



Spelling development throughout the elementary grades: The Dutch case

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Abstract

The purpose of the present study was to explore Dutch spelling development throughout the elementary grades. Two issues were considered (a) dimensional structure over time, and (b) rate of change. Whether the rate of change differs depending on gender, ethnicity, or word reading skill was examined in particular. A pseudolongitudinal dataset with the responses of more than 1300 children to five different sets of 120 spelling items was analyzed. Factor analyses showed that spelling ability can be conceived as a unidimensional ability for grades 2 through 6. This result was then confirmed by the results of analyses from the perspective of Item Response Theory although the children showed a tendency to master specific types of spelling problems during different – partially overlapping – periods in their development. Structural analyses further showed the children's spelling ability to systematically increase from the beginning of second grade through to the end of sixth grade. Whereas word reading skill level was an important predictor of spelling growth, gender and ethnicity did not have a significant influence.

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1. Introduction

It is generally assumed that the child's ability to spell is influenced by a variety of skills. Phonological skills appear to be critical (Gentry, 1982; Henderson & Beers, 1980) in addition to orthographic knowledge (Templeton & Morris, 2000), awareness of morphological structures (Treiman, Cassar, & Zukowski, 1994), and knowledge of spelling rules (Rittle-Johnson & Siegler, 1999). One popular conception of spelling development is that the skills and strategies that are acquired during the learning process follow a sequence of qualitatively distinct stages in which different sources of knowledge are used (Ehri, 1986, 1992; Frith, 1980; Gentry, 1982; Henderson & Beers, 1980; Templeton & Bear, 1992). Both Gentry (1982) and Ehri (1986, 1992) have distinguished five stages for spelling development: (a) the precommunicative stage, (b) the semi-phonetic stage, (c) the phonetic stage, (d) the transitional or

morphemic stage, and (e) the correct stage. Each stage is labeled such that it reflects the predominant information and strategies used at that stage of development. It is suggested that children initially combine letters and letter like symbols in a relatively haphazard manner without showing systematic knowledge of letter-sound correspondences. During the second stage of spelling development, children use their knowledge of letter names to spell, but their written word representations do not yet constitute a complete mapping of the sound structures of words. The sound-out strategy is considered characteristic of the third spelling stage: All of the sounds in a word are represented by letters, but the children do not show full knowledge of orthographic conventions. In the fourth spelling stage, children demonstrate their growing knowledge of basic spelling patterns, orthographic conventions, and morphological relations in their spellings. Finally, children enter the fifth stage of spelling development when both the phonological, orthographic, and morphological aspects of spelling competence are mastered.

Other theories that postulate spelling development to occur in a stage-like manner have clear synergies with that of Gentry (1982) and Ehri (1986, 1992), but have posited the existence of slightly different stages. For instance, Templeton and Bear

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(1992) and Henderson (1992) have extended the phonetic and transitional stages to describe different phonological and orthographic characteristics within words, across syllables, and across morphemes. In addition, some stage theories do not subsume a qualitatively different “correct” stage, recognizing that correctly spelled words are not necessarily spelled using qualitatively different information and strategies from incorrectly spelled words. All stage theories, however, presume a transition from relying on phonological properties of words to recognizing and representing orthographic and morphological regularities and rules. Furthermore, the different stage theories have the common feature that the stages of development are qualified by the static and consistent use of one single strategy to solve the spelling problem. Stage theories, thus, conceptualize transitions from one stage to another as instant qualitative changes in the use of strategy and involve children to spell words fundamentally differently in the successive stages of spelling. According to stage theory, therefore, the development of spelling ability should be conceived as a discontinuous and multidimensional process, reflecting instant developmental changes in children’s information and strategy use.

Theories that conceive spelling development as proceeding through a series of distinct stages are not without controversy. It can be argued, for instance, that a stage description of spelling development does not fully capture the complexity of learning to spell. More importantly, the depth of children’s knowledge of the spelling system of a language and the variety of knowledge sources and strategies that children can use to spell are not taken into account within such a stage approach to the development of spelling (Treiman & Cassar, 1997; Varnhagen, McCallum, & Burstow, 1997). Therefore, some researchers have suggested that the variability of strategy use in spelling may be better described in terms of the general learning framework of overlapping waves as proposed by Siegler (2000). In essence, the theory of overlapping waves is based upon three key components: (a) abundant variability, (b) adaptive choice, and (c) gradual change. During the learning process, that is, children develop a broad repertoire of spelling strategies where they can adaptively choose from at given times in the development (Bowman & Treiman, 2002; Rittle-Johnson & Siegler, 1999), but over time, gradual changes in the frequency of the use of particular strategies may occur (Steffler, Varnhagen, Friesen & Treiman, 1998; Varnhagen et al, 1997). The overlapping waves model, thus, endorses the use of multiple strategies to problem-solving and shifts in strategy performance, but clearly denies the consistent and static use of only a single strategy at a particular point in the development of children’s spelling ability. According to overlapping waves theory, therefore, the development of spelling ability should be conceived as a continuous and unidimensional process, reflecting gradual improvements in children’s phonological, orthographic, and morphological knowledge.

The discrepancies between the stage and overlapping wave approaches to children’s spelling development raise the question of whether spelling ability should be conceptualized as a multidimensional or unidimensional phenomenon. As stated, the stage-to-stage approach entails multidimensionality

because the process of spelling development is conceptualized as proceeding through a series of qualitatively distinct stages in which different knowledge sources are involved. Multidimensionality may arise between or within groups of children. The presence of multidimensionality between groups of children means that test items measure different things for members of one group as opposed to members of another. The test items, thus, reflect more than one dimension of individual difference variation. According to stage theories one would expect this type of multidimensionality to arise between the different grade levels. The presence of multidimensionality within groups of children means that even when data from a single group are considered, test items measure different attributes. Although not directly implied by stage theories, this type of multidimensionality may arise between words that require the application of different spelling strategies; for example, analogy-based words may appeal to another knowledge source for spelling than rule-based words. In contrast with stage theories, the overlapping waves approach to spelling development postulates one single knowledge source for spelling in which various strategies compete with each other over prolonged periods of time. Changes in strategy use may occur, but these are gradual and have varying rates. According to overlapping waves theory, thus, grade levels may certainly differ in strategy use, but children’s spelling development can still be seen to constitute a unidimensional and continuous learning process. The results of a few studies provide empirical support for the overlapping wave theory of spelling development. Varnhagen et al. (1997), for example, did not find any empirical support for developmental stages that adequately characterize the development of children’s spelling ability throughout the elementary school grades. In other research, Treiman (1993) showed even beginning spellers to largely understand the relations between phonemes and graphemes, orthographic conventions, and morphology.

1.1. Modeling spelling development

Obviously the issue of dimensionality is critical for the modeling of developmental trajectories. In the case of multidimensionality, a relatively complicated explanatory model with predictive relationships between the various skills is called for. In the case of unidimensionality, an autoregressive model may be best suited for the predication of spelling ability over time. Model selection, however, is not the only issue of concern here. At least two other issues must be taken into consideration for modeling purposes. The first issue concerns the question of how to measure spelling ability over time. Administration of the same test on successive measurement occasions is obviously not an option. Apart from the question of whether the same test can be administered twice to the same person and thus give rise to possible memory effects, it is simply not meaningful to administer the same test in the lower as well as the upper grades of elementary school. If different spelling tests are used, however, the question of whether the different indicators relate to the same underlying skill in the same manner over time quickly arises (Horn & McArdle, 1992).

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