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Core Vocabulary in Written Personal Narratives of School-Age Children

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Abstract

This study aimed to describe core words of written personal narratives to inform the implementation of AAC supports for literacy instruction. Investigators analyzed lexical diversity, frequency of specific word use and types of words that made up 70% of the total words used in 211 written narrative samples from children in first grade ($n=94$) and fourth grade ($n=117$). Across grades 191 different words made up 70% of the total words used in the 211 written narrative samples. The top 50 words were comprised of content words (64%) and function words (36%). Grade differences were noted in diversity and types of words, including differences in the number of words comprising the core (132 words for children in first grade and 207 for fourth grade) and a higher proportion of abstract nouns for children in fourth grade based on the 200 most frequently occurring words for each grade.

Keywords

Core vocabulary; Written narratives; School age; Abstract nouns

Literacy success for all students is a national priority in the United States (Capps, Fix, Murray, Ost, Passel, & Herwanto, 2005) and is identified as a global priority by UNESCO, the United Nations Educational, Scientific and Cultural Organization (Bokova, 2014). As Bokova stated, in her capacity as president of UNESCO, “Literacy is much more than an educational priority... We wish to see a century where every child is able to read and to use this skill to gain autonomy” (retrieved from <http://www.americaspromise.org/news/unesco-world-literacy-day>). Within literacy achievement, the focus has been on reading skills; however there has been a growing focus on how children become proficient writers (Miller & McArdle, 2011; Troia, 2007). Further, written narratives are often used in progress monitoring to provide snapshots of numerous interconnected language skills including vocabulary, grammar, sentence formation, and story structure (Scott, 2005; Singer & Bashir, 2004; Wise, Sevcik, Morris, Lovett, & Wolf, 2007). School-age children with typical development receive guided practice opportunities on a variety of writing tasks. Children with complex communication needs may receive less instructional focus on writing development and literacy skills in general (Sturm & Clendon, 2004). In response, the current

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research explores the vocabulary of writing for school-age children within a structured task, in the hope that the findings will be useful to inform design of AAC systems and instructional supports.

Importance of Vocabulary Selection for AAC

Although literacy is the goal for all children, AAC systems are not always designed in a way that allows children to engage in language and literacy activities to the same extent as children who are typically developing (Smith & Grove, 1996; Sturm & Clendon, 2004). One notable challenge is ensuring children have access to the vocabulary they need to meet the varied school-age language and literacy demands, including supports for written language development and practice opportunities with written narratives. Expressive vocabulary may be artificially constrained by the lexical items available on a child's AAC system (Sutton, Soto, & Blockberger, 2002).

Approaches to vocabulary selection for AAC systems may still focus disproportionately on words to serve basic communication needs (Morrow, Miranda, Beukelman, & Yorkston, 1993) or individual word preferences (Thistle & Wilkinson, 2015). In a recent survey of professionals, only 15% of clinicians with more than 13 years of experience reported leveraging word frequency information when selecting core vocabulary for an AAC system (Thistle & Wilkinson, 2015). The term core vocabulary refers to words that are frequently occurring which may be considered central to expressive vocabulary, and reflect a range of word classes that can be used across contexts (Boenisch & Soto, 2015; Witkowski & Baker, 2012). Given that clinicians may not be considering core vocabulary in word selection (Snodgrass, Stoner, & Angell, 2013), there may be insufficient lexical access for classroom literacy tasks and available vocabulary may not be sufficient to support desired growth in literacy development as the child engages in more sophisticated language experiences and complex language tasks in school (Sturm & Clendon, 2004).

Additional studies of core vocabulary are needed, particularly with increasingly complex school-age language and literacy demands in mind. Although numerous studies have examined oral vocabulary use of young children (Banajee, Dicarlo, & Buras Sticklin, 2003; Beukelman, Jones, & Rowan, 1997; Crestani, Clendon, & Hemsley, 2010; Fallon, Light, & Paige, 2001; Fried-Oken & More, 1992; Trembath, Balandin, & Togher, 2007) and identified core vocabulary lists for AAC systems, such lists may not be generalizable to written narratives given the known differences between written and oral communication in children (Hooper, Roberts, Nelson, Zeisel, & Fannin, 2010; Lienemann, Graham, Leader-Janssen, & Ried, 2006), including differences in types of words such as the use of abstract nouns and more formal language features prevalent in written constructions.

Core Vocabulary of Written Samples

In order to examine core vocabulary within children's written narratives, the investigators turned to the literature on frequently occurring words in written language tasks. Relatively few studies comprise the literature base on vocabulary of AAC systems for written language tasks; fewer still consider word types between different grades, or include samples from

children of ethnic backgrounds proportional to the demographics of the United States. The existing studies set a foundation of the methods and expected overlap in the core vocabulary across studies. Three studies in particular will be reviewed in more detail as they form the background for our research on what comprises a child's core vocabulary for writing and how it can be applied to AAC programming.

In a seminal study, McGinnis and Beukelman (1989) described written vocabulary samples of elementary school students in order to provide insights for the vocabulary selection for a student's AAC device. The study involved written samples on a variety of topics (e.g., letter writing, science topics, hobbies, and pets) by 374 students in second, third, fourth, fifth, and sixth grades of primarily White Caucasian middle income backgrounds. Findings for the letter-writing task indicated that the 23 most frequently used words in all the samples represented 39% of the total written sample. The authors reported that 131 words occurred at least once per every 1000 words in the sample. The core word bank was comprised of 161 words. This core word bank accounted for 70% of the different words in the samples, while 200 words comprised 76% of vocabulary children used in the writing tasks. Additionally, the authors considered commonalities across grades and found that, on average, the top 23 words were used across all five grades by almost all children.

Another study that explored vocabulary use in writing included young children in first through fourth grade who wrote on self-selected writing topics across a 6-week period (Clendon & Erickson, 2008). This study compared 125 children from North Carolina to 113 children from New Zealand. The children in both groups represented a variety of ethnic groups, all with English as their first language. A total of 2,721 writing samples were gathered from 238 children with 1–33 samples per child. Mean scores for total number of words and number of different words were calculated across the set of writing samples produced by a child, which generated an average ratio of different/total words of .73 for first grade and .63 for fourth grade. The writing samples contained a total of 85,759 words, comprised of 5,724 different words. After gathering a list of core vocabulary words, this study found that 163 words accounted for 70% of the total words used. Grammatical words were more common than content words, comprising 70% of the 50 most frequently occurring words, 56% of the 100 most frequently occurring core words, and 45% of the top 150 core words.

The findings of Clendon and Erickson (2008) were substantiated by Clendon, Sturm, and Cali (2013), who analyzed vocabulary in written language samples from 124 children with typical development in kindergarten ($n = 65$) and first grade ($n = 59$). The investigators gathered 457 written samples (two to six samples per child) using self-selected topics on nine different writing tasks (labeling, story, narrative retell, plan, procedure, description, report, opinion, and explanation) with the most common being narrative retells (28%) and opinions (24%). The participants were primarily Caucasian (72%) with 2% Hispanic, 24% African American and 2% Asian American. School level socio-economic status was reported, with participating schools ranging from 22%–90% free and reduced lunch eligibility. The results indicated that 140 core words in this age group made up 70% of the vocabulary of the samples. Based on word frequency, structure and grammatical words were more common than content words. Some vocabulary was specific to particular writing

genres. For example, *going* occurred in response to some writing prompts but not others. In contrast, some words such as *mom* were high frequency across multiple writing genres.

Taking the studies together, it appears there are similarities and differences expected between core words in written samples. Clendon et al. (2013) reported 58% overlap in the top 50 most frequently occurring words in their findings compared to the letter writing activities in the McGinnis and Beukelman study (1989). This is similar to the previous study (Clendon & Erickson, 2008), which reported 62% overlap in core words based on the top 50 words in their samples and the letter writing task of McGinnis and Beukelman. Further, there was 56% overlap in the language arts writing task. Clendon et al. (2013) reported that 20 out of 50 of the top core vocabulary words matched two other studies' findings. The distribution of different word types or word choice varied across the studies. The authors speculated that differences may be related to the different contexts used for the writing tasks (e.g., letter writing, language arts, science, and open-ended topics). Differences in the distribution of the types of words (e.g., grammatical words, nouns, and function words) may also be related to the grade levels of participants, which differed across studies.

Grade Level Word Choice Differences: Abstract Nouns

Based on review of a broader literature base, word choice differences between grades may also be expected with regard to the use of abstract nouns (Graves, 1975; Hooper et al., 2010; Lienemann et al., 2006; Myhill & Fisher, 2010). Researchers define abstract nouns such as happiness, life, and opportunity, as "intangible entities, inner states, and emotions" (Sun & Nippold, 2012, p. 3). In contrast, concrete nouns refer to that which physically exists, such as house, ball, and apple. Concrete nouns are thought to be processed more quickly; acquired nouns are thought to be processed earlier and more easily recalled (Kroll & Merves, 1986; Walker & Hulme, 1999). The use of abstract nouns may be more prevalent in written language samples of older children who may leverage written language opportunities to plan word choice, organize and revise. As such, the frequency and variety of children's use of these nouns may be expected to differ across grades. This is supported by the findings of Sun and Nippold, who examined the use of abstract nouns in relation to other indexes of written language. Based on their analysis of written samples of 120 school-age children (40 in each of three grades: fifth, eighth, and eleventh), the investigators reported a significant main effect of grade on the frequency of use of these nouns.

Purpose of Current Study

Based on the assumption that the available lexicon affects acquisition and use of vocabulary and recognizing the importance of written language development, we presume that having appropriate lexical access for written language narratives is critical. There is a wealth of literature establishing the importance of written language development, writing practice, and narrative construction in children (Graves, 1975; Hooper et al., 2010; Lienemann et al., 2006; Myhill & Fisher, 2010), yet insufficient studies on core vocabulary to equip children with complex communication needs to participate in written language practice. Existing studies may not reflect the contemporary composition of societal diversity as previous findings are primarily based on students of Caucasian backgrounds. It is may also be

important to examine core vocabulary within a structured writing task with a consistent writing prompt that can be easily replicated or utilized for daily writing tasks (Connelly, Dockrell, Walter, & Critten, 2012; Dockrell, Ricketts, Charman, & Lindsay, 2014).

Past studies on vocabulary development for children who use AAC provide a foundation for this research area; however, more research and replication is needed to identify a contemporary core word-bank contextualized in a structured written personal narrative and within a diverse sample of children reflecting current composition of first and fourth grade. The current study aims to identify a core word-bank from the written samples of children in first and fourth grade. The primary research questions are as follows:

1. How many different words comprise school-aged children's written core vocabulary (based on 70% of total words used)?
2. What types of words comprise the top 50 most frequently occurring words in the children's written samples (e.g., nouns, verbs, and function words)?
3. Are there grade level differences in types of core words (e.g., abstract nouns) used by children in first and fourth grade?

Methods

Participants

Written samples for this study were obtained from a larger study of 1023 writing samples of twins in Florida in first to ninth grade (Taylor, Hart, Mikolajewski, & Schatschneider, 2013). The project was approved by the human subjects review committee at Florida State University to study the written language samples of the twins. From the larger study following twin development more broadly, the investigators utilized all samples from two grade levels of interest, first and fourth grade to examine core vocabulary. The two grades were selected to allow for examination of potential vocabulary differences in word choice by grade and based on the recommendation of previous researchers suggesting that the core words of beginning writers may be most relevant to children with complex communication needs (Clendon & Erickson, 2008).

Using grade as the only criterion, a total of 211 participants' writing samples were examined. The participants were comprised of 94 children in first grade and 117 children in fourth grade, 57% of whom were female and 43% of participants were male. Of the total sample, 49% were White/Caucasian, 32% were Hispanic/Latino(a), 9% were Black/African American, 5% were Asian, 1% were Native American or Pacific Islander, and 4% were reported as being of mixed racial/ethnic background. A small percentage of participants (5%) reportedly had academic delays or difficulty in language, reading, or spelling. For the current study all samples were included regardless of the language background of participating children, in an effort to obtain an inclusive sample of the vocabulary use of children with varied abilities.

Materials and Previous Collection

Families who provided signed consent received a packet of materials in the mail. Participants were given a variety of tasks for each of the twins to complete, including a written personal narrative task. The paper contained the typed prompt, “One day when I got home from school...” which was similar to written prompts used in other studies (Connelly et al., 2012; Dockrell, et al., 2007; Wechsler, 2005). The writing task was untimed and not constrained in length. Parents were instructed to allow children to complete the task independently and that it should take approximately 10–15 min. Parents were asked to report any deviations from the instructions and return the narrative in the stamped envelope provided.

Procedures and Analysis

Students in speech-language pathology entered the written samples electronically and the investigators ensured accuracy. An accuracy check of 35% of the samples indicated 99% accuracy in the conversion of the samples from paper to electronic format. The Systematic Analysis of Language Transcriptions (SALT) program (Miller & Iglesias, 2012) was utilized to derive the word list of the collective lexicon used in the personal narratives, the percentage of transcripts that contained the word, and the total number of occurrences of each word across first and fourth grade samples. To answer the first research question the lists were put in ascending order by the number of occurrences in order to rank order the most frequently occurring words and identify the core vocabulary.

The procedures for determining the core vocabulary followed methods of previous studies. Generally across studies, core vocabulary has been operationalized as the set of words that represents 70%–80% of the total vocabulary generated. McGinnis and Beukelman (1989) reported that a core list of 161 words comprised 70% of children’s vocabulary in letter writing while 200 words made up 76% of the sample. Similarly in Clendon and Erickson’s (2008) study, 163 words accounted for 70% of the total words used in written samples. Based on the previous methods, the current study used a 70% cut off. Within the word list, misspelled words were excluded from the occurrence list if the word was unidentifiable (i.e., neither author recognized an intended word) or if the two reviewers did not independently generate the same intended word.

To answer the second research question, descriptive statistics were analyzed to examine the percentages of nouns, verbs, and function words. To further explore types of words used, the top 25 nouns and verbs for each grade were identified. In order to provide an accurate list of the most frequently occurring nouns and verbs all forms of the words were considered in the total, including plural and possessive forms of nouns and past, present, and future tenses of the verbs.

To answer the third research question, the investigators further inspected similarities and differences between the first and fourth grade vocabulary of written samples. Grade level differences were examined for word types by examining the use of abstract nouns and action versus mental state verbs. Action verbs reference observable actions, motion, or movement which may be more transparent in meaning (Mineo, Peischl, & Pennington, 2008) indicating

something a person, animal, or force of nature can do such as jump, run, sweep, and eat. In contrast, mental state verbs involve cognitive processing or non-observable acts such as remember, compare, and love (Curenton & Justice, 2004; Moore, Furrow, Chiasson, & Patriquin, 1994). To examine the use of abstract nouns and mental state verbs in the core vocabulary of children by grade, each noun in the top 200 most frequently occurring words was independently categorized by each author. A researcher-compiled list of abstract nouns and mental state verbs was consulted whenever the authors were uncertain. The list was compiled prior to the start of the study by compiling across multiple open access web sources for a combined list of abstract nouns and mental state verbs for quick reference.

Results

Overall Core Word-Bank

From the 217 written samples, there were 27,391 total words made up of 3,781 different words. Table 1 shows the core vocabulary bank from the combination of all the samples. It is sorted by the total occurrences but also reflects the percentage of transcripts that contained the word and the frequency of the word per 1000 words. In total, 191 different words made up 70% of the entire written sample, which was considered the core vocabulary of the sample (Clendon & Erickson, 2008). The top 50 words of this core vocabulary accounted for 51% of the total word count. The top 50 words were made up of 64% content words (including nouns, verbs, adjectives, and adverbs) and 36% function words (such as articles and prepositions).

First Grade

The first grade participants used a mean number of different words of 36.99 ($SD = 21.06$) and an average of 61.07 total words in individual narratives ($SD = 45.07$). Combining the first grade samples, there were a total of 5,423 words with 1,246 different words. In total, 132 different words made up 70% of the entire sample, which was considered the core vocabulary for the first grade written sample. Table 2 shows the 50 most frequently occurring words for the first grade writing samples. The top 50 words accounted for 56% of the total word count. These 50 words were made up of 66% content words (36% nouns and 30% verbs) and 34% function words.

The 25 most frequently occurring nouns of the first grade sample (excluding pronouns) are found in Table 3. These nouns occurred in the narratives an average of 3.28 times per 1000 words in the sample. Table 4 shows the 25 most frequently occurring verbs by grade. The verbs are listed by their infinitive form, but all forms of the verbs were combined in order to get the total number of occurrences in the sample. The top 25 verbs in the first grade sample occurred an average of 5.9 times per 1000 words in the sample. The verbs were largely action verbs (i.e., observable motion) such as *play*, *eat*, *said*, *run*, *read*, and *saw*. The 50 most frequently occurring words for first grade also contained three mental state verbs: *love*, *know*, and *want*. Among the 200 most frequently occurring words, there were 60 different nouns; 30% (18/60) were abstract nouns (e.g., *time*) and 70% (42/60) were concrete nouns (e.g., *dog*).

Fourth Grade

The fourth grade participants used a mean number of different words of 96.58 ($SD = 42.26$) and 179.96 total words in individual narratives on average ($SD = 91.10$). The combined fourth grade list had a total of 21,968 words with 3,013 different words. In total, 207 words made up 70% of the entire sample, which was considered the core vocabulary for the fourth grade written samples. The 50 most frequently occurring words (displayed in Table 5) were comprised of 54% content words and 46% function words.

Table 3 shows the 25 most frequently occurring nouns for the fourth grade sample (excluding pronouns). The top nouns occurred in the sample an average of 2.16 times per 1,000 words in the sample. Table 4 shows the top 25 most frequently used verbs in the fourth grade sample. The most common verbs occurred an average of 5.52 times per 1,000 words through the entire fourth grade sample. The verbs were primarily comprised of action verbs but included some mental state verbs including *think*, *want*, *know*, and *like*. Among the 200 most frequently occurring words, the fourth grade samples demonstrated a smaller proportion of nouns overall (45/200) compared to first grade, but a larger number of abstract nouns. Of the nouns in the 200 most frequently occurring words, 44.4% (20/45) were abstract (e.g., *thought*) and 55.5% (25/45) were concrete nouns (e.g., *water*).

Discussion

This descriptive study identified a list of 191 core vocabulary words used by school-age children in their written narratives following the written prompt of “One day when I got home from school...” The key findings substantiate previous results in the literature suggesting a core word bank can be identified for children that comprises 70% or more of their words and that the most frequently occurring words reflect a variety of word types (nouns, verbs, adjectives, adverbs). Children in fourth grade used a higher proportion of abstract nouns than children in first grade, based on comparison of nouns in the 200 most frequently occurring words for each grade.

Core Vocabulary

Findings of the current study show similarities to previous studies of frequency of occurrence of words in children’s written language, which further substantiates the existence of a core set of words. There was 46% overlap in words (88/191) between the core word list of the current study and the 140 words reported in Clendon et al. (2013). There were commonalities between the 50 most frequently occurring words in the current study and those identified in Clendon et al. (2013). Comparing the most frequent 50 words between the two studies, 21 words (42%) are present in both studies’ 50 most frequently occurring list. An additional 26 words (52%) appear lower down on Clendon and colleague’s 140 core word list, but not within the 50 most frequently occurring. These commonalities are indicated with asterisks in Table 1. Additionally, comparing the top 50 words in the current study to the work of McGinnis and Beukelman. (1989) for the letter-writing task, there were 27 (54%) words in common between the two studies’ 50 most frequently occurring words.

Differences across studies are thought to be partially attributable to differences in the context of the task. The writing task in the McGinnis and Beukelman (1989) study involved letter writing and as a result, some of the most frequently occurring words on their list appear to be more prevalent in letter writing such as *dear*, *pen pal*, and *name*. In contrast, the task of the current study asked students to write about experiences after school and consequently some of the words in the top 50 may be more prevalent in after-school contexts such as *house*, *home*, *day*, *dad*, and *play*. Along the same lines, the Clendon et al. (2013) samples were collected in the spring, which may explain why some words (*Easter*, *eggs*, *field*, *bunny*, *rabbit*) were among their core word list but were not observed in the current study. The top 50 words generated from the current study also contained other connectives including: *when*, *then*, *after*, and *that*, and basic concepts such as *up* and *down*, which were perhaps related to the discourse and context of the samples in the current study.

Additionally, the size of the core vocabulary was similar although somewhat larger in the present study when compared to past studies. In the current study, the core was comprised of 191 words, compared to Clendon and Erickson (2008) and Clendon et al. (2013), who reported 70% core-word lexicons consisting of 163 and 140 words, respectively. Differences in size of the core could be due to the different prompts the children were given or the differences in age groups across studies. It is also possible that the list of words important for written personal narratives is larger than that generated by the writing tasks in other studies (e.g., opinion or letter writing).

Grade Differences

The finding that there were differences between the grades in terms of lexical diversity was not surprising. The first grade children had 1,246 different words and the children in fourth grade had 3,013 different words in their samples. Of the previous studies, the current study's findings for first grade are most similar to the word list of the Clendon et al. (2013) study. The similarities in findings may be at least partially attributed to the similarities in age groups. The participants of their study were entirely kindergarten and first grade students. Compared to the Clendon et al. study, the first grade sample in the current study showed 37 of the same top 50 most frequently occurring words, providing additional evidence for the importance of inclusion of these words on AAC systems to support written narratives.

Grade Differences in Types of Words

The percentage of function words in the current study varied by grade (46% for fourth grade and 34% for first grade) and overall was lower than previous studies (70% or more in Clendon & Erickson, 2008; Clendon et al., 2013). The current findings highlighted a higher proportion of linguistic function words and abstract nouns in the older grade compared to first grade. Additionally, words such as *but*, *after*, and *as* appeared on the fourth grade list only. The grade comparison findings taken together reflect more sophistication in the word-bank of children in fourth grade.

Limitations

Several limitations should be noted, particularly related to the retrospective nature of the study, in that the sample characteristics and collection were derived from a larger study.

Although the larger study investigated written language performance, it was not designed to sample across contexts or particular word types. The writing prompt was not specifically designed to elicit words that would be useful to school contexts or abstract nouns. It should also be noted that the current study is not an exhaustive list of linguistic comparisons of the written samples or grade level differences. Although written samples from nine grades were available in the larger dataset, it was not feasible for the current project to examine all grades. It cannot be assumed that children in other grades would demonstrate a similar size of the core vocabulary or a similar representation of grammatical words within the core.

Results should be interpreted cautiously in light of the context created by the specific prompt. Given the prompt, “One day when I got home from school...” it is likely that the children chose to talk about after-school or home-related things. It cannot be assumed that the same words would be derived from written samples that utilized a different writing prompt or writing context. It is likely that the specific prompt accounts for the high occurrence of words such as *homework*, *school*, and *home* but this cannot be further disentangled given that only one writing sample for each participant was available.

Clinical Implications

Despite the limitations of the study, the key findings have implications for word selection in designing AAC systems to ensure word selection accommodates not only oral communication but also the demands and opportunities of written language tasks. The overall core vocabulary or word-bank that was identified in Table 1 may be useful in supporting written personal narrative experiences on a child’s AAC system. The findings are thought to be relevant to children from Hispanic/Latino(a) backgrounds due to the fact that one third of the participant pool (32%) reported Hispanic/Latino(a) backgrounds. The most frequently occurring word list by children in first and fourth grade substantiates previous practical recommendations that core words of children’s written language should include more than simple concrete nouns and verbs. The descriptive data may be useful for educational teams in constructing AAC supports for written language activities, particularly with a prompt similar to the current study.

The findings of the study also highlight the importance of grade level differences in the vocabulary array included in written personal narratives. The differences between the first and fourth grade word banks substantiates that the vocabulary array for communication systems should not stay stagnant across elementary grades, but should instead be designed to facilitate experience and practice with an increasingly complex lexicon for written language development. The more complex core vocabulary of children in fourth grade compared to first grade also highlights the importance of transitioning to an alphabetic system as soon as feasibly possible, to match the demands of an evolving and advancing lexicon of elementary school. An alphabetic system becomes critical to assuring access to an unrestricted word bank, given that children in fourth grade used a higher proportion of abstract nouns, and that abstract nouns and linguistic function words are not easily represented by a picture/image-based symbol system.

The core words identified in the current study may be useful in designing intervention guided-practice with written personal narratives, particularly with a similar prompt. The

most frequently used words in narratives for this sample may provide a foundation of words to practice sentence building as well as to practice constructing written narratives. Such lists could provide the basis for a study on the effectiveness of the use of a core word bank in narrative-related interventions for children who rely on AAC for communication.

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Table 1

Most Frequently Occurring Words for Combined First and Fourth Grades

	Word	Occurrences	#/1000 words
1	I **	1829	66.77
2	and **	1117	40.78
3	the **	1109	40.49
4	my **	866	31.62
5	to **	801	29.24
6	a **	692	25.26
7	was **	639	23.33
8	we **	525	19.17
9	it **	496	18.11
10	in **	286	10.44
11	so *	256	9.35
12	then *	251	9.16
13	of **	241	8.80
14	that *	238	8.69
15	got **	236	8.62
16	on **	232	8.47
17	said *	219	8.00
18	when *	202	7.37
19	me **	198	7.23
20	went	196	7.16
21	mom *	194	7.08
22	for *	186	6.79
23	with *	174	6.35
24	go *	157	5.73
25	home *	157	5.73
26	had *	147	5.37
27	you **	143	5.22
28	out *	132	4.82
29	is **	129	4.71
30	at **	127	4.64
31	up **	125	4.56
32	he *	120	4.38
33	but *	117	4.27

	Word	Occurrences	#/1000 words
34	were *	115	4.20
35	there *	114	4.16
36	day *	113	4.13
37	she *	113	4.13
38	all **	108	3.94
39	one *	100	3.65
40	play *	98	3.58
41	house *	97	3.54
42	do *	96	3.50
43	as	94	3.43
44	her *	93	3.40
45	what	93	3.40
46	time *	89	3.25
47	dad *	87	3.18
48	saw	87	3.18
49	after *	86	3.14
50	school *	85	3.10
51	like	84	3.07
52	get *	83	3.03
53	from	79	2.88
54	have **	78	2.85
55	did **	77	2.81
56	came **	77	2.81
57	back **	74	2.70
58	they	73	2.67
59	our **	69	2.52
60	next *	67	2.45
61	him	65	2.37
62	asked	65	2.37
63	bed	61	2.23
64	going **	60	2.19
65	played *	59	2.15
66	because *	57	2.08
67	door	56	2.04
68	are **	55	2.01
69	some *	55	2.01
70	could	54	1.97

	Word	Occurrences	#/1000 words
71	started	54	1.97
72	took *	53	1.93
73	be *	52	1.90
74	down	52	1.90
75	fun	52	1.90
76	will **	52	1.90
77	homework	52	1.90
78	about	51	1.86
79	put *	46	1.68
80	them *	46	1.68
81	two **	46	1.68
82	not *	45	1.64
83	your	45	1.64
84	if *	44	1.61
85	dog *	43	1.57
86	this **	43	1.57
87	little *	43	1.57
88	over *	42	1.53
89	where	42	1.53
90	first **	40	1.46
91	good **	40	1.46
92	take	40	1.46
93	TV	40	1.46
94	room	39	1.42
95	told	39	1.42
96	thought	39	1.42
97	sister **	39	1.42
98	car	38	1.39
99	eat *	38	1.39
100	just	38	1.39
101	friend **	38	1.39
102	into *	37	1.35
103	know *	36	1.31
104	an **	35	1.28
105	his **	35	1.28
106	see *	35	1.28
107	didn't	35	1.28
108	can *	34	1.24

	Word	Occurrences	#/1000 words
109	big **	33	1.20
110	found	33	1.20
111	pool **	33	1.20
112	ran	33	1.20
113	inside	32	1.17
114	water *	32	1.17
115	finally	32	1.17
116	made *	31	1.13
117	very *	31	1.13
118	brother *	31	1.13
119	would	31	1.13
120	by	30	1.10
121	end	30	1.10
122	no	30	1.10
123	say	29	1.06
124	walked	29	1.06
125	want *	29	1.06
126	later	29	1.06
127	outside	29	1.06
128	ate	29	1.06
129	left	28	1.02
130	new **	28	1.02
131	game **	28	1.02
132	right	28	1.02
133	opened	28	1.02
134	off	27	0.99
135	friends **	27	0.99
136	night	27	0.99
137	around	26	0.95
138	best *	26	0.95
139	gave *	26	0.95
140	thing	26	0.95
141	really *	26	0.95
142	name	25	0.91
143	work	25	0.91
144	again	25	0.91
145	wanted	24	0.88
146	never	24	0.88
147	think	24	0.88
148	birthday *	24	0.88

	Word	Occurrences	#/1000 words
149	away	23	0.84
150	side	23	0.84
151	games	23	0.84
152	happy	23	0.84
153	dinner	23	0.84
154	ever	23	0.84
155	heard	23	0.84
156	called	22	0.80
157	food	22	0.80
158	now	22	0.80
159	while	22	0.80
160	why	22	0.80
161	something	22	0.80
162	okay	22	0.80
163	or	21	0.77
164	other	21	0.77
165	before	21	0.77
166	cat *	21	0.77
167	minutes	21	0.77
168	don't	20	0.73
169	oh	20	0.73
170	way	20	0.73
171	ready	20	0.73
172	watched	20	0.73
173	its	19	0.69
174	love *	19	0.69
175	more	19	0.69
176	team	19	0.69
177	come	19	0.69
178	family *	19	0.69
179	here	19	0.69
180	sleep	19	0.69
181	lot *	19	0.69
182	until	19	0.69
183	am **	18	0.66
184	bus	18	0.66
185	hours	18	0.66
186	how	18	0.66
187	still	18	0.66
188	too *	18	0.66
189	yelled	18	0.66

	Word	Occurrences	#/1000 words
190	turned	18	0.66
191	last *	18	0.66

Note.

* Denotes words that appear in the core word list of the study by Clendon, Sturm, and Cali (2013) but not in their 50 most frequently occurring list.

** Denotes words that appear in the 50 most frequently occurring words on the core word list of the study by Clendon et al. (2013).

Table 2

First Grade: 50 Most Frequently Occurring Words

	Word	Occurrences	#/1000 words
1	I	421	77.63
2	and	274	50.53
3	my	258	47.58
4	the	182	33.56
5	to	173	31.90
6	a	143	26.37
7	was	130	23.97
8	we	114	21.02
9	it	106	19.55
10	then	74	13.65
11	go	62	11.43
12	home	59	10.88
13	in	53	9.77
14	mom	51	9.40
15	got	48	8.85
16	with	48	8.85
17	went	45	8.30
18	me	43	7.93
19	when	40	7.38
20	on	39	7.19
21	so	38	7.01
22	said	38	7.01
23	play	36	6.64
24	for	35	6.45
25	of	33	6.09
26	that	30	5.53
27	do	29	5.35
28	day	28	5.16
29	had	28	5.16
30	one	28	5.16
31	is	27	4.98
32	at	26	4.79
33	will	24	4.43
34	eat	23	4.24
35	dad	23	4.24
36	school	23	4.24
37	fun	21	3.87
38	there	21	3.87
39	she	20	3.69

	Word	Occurrences	#/1000 words
40	them	20	3.69
41	homework	20	3.69
42	like	19	3.50
43	played	19	3.50
44	out	18	3.32
45	he	18	3.32
46	are	18	3.32
47	house	18	3.32
48	saw	17	3.13
49	you	17	3.13
50	they	17	3.13

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Table 3

Most Frequently Used Nouns by Grade

First grade				Fourth grade			
Noun	Occurrences	#/1000 words	Noun	Occurrences	#/1000 words		
1 home	60	11.06	mom (mom's)	148	6.74		
2 mom	51	9.40	home	97	4.42		
3 day (days)	30	5.53	day (days)	86	3.91		
4 dad (dad's)	24	4.43	house (houses)	80	3.64		
5 friend (friends)	24	4.43	time (times)	74	3.37		
6 school	23	4.24	Dad (dad)	66	3.00		
7 fun	21	3.87	school	62	2.82		
8 homework	20	3.69	bed	47	2.14		
9 house	18	3.32	door	47	2.14		
10 TV	15	2.77	friend (friends)	42	1.91		
11 bed	14	2.58	dog (dogs)	39	1.78		
12 birthday	14	2.58	game (games)	39	1.78		
13 Sister	13	2.40	sister (sisters)	33	1.50		
14 game (games)	12	2.21	car	32	1.46		
15 dog	11	2.03	homework	32	1.46		
16 family	11	2.03	fun	31	1.41		
17 toy (toys)	11	2.03	room	30	1.37		
18 dinner	10	1.84	water	28	1.27		
19 door	9	1.66	minute (minutes)	28	1.27		
20 mommy	9	1.66	brother (brother)	27	1.23		
21 pool	9	1.66	tree (trees)	26	1.18		
22 room	9	1.66	TV	25	1.14		
23 duck	9	1.66	pool	24	1.09		
24 sleep	9	1.66	name (names)	22	1.00		
25 bath	8	1.48	outside	20	0.91		
26 cat	8	1.48					

Note. Taken from the list of most occurring words from the written samples. Pronouns are not included but all plural and possessive forms of the noun were added.

Table 4

Most Frequently Used Verbs by Grade

First grade				Fourth grade			
Verb	Occurrences	#/1000 words	Verb	Occurrences	#/1000 words	Verb	Occurrences
1 To be (is, was, were, are)	199	36.70	To be (is, was, were, are)	1421	64.68		
2 To go (went, going)	115	21.21	To go (went, going)	928	42.24		
3 To get (got)	64	11.80	To get (got)	843	38.37		
4 To play (playing, played)	57	10.51	To say (said)	631	28.72		
5 To do (does, doing, did)	48	8.85	To have (had)	609	27.72		
6 To say (said)	44	8.11	To do (does, doing, did)	550	25.04		
7 To have (had)	41	7.56	To play (playing, played)	509	23.17		
8 To eat	34	6.27	To see (saw)	418	19.03		
9 To take (takes, taking, took)	29	5.35	To come (comes, coming, came)	417	18.98		
10 To see (saw)	27	4.98	To ask (asked)	234	10.65		
11 To come (comes, coming, came)	19	3.50	To take (takes, taking, took)	221	10.06		
12 To make (made)	13	2.40	To start (started)	208	9.47		
13 To work (working, worked)	11	2.03	To like (likes)	206	9.38		
14 To name (named)	11	2.03	To think (thinking, thought)	193	8.79		
15 To run (ran)	10	1.84	To tell (telling, told)	188	8.56		
16 To ask (asked)	10	1.84	To walk (walks, walking, walked)	180	8.19		
17 To find (found, finding)	9	1.66	To look (looks, looked)	177	8.06		
18 To love (loved)	9	1.66	To want (wanted)	162	7.37		
19 To look (looks, looked)	9	1.66	To know (knowing)	156	7.10		
20 To know (knowing)	8	1.48	To open (opens, opened)	152	6.92		
21 To give (gives, gave)	8	1.48	To find (finding, found)	149	6.78		
22 To read (reading)	7	1.29	To make (made)	146	6.65		
23 To start (started)	6	1.11	To run (ran)	132	6.01		
24 To call (called)	6	1.11	To leave (left)	126	5.74		
25 To want (wanted)	6	1.11	To give (gave)	119	5.42		

Note. Taken from the list of most occurring words from written samples. The words are listed in their infinitive form. All forms of the verbs were added to reach a total number of occurrences, including the forms provided in parentheses.

Table 5

Fourth Grade: 50 most frequently occurring words.

	Word	Occurrences	#/1000 words
1	I	1421	64.68
2	The	928	42.24
3	And	843	38.37
4	To	631	28.72
5	my	609	27.72
6	A	550	25.04
7	was	509	23.17
8	we	418	19.03
9	It	417	18.98
10	In	234	10.65
11	So	221	10.06
12	Of	208	9.47
13	that	206	9.38
14	On	193	8.79
15	got	188	8.56
16	said	180	8.19
17	then	177	8.06
18	when	162	7.37
19	me	156	7.10
20	for	152	6.92
21	went	149	6.78
22	mom	146	6.65
23	you	132	6.01
24	with	126	5.74
25	had	119	5.42
26	out	114	5.19
27	up	110	5.01
28	he	106	4.83
29	is	104	4.73
30	but	103	4.69
31	at	101	4.60
32	were	101	4.60
33	got	98	4.46
34	home	97	4.42
35	all	97	4.42
36	she	94	4.28
37	there	94	4.28
38	as	92	4.19
39	day	85	3.87

	Word	Occurrences	#/1000 words
40	her	85	3.87
41	what	81	3.69
42	time	79	3.60
43	house	79	3.60
44	after	77	3.51
45	one	73	3.32
46	saw	70	3.19
47	do	69	3.14
48	get	68	3.10
49	came	67	3.05
50	our	66	3.00