, particularly L2 learners and those in beginning reading programs [17]. Thus, vocabulary instruction must constitute an integral component of every reading and language arts program.

Still, a large corpus of vocabulary remains crucial in the middle and high school grades, as learners are increasingly required to define and use challenging academic words [18]. Many older students struggle with vocabulary; in the US, results from the 2014 National Assessment of Educational Progress (NAEP) found that only 36% of eighth graders read at a basic level, with vocabulary cited as one of the primary barriers to reading comprehension [19]. To counteract this, research suggests that middle- and high-school students be provided with multifaceted instruction on the use of context clues and morphology, as well as opportunities for active use of new words [6].

While much research has investigated strategies for word learning [6], none have critically examined the theories underlying these strategies. The present study seeks to uncover the theories behind the vocabulary instructional practices recommended for practitioners, and to cross-reference our findings with those of a literature review of empirical vocabulary studies [5]. In the following sections, the effects of vocabulary instruction on word acquisition and the impact of vocabulary instruction on reading comprehension will be reviewed, as well as teacher attitudes towards theories.

1.1. Effects of Vocabulary Instruction on Vocabulary

A variety of studies and syntheses have been conducted about the effects of vocabulary instruction on word learning [6,20–22]. Below, we will focus on the findings from several review papers to present an overview of recent studies on vocabulary instruction.

Hairrell, Rupley, and Simmons engaged in a systematic review of vocabulary research and determined that targeted vocabulary instruction leads to increased word knowledge for elementary students [21]. The authors described three of the most common strategies to build vocabulary reported in empirical research: (1) Contextual analysis, (2) semantic strategies, and (3) repeated exposure [21]. While all were found to impact general word knowledge, semantic strategies, including the use of dictionaries, graphic organizers, discussions, etc., were seldom used in isolation [21], making it difficult to determine the extent of their influence. Additionally, the moderating factors underlying each reviewed study were not reported, so we are unsure if these strategies were found to be effective with learners from different cultural or linguistic backgrounds.

By contrast, Ford-Connors and Paratore reported that wide reading contributes to vocabulary development [6]. However, moderating variables such as text complexity, frequency of engaging in wide reading, and language proficiency were found to influence the relationship between wide reading and vocabulary development. Readers with high English proficiency who regularly engaged in reading complex texts were determined to be the most likely to benefit from word reading [6], suggesting that student background plays a key role in word learning.

In one meta-analysis, Marulis and Neuman reported that explicit vocabulary instruction embedded within meaningful texts and combined with multiple opportunities to practice results in significant vocabulary gains for at-risk children [22]. Interventions such as teaching sight words

with picture books, implementing storybook reading to develop oral vocabulary, and adopting a multidimensional vocabulary instruction approach were found to be effective for at-risk children. Word knowledge was shown to increase the most in small-group and one-on-one instructional settings. Finally, the type of intervenor was shown to affect the vocabulary gains. Negligible vocabulary gains were associated with uncertified and ill-equipped teachers. Such findings underscore the importance of knowledgeable teachers who not only provide meaningful word-learning experiences, but are also aware of how to customize instruction according to students' needs.

Finally, Chiu examined the impact of computer-mediated instruction on second-language (L2) vocabulary acquisition, and determined that it had a moderate effect [20]. Electronic flashcards with annotations, visuals, and digital word games were shown to be the most influential for increasing L2 vocabulary [20]. These findings indicate that computer-mediated instruction leads to vocabulary gains through multiple exposures and the meaningful contextualization of unknown words. With the ever-increasing presence of technology in 21st century classrooms, this review provides a critical look into the promises and pitfalls of technology for vocabulary instruction.

1.2. Effects of Vocabulary Instruction on Comprehension

Given the direct relationship between vocabulary and reading [5], it stands to reason that vocabulary instruction would have an impact on reading comprehension; such relationships, however, have not been well established in the literature. Nagy and Townsend reviewed studies on academic vocabulary interventions and found that, while most were successful in helping students learn to use academic words, there is a lack of evidence that vocabulary interventions lead to generalized improvements in academic language or enhanced reading comprehension [23]. The conditions in which instruction on academic words can be generalized beyond the specific words taught needs to be further researched [23].

Similarly, Wright and Cervetti reviewed vocabulary interventions with comprehension outcomes, analyzing the measure used, type of intervention, and characteristics of the instructional recommendations [5]. Like Nagy and Townsend, they found inadequate evidence to suggest that direct teaching of word meanings can advance generalized comprehension [23]. They also argued against the notion that instruction on one or two strategies will lead to generalized comprehension, instead advocating for teaching flexible word-learning strategies and techniques for self-monitoring to improve comprehension [5].

Both reviews indicate the lack of evidence linking vocabulary instruction to improvements in general reading comprehension, particularly when only a handful of strategies are employed. We can postulate that vocabulary instruction may be more effective if strategies based on a variety of theoretical frameworks are utilized and if recommendations focus less on learning individual words and more on tools that can be used to facilitate word knowledge across a variety of contexts.

1.3. Attitudes towards Theories

While vocabulary instruction based on a range of theoretical frameworks may be recommended, the massive boom of empirical reading research has not been associated with matching access to theories [24]. Practitioner-oriented articles, for example, focus on describing the characteristics of strategies and providing tips for their implementation. Rarely do these articles state the underlying theories on which the recommended learning strategies are grounded [25]. Cain and Parilla attribute this to the fact that no single theory has been able to capture the reading process in its entirety, due its complexity and dependence on several components [24]. Likewise, there are currently very few learning or reading theories that specifically address vocabulary development and instruction.

Perhaps because of this, many teachers fail to see the relevance of theories to their classrooms [26]. Most teachers are equipped with a plethora of prior knowledge about teaching and learning, and are less likely to accept theories that do not match their prior knowledge [27,28]. Furthermore, teachers are mostly interested in learning explicit teaching strategies that can be directly put into practice [27,29,30], and they tend to value and appreciate the testimonies and suggestions

of their fellow teachers more than recommendations from theorists, researchers, or even teacher educators [27–29,31]. This is compounded by the fact that the many demands placed on teachers limit their free time, making it less likely that it will be spent identifying the theoretical basis of instructional practices. Similarly, some educators believe that those who are distanced from the daily reality of teaching, such as researchers, are not in a position to offer educational insights, and thus receive research with skepticism [27–29,31]. In this content analysis study, we seek to determine the salient theories that underlie vocabulary instructional practices and strategies recommended in two practitioner-oriented journals. Through this, we will ensure that whatever time spent by teachers studying and understanding theories is directly related to their classroom practices.

1.4. Justification for Present Study

Students bring their own background knowledge and experiences (i.e., world knowledge) into the classroom. This knowledge is organized in students' minds in abstract forms called schemas, which emerge through social interactions. Social interactions activate stored schemas and facilitate the building of new ones [32], all of which is mediated by vocabulary. If students lack sufficient vocabulary knowledge, their capacity to make self-to-world connections and inferences is hindered [33,34]. It is also important to recognize that word knowledge is not an all-or-nothing phenomenon [35], but instead falls along a continuum. Word knowledge incrementally increases from no knowledge to context-bound knowledge, context-free knowledge, and finally metaphorical knowledge [36]. Teachers who understand the development of word knowledge are more readily able to select vocabulary instructional practices based on theories that support the acquisition of vocabulary.

Teachers who are knowledgeable about vocabulary development make sure that word-learning strategies associated with teacher–student and student–student interactions are incorporated in their vocabulary lessons. Examples of such strategies include semantic maps and other forms of graphic organizers, read-aloud discussions, student-generated definitions, word walls, word games, and shared journal/class books. The social dialogue generated through these strategies allows students to make semantic connections, use newly-learned words in their appropriate contexts, and predict unfamiliar meanings [37]. As this social dialogue becomes habitual in classrooms, we can then expect students to move forward in the word knowledge continuum [36] and take ownership of word meanings. Additionally, many teachers include the use of visuals within vocabulary instruction, which is based on the premise of Dual Coding Theory (DCT). A common misconception amongst teachers is that students will naturally realize the connections between visuals and words [38]. When teachers understand DCT, they recognize that instruction must include a purposeful focus on contextual referents [39] so that all students will understand and internalize new words.

It is also important to realize that “one size” of vocabulary instruction does not necessarily fit all. Students display individual differences in terms of their needs, interests, and prior word knowledge. Motivation theory provides a framework for teachers to customize their instruction to match the needs of all students. Teachers can choose to motivate students and enhance self-efficacy through consistent modeling and the application of self-regulation strategies [40]. Another strategy teachers can use to motivate students involves the incorporation of technology, which has been reported to have a positive influence on students' attitudes towards word learning [41–44]. Knowledge of motivation theory leads teachers to understand how to differentiate instruction to satisfy students' needs, interests, and style of learning.

Thus far, we have built the case that theories have natural implications for vocabulary instruction. Theories help teachers understand how vocabulary knowledge develops, and signals to teachers why some practices are fruitless. Practitioner-oriented articles provide teachers with a plethora of instructional practices and strategies. Teachers may be aware of these strategies and how they are used; however, awareness of the underlying theoretical bases of *why* these were created increases the likelihood that teachers will recognize their utility. Understanding these theories also allows teachers to reflect upon their performance, evaluate their effectiveness, and justify their choice of strategies. Theories enable teachers to choose, manipulate, and modify their vocabulary instructional

practices according to students' need and characteristics of words. Despite this, most teachers are not consciously aware of the theoretical basis of their instructional practices [26].

In this content analysis, articles published between 2007 and 2017 in *The Reading Teacher* and *Journal of Adolescent and Adult Literacy* were dissected to identify and code: (1) The embedded word-learning strategies, (2) grade levels addressed, (3) target student population, and (4) desired outcome (i.e., receptive or productive word knowledge). The primary focus was to examine the embedded word-learning strategies, and to identify the underlying theories on which these strategies rest. Identification of these theories will enable teachers to understand under which circumstances a certain strategy works and provide them with the tools to reflect upon and modify their instructional practices. Through this article, we hope to encourage the explicit disclosure of the theoretical underpinnings of instructional practices reported within practitioner journals and to guide future researchers to investigate how teacher knowledge of theories increases the effectiveness of teachers' performance and enhances students' achievement.

1.5. Description of Theories

The following theories guided our analysis: (1) Social constructivism/sociocultural theories; (2) schema/psycholinguistic theories; (3) dual-coding theory; and (4) motivation theory. We selected these because they were identified by the International Literacy Association as having exerted substantial influence over reading research [45] and had been utilized by previous content analyses [25]. Below, information about each theory will be provided.

1.5.1. Social Constructivism and Sociocultural Theories

A core assumption of both social constructivism and sociocultural theory is that knowledge is constructed via interaction with others during social activities [45]. More knowledgeable others are believed to facilitate the understanding and internalization of the social context and its contextual elements (e.g., culture and language), through which the construction of reality develops. Sociocultural theory is well-known for its Vygotskian perspectives, particularly the Zone of Proximal Development (ZPD), scaffolding, psychological tools, and inner speech [46,47]. ZPD refers to the zone that mediates what learners can and cannot do, in which learning must be scaffolded by more advanced adults and/or peers. Scaffolding enables learners to accelerate their mastery of psychological tools (e.g., language) and psychological tools allow learners to control and utilize their higher order mental processes. Bruner and his colleagues postulate that structured and scaffolded interactions between students and knowledgeable adults leads to growth in students' thinking, language, skills, and knowledge [48]. Students start these interactions dependent upon adults, which later fades when skills are mastered and self-regulation is achieved.

These theories imply that all individuals are active participants in the meaning-making process [49], so vocabulary instruction should be perceived as a social dialogue through which meanings are constructed via scaffolding and collaboration. Therefore, tasks where students work cooperatively to construct definitions of words and participate in collaborative discussions about new vocabulary [50] are rooted in social constructivism and sociocultural theory [51,52].

1.5.2. Schema and Psycholinguistic Theories

Schema theory refers to the cognitive and conceptual structure and representation of knowledge [45]. Schemas can be thought of as mental filing cabinets that allow individuals to process, encode, organize, and retrieve information [53]. Comprehension results from the activation of schemas, which provide a framework for explaining objects and events within a text [53]. Similarly, psycholinguistic theory proposes that readers do not rely exclusively on textual clues to make meaning, but instead make predictions as they read [45]. A readers' background knowledge interacts with conceptual abilities and processing strategies to produce comprehension [54]. Both schema and psycholinguistic theories demonstrate the active role of learners when constructing meaning and

play a role in vocabulary instruction when students are asked to connect new words to synonyms and antonyms, analyze the morphological features of words [10,11], create concept maps, graphic organizers, and semantic maps [55], and when using prior knowledge to determine word meanings [56].

1.5.3. Dual Coding Theory

The basic premise of dual coding theory (DCT) is that the human mind processes environmental stimuli via two mental systems (or codes), verbal and nonverbal. The two codes, though independent, are connected. The verbal code is responsible for processing and representing language, while the nonverbal code does so for nonlinguistic objects and events. In DCT, cognition occurs when representations from both codes become connected. Verbal-only associations result from a failure to concretize the abstract, producing only shallow understandings [57]. In vocabulary instruction, practices emphasizing the concreteness and imageability of words, such as the use of multiple modalities [58] or the elicitation of mental images [59], are rooted in DCT.

1.5.4. Motivation Theory

Motivation theory, as it pertains to literacy, posits that readers become engaged with a text when it aligns with their goals, desires, and objectives within a particular social milieu [45]. Students become intrinsically driven to read when they are curious about the topic of the book or the author, believe in their reading abilities (self-efficacy), are given autonomy in choice of reading material, or are provided with texts of interest [60]. Motivation also can increase through extrinsic means, such as achieving learning goals based on competition [61] or the desire for external rewards or praise [62]. Vocabulary practices based on motivation theory include the development of word consciousness to enhance student interest [40], the use of word-learning games [63], and technology-based activities [58].

1.6. Research Questions

When teachers have a solid understanding of the theories that drive instruction, they can then recognize why certain strategies are effective, how to properly modify them, and for what purposes each should be used [25]. Therefore, the present study seeks to identify the underlying theories behind recommendations made for vocabulary instruction within two practitioner journals, *The Reading Teacher (RT)* and *Journal of Adolescent and Adult Literacy (JAAL)*. We selected *RT* and *JAAL* for several reasons: (1) We wanted to examine the theories behind practices that are guiding classroom instruction, so practitioner journals were more suitable than empirical research journals, and (2) both *RT* and *JAAL* are considered to be high-impact, flagship journals that reach a large audience of classroom teachers and are widely cited in pre-service teacher education textbooks.

Additionally, we chose to do a parallel coding of our study with a recent review published in *Reading Research Quarterly (RRQ)* by Wright and Cervetti [5]. *RRQ* is a leading empirical research journal in the field of literacy and the study by Wright and Cervetti provides a systematic review of vocabulary intervention studies with comprehension outcomes. Through this parallel coding, we sought to determine whether the underlying theories that guide the word-learning strategies recommended in practitioner journals are the same as those recommended in empirical research journals. Additionally, we wanted to determine if there are any word-learning strategies that are exclusively suggested within practitioner-or empirical research, and point out the need for further investigations on these.

Our study is guided by the following research questions:

1. What theories underlie the recommendations for vocabulary instruction made by articles published in practitioner journals?
2. How do the theories underlying recommendations for vocabulary instruction in practitioner journals vary across grade levels, special populations, and desired outcomes (i.e., receptive or productive)?
3. What are the differences and similarities between theories underlying vocabulary instruction made by empirical research articles and practitioner-oriented articles?

2. Methods

2.1. Search Criteria

The current review includes articles that were published in *RT* and *JAAL* between 2007 and 2017. To be selected, the primary focus of each article (over 50%) had to be on vocabulary instructional strategies. Words synonymous with vocabulary, including *word meaning* and *word knowledge*, were used to search the *RT* and *JAAL* databases, yielding an initial 200 articles: 156 from *RT* and 44 from *JAAL*.

2.2. Inclusion and Exclusion Criteria

Following the review by Yang, Kuo, Ji, and McTigue, we included articles that focused on any aspect of word learning or instruction [64]. Articles were excluded if over half of the word count of the entire article was not related to vocabulary instruction or if they were book reviews, commentaries, literature reviews, or editorial columns. This culminated in the identification of 76 articles for analysis, 61 from *RT*, and 15 from *JAAL*.

2.3. Coding Procedures

Five out of the six authors collaborated to code the articles. Each article was read in its entirety and coded for the factors most relevant to the research questions, including: (1) Student characteristics, including grade level and explicit reference to ELLs or struggling learners; (2) the desired outcome, such as *productive* or *receptive*; (3) the reading theories underlying the recommended practices; and (4) explicit or implicit statement of theories [64].

Following Unrau and Alvermann, recommendations for vocabulary instruction were coded as being guided by social constructivism/sociocultural theories, schema/psycholinguistic theories, DCT, or reading motivation theory [45]. Decisions on how to code each practice was based on *why* and *how* it was used within the classroom. For example, using vocabulary journals was coded within social constructivism and sociocultural theories because students were encouraged to work collaboratively to create their own definitions and to share explanatory resources and illustrations. A theory was coded as *explicit* if it was named within the article, and *implicit* if the theory was not stated, but enough evidence was present to suggest that it provided a framework for the practice [61]. Finally, articles could be coded as being guided by more than one theory if sufficient evidence was present [64].

After the initial coding was completed, 20% of the articles ($n = 40$) were stratified and randomly selected for re-coding to establish interrater reliability. Initial results yielded 73% agreement, which was determined to be unsatisfactory. Coders met and discussed all discrepancies, after which a second round of coding was conducted following the revised coding scheme, and an interrater reliability of 85% was reached. Coders met one final time to resolve all remaining differences.

3. Results and Discussion

3.1. Research Question One

Research question one asked, what theories underlie the recommendations for vocabulary instruction made by articles published in practitioner journals? We found that recommendations guided by social constructivism/sociocultural theories were the most prevalent, followed by schema/psycholinguistic theories, motivation theory, and finally DCT (see Table 1). These findings will be discussed in greater detail below.

Eighty-eight percent ($n = 67$) of the recommendations were guided by social constructivism and sociocultural theories, with only 6% ($n = 4$) explicitly naming the theory. This finding is anticipated, as teaching pedagogy has increasingly emphasized learning through social, collaborative discovery [65]. In *RT* and *JAAL*, suggestions based on these theories included the use of cooperative groups to create student-friendly definitions [66], and partner “think-pair-share” work to build meaningful sentences with new words [67].

Table 1. Summary of articles included, presented chronically.

Citation	Grade Level ¹	Explicit References to ELLs	Explicit References to Struggling Readers	Vocabulary Type ²	Technology	Social Constructivism/ Sociocultural Theories	Schema/ Psycholinguistic	Dual Coding Theory	Motivation Theory
Abrams and Walsh (2014) [41]	HS			R	X ⁵				Implicit
Adams and Pegg (2012) [68]	HS			P		Implicit	Implicit		
Baumann, Ware, and Edwards (2007) [69]	UE			P		Implicit	Implicit	Implicit	Implicit
Beauchat, Blamey, and Walpole (2009) [70]	PS			R		Implicit		Implicit	
Blamey and Beauchat (2011) [71]	PS			R		Implicit	Implicit	Implicit	
Boulwar-Gooden (2010) [72]	UE			R		Implicit	Implicit		
Boyd, Sullivan, Popp, and Hughes (2012) [73]	HS			R		Implicit	Implicit	Implicit	
Brabham et al. (2012) [42]	EE and UE	X ³		R	X	Implicit	Implicit		
Briceño (2016) [74]	EE	X		R		Implicit	Implicit		
Bromley (2007) [75]	MS and HS	X		P		Implicit	Implicit		Implicit
Ciechanowski (2009) [76]	UE	X		P		Implicit			Implicit
Crosson and Lesaux (2013) [77]	UE	X		P			Implicit		
Dalton and Grisham (2011) [58]	UE	X	X ⁴	R	X	Implicit	Implicit	Implicit	Implicit
Dashiell and DeBruin-Parecki (2014) [78]	PS		X	R	X	Implicit	Implicit	Implicit	Explicit
Donnelly and Roe (2010) [79]	UE	X		P		Implicit	Implicit		Implicit
Ellery (2010) [66]	*			P		Implicit	Implicit		Implicit
Feezell (2012) [67]	UE	X		P		Implicit	Implicit		
Fisher and Frey (2014) [80]	*			P	X	Implicit	Implicit		Implicit
Flanigan and Greenwood (2007) [81]	MS			R		Implicit	Implicit		Implicit
Flanigan and Greenwood (2007) [81]	MS			R		Implicit	Implicit		Implicit
Flanigan, Templeton, and Hayes (2012) [82]	HS			R			Implicit		
Flynt and Brozo (2008) [83]	*	X		P	X	Implicit	Implicit		
Gallagher and Anderson (2016) [84]	UE			P		Implicit	Implicit	Implicit	
Ganske (2016) [85]	EE			R				Implicit	
Gill (2007) [86]	*			R		Implicit	Implicit	Implicit	
Gillanders, Castro, and Franco (2014) [87]	PS	X		R		Implicit	Implicit	Implicit	Implicit
Gillis (2014) [88]	*			R		Implicit	Implicit		
Giroir, Grimaldo, Vaughn, and Roberts (2015) [37]	EE and UE	X		R		Explicit	Explicit	Implicit	
Goodwin and Perkins (2015) [89]	EE, UE and MS		X	R		Implicit	Implicit		
Goodwin, Cho, and Nichols (2016) [90]	MS			R		Implicit	Implicit		
Goodwin, Lipsky, and Ahn (2012) [91]	EE, UE and MS			R		Implicit	Implicit		
Grant et al. (2012) [92]	MS			R		Explicit	Explicit		Explicit
Graves and Watts-Taffe (2008) [93]	*			R					
Green (2015) [94]	UE			R			Implicit		
Greenwood and Flanigan (2007) [95]	UE			R			Implicit		
Griffith and Ruan (2007) [96]	EE	X	X	P		Implicit			
Hall (2016) [97]	EE			P		Explicit			
Harmon et al. (2009) [98]	MS			R		Implicit		Implicit	
Helman and Burns (2008) [99]	EE	X		R		Implicit		Implicit	Implicit
Hendrix and Griffin (2017) [100]	MS			R	X	Implicit	Implicit		Implicit
Hernández (2016) [101]	EE UE	X		R	X		Implicit	Implicit	
Kieffer and Lesaux (2007) [102]	MS			P		Implicit	Implicit		Implicit
Kesler (2010) [103]	EE UE			P		Implicit	Implicit	Implicit	
Kieffer and Lesaux (2010) [102]	UE			R		Implicit	Implicit		
Kieffer and Lesaux (2010) [102]	MS	X		P			Implicit		

Table 1. Cont.

Citation	Grade Level ¹	Explicit References to ELLs	Explicit References to Struggling Readers	Vocabulary Type ²	Technology	Social Constructivism/ Sociocultural Theories	Schema/ Psycholinguistic	Dual Coding Theory	Motivation Theory
Kindle (2009) [104]	EE			R		Implicit			
Kozdras, Joseph, and Schneider (2015) [43]	UE	X		P	X	Implicit			Implicit
Kucan (2012) [105]	*			R		Implicit	Implicit		
Labbo, Love, and Ryan (2007) [44]	EE			P	X	Implicit	Implicit	Implicit	Implicit
LaBrocca and Morrow (2016) [106]	UE			P		Implicit	Implicit	Implicit	Implicit
Lane and Allen (2010) [40]	EE			P		Implicit			Implicit
Larson (2014) [107]	EE			P		Implicit	Implicit		Implicit
Manyak (2007) [108]	EE UE MS			R		Implicit	Implicit		
Manyak (2010) [109]	UE	X		R		Implicit	Implicit		Implicit
Manyak and Bauer (2009) [110]	*	X		R		Implicit	Implicit	Implicit	Implicit
Manyak et al. (2014) [111]	UE			R		Implicit	Implicit	Implicit	Implicit
McGee and Schickedanz (2007) [112]	PS EE			R		Implicit	Implicit	Implicit	Implicit
McKeown et al. (2013) [113]	MS			R	X	Implicit	Implicit		Implicit
Mountain, L. (2007) [114]	HS			P		Implicit	Implicit		Implicit
Neuman and Roskos (2012) [115]	*			P		Implicit	Implicit	Implicit	Implicit
Picot (2017) [116]	EE UE	X		R		Implicit	Implicit	Implicit	Implicit
Pierce and Fontaine (2009) [117]	UE			R		Implicit			
Pollard-Durodola et al. (2011) [118]	PS			P		Implicit	Implicit	Implicit	Implicit
Putman and Kingsley (2009) [119]	UE			R	X	Implicit	Implicit	Implicit	Implicit
Rasinski, Padak, Newton, and Newton (2011) [120]	EE UE			R		Implicit	Implicit		
Rodgers (2017) [121]	EE		X	R		Implicit			
Savino (2011) [122]	MS			P	X	Implicit	Implicit		Implicit
Snell, Hindman, and Wasik (2015) [123]	PS EE			R		Implicit	Implicit		Implicit
Toth (2013) [124]	EE			R		Implicit	Implicit		
Townsend (2009) [125]	MS	X		R					Implicit
Wessels (2011) [126]	*	X		R		Implicit	Implicit		
Williams et al. (2009) [127]	EE			P		Explicit			Explicit
Winters (2009) [128]	*			R	X	Implicit	Implicit		
Wolsey, Smetana, and Grisham (2015) [129]	UE			R	X	Implicit			Implicit
Wright (2014) [130]	EE			R		Implicit	Implicit		Implicit
Yopp and Yopp (2007) [131]	*			R		Implicit	Implicit	Implicit	
Zoski and Erickson (2017) [132]	EE		X	R		Implicit	Implicit		

Note: ¹ PS: Preschool; EE: Early elementary (Grades K–2); UE: Upper elementary (Grades 3–5); MS: Middle school (Grades 6–8); HS: High school (Grades 9–12); U: University students; A: Adult; *: Grade level is not indicated in the article; ² P: Productive vocabulary; R: Receptive vocabulary; ³ X: ELLs are explicitly referred in the article; ⁴ X: Struggling readers are explicitly referred in the article; ⁵ X: Technology is applied into vocabulary instruction.

Social constructivism and sociocultural theories may be critical for word learning, as collaborative practices enable teachers to conquer the old-fashioned, deep-rooted notion that vocabulary instruction is solely about providing definitional information while students remain passive listeners. Instead, students engage in the word-learning process interactively, which was evidenced in the suggestion provided by Giroir, Grimaldo, Vaughn, and Roberts; the authors recommended the use of read-aloud discussions to challenge students to “use and predict new language by making meaningful text-to-self and text-to-world connections” [36] (p. 640). Collaborative scaffolding, such as within discussions, fosters multidimensional, world knowledge that goes beyond ability to recall meanings. This knowledge entails fluent access to the precise metaphorical use of words, awareness of oral and written word formats, and the ability to manipulate words across various contexts [35].

Schema and psycholinguistic theories also commonly influenced recommendations for vocabulary instruction, coded in 76% ($n = 58$) of reviewed articles, with 3% ($n = 2$) explicitly naming the theory. This aligns with findings by Wright et al., who determined that practitioner articles about science disciplinary literacy instruction were largely guided by schema theory [25]. In the current review, authors such as Flanigan and Greenwood recommended teaching words through semantic groupings and by comparing and contrasting features of words [81]. Also recommended to support students’ development and reorganization of conceptual knowledge was the use of the Frayer Model, a graphic organizer that requires students to define target vocabulary, generate examples and non-examples, provide characteristics, and/or illustrate the word meanings [36]. Briceño asked dual language teachers to create cognate word walls and incorporate students’ home language into class discussions to foster understanding about shared semantic meanings and the phonological and orthographic features of each word [74]. Through this, students were able to build rich representations of cognates that went beyond semantics. Afterwards, students were encouraged to use words from the cognate walls within their writing.

The prevalence of Schema/Psycholinguistic strategies indicates that a large chunk of classroom vocabulary instruction centers around the activation of prior knowledge, mental organization of words, and the connection of words to each other. While such strategies play a critical role in word processing, instructional practices that focus only on association (such as categorizing synonyms and antonyms) are not enough for students to gain a deep understanding of words [133]. Strategies such as the Frayer Model must be accompanied by opportunities for students to actively use words in meaningful and authentic ways [14]. Students should be given opportunities to talk about the connections between words, including analyzing word relationships and articulating incidents when one synonym would be preferable over another [14].

Motivation was the third most coded theory, underlying 47% ($n = 36$) of the articles, and explicitly referred to within 9% ($n = 3$). Tenets of motivation theory include the use of rewards, competition, and the generation of student interest, all of which were evidenced in the reviewed articles. The majority of recommendations focused on building intrinsic motivation through word consciousness activities [39,64,69,107,109,133,134] designed to increase student interest in words. To illustrate, Baumann et al. encouraged teachers to promote engagement through an activity where students investigate common slang words used in their homes [69].

Also popular within *RT* and *JAAL* was the use of games for increasing both intrinsic and extrinsic motivation [41,43,58,78,80,106,114,122,125]. Townsend described a variety of games that can be used to build the English vocabulary of ELLs, including picture and music puzzlers, matching and dice games, taboo, jeopardy, and pictionary [125]. She found that the games were “by far, the most engaging part of the intervention, and they were an essential draw to the program for students who would not have been easily convinced of the immediate value of learning words” [125] (p. 250). Technology-based games and programs were also recommended in several articles as a strategy for creating student interest in word learning [41,43,129].

Abrams and Walsh were the only researchers to note the potential of technology for increasing autonomy, as the immediate feedback provided by the computer program in their study facilitated

independent learning [41]. This article was unique in that it explores an aspect of motivation theory that has been underused in vocabulary instruction. Aspects such as the development of autonomy, self-efficacy, and personal goal setting were largely overlooked within the other articles in *RT* and *JAAL*. Recommendations for vocabulary instruction that address these, such as the suggestion by Grant, Lapp, Fisher, Johnson, and Frey to use inquiry-based learning to shift the responsibility of learning from teachers to students, should be further examined for their impact on word learning [92]. Additionally, studies involving individualized technology should consider its potential to facilitate multiple aspects of motivation theory, such as the development of goals and self-efficacy [135].

Uncommon within the literature were vocabulary instruction practices based on DCT, found in only 32% ($n = 24$) of the articles, and all implicitly coded. These findings contrast with those of Wright et al., in which DCT was the second most commonly identified theory [25]. In *RT* and *JAAL*, strategies based on DCT revolved around the use of digital books [58] and the incorporation of drama, real objects, and visual images [109]. The use of *mnemonics keywords*, in which students are asked to generate mental images to make words more memorable and concrete, was never mentioned over the past decade in *RT* and *JAAL* [39]. Future studies published in *RT* and *JAAL* could highlight this instructional practice and its role in developing students' vocabulary.

The shortage of recommendations guided by DCT might indicate a failure by teachers and researchers to recognize the association between the different processes in vocabulary learning, or a general misunderstanding about the tenets of DCT. Sadoski and Paivio argue that DCT is frequently misunderstood or mischaracterized, with many believing that it solely encompasses the connection of verbal representations to nonverbal representations [57]. While word learning should include opportunities to activate verbal and nonverbal aspects of vocabulary, word concreteness (e.g., ring) and word context (e.g., wedding ring, boxing ring, telephone ring) must also be acknowledged [39] (p. 223). DCT discourages teachers from using visuals in isolation, as students are then forced to infer appropriate contextual referents and meanings. Thus, it is imperative that educators are provided with explicit theoretical rationales of DCT to overcome misconceptions and unsupported practices.

3.2. Research Question Two

Research question two sought to uncover how the theories underlying vocabulary instructional practices differed across grade levels, special populations, and desired outcomes of vocabulary learning. Findings will be discussed below.

Twenty-eight percent ($n = 21$) of the reviewed articles explicitly focused on vocabulary instruction for ELLs. Of these, 81% ($n = 17$) were driven by theories of social constructivism/socioculturalism, 71% ($n = 15$) by schema/psycholinguistic theories, 52% ($n = 11$) guided by motivation theory, and 33% ($n = 7$) by DCT. Much like the strategies recommended for the general student population, the social nature of word learning and scaffolding was highly valued within ELL instruction. For example, Ciechanowski suggested engaging ELLs in critical discussions using new vocabulary words, so that students could utilize their sociocultural resources to build meaning [76]. In-depth word analysis [136] was also supported within the reviewed articles; most commonly, authors recommended that teachers use morphemic word analysis when working with ELLs [137–139]. Articles that recommended this strategy posited that structured exposure to, and teaching of, meaningful word parts through scaffolding and class discussions is essential for the vocabulary development of ELLs [86].

Aside from the prominence of social constructivism/sociocultural theories, schema theory also played a large role in ELL instruction. This may be due to the widely-held belief that schema theory involves the activation of background knowledge, which has been long recognized as a successful strategy for ELL reading instruction [54]. Future recommendations for ELLs should consider how other aspects of schema theory, such as strategies for “structuring” information in a way that is efficient for encoding, storing, and retrieving words, impacts second-language word learning.

Very few articles that made specific reference to struggling readers (8%, $n = 6$), which is surprising given the fact that, in 2015, only 36% of fourth graders were performing at or above the basic level

in reading [19]. Similar to the findings for ELLs, social constructivism/sociocultural theories drove most suggestions (100%, $n = 6$) for struggling readers. Sixty-seven percent ($n = 4$) were based on schema/psycholinguistic theories, whereas 33% ($n = 2$) were rooted in motivation, and 33% ($n = 2$) in DCT.

It is intriguing that more recommendations were not based on motivation theory, given that struggling readers would likely benefit from the development of self-efficacy and personal goal setting. Research has shown that high self-efficacy is correlated with higher achievement [140] and that values, goals, and expectancy mediate the relationship between self-efficacy and achievement [141]. In the present review, one study extolled the use of word-learning technology for igniting the struggling readers' interest in words and for developing self-efficacy [58]; however, the latter was more of an afterthought and not emphasized within the article. Research has consistently shown that technology increases the engagement and interest of struggling readers [142]; however, other aspects of motivation theory need to be considered when planning for instruction. Educators of struggling learners should be careful to include a variety of motivational techniques within their vocabulary instruction.

Similarly, very few articles targeting struggling students were influenced by DCT. This lack may be attributed to the nature of instructional recommendations usually provided for this population, which highlights the use of independent word-learning strategies, such as morphological analysis. While Sadoski argues that DCT encompasses morphological analysis when students analyze words into meaningful parts, then "recombine those parts into meaningful wholes" [39] (p. 233), this argument fails to provide a sufficient explanation for how this connects to the nonverbal code. Because of this concern, we coded the morphological analysis strategy as underlain by the schema, social constructivism, and sociocultural theories.

Eighty percent ($n = 61$) of the identified articles were drawn from *RT*, a journal geared primarily towards teachers of elementary-aged students. Conversely, only 20% percent ($n = 15$) of articles were from *JAAL*, a journal for middle- and high-school practitioners. This paucity is alarming, as it suggests that the focus on vocabulary instruction within research dwindles as students get older. McKeown et al. echoed this concern, noting the lack of intervention studies focusing on word learning that have been conducted with middle- and high-school students [18].

Social constructivism and sociocultural theories were found to significantly underlie most vocabulary instructional recommendations, particularly for the elementary grade levels. Seventy-three percent ($n = 11$) of the articles in *JAAL* were based on these theories, indicating the possibility that middle- and high-school students are using social constructivist/socioculturally-rooted activities to develop academic word knowledge.

Teachers of elementary students were also frequently directed to use strategies based on schema/psycholinguistic theories for building word knowledge. This aligns with findings by Chilton and Ehri, who determined that third graders learned the meaning of vocabulary words better when using cohesive sentences (schema theory) than unconnected sentences [143]. Thus, elementary teachers would benefit from a solid understanding of these theories in order to effectively design and modify vocabulary instruction for their students.

Motivation theory undergirded 60% ($n = 9$) of *JAAL* articles. This number is relatively large compared to those found in *RT* (20%, $n = 12$), which may be due to the increased focus on autonomy in the upper grades, as students strive to become independent thinkers who are less reliant on teacher assistance [102]. Alternately, DCT was somewhat influential for vocabulary learning in early schooling, but only underlay recommendations in 13% ($n = 2$) of *JAAL* articles. We noted that the vocabulary instructional practices published in *JAAL* were more abstract in nature; once again, this could be attributed to the focus on content instruction in the upper grades. However, many recently-published content areas textbooks for older learners contain visuals [144], so teachers must not assume that students are going to make the verbal-nonverbal connection naturally [57,144]. Direct, explicit, and scaffolded instruction is required. Practices guided by DCT could assist in concretizing the abstract and allowing students to connect verbal representations to context-appropriate visuals.

Articles were also coded for the desired outcome (productive or receptive) focused on. Our review noted that the majority of recommendations sought to increase receptive vocabulary; whereas 68% ($n = 50$) of articles provided recommendations for developing receptive vocabulary, only 34% ($n = 26$) focused on productive. Much like our other findings, recommendations for both outcomes were primarily driven by social constructivism/sociocultural theories (Receptive 84%, $n = 43$; Productive 92%, $n = 24$) and schema theories (Receptive 76%, $n = 39$; Productive 73%, $n = 19$). Strategies for productive vocabulary were more frequently derived from motivation theory (65%, $n = 17$) than those focusing on receptive vocabulary (37%, $n = 19$).

The fact that productive vocabulary has been largely overlooked was unexpected, especially considering the recent emphasis in vocabulary literature on active word use across a variety of contexts [14]. Vocabulary instruction should not end at an assessment of understanding or a recall of words, but should instead consider if students are able to use the new words they have acquired. Kelley et al. assert that integrating writing activities into vocabulary instruction is essential, because including new words within writing indicates a true understanding of their meaning [134]. However, the use of writing for vocabulary development was reported in very few of the articles in *RT* and *JAAL*. Those that did ask students to write only required a few sentences, such as writing within semantic graphic organizers or creating sentences with new words [68,79]. Only articles that included journaling activities called for students to write multiple paragraphs using new words [97,107], indicating that writing and vocabulary are seldom paired.

3.3. Research Question Three

In research question three, we sought to determine the differences and similarities between the underlying theories within empirical vocabulary research and practitioner-oriented vocabulary articles. More than half ($n = 20$) of the practices coded by Wright and Cervetti intersected with practices identified in our coding scheme, allowing us to easily code the underlying theory [5]. For the remaining 11 practices, our team of coders met and reached a consensus on how they should be coded. Through comparing the empirical research articles in Wright and Cervetti to our findings, we sought to discover what vocabulary instructional strategies, if any, were identified in empirical journals but not in practitioner-oriented articles, and vice versa. By highlighting such strategies, we could guide future researchers towards practices that warrant further investigation.

Schema theory was found to guide 48% ($n = 15$) of the research interventions reviewed by Wright and Cervetti, suggesting that schema theory exerts an important influence in practitioner and empirical research [5]. Interestingly, strategies that are encouraged within practitioner journals, such as the Frayer Model [68], were absent within the intervention studies reviewed by Wright and Cervetti [5]. This may suggest that strategies to develop content-area vocabulary are not often emphasized, despite promising evidence that the integration of literacy strategies within content instruction is an effective way to increase students' achievement [145].

Social constructivism and sociocultural theories were found to underlie 32% ($n = 10$) of the interventions reported by Wright and Cervetti [5]. The prevalence of social constructivism and sociocultural theories indicate that both empirical and practitioner-oriented research are pushing for the use of interactive learning activities, such as "think-pair-share" [67].

Nine of the instructional practices included in Wright and Cervetti were frequently recommended within *RT* and *JAAL* over the past decade [5]. The only practice that was seldom suggested for use in the classroom was *syntactic feature analysis*, which requires teachers to draw attention to different forms of the target word, and how they relate to certain parts of speech [144]. Knowledge of a word extends beyond its *meaning* to its *form* and *use*, which includes its grammatical functions [18]. Given our findings, it is reasonable to conclude that recommendations for vocabulary instruction published in *RT* and *JAAL* focus primarily on activities to develop *meaning* and *form*, with little acknowledgment of *use* [146]. Future research could investigate the benefits of incorporating grammar and discourse in vocabulary instruction and suggest evidence-based practices for practitioners.

Only 18% ($n = 4$) of studies were directed by motivation theory within Wright and Cervetti [5]. Suggestions grounded in motivation theory, such as the use of real-life experiences, the development of self-efficacy, and games based on student interests, seem to appear more frequently within practitioner journals than in empirical studies. Other underpinnings of motivation theory, such as goal setting and the development of autonomy [147], should be examined for their ability to increase breadth and depth of word knowledge, particularly with struggling learners and ELLs. Additionally, researchers may want to consider how traditional constructs of motivation impact diverse student populations, as varying cultural beliefs and goals may require different types of motivational interventions [148].

Much like in the present review, intervention studies based on DCT were scarce within Wright and Cervetti, with only 6% ($n = 2$) guided by this theory [5]. It seems that within both practitioner and research journals, the use of DCT-based strategies for vocabulary learning is uncommon. Interestingly, in reviewing Wright and Cervetti, we noted the overall lack of influence that DCT has had on vocabulary instruction research during 1965–2006. Out of the 31 strategies included by Wright and Cervetti, none outside of Türk and Erçetin and Levin, Levin, Glasman, and Nordwall were guided by DCT [149,150]. One possible explanation for this is made by Sadoski and Paivio themselves [57]. They stated that DCT started as a theory of memory and cognition in the 1970s, continued to focus on memory and cognition in the 1980s and 1990s, extended to explain literacy-related issues (i.e., reading comprehension and composition) in the 1990s, and was finally declared as a unified theory of literacy at the beginning of the new millennium [57] (p. 886). Further research could dig deeper into this matter and provide additional explanations for why DCT has gained popularity in the past decade.

4. Conclusions

4.1. Summary of Findings

In the present content trend analysis, we sought to investigate the salient theories on which vocabulary instructional recommendations made by practitioner-oriented articles are founded. We also examined how theories underlying recommendations for vocabulary instruction varied across grade levels, student populations, and desired learning outcome. Finally, we parallel-coded our findings with those of Wright and Cervetti, who reviewed empirical vocabulary research [5].

Our analysis showed that a combination of theories guided most strategy recommendations: Social constructivism and sociocultural theories, schema and psycholinguistic theories, motivation theory, and dual coding theory. Social constructivism and sociocultural theories were the most influential, guiding 88% of vocabulary instructional recommendation in *RT* and *JAAL*. Schema and psycholinguistic theories also commonly influenced recommendations for vocabulary instruction, guiding 76% of vocabulary instructional recommendation in *RT* and *JAAL*. Forty-seven percent of vocabulary instructional recommendations in *RT* and *JAAL* were rooted in motivation theory, and 32% in DCT.

Our findings are similar to those of another content analysis that focused on the underlying theories guiding instructional recommendations for science literacy in *JAAL* [25]. Wright et al. examined 22 articles and found that 77% were guided by social constructivism and sociocultural theories, 36% by DCT, 27% by schema theory, and 18% by motivation theory [25]. The predominance of social constructivism and sociocultural theories in both content analyses indicate that practitioner-oriented articles are pushing for interactive learning environments in which inquiry, collaboration, dialogue, and active participation are encouraged. By contrast, of the 14 articles in Wright et al. that focused on vocabulary, most were guided by DCT and schema theory [25]. As only 32% of strategies in the present review were rooted in DCT, we can postulate that strategies based on DCT may be more common for teaching science or other content-area vocabulary, and with older students.

Another finding from the present study is that very few theories were explicitly referenced within *RT* and *JAAL* (12%, $n = 9$), which was also reported by Wright et al. (23%, $n = 5$) [25]. We posit

that explicitly stating the theoretical underpinnings of instructional recommendations is essential for increasing teachers' awareness of the link between theory and practice, particularly as this relationship may not be transparent to teachers [36]. The process of turning theories into practice requires explicit discussions and can be problematic if theories are misunderstood. Perhaps this issue is what led Jagger and Yore, who analyzed theories underlying science literacy recommendations, to conclude that 56% of the instructional recommendations were atheoretical [151].

The present review also examined the grade levels addressed, target student populations, and desired outcome. In terms of theories guiding recommendations for ELLs and struggling readers, most were rooted in social constructivism, sociocultural, and schema theories. It is noteworthy, however, to acknowledge that very few articles addressed struggling readers. More research is needed to help this population of students advance their word knowledge. The majority of reviewed articles targeted elementary students, with similar theoretical foundations; social constructivism, sociocultural, and schema theories were the most common. Few articles suggested practices for middle-school students and very few targeted high schoolers. More research addressing vocabulary instruction for middle- and high-school students is needed, particularly because vocabulary is essential for comprehending the abstract and domain-specific vocabulary found in content-area textbooks [152].

Most of the instructional recommendations in the present review targeted receptive vocabulary and were guided by social constructivism, sociocultural, and schema theories. Future researchers could investigate how to incorporate productive vocabulary practices in classrooms, particularly as it relates to using new words within writing.

The parallel coding of our content analysis with the literature review by Wright and Cervetti revealed a similar pattern between practices in empirical and practitioner-oriented research [5]. The combination of theories that guided the majority of instructional recommendations in Wright and Cervetti were schema theory (48%), social constructivism and sociocultural theories (32%), motivation theory (18%), and DCT (6%) [5].

4.2. Limitations and Directions for Future Research

Our study was constrained by several limitations, which point to several directions for future research. Due to the nature of a content analysis, we were unable to examine a critical issue underlying our research, which is how teacher knowledge of theories impacts their implementation [25]. Additionally, we had not anticipated that recommendations for vocabulary instruction would be less common for ELLs, struggling readers, and students in middle and high school, or that DCT and motivation theories would be so underrepresented. This could be because we were only able to review two practitioner journals, *RT* and *JAAL*. It is possible that other journals would have provided a more theoretically diverse range of recommendations and/or targeted different populations of students. Future content analyses could examine all literacy journals geared towards practitioners to extend the findings of this study.

Our study makes a unique contribution to the field, in that no other research has investigated the theories driving vocabulary instruction in K–12 schools. In this content analysis, we have theorized that knowledge of underlying theories of vocabulary instructional practices helps teachers to focus on the big picture within vocabulary lessons, to manipulate and modify their vocabulary instructional practices according to students' need and characteristics of word, to reflect upon their practices and self-evaluate their performance, and most importantly to justify their choice of practice. Our findings can be used by educators as a guide to what theories are important for understanding how to provide effective vocabulary instruction.

Individuals interested in literacy can use our findings as a guide for future directions in vocabulary research. Our content analysis can be considered as phase 1 of an exploratory sequential design mixed method study. In such a design [153], qualitative data are initially gathered to explore a certain phenomenon or to identify themes. Then, these findings are used to help future researchers determine questions, variables, and samples for the follow-up quantitative phase. One suggestion for future

researchers would be to empirically investigate whether knowledge of theories has an impact on teachers' performance and/or students' achievement in word knowledge and reading comprehension measures. It is possible that such research could provide the foundation for how to approach theory and vocabulary instruction in pre-service teacher preparation programs, professional development, and vocabulary research.

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