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Knowledge of Spelling: An Experimental Study of ESL Learners in Primary Education

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Abstract:

This study aims to examine children's knowledge of spelling in relation to three stages of spelling development (phonological stage, orthographic stage, and morphological stage), and to identify the amount of learning happening across grades. The subjects are children of first grade and third grade from St. Peter Primary School, Hyderabad, India. Two types of tasks have been conducted: production task and choice task. Frequency and percentage of the words spelled correctly have been used to analyze the data of the two tasks. The study found that there is a grade-wise development in spelling acquisition; third grade children have better accuracy than first grade children in both tasks (production and choice). However, both grades have achieved better performance in the choice task than the production task. The study also revealed that the first graders are still in the phonological stage of spelling development since they depend mostly on graphotactic clues when spelling words. On the other hand, the third graders have reached, to some extent, the orthographic stage of spelling acquisition since they use more graphotactic clues to spell words than first-grade children.

Key Words: *Spelling knowledge, phonological stage, orthographic stage, morphological stage, spelling development*

1. Introduction

Spelling knowledge is crucial for reading and writing forming the beginning stage of mastering them; and working as an interface between them. Though spelling is very important especially in formal writing, English spelling is very challenging, especially for English language young learners, as there are no many fixed rules for spelling and most of the available rules can be broken. English is a non-phonetic language; in the sense that there is no one-to-one correspondence between sound and letter. Furthermore, there is a mismatch between names and shapes of letters, for instance, the letter *c /si:/ in cat* is pronounced as */k/* rather than /s/. Such mismatch between the name and the shape of letter causes a spelling problem for young language learners. Learner has more access to the sound system than print since oracy skills (listening and speaking) are picked up from the surrounding environment. The first attempt for a child is to start to distinguish human language from other forms of sounds. Human language for children is a stream of sounds and this, in turn, hinders their spelling development. In other words, what is heard by a child as one sound is represented as one letter. For example, a child might spell *street* as *set* if he/she hears the cluster '*str*' as single '*s*'. Another case is that many

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words have double letters, but a person cannot recognize the double letters by just listening to them. In this situation, a child may spell the word 'different' with one letter when he/she hears /f/ as a single sound.

According to Smith (2004), children go through three levels of segmentation: firstly, they recognize the word as a stream of sound, e.g. *play* (single sound); subsequently, they identify some clusters in words like *pl-ay* (two syllables) and finally, they build the ability to divide words into letters, e.g. p-l-a-y. Based on this idea, a child needs three kinds of knowledge to achieve development in spelling acquisition; namely, letter identification, word recognition and phonological awareness (knowledge of phonemes). Each letter has a name and a shape and letter identification involves recognizing the name and the shape of letters. A child deals with 26 letters but he/she needs to identify the names and the shapes of these letters; each letter has upper case and lower case (shape of the letter), thus, the child has to identify 52 letter shapes. Further, letters can be written in different fonts and sizes (shapes); recognizing the different shapes of the letter '*s*' requires understanding of the distinctive features (features that are significant) of that letter. A child might write b instead of d if he is not able to understand the distinctive features of these letters (119-120). Consequently, letter identification includes not only the ability to classify letters but also to discriminate between them based on their distinctive features. For example, in order for a child to identify *b*, he/she needs to know the distinctive features of *b* and the features of the other letters such as *d* and *p*. He/she needs to know that *p* has a stroke upwards with the rounded part to the right whereas *d* is written with a stroke upwards and left-side rounded part. It is similar to the fact that a person's ability to recognize the white color by its features would presumably inform us that person is able to recognize the black color as opposed to the white color. It is suitable here to emphasize what Schlagal (2002) suggested that we can teach learners to spell words successfully by encouraging them make use of their current word knowledge to help spell new words that they study. For instance, a learner who understands the spelling rule when writing words with short vowels as oppose to words with long vowels (e.g. cut and meet) will be successful at controlling the spelling rule of doublets or the deletion of e when adding a suffix beginning with a vowel (cutting and meeting).

As far as word recognition is concerned, word cluster and word patterns play a major role in helping young language learners spell words. For example, a child may easily recognize words with clusters like *ch*, *scr*, or *tch* as English words rather than words with clusters like *xc*, *ml*,or *dxd*. Since consonants and vowels are identified in clusters, a child should have knowledge of which phoneme cluster occurs in which position in a word (initial, medial or final). The ability to identify patterns or clusters and their positions help children spell words correctly. For instance, having the ability to identify *ing* as cluster occurs in word final position; will enable children to

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correctly spell words like *king*, *sing*, *ring*, *wing*, *bring*, and *sting* because these words have the same spelling except for one letter (minimal pairs).

Phonological awareness is the third important area of spelling development (e.g., Muter and Snowling, 1997; Sterling and Robson, 1992), because children usually tend to heavily use their phonological knowledge to spell words (Nunes, Bryant, and Bindman, 1997; Read, 1986; Treiman, 1993; Steffler, Varnhagen, Friesen, and Treiman, 1998; Varnhagen, Boechler, and Steffler, 1999; Varnhagen, McCallum, and Burstow, 1997; Zutell, 1980). It involves awareness of all sounds of language and the ability to hear and distinguish one phoneme from another. In English language, there are 26 letters of alphabet but there are 44 phonemes. There is arbitrary relationship between sounds and letters of alphabet in English; one sound is represented by various letters. For instance, /f/ is represented by *ph, f, ff,* and *gh* as in *phone, full, stuff* and *enough*. On the other hand, one letter represents various sounds. For example, *c* is pronounced as /s/ and /k/ in words like *cinema* and *cat, while f* is pronounced as /f/ and /v/ as in *off* and *of* respectively.

Young children may express their feelings through drawing as for children writing is a kind of drawing shapes. Levin and Bus (2003 as quoted in Barone 2008) discovered that until about the age of 3, young children's writing and drawing are similar and cursive writing is an extension of drawing. For children words with many letters represent big things, whereas words with few letters represent small things, e.g. *elephant* and *ant*. But later they realize that such generalization is wrong when they notice that an adult has a short name and a child has a long name. They also expect words to have at least three letters, so the word *to* is not a word to them (Barone 2008).

Based on the above discussion, it can be stated that children go through different stages of development when acquiring spelling knowledge. However, some of these stages and practices may sound to adults ridiculous, but for children these stages are very serious and they form systematic steps that lead to better understanding and recognition of the correct spellings of words.

2. Stages of spelling development

For children spelling is neither an arbitrary process and nor is it a form of rote memorization. They actually make their own rules with distinctive features regarding how to spell words. Children pass through various developmental stages to acquire spelling; each stage has certain rules that help children develop their spelling knowledge. Children usually depend on spelling rules as one of the main strategies to spell words (Evans and Smith, 1989; Varnhagen, McCallum, and Burstow, 1997). Bourassa and Treinian (2001) asserted that children pass through three developmental stages of acquiring spelling: phonological stage, orthographic stage, and morphological stage; and in each stage, children create their own rules. The spelling rules that Bourassa and Treinian assigned under each stage have been summarized below.

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2.1 Phonological stage

According to Hayes, Treiman, and Kessler (2006) children continue to use sound to letter correspondence or phonological cues to develop spelling till they figure out the irregularity between sound and letter. For instance /k/ may be spelled instead of *k, c, ck, cc, q,* or *ch* as in *seek, cat, stuck, success, technique,* and *school* respectively. Later, they use onset and coda contexts to help them spell words. In the phonological stage, young learners only use phonological cues to spell words (spelling-sound relationship). Kemp, N. (2009) stated that young learners are possibly to perform much better in spellings for words with sound-word correspondences (such as rat, man) than spellings for words that are spelled differently from the way they are pronounced (as in rate and main) or words that include irregular spellings (such as knight and yacht). Several rules can be made by young learners in this sage as follows:

Rule 1: Writing reflects meaning; small objects are represented by less number of letters compared to big objects, e.g. ant and elephant.

Rule 2: Consonant clusters are represented by one letter. Based on this rule, young leaners practice the following tendencies to spell words:

a) Dropping initial consonants of final cluster, e.g. *hand* spelled as *had* and *wind* as *wid*; the child thinks that *nd* is represented by one letter as he/she just hears the two letters as a single sound.
b) Dropping the second or the third consonant of the initial cluster, e.g. *street* spelled as *set* and *clever* as *kever*.

Rule 3: Phonemes are represented by letter names, e.g. *bl* represents *bell* as the letter *l* is preceded the sound /i/ when we pronounced it /il/.

Rule 4: Sound-print relationship does not always match writing conventions, e.g. *egucation* represents *education*, *grik* represents *drink* (j=g not d) and *dirdy* represents *dirty* (American English /t/ = d not t.).

2.2 Orthographic stage

Orthographic knowledge is another essential element for learners' spelling development. Before presenting the rules of this stage, defining the terms *digraphs* and *doublets* will be useful. Digraphs are consonants or vowels placed together to produce a single sound, e.g. *ck*, *ph*, and *ea*. Doublets are two same letters placed in the same position and pronounced as single sound, e.g. *pp* in *apple* /ˈæpl/ and *tt* in *bottle* /ˈbɒtl/. Orthographic knowledge is acquired when a child reaches the level of word segmentation (knowledge of one by one sound); that is when they know which possible sound of cluster can occur in which position. Orthographic knowledge is based on letter cluster, for instance, xx and pz can never form cluster in English, so it is the shape of cluster that matters. Another base of orthographic knowledge is the position of cluster or letter, namely initial, medial or final. For instance, the clusters *ck* and *ing* cannot occur at initial

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position. Some of the rules generated by children who use orthographic cues to develop spelling accuracy include:

Rule 1: Diagraphs occur in certain positions in words. For example, *ck* occurs only in medial and final positions, and never in initial position.

Rule 2: Doublets appear in certain positions in words, i.e. medial and final positions. This type is noticed very early, e.g. *bell, inn, supper* and *matter*.

Rule 3: Vowel-consonant relationship is established in word medial and final position as follows:

a. Long vowels are followed by single consonant, e.g. *pool, steal, feel*
b. Short vowels are followed by doublets or digraphs, e.g. *pull, still, fill*.

Rule 4: Vowels are chosen according to consonant context.

a. Vowels are chosen according to preceding consonant, e.g. *a* after *w* (as in *watch and want)* and *o* after *p* (as in *poll* and *pond*).
b. Vowels are chosen according to succeeding consonants, e.g. *ee* before *p* (as in *creep* and *keep*) and *ea* before *m* (as in *cream* and *dream*).

2.3 Morphological stage

Though sound-spelling correspondences are not regular, children find regularities between morphemes of words that are derived from the base words. The following are rules used by children who use morphological cues.

2.3.1 Inflected words (affixation = prefixes and suffixes)

Rule 1: For expressing past tense or for past tense marker, words attach *ed* morpheme. Therefore, when the pronunciation of *ed* is /t/ or /d/, children do not find difficulty in spelling it, e.g. *looked* /t/ and *scanned* /d/. However, when children overgeneralize this rule, they misspell word (irregular verbs), e.g. *keped* , and *runned*.

Rule 2: Consonant dropping from final and initial cluster may be lesser if the word is inflectional or derived, e.g. branded, handed (n is less likely to be dropped in the derived word because of syllabification – bran-ded = two syllables). While in *turn- turned- turning*, errors are likely to occur because the past and present suffixes are morphologically complex; they do not add any meaning to words and do not add a syllable to the base as well. However, though *turnip* (tur-nip) looks similar to *turned* and *turning*, but it is different in syllabification and meaning.

2.3.2 Derived words (Morphologically complex)

Rule 3: In base-derived word pairs, the spelling of the base form is retained or recognized and this leads to easier learning. Children misspell words such as *sign* and *closely* because they are not aware that *sign* is a root of *signal* or that *closely* is derived from *close* (Treiman and

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Bourassa, 2000). On the other hand, a learner who knows that *Christ* is the base of *Christmas, Christian, and Christianity* can easily spell the word *Christ* though it has the letter *t* silent.

Rule 4: Sometimes spelling of base-derived pairs word might undergo slight modifications based on context (long/short vowels), e.g. *inflame* (long /ei/) becomes *inflammation* (short /ə/ followed by a double *mm*). A young language leaners' spelling errors occur on words such as *inflammation* because the learners do not know yet that some base-derived pairs require slight modifications on spelling. Thus, some learners may misspell *inflammation* as *inflamation* with single *m*.

Learners will be able to identify spelling errors in words depending on their spelling knowledge level. Lauren and Connie (2004) explained why leaners can easily detect phonological errors as opposed to detecting orthographic and morphological errors. They noted that the word endings, which are misspelled due to relying on phonological strategies, have an unusual occurrence. For example, learners can easily spot the phonological error in the word *incredibul* because -ibul is an unconventional word ending). However, the spelling errors occurring due to learners' application of orthographic and morphological strategies, may have very similar to the usual spelling. For instance, *-tion* is not the correct word ending for *conclusion*, but it is a correct suffix for many other words, such as solution).

3. Types of errors

From the developmental stages of spelling acquisition explained above, we can notice that children can make three types of errors.

a. **Substitution error**: to substitute one letter with another as in *grink* for *drink* (j=g not d) and *wader* for *water* (*t* = *d* not *t* in American English.)
b. **Omission error**: to omit letter(s) from a word spelling as in *had* for *hand* (omitting initial consonants of final cluster) and *mater* for *matter* (omitting one letter of the doublet *tt*).
c. **Addition error**: to add letter(s) to a word spelling as in *mille* for *mill* and *teatch* for *teach*.

4. Previous studies

Some studies have been conducted in the spelling knowledge area. Margolin and Abrams (2007) examined young and older adults' knowledge to spell high- and low-frequency words. The findings asserted that poor spelling old adults were less accurate in recognizing and producing correct spelling than poor spelling young adults. In contrast, low-frequency words were especially difficult for young adults and poor spellers, comparing to older adults and good

spellers. They concluded that age and poor spelling can both contribute learners' ability to recognize and produce spelling.

Kessler and Treiman (2001) examined sound spelling consistency in English monosyllabic words. They concluded that there is consistency between sounds and letters. An example of coda consistencies depending on the vowel context is *ff* and *ll* in the coda after short vowels (stuff, skill) and only *f* or *l* after long vowels (life and steel). An example of spelling onset consistencies is initial /k/ is typically spelled *c* (e.g. *cost* and *cut*), but before certain vowels such as /e/ and /i/, it is spelled *k* (e.g. *kept* and *kill)*.

In another similar study, Kessler and Treiman (2004) investigated whether adults use vowel context to spell consonants in coda. They found out that adults tend to spell *ce* after the vowel /ai/ (mice and nice) but *se* after the vowel *ou* (house and mouse).

A study by Varnhagen, Boechler and Steffler (1999) examined whether the consonant context can help children to spell vowels. It has been found that children use consonants to spell the vowels; for instance, *o* is used if followed by a single consonant as in *got, rot. pot, frog*, whereas in other words *a* is used when followed by double consonants as in *mall, caught, fall*.

The present study is an attempt to examine the spelling knowledge development of young language learners across different levels of study in relation to the three stages of spelling development: phonological stage, orthographic stage, and morphological stage.

5. Participants

The participants include children of first and third grades in primary school (St. Peter Model School) during the academic year 2015-2016. The first graders are at the age of 5, while the third graders are the average age of 7. The total number of participants is 42 (17 first graders and 25 third graders). The age and the grade differences could make all the difference. Since the third-grade children are older and studying in a higher level, they are expected to have better spelling knowledge than first grade children.

6. Aim

The aim of this study is to examine children's knowledge of spelling in relation to three stages of spelling development (phonological stage, orthographic stage, and morphological stage), and to identify the amount of learning happening across grades.

7. Objectives

a. To identify the stage of spelling development to which young learners studying in two different grades reach.
b. To examine which of the two grades of young learners have better achievement in spelling.

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c. To find out the type of words that younger learners experience as most easy or most difficult to spell.

8. Research tools: Tasks

To collect data for the present study, two types of tasks have been used: production task and choice task; the idea of using the two tasks have been taken from Hayes, et al (2006). The aim of the production task is to address whether children use vowels as cues to consonants and whether they are influenced by phonological or *graphotactic* cues (knowledge of vowel letters or vowel clusters and knowledge of consonant letters and consonant clusters). On the other hand, the choice task aims to examine the role of graphotactics, in other words, to double check to see whether children use garphotactic contexts to help them in spelling. Ultimately, the analysis of these two tasks would help in achieving the objectives of the study. The words in the production task have been divided into six categories: 1) the extended coda/non-extended coda category includes six words: *fool, full, book, back, meal,* and *mill*. 2) The silent letter category includes four words: *knee, teach, honest,* and *Christmas.* 3) Consonant cluster in the onset category contains the words: *truck, school, bread,* and *clever*. 4) Doublets in the middle category consist of four words: *parrot, little, hammer, and happy*. 5) Morphological derivation category consists of six words: *photo, photograph, walk, walking, jump,* and *jumping*. 6) K/C spelling in the onset category includes six words: *cat, cupboard, cabbage, kite, king,* and *key*. The total number of words in the production task is 30 words. The choice task tests two categories: 1) the extended coda/non- extended coda category which includes ten words: *fool, full, book, back, meal, mill, pool, pull, roof,* and *rough* and 2) K/C spelling in the onset category which consists of nine words: *cat, cupboard, cabbage, coffee, kite, king, key, kitten,* and *kettle* (see appendixes for samples of the children's answers to the worksheets used for data collection).

The words for both tasks have been chosen to suit the cognitive and psychological level of students. All words are familiar to them since they are concrete words or related to their direct experience and environment, some words have been chosen from the children's textbooks. The words used for both tasks are either monosyllabic or disyllabic; though the word *photograph* and *Christmas* are trisyllabic, it is purposefully chosen in order to examine rules used by children who use morphological cue to help them in spelling. Three sheets have been designed to test children spelling knowledge: production task sheet and two choice task sheets; words in these three tasks are randomized. Further, the production task is administered first to the children , while the two choice tasks are given later on another day. Conducting the production task before the choice task helps overcome response bias since doing the choice task first could have helped the children perform better in the production task.

To analyze the data collected through the three tasks, children's spelling accuracy are considered using frequencies and percentages. The words spelled correctly are given 1 mark, whereas words with wrong spellings are given zero. Then the correct-spelling words are counted and the

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percentages of them are found. The nature of the cues or strategies that the children use to help them to spell the correct words correct are examined with the purpose of achieving the three objectives of the study.

9. Findings

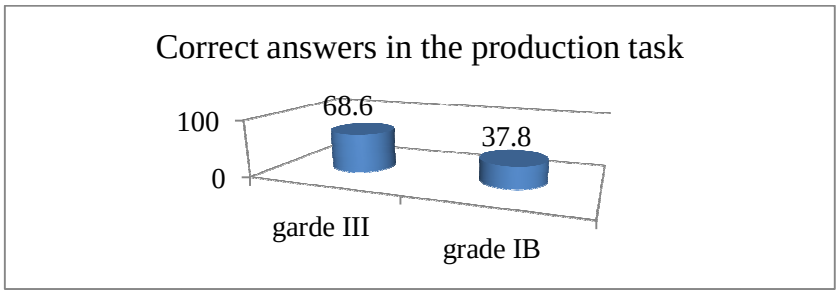
This section discusses the data collected for the study in forms of graphs and tabular. Children's performance in the production task is presented first and their performance in the choice task is presented second. Subsequently, comparison between the two tasks is made.

8.1 The production task

In this section, the children's performance in the production task is presented.

8.1.1 Overall accuracy in the production task (1st grade and 3rd grade)

The overall accuracy in the production task for the first grade and the third grade has been presented in graph 1.



Graph 1. Overall accuracy in the production task (1st grade and 3rd grade)

From the table above, we can notice that the overall accuracy of the first grade in the production task (37.8%) is less than the overall accuracy of the third grade (68.6%). This finding is expected to occur since the differences in levels of study and age of the learners should lead to differences in their abilities to spell words correctly; the third graders have higher level of accuracy since they have received two more years of instruction compared to the first graders.

8.1.2 Accuracy across categories in the production task

a. Grade I

First grade accuracy in the production task across the six categories is presented in Graph 2.

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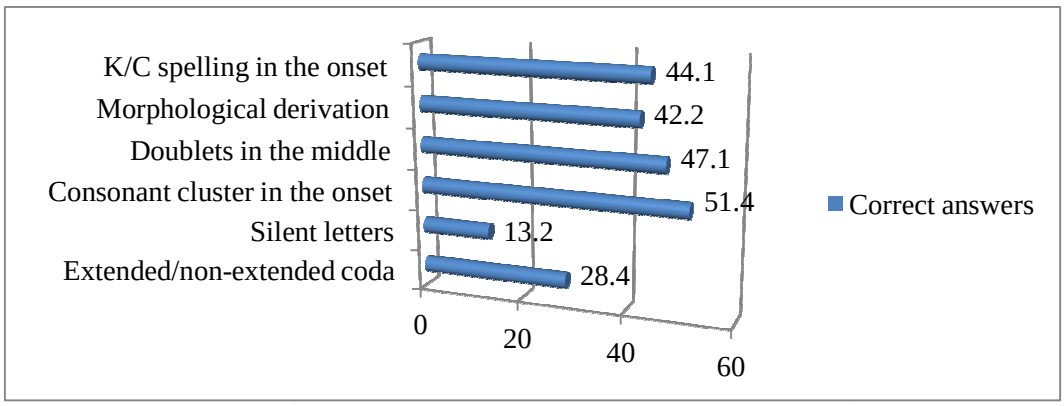
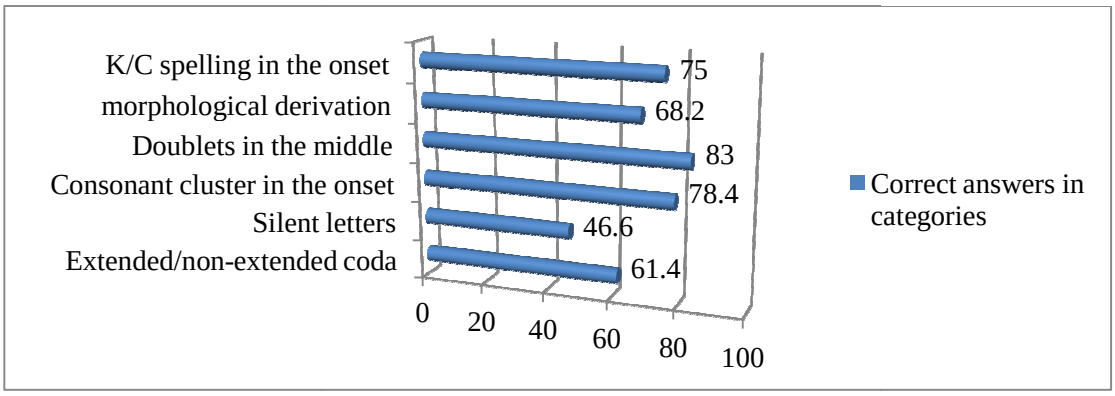


Graph 2. Accuracy across categories in production task (1st grade)

The easiest category for the first graders to spell, as indicated in the graph above, is words with *consonant cluster in the onset* 51.4%. This finding could imply that words such as *truck, school, bread* and *clever* are words that teachers should start with when they test the spelling knowledge of young learners at earlier stages. However, the most difficult category for them to spell is words with silent letters (13.2%). The second difficult category for the first graders is words with extended/non-extended coda (28.4%). There two findings would provide teachers with the types of words that teachers can introduce to check spelling knowledge of young learners at advanced stages. For example, teachers can introduce words with silent letters such as *knee, teach, honest,* and *Christmas* and words with extended/non-extended codas such as *fool and full, book and back,* and *meal and mill*.

b. Third grade

Overall accuracy of the third grade young learners in the production task across the six categories has been calculated in graph 3.



Graph 3. Accuracy across categories in production task (3rd grade)

Graph 3 proves that the easiest category for the third graders is words with *doublets in the middle* (83%), whereas the most difficult one for them is words with silent letters (46.6%). The second

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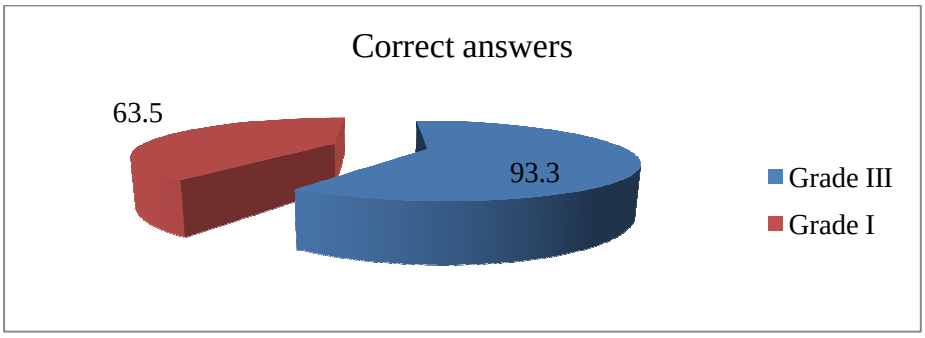
difficult category for the third graders is words with extended/non-extended coda (61.4%). It is interesting enough to find that the most two difficult categories to spell for both graders are the same: silent letter category and extended-non-extended category e.g. graph 2 and graph 3. This finding proves that these two types of words need to be presented and tested to young learners of advanced levels as they require high abilities of spelling knowledge. Here *doublets in the middle* is the easiest category for third grade, while for grade 1, as found earlier, the easiest category for them to spell is *consonant cluster in the onset*.

8.2 Choice task

8.2.1 Overall accuracy in choice task (First grade and third grade)

The graph below compares the overall accuracy of both grades in the choice task.



Graph 4. Overall accuracy in choice task (1st grade and 3rd grade)

As proved in the graph above, the first graders have less accuracy in the choice task (63.5%) than the third graders (93.3%). From that data presented in graph 1 and 2, there is evidence that first grade has less overall accuracy in spelling knowledge than third grade. This finding was expected because the third grade learners have received two more years of instruction in English than the first grade learners. The difference in the level of education is the reason behind the difference in spelling accuracy among the two groups.

8.2.2 Accuracy across categories in choice task

i. First grade

The graph below includes the first graders' accuracy across two categories in the choice task.

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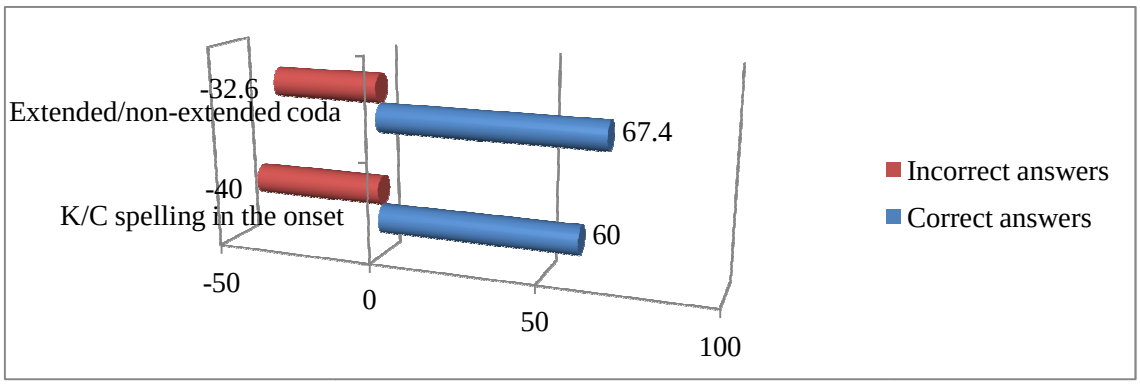
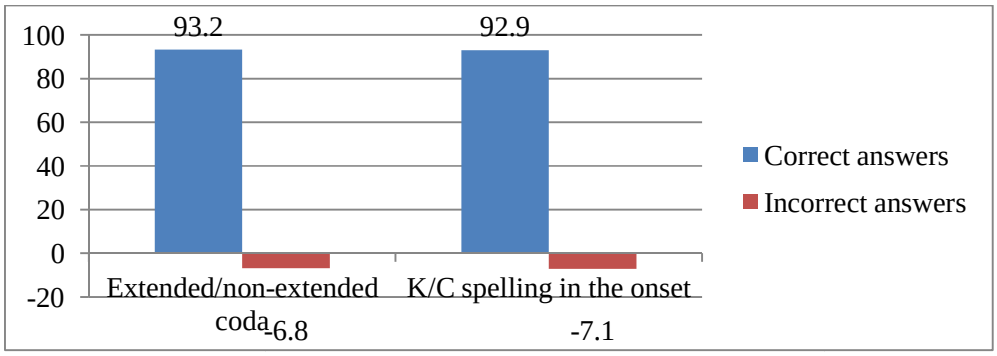


Graph 5: Accuracy across categories in choice task (1st grade)

In the graph above, the percentage of the correct and incorrect answers across the two categories in the choice task has been introduced. It confirms that the first graders do slightly better in spelling words with K/C in the onset (67.4%) than in spelling words with extended /non-extended letters in the final position (60%).

ii. Third grade

Graph 6 determines the third graders' accuracy across two categories in the choice task.



Graph 6. Accuracy across categories in choice task (3rd grade)

As it is demonstrated in graph 6, the percentage of the correct answer above the horizontal line and the percentage of the incorrect answers under the horizontal line (minus percentage) prove that third graders have almost similar levels of accuracy in the both categories: *extended/non-extended coda* (93.2%) and *K/C spelling in the onset* (92.9%).

8.2.3 Accuracy in extended/non-extended coda category in choice task (first grade and third grade)

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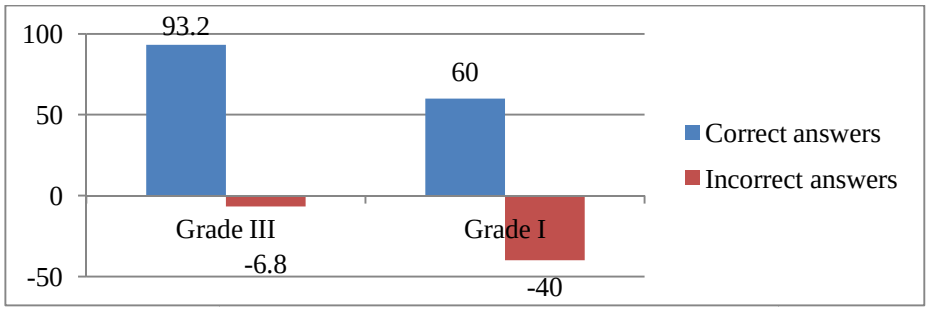
Comparison has been made in graph 7 between the two grades' accuracy in the spelling extended/non-extended coda in the choice task.

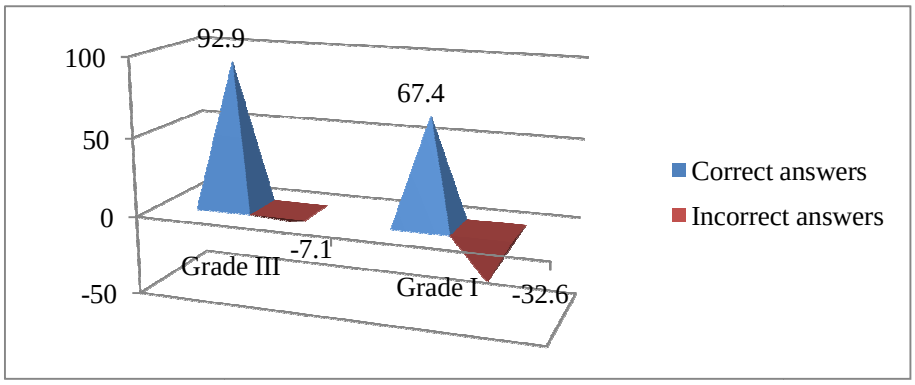


Graph 7. Accuracy in extended/non-extended coda category in choice task

As far as the extended/non-extended coda category is concerned, the third graders (93.2%) achieved better in spelling than the first graders (60%). The following section compares the two graders in spelling words with K/C spelling in the onset.

8.2.4 Accuracy in K/C spelling in the onset category in choice task (1st grade and 3rd grade)

Performance of the two graders in spelling K/C in the onset category is presented in graph 8.



Graph 8. Accuracy in K/C spelling in the onset category in choice task

The third grade children (92.9), as indicated in graph 8, have better ability to spell words with K/C in the onset than the first grade children do (67.4%). This proves that the majority of the third graders passed the phonological stage; in other words, they did not depend on how the word

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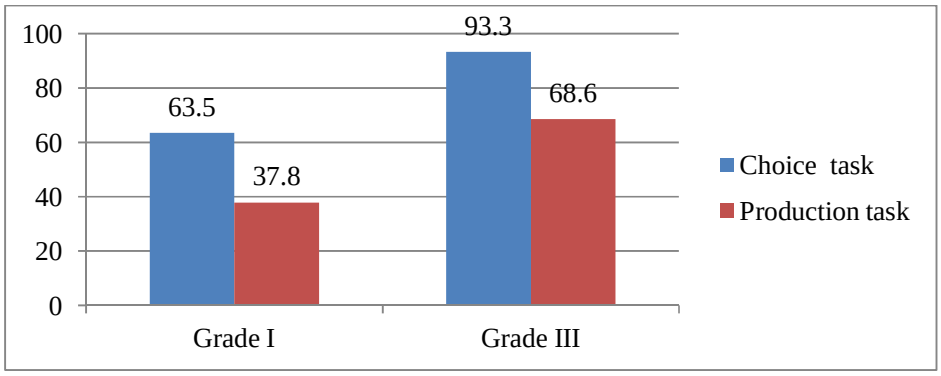
sound to spell it. However, children of the first grade are still spell words according to how they sound and this is the reason that they misspelled words with K/C in the onset, such as *cat* as *Kat*.

8.3 Production task vs. choice task

The children's performance in the production task and the choice task are displayed in Graph 9.



Graph 9. Production task vs. choice task

As it is illustrated in this graph, the third graders (93.3% and 68.6%) do better in both tasks than the first graders (63.5% and 37.8%). Further, the children of the both grades do better in the choice task (63.5% first grade and 93.3% third grade) than the production task (37.8% for first grade and 68.6% for third grade). Children of the both grades do better in the choice task than the production task since the former requires children just to circle the correct spelling of a word out of two alternatives, while in the latter children need to listen to the dictated words carefully to write down the correct spelling.

10. **Discussion**

9.1 Grade-wise performance

From the data presented above, there is proof that the third graders have better spelling knowledge than the first graders (graphs 1 and 4). The third grade children perform better in both production and choice tasks (graph 9). They also achieved higher performance than the first grade children in all categories of the production and choice tasks (graphs 2, 3, 5, and 6). There is some evidence that learning improves as children move to higher grades. The first graders are still in the phonological stage since they mostly use phonological clues to spell words, whereas third graders to some extended reached the orthographic stage since they use more graphotactic clues to spell words more than the first graders do. Interestingly enough, the both grades have their lowest performance for the production task in spelling words with the silent letter. This indicates that this category of words is the most difficult for the two graders to spell.

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It is worthy now to analyze the two categories of words with silent letters and words with extended/non-extended coda since majority of the children do not perform well in them. Thus, this analysis will help us understand which of the three developmental stages of acquiring spelling the children reach.

9.2 Silent letter category (first grade and third grade)

The following table shows the children's accuracy in spelling words with silent letters.

Table 1.
Silent letter performance (1st grade and 3rd grade)

Level	**First grade**				**Third grade**			
Words with silent letters	knee	teach	honest	Christmas	knee	teach	honest	Christmas
Number of correct answers	0	3	0	6	7	19	4	11
Total	9				41			
Total accuracy in percentage	13.2%				46.6%			

Very few first graders (13.2%), compared to the third graders (46.6%), spell words with silent letters correctly; none of the first grade children spell *knee* and *honest* correctly. It can be argued that the first graders are influenced by phonological cues; they are still in the phonological stage (see the stages of spelling development section above) since they depend on the sound to spell words. They spell the word *knee* as it is heard *nee*, *nea*, or *ne* e.g. Table 2. On the other hand, the third graders, to some extent, reach the orthographic stage of the development of spelling since they depend on graphotactic cues to spell words e.g. Table 1. They know that if *k* followed by *n* in initial position, *k* is silent as in *know*, *knee, kneel, knight,* etc. They also know that *h* in initial position is sometimes silent as in *honest* and *hour*.

However, compared to the other words in the silent letter category, the word *Christmas* has been spelled correctly (six correct answers for the first graders and eleven for the third grade). The reason for getting the spelling of the word Christmas correctly cannot be attributed to their use of the morphological cue that *t* in the root word *Christ* is pronounced because it has already proven above that the children, especially the first graders did not reach the morphological stage. Instead the reason behind spelling *Christmas* correctly is that this word is closely related to the

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students' environment, since their country, India, celebrates the Christmas day so the children are familiar with this word because they see it written in different places, especially in their Christmas gifts. Some students also spell the word *teach* correctly (3 among the first graders and 19 among the third graders). This could also be ascribed to their familiarity with the word *teach* and *teacher* since it is related to their school environment.

The frequent spelling errors in words with silent letters are given in table 2. The criterion of considering an error as frequent is frequency count; in other words, an error that is made by three or more students are counted as a frequent error.

Table 2.

Frequent spelling errors in words with silent letters

Correct spelling	knee			teach	Honest			Christmas
Spelling errors	nea	nee	ne	teech	onest	onst	on nest	crimas
First grade	3	1	8	3	1	3	3	1
Third grade	1	9	2	1	10	-	-	3
No. of error frequency	4	10	10	4	11	3		4

Based on the data presented in the table above, the children frequently spell *knee* as *nea* (4 times), *nee* (10 times) and *ne* (10 ten times). All these errors go under the *omission* type of error (see page 5 above). The children delete the silent letter, however, they spell the vowel /i:/ in knee /ni:/ differently. Those who spell it as *nea* are influenced by the nuclear (vowel(s) in a syllable) of the words like *tea* and sea; those who spell *nee* may know the correct spelling of the word knee but they do not know the rule that *k* is silent if followed by *n* in initial position. Moreover, the word *teach* is spelled as *teech*, this kind of error can be *substitution* wherein children substitute *ea* with *ee*. As far as the word *honest* is concerned, children tend to spell it as onest (11 times), onst *(3times)* and *on nest* (3). There is an omission error here also; children omit the silent letter *h*; the reason can also be that children do not know the rule that *h* is sometimes silent when it occurs in initial word position as in *hour* and *honor*. There is another kind of deletion in spelling *honest* as *onst (first grade error);* besides omitting the silent letter, children also omit the nuclear (vowel) */e/*of the second syllable /*nest*/. Such error can go under the segmentation issue (see the orthographic stage page 3) and this, in turn, proves that children, particularly the first graders, do not reach the orthographic stage of spelling knowledge. Further, the children who spell *honest* as *on nest* seem that they do not understand the meaning of the dictated word

so they spell it as another meaningful phrase to them (on nest). Regarding the word *Christmas*, children misspell it as crimas (4 times). Besides the silent letter error, there is another orthographic problem; children seem not to know the different letters that represent the sound /k/ in initial position (*ch* as in *Charismas*, *k* as in kettle and *c* as in *cat*). Treiman (1993 as quoted in Hayes et al 2006) mentions that a child who knows that /k/ is only represented by the letter *k* may spell *care* as *kare*, *scratch* as *skrach*, or *truck* as *truk*.

9.3 Extended/non-extended coda category (production task and choice task)

The next table contains students' performance in spelling extended/non-extended coda words in both the production and the choice task.

Table 3.
Extended/non-extended coda performance of 1st grade and 3rd grade
(production task and choice task)

Task		Production task								Choice task											
Words		fool	full	book	back	meal	Mill	*Total*	*Accuracy*	fool	full	book	back	meal	mill	pool	pull	roof	rough	*Total*	*Accuracy*
Correct spelling	1st grade	9	0	11	2	4	3	29	28.4 %	10	7	12	11	7	14	3	13	11	8	96	60 %
	3rd grade	12	20	20	20	6	3	81	61.4 %	23	25	25	25	17	25	21	25	24	23	233	93.2 %

The first graders achieve less performance in spelling the extended/non-extended coda words (28.4% in production task and 60% in choice task) than the third graders (61.4 % in production task and 93.2% in choice task). As shown in the table above, compared to 20 correct answers by third graders, none of the first grade children spell the word *full* correctly and only two of them spell the word *back* correctly. This finding supports the fact established above that there is a big difference in performance between the two grades e.g. Table 1 and Table 2. The first grade children still struggle in the phonological stage, while third grade has exceeded this stage.

The table below consists of the frequent errors children make when spelling the extended/non-extended coda in both the production task.

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Table 4.

Frequent spelling errors in words with extended/non-extended coda

Correct spelling	fool	full		back	meal			Mill	
Errors in spelling	fol	Foll	fool	bake	mene	mean	meel	mil	Milk
Grade I	5	3	5	4	3	-	-	8	-
Third grade	-	-	1	-	-	7	5	1	13
No. of error frequency	6	4	5	4	3	7	5	9	13

Table 4 contains the three types of spelling errors: substitution, omission and addition (see page 5 for more information about these three types). The substitution errors are like *meel* and *mean* for *meal* and *foll* for *full*; whereas the omission errors include *fol* for *fool* and *mil* for *mill.* The addition and deletion errors are like *milk* for *mill* and *bake* for *back.* This findings truly confirms that most first graders are in the phonological stage since they are mainly influenced by theological cues to spell words. For example, as revealed in table 4 above, 8 of the first grade children spell *mill* as *mil* and 5 of them spell *fool* as *fol* and *full* as *fool.* They do not even know that if a consonant in coda is preceded by a long vowel, it is written as a single letter, e.g. *fool* and *meal*; whereas if it is preceded by a short vowel, it is written as a doublet as in *full* and *mill*. Interestingly, 13 of the third grade children spell *mill* as *milk*. This happened probably because of their familiarity with the word *milk* than the word *mill* or because of the influence of the tester's way of pronunciation. The sound /l/ in *mill* is called dark /l/ which is different in pronunciation from *light* /l/. Dark /l/ occurs in the medial and final position as in *pull*, *milk* and *bottle*; while light /l/ occurs in initial position as in *light*, *low* and *lamb*. Indian children always use light /l/ in all position; however the tester might spell *mill* with dark /l/ and this is why children could hear *mill* as *milk* .

To conclude, based on the aforementioned discussion, the third graders performed better in spelling knowledge than the first graders in both the production task and the choice task. However, both grades have better performance in the choice task than the production task. Moreover, first grade children happen to be in the phonological stage of spelling acquisition and that they were influenced by phonological cues in spelling words; while third grade children have reached the orthographic stage and used both phonological and orthographic cues to develop their spelling ability. It is also proved that the easiest category for the third graders is words with *doublets in the middle*, whereas the most difficult one for them is words with silent

letters. Moreover, both the third and the first graders committed the three types of spelling errors: substitution, omission and addition.

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Appendix 1: Sample of 1st graders' answer

WORKSHEET 1

Listen to the words and write down their correct spelling. Write one spelling per box. The first one is done for you

Ex.	break		
1.	Cat	16.	Mil
2.	Walk	17.	parrot
3.	foto	18.	chirmes
4.	nec	19.	fool
5.	cabge	20.	king
6.	Ham	21.	little
7.	bread	22.	Jump
8.	Truck	23	foto graf
9.	Jumping	24.	on nest
10.	neel	25.	back
11.	cabord	26.	Walking
12.	Happy	27.	teach
13.	fool	28.	book
14.	key	29.	daver
15.	SCHOOL	30	kite

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Appendix 2: Sample of 1st graders' answer

WORKSHEET 2

Look at the words and circle the correct spelling. The first one is done for you

1.	tool	tol
2.	fol	fool
3.	rof	roof
4.	mill	mil
5.	bak	back
6.	meal	meall
7.	pooll	pool
8.	rough	rouf
9.	ful	full
10.	bok	Book
11.	pull	pul

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Appendix 3: Sample of 1st graders' answer

WORKSHEET 3

Look at the words and circle the correct spelling. The first one is done for you

1.	cot	kot
2.	kabbage	cabbage
3.	komb	comb
4.	king	cing
5.	coffee	koffee
6.	cey	key
7.	kettle	cettle
8.	kupboard	cupboard
9.	cat	kat
10.	citten	kitten
11.	kite	cite

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Appendix 4: Sample of 3rd graders' answer

WORKSHEET 1

Listen to the words and write down their correct spelling. Write one spelling per box. The first one is done for you

Ex.	break		
1.	cat	16.	milk
2.	wrock	17.	poprat
3.	potow	18.	crinstmes
4.	Nee	19.	
5.		20.	Kink
6.	Hamer	21.	kitty
7.	Bred	22.	jump
8.	Trock	23	
9.	Iping	24.	Onoizate
10.	meel	25.	Bag
11.		26.	Wrocking
12.	Hoppy	27.	teeth
13.	pool	28.	Book
14.	Key	29.	Dakey
15.	School	30	Kite

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Appendix 5: Sample of 3rd graders' answer

WORKSHEET 2

Look at the words and circle the correct spelling. The first one is done for you

1.	**tool**	**tol**
2.	**fol**	**fool**
3.	**rof**	**roof**
4.	**mill**	**mil**
5.	**bak**	**back**
6.	**meal**	**meall**
7.	**pooll**	**pool**
8.	**rough**	**rouf**
9.	**ful**	**full**
10.	**bok**	**Book**
11.	**pull**	**pul**

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Appendix 6: Sample of 3rd graders' answer

WORKSHEET 3

Look at the words and circle the correct spelling. The first one is done for you

1.	**cot**	**kot**
2.	**kabbage**	**cabbage**
3.	**komb**	**comb**
4.	**king**	**cing**
5.	**coffee**	**koffee**
6.	**cey**	**key**
7.	**kettle**	**cettle**
8.	**kupboard**	**cupboard**
9.	**cat**	**kat**
10.	**citten**	**kitten**
11.	**kite**	**cite**