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Case Study

The Development of Spelling Ability in Emerging Literates: An Investigation of Different Models

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ABSTRACT

Purpose **-** The aim of this paper is to analyse the existing models of spelling development. Researchers who have observed children's writing have not been able to reach a consensus over the development of spelling in children's initial schooling years. Differing opinions broadly categorise spelling into linear development and non-linear development models. This paper investigates questions like, whether or not spelling stages exist, if the stages exist do they exist distinctly, and can we trace the elements of every single stage throughout a child's spelling development. ***Design/Methodology/Approach*** **–** A systematic identification of peer-reviewed studies was done for inclusion in this study. Both quantitative and qualitative studies dealing with the theme of spelling development were first scrutinized and then selectively included. From the beginning, it was maintained that the included studies must represent a diversity in deciphering the nature of the spelling development. In order to fulfil this objective, the range of the included studies varies between the pioneer studies of the spelling development from the 1970s till 2017. ***Findings*** **–** The author's search yields that there is a contradiction between both linear and non-linear models. The linear model asserts that spelling competency develops through hierarchical and sequential stages that move towards phonological to orthographical and morphological writing. By indicating the inadequacy of linear model, the non-linear model suggests that the ability to spell develops through the composite interaction of phonology, morphology, and orthography. By asserting the statistical learning theory, the non-linear model claims that this composite interaction develops non-linearly by rich exposure to printed language materials and writings. Additionally, the nature of the writing system and the degree of phonological and orthographic correspondence also shape the spelling process of a language. ***Research limitations*** **–** The limitation of this study is that it is based on the Latin scripts exclusively. Therefore, the spelling development process concerning the scripts other than Latin is untouched. ***Originality/Value*** **–** This study offers a possibility for integrating the existing models in order to understand the process of spelling development and the aspects of the phonological, orthographic, and morphological awareness of literacy.

Keywords: *Spelling Development, Linear Model, Non-Linear Model, Literacy*

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Spelling as an ability shapes the flawless occurrence of individual words and other aspects of written literacy. However, it is believed that memorization is the way to learn to spell as spelling incorporates inconsistency and to produce conventional spelling the occurrence of every single letter inside a word must be memorised by the children (Graham et al., 2008). To some extent, this conventional outlook still sustains to influence the pedagogical methods, ensuring educators to teach spelling as a rote memory skill (Fresch, 2007). On the contrary, systematic investigations about how the ability of spelling develops in children discard existing misbeliefs and, hence, empirically identify the patterns and progressions in spelling development that move towards phonological to orthographic and morphological writing. However, researchers, who observe the literacy acquisition in general and spelling acquisition in particular, have not been able to arrive at a consensus over the development of spelling in the early schooling years of children. Differing opinions broadly categorise spelling into linearand non-linear development. Both the developmental models investigate questions like, whether or not spelling stages exist, if they do then whether they exist distinctly, and can we trace the elements of every single stage throughout a child's spelling development.

This paper aims to highlight the literature about the spelling acquisition. It begins with a deliberation on the linear notion of spelling development. This notion attempted to trace the stage based strategies children apply while learning to spell. After outlining the emerging theoretical base of spelling acquisition, the explanation reviews the different models proposed under the stage theory. This paper briefly describes the stages or phases of typical spelling development.

In the next section, the present paper reviews studies on the non-linear views on spelling development. The non-linear approach discards the hierarchical stages proposed by stage theorist and suggest that children may possess multiple strategies, devoid of any hierarchy, in their advancement of spelling activity. Further, this discussion does also focus on exploring the awareness of phonology, orthography, and morphology, which according to the non-linear approach interact concurrently even at the initial stage of spelling development. In addition, this paper correlates the aspects of writing system with the spelling acquisition process.

Linear development

The experts advocating the linearity of spelling development (see Helman, 2004; Bryant, 2002; Templeton, 2003a;) assert that spelling competency develops through hierarchical and sequential stages. Each stage shows children's acquired knowledge of the linguistic characteristics of language that accords with the spelling constructions, and further with their semantic representations (Bear & Templeton, 1998). The early linear notion of spelling development took shape in the works of Read (1971) and Chomsky (1971), who pioneered the study of orthographic development by proposing the conception that spelling errors could lead to the manifestation of slightly less intelligible cognitive processes of children. By closely analysing the writings of children in their early childhood, Read (1971) and Chomsky (1971) propounded that there are certain ubiquitous strategies that comprisea consistent logical patterning employed by children having limited or no exposure to the spelling architecture. The developmental process of spelling involves both the cognitive and linguistic advancement that appear through common sequential stages (Read, 1975). The series of stages reflect the understanding of phonemes (speech sounds), the grapho-phonic knowledge (symbol-sound relationship), and the morphemes (units of meaning), which constitute the

spelling construction (Westwood, 2005). Read's work (1971, 1975) elucidated that children's act of spelling is systematic and apply categorical logic. These inferences resulted in a profound shift towards considering spelling as a complex linguistic process rather than a rote learning mechanism.

The influential works of Read (1971, 1975) and Chomsky (1971) provided the emerging ground on which stage theorists (like Ehri, 1989; Moats, 1995; Beer & Henderson, 1977) later developed the comprehensive model of spelling development. However, the number and nature of stages of linear development model vary from study to study and are often debatable. The different terminologies used for spelling development are primarily 'characterised by similar qualitatively descriptive categories or stages' (Daffern et al. 2015, p. 73). According to Gentry (2000, p. 319; cited in Daffern et al, 2015, p. 73) 'Developmental spelling stages derive from Piagetian theory and the notion that aspects of cognitive development proceed by way of qualitative stage-like change.' It has been noted that Piaget's constructivist perspective has been central to the stage theories of spelling development (Nunes & Bryant, 2004).Piaget argues, for instance, that children will abandon all the previously acquired inadequate schemas, which they happen to apply to everything, by encountering the exceptions to it. He suggests that children with every new exception will either adapt or extend the reach or utility of the schema acquired previously and subsequently will lead to the development of an advanced theory (Piaget, 1998). The Piagetian framework that establishes a predetermined path of intellectual development, is quite evident in the models of several stage theorists. Henderson and Templeton (1986), for instance, categorise spelling development into five stages: emergent spelling, letter-name alphabetic spelling, within word pattern spelling, syllables and affixes spelling, and derivational relations spelling. Gentry (2000, p. 324) provides five distinct stages of spelling development, namely, precommunicative, semiphonetic, phonetic, transitional, and correct or conventional. Westwood (2005) provides relatively similar developmental stages, but with different headings: pre-phonetic, early phonetic, phonetic, transitional, and independence. Further, while delineating and categorising the process of learning to read and spell, Ehri (2005, p. 176, 2014) uses the term sequential 'phases' instead of 'stages' to recognise the overlapping conditions of spelling development. She describes the successive phases as prealphabetic, partial alphabetic, full alphabetic, and consolidated alphabetic.
The sequential framework of stage theories:

Stage 1
Emergent spelling, which can also be characterised as Pre-Phonetic spelling, illustrates the preliminary tendencies of early writing attempts of children that is entirely devoid of any reading practices (Bear et al, 2015). Children generally imitate or pretend to be writing by forming scribbles or random strings of letter-like forms. At this stage, children begin to develop the notion that communication or sharing of ideas could take place by making a connection of pen and paper. However, the awareness of atangible sound-symbol relationship or speech-writing connection fails to emerge at this spelling stage (Treiman et al, 2001).

Stage 2
The second stage, referred to as the Letter Name-Alphabetic stage, shows the early perceptible phonetic indication of formal literacy engagement in children. The incidentally acquired knowledge of letter names and sounds make their appearance in the children's initial attempts of writing words. However, this written attempt is mostly limited to the consistent use of consonants. At this stage, a word construction is mainly dependent on the use of first and last consonant sounds or the root sounds (which are primarily the consonant

sounds) of a word, while vowels are often omitted, like [br] for *bear* or [erpln] for *aeroplane* (Westwood, 2005; Bear et al., 2015). From these indications, one can estimate that in this state children start to become aware of the sound arrangement of spoken words and the representation of these spoken units into print (Ehri, 1989; Tangle & Blachman, 1995).

Stage 3

The third stage can best be understood with the terms: Within Word Pattern Stage and Phonetic Stage. The title of Within Word Pattern stage indicates that at this level children gain enough exposure for their writing to achieve the automaticity. This automaticity becomes significant for children as they come out of the alphabetic phase of literacy, existing in the first two stages (Bear et al, 2015). During this stage, a shift occurs towards pattern recognition and the employment of patterns within words to represent sounds. They begin to apprehend that a word consists of chunks that include both the vowels and consonants. Children apply the use of long vowel patterns explicitly, though thesubstitution of spoken sounds with other letters continues (Henderson & Templeton, 1986).

The Phonetic stage states that initially, children use there gularsound-symbol correspondence accurately in their writing. This habit turns into an error when they fail to recognise the orthographic patterns of irregular words, where the sound-symbol correspondence is inconsistent (for example, *fot – fought*, *dun – done*). At an intermediate phonetic stage, children face difficulty in identifying and discriminating all chunks and clusters within a word, still, they make a genuine effort to spell difficult words, certainly the more irregular words. Their efforts sometimes result in making a good approximation of the letter sequences of the difficult words. Towards the end of the phonetic stage, children attain a sustainable linguistic level where they identify and master over a good number of letter-chains, the physical form(s) of morphemes (like, *im-*, *dis-*, *-s*, *-ed*), and vowel diagraphs (like, *-ee-*, *-oo-*) (Westwood, 2005).

However, several children's spelling activity cease to develop further from the phonetic stage as it becomes the last stage of their developing spelling ability. Templeton (2003) has termed this phenomenon as being at 'phonocentric stage' where a child solely relies on phonic cues to spell.

Stage 4

At this stage, i.e. Syllables and Affixes stage or Transitional stage, a sophisticated discernment of morphology becomes apparent in a child's acquisition of literacy. Children use a methodology of making consistent and decisive use of spelling by analogy technique when aiming unfamiliar words to spell. This methodology helps them to generate a visual strategy along with the existing phonetic strategy to monitor the accuracy of their written product. In addition, as they progress, they become better able to identify syllables, prefixes, and suffixes in words. The increasing acquaintance with the units of meaning and the formation of complex words equippies them to identify and apply the norm exceptions (like, the plural of *monkey* is *monkeys* and not *monkies*) (Heanderson & Templeton, 1986; Bear et al., 2015).

This stage witnesses a substantial mental bank of accurate word images in children who indulge in extensive writing. The children, who are progressing normally with a regular writing activity, succeed to get a considerable automaticity through which they readily attempt nearly every single common word. Along with the writing activity, catholic reading

helps the mental bank to increase with new words swiftly. However, children involved with less literacy activity discontinue moving further from the phonetic stage (Westwood, 2005).

Stage 5

The subsequent final stage, i.e. the Derivational Relations Spelling stage or the Independence stage, favours children to write like a mature literate writer. This stage allows children to spell words with much-increased proficiency and proofreading skills, nonetheless, at times children do commit some errors in atypical spellings (Westwood, 2005; Bear et al., 2015).

Stage theorists suggest that the characteristics of developmental stages, which define the progress rate of children's spelling capability through each specific stage, are primarily influenced by the kind of instructions children receive academically or at home (Tangle & Blachman, 1995). Some children require limited or less explicit guidance from a teacher as they possess a natural aptitude for spelling progression. Conversely, other children would require direct and explicit instructions stated in detail to make progress largely (Graham, 2000). Children's age is also a defining characteristic that reflects the levels of typical acquisition of spelling patterns. Though stage theorists suggest age windows for each stage of spelling acquisition, nonetheless the identification of these developmental ages remains to be rough approximations. Some children could arrive and pass the spelling stages much before the age window suggested and others may reach the suggested stages much later in their developing age, particularly those who have learning difficulties. There is also a possibility that few children could even leave their school without mastering the final stage, and may face difficulties in spelling some words throughout their life (Westwood, 2005).

The linear model is contentious in some sense as it approves the linearity of the spelling development. However, in terms of understanding the literacy process, stage theories give a profound understanding of the kind of errors children commit while achieving the desired literacy. Researchers find the spelling errors arising in a systematic pattern that they try to delineate concerning developing stages. A set of error categories come into existence when children shift towards treating spelling process more abstractly than concretely. These error categories are formulated on failing to recognize morphemes, faulty discernment of phonemes, applying wrong orthographic rules, or forgetting the norm exceptions or norm deviations of spelling structures (Moats, 1995; Ehri, 2000).

Non-linear development

There are a number of studies that question the hierarchy of stages suggested by stage theorists and view spelling as it develops through the unification of various linguistic activities that flourish over time (Apel & Masterson, 2001; Devonshire & Fluck, 2010; Bourassa & Treiman, 2008, 2013; Masterson & Apel, 2010). By indicating the inadequacy of stage-based theory, Treiman and Bourassa (2000, p. 2) state that this linear model 'gives a rough overall picture of spelling development…. they do not fully capture the complexities of phonological and morphological representations as they relate to spelling.' Varnhagen (1995) suggests that generally, a child differs from another child inutilising the different linguistic elements in order to make a form incomprehensible to comprehensible in spelling progression. She further argues that children may possess numerous strategies in their advancement of spelling ability. This availability of numerous strategies put them in a position where they vacillate between employing more or less sophisticated strategies. However, the emerging advanced and functional strategies mitigate the use of less advanced and inchoate strategies. For example, as the orthographic ability moves towards automaticity, it substitutes the formerly acquired skills that are less automatic in representing orthography

(Varnhagen et al., 1997). Unlike astage-based theory, the non-linear model considers that emergent spellers have access to the intricate building blocks of words, like orthographic or morphological constructions, since the beginning of their literacy stages (Bourassa& Treiman, 2000). Reece and Treiman (2001) found that children were making use of both phonological and orthographic awareness to spell words since the first grade of their schooling. The assumption behind this deduction is that children attribute a number of ways to think and these ways of thinking compete with each other (Chen & Siegler, 2000). The use of a strategy remains inconsistent within a developmental stage.

Triple Word Form Theory (TWFT) is a theoretical framework that advocates a non-linear stance by postulating that multiple elements of linguistic efficiency consolidate concurrently in children's initial years of learning to write (Masterson & Apel, 2010a, 2010b, Gracia et al., 2010). Spelling activity necessitates the composite interaction of phonology, morphology, and orthography that are acquired and further developed non-linearly by rich exposure to printed language materials and writings. Normally developing children transcribe phonology and morphology into orthographic representations without much difficulty when proper linguistic instructions are provided (Graham et al., 2008). As described by the statistical learning theory, continuous exposure of the conventional spelling patterns strengthens the significance and utility of patterns in children's orthographic memory. The simultaneous integration of phonology, orthography, and morphology is an essential factor for spelling production, butanimpediment in any of these linguistic areas causes a hindrance to this process(Saffran et al., 1996; Apel, 2011).

Awareness of literacy components

The process of text construction, which comprises the act of spelling, is an essential component of the system that enables conceptualisationin terms of thoughts to be delivered through written symbols (Singer & Bashir, 2004). The delivery of the concepts through written symbols begins with the awareness of different components of literacy. This section provides the aspects of the phonological, orthographic, and morphological awareness of literacy.

Phonological Awareness

Accuracy in phonological representation, or the ability to comprehend the internal arrangement of sounds in a word, reflects the accumulated efficiency a child has gained in literacy acquisition. Phonological awareness delineates one of the components of literacy outcomes in terms of segmenting and manipulating speech sounds at the various levels of a word (Ganske, 2014; Bear et al., 2015). The different levels within a word arenamely syllable, sub-syllable, and the phoneme (Ritchey, 2008).This awareness of different levels of word equips children with the required phoneme-grapheme correspondence to deliver the desired spellings (Bourassa & Treiman, 2001).Thereby, a deeper phonological awareness generates skills, which are metrical in literacy development, like omitting sounds (what is 'beat' without '/e/'? = bat), blending sounds (what does '*c*' + '*at*' make? = *cat*, or '*f*' + '*at*' = *fat*) or making complicated manipulations of sounds (what is '*spring*' without '*sp*'? = *ring*, or what is '*scream*' without '*scr*' and with '*t*' = *team*) (Ritchey & Speece, 2006; Strattman, & Hodson, 2005; Caravolas et al., 2001).However, restricted phonological awareness and unconventional use of these skills, as in encoding or decoding words, lead to frequent spelling errors in young learners (Friend & Olson, 2008).Even when phonological awareness is not restricted and fully mastered, the one to one phoneme-grapheme mapping may not always independently bring out a correct spelling. For example, omitting the silent /*e*/at the

word final position of words like *hate* or *game* by phonetically assuming /*e*/ as non-tactile (Treiman & Bourassa, 2000).

Orthographic Awareness

Orthographic awareness is the stored mental knowledge that a child uses to represent the spoken form of language through written symbols. This stored orthographic mental knowledge contains the awareness of specific grapheme sequences, clusters of letters, and the general comprehension of orthographic patterns needed for establishing the link between phoneme and grapheme (Apel, 2011). For example, when orthographic awareness develops in children, they discern the patterns like [-ight] as a whole unit. The discernment of such patterns automatically encodes the identified unit in words (like *bright*, *light*, *fight*), unlike encoding each individual grapheme as [i-g-h-t]every single time. This phenomenon makes children attentive, as [-ight] grapheme sequencing is acceptable, but not the [-tghi] or [-gtih]. Once, certain orthographic sequences are identified and corresponded with their phonological counterpart, the automaticity and accurateness become perceptible in the spelling. Treiman and Kessler (2006, p. 642) termed this orthographic pattern sensitivity as 'statistical learning'. The statistical learning reduces the rote learning of individual words (Berninger et al., 2006; Deacon, 2008). Moreover, orthographic familiarity also involves the basic understanding of vowel and consonant patterns, like the syllable structure CVC (as in *cat*), or CVVC (as in *four*), or CVCe (as in *late*). The sensitivity of orthographic features is measured through tasks like, writing the standard words, identifying the pseudowords, answering which word pattern looks more real of non-real words, and verifying the distinction between different homophones (Quick, 2017).

Further, with the growing orthographic knowledge children realise that only phonological awareness is not enough to assemble a correctsequence of letters and, hence, spellings can be produced without always accessing the phonological strategies (Ehri, 2000; Masterson & Apel, 2010b).To yield a plausible orthographic representation of unfamiliar words, children apply the gained orthographic knowledge along with the phonological strategies (Apel, 2011).

Morphological Awareness

Morphological awareness is dexterity of an individual in manipulating and using the smallest meaningful units of language, i.e. morphemes, in words (Carlisle et al., 2010). This awareness enables the children to represent morpheme graphemically and to apply the morphological affixing rules (Apel et al., 2004). Developing acquaintance with morphological structures imparts children with the ability to process and reproduce statistically predictable patterns of morphemes (Berninger et al., 2008; Deacon, 2008). The better understanding of statistically predictable patterns of morphemes gets realised in spelling the derivational words. Children with morphological awareness easily identify the correlation between derived words (Wolter et al., 2009).

Evidence supports the idea that the importance of morphological expertise surpasses the relevance of phonological awareness after the initial years of learning (Berninger et al., 2010; Nagy et al., 2006). Further, the derived morphological understanding puts certain limitations on the range of orthographic techniques used earlier in reaching the spelling accuracy (Wolter et al., 2009; Deacon et al., 2009). This awareness aids in segmenting the words to decodable chunks, which might not be comprehensible by applying the phoneme-grapheme correspondence method. The amalgamation of morphological effectiveness with phonological and orthographic efficiencies compounds the reading and spelling comprehension for children more accurately (Wolter & Dilworth, 2014).

Aspects of spelling across writing systems

The essential abilities required to learn to write vary from one writing system to another. It is true that the phonological and morphological sensitivities are significant in several writing systems, however, their particular application or necessity exists relatively. English writing system requires advanced phonological awareness, while Hebrew or Chinese writing systems certainly require a plausible awareness of the morphemic structures. In English writing system, the awareness of phonological entities precedes the morphological awareness, which results in the misspelling of past tense forms, like – *ed*, till the third-grade students (Share & Levin, 1999; Goswami, 1999; Cook & Bassetti, 2010).

It has been claimed that transparent orthography, in contrast to deep orthography, gives an easy access to literacy acquisition as children require only to learn the conventional and stable correspondences of phoneme and grapheme (Wyse & Goswami, 2008).For instance, unlike English, children learn the reading skills in Finnish orthography, whichis highly transparent in nature with a higher degree of accuracy, even after having the exposure of formal instruction for a very short duration (roughly ten weeks). The same amount of accuracy in English requires a period of four to five years (Goswami, 2005). Furthermore, Cryastal (2000) examined the deep orthography of English and estimated that only 56% of its words can be spelt by applying the English phonological rules.

The most frequent method used by the educationists to teach the spelling skills, primarily in the alphabetic orthographies, is phonics. The purpose of the phonics method is to accentuate the relationship between phonemes and graphemes. The matching of phonemes and graphemes in the phonics method underlies the phonological properties of language. For example, this method teaches a child to point out the sound /f/ in the word *fat* and then associate it with its graphemic representation [f]. However, there are two approaches to apply the phonics method: synthetic phonics and analytic phonics. Synthetic phonics reaches the spelling of a word by blending together the phonemes in sequence, whereas, analytic phonics identifies every single phoneme by taking a complete word at once to connect it with the phonological continuum of that word (Devonshire et al., 2012; Rose, 2006; Wyse & Goswami, 2008).

A dual-route model is proposed for researching the English spelling process. This dual-route model comprises the non-lexical or assembled route and the lexical or addressed route. The non-lexical route asserts the use of phoneme-grapheme conversion in the act of spelling, whereas the lexical route suggests the action of obtaining a word arrangement from the stored orthographic lexicon (Barry, 1994; cited in Cook & Bassetti, 2010). In alphabetic writing systems with deep orthography, it becomes likely imperative to use both the routes. For example, if a child has to write the word *pneumonia*by applying the non-lexical route, it may turn out to be /njumonıa/ by eliminating the initial silent /p/. It is apparent that the deep orthography of English creates a disparity between the spoken and written representation, a speller has to store and access the lexical route to cover the irregular and frequent words of English lexicon and to make use of non-lexical route for spelling the regular and frequent words (Cook & Bassetti, 2010). Other writing systems, for example, the Chinese morphemic writing system favours the retrieval of whole Hanzi from the stored orthographic lexicon as the phoneme-grapheme correspondence will not be an adequate technique to convert the morphemes into graphic symbols. In consonantal writing systems, for instance, in case of Hebrew, the centrality of consonants would facilitate the learning of consonants first, followed by the learning of vowels in diacritic form (Share & Levin, 1999).

CONCLUSION

Since the ability to spell is considered a crucial component of literacy development and a standard measure of lexical quality, therefore, the analysis of spelling is indispensable. The exponents of stage theory propose a linear framework comprising hierarchical stages of literacy development. This framework suggests that children advance in their spelling development through passing literacy stages which occur in a specific sequence. The stage hierarchy determines the strategical awareness of phonology, orthography, and morphology in a predetermined progression. Contrary to stage theory, the non-linear development model formulates non-hierarchical framework which argues that the phonological, orthographic, and morphological awareness occur concomitantly to construct the structure of a word. In order to achieve this construction, a child possesses numerous strategies as the linguistic elements occur simultaneously, unlike the stage model. However, the more advanced strategies relegate the less advanced strategies. Additionally, the nature of the writing system and the degree of phonological and orthographic correspondence shape the spelling process of a language. In a transparent writing system, teaching literacy skills through the phonics method would yield plausible results, however, in non-transparent writing systems, like in English, the desired results would be limited.

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