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Profiles of cognitive precursors to reading acquisition. Contributions to a developmental perspective of adult literacy

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ABSTRACT

This article discusses conceptual and empirical elements concerning the development of cognitive processes that function as precursors of reading, and their association with the acquisition of reading skills in an adult population participating in literacy courses. It connects emergent literacy research with historical–cultural and bioecological concepts. Subsequently, it focuses on the problem of the development of profiles of cognitive reading precursors. A sample of 63 Chilean adults was studied through a growth/learning curves approach. The study replicated previous results indicating the existence of three major profiles of these cognitive precursors. Together, these precursors are associated with significantly different learning curves beyond the effect of each precursor considered separately. In addition, it established a negative association between initial phonological awareness and the rate of reading acquisition during the course. It has been claimed that an individual's participation in specific cultural activities throughout his/her life influences the development of the precursors of reading. Based on a complementary biographical study of a subsample of participants, preliminary evidence is presented that supports this link.

1. Introduction

The number of illiterate adults – those unable to read, write, and understand a brief account of events from their daily life – has reached approximately 759 million worldwide (United Nations Educational, Scientific and Cultural Organization UNESCO, 2010). In Chile, illiterate adults comprise 4% of the population above 15 years of age (Ministry of Education, Chile MINEDUC, 2009), while 50% of the adult population presents very low functional literacy levels (Bravo, Contreras, & Larrañaga, 2002; MINEDUC, 2008).

Illiteracy constitutes a serious problem for the sustainable development of contemporary societies. For many reasons, people without a sufficient mastery of written language risk economic, social, and cultural marginalization (see Bravo et al., 2002; Descy, 2002; Fransman, 2008; UNESCO, 2006). Moreover, illiteracy is a factor of social, familial, and personal stagnation which tends to be reproduced over the generations through change-resistant mechanisms (Martínez & Fernández, 2010).

A great number of educational initiatives have been created to overcome child illiteracy (see National Institute of Child Health and Human Development NICHD, 2000) as well as adult illiteracy (see La Belle, 2000). However, the psychological aspects of adult literacy development have been comparatively neglected. In the case of reading, Venezky and Sabatini (2002) found that research on the psychological aspects of adult learning has been especially poor compared to the same type of research in children. The present article intends to contribute to the understanding of these psychological processes of adult learning. It presents the conceptual and empirical aspects of a study on the development of profiles of cognitive precursors to reading in adults.

1.1. Cognitive precursors of reading

Written language can be seen as a semiotic (Vygotsky, 1931/1993) or representational system (Kohl de Oliveira & Valsiner, 1998), developed over the course of human cultural history, and which, therefore, is an external object that exists before a child is born. From this perspective, a prehistory of the development of written language has been identified; i.e., the period in which complex psychological operations or functions emerge and support further mastery of this language (Ferreiro & Teberoski, 1979; Vygotsky, 1931/1993). In a comparable way, contemporary studies identify a domain of emergent literacy (Whitehurst & Lonigan, 1998), consisting of a set of developmental *precursors* (skills, knowledge, attitudes) to the conventional and alphabetical reading and writing skills that appear at an early stage in a child's life. Thus, the development of the abilities to read and write is regarded as a continuum without an absolute differentiation between being literate and illiterate. Furthermore, oral language, reading, and writing develop in a concurrent and interdependent manner, based on children's exposure to social interactions in which

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written language is a major component (Rhyner, Haebig, & West, 2009).

Written language is a social and inter-subjective process which can be internalized and developed as an intra-psychological process by members of a social group, through their systematic participation in different activities that the group conducts using written language (Kalman, 2003; Rogoff, Mosier, Mistry, & Göncü, 1993). In this sense, for historical–cultural psychology, it is *participation* rather than *exposure* that generates development. What is more, in the bioecological theory of human development (Bronfenbrenner, 2005), for development to take place it is necessary that the individual and his/her environment interact for extended periods, through the individual's participation in progressively complex activities which are supported by the involvement of a person as a third party. Both the historical–cultural and bioecological approaches, therefore, argue that written language development requires the active and systematic involvement of the individual in social interactions.

The precursors of reading and writing, which are part of emergent literacy, are mainly a set of knowledge and skills functioning as *components*; that is, as skills that develop independently and whose combination or articulation, together with their interaction with formal instructional processes, result in reading or writing (Sénéchal, LeFevre, Smith-Chant, & Colton, 2001; Whitehurst & Lonigan, 1998, 2002). From the perspective outlined in the present article, the notion of a precursor is not only connected to the idea of an antecedent to a developmental outcome but also suggests that precursors have their own development line associated with the developmental outcome. In other words, reading and writing precursors do not stop developing after the initial ability to read or write is achieved, although their development is affected by the new capacity of which they are part (Rhyner et al., 2009). The ideas of Alexander (2005/2006), referred to as a "lifespan developmental perspective on reading," are interpreted in this fashion. Alexander regards this early articulation of knowledge, skills, and attitudes that result in initial reading as only the beginning of a long developmental process which can span a lifetime.

A large group of studies refer to the processes involved in reading acquisition (Justice & Pullen, 2003; National Early Literacy Panel, NELP, 2008; Villalón, 2008; Wood, 2000). Based on a comprehensive review of the relevant literature, Alegría (2006) and Bravo (2003) distinguish three types of cognitive processes which might be essential for initial reading development — "precursors" in the sense previously alluded to. By establishing connections with one another, these processes allow people to construct personal meaning based on the graphic signs of the written language, via its transformation into oral language during initial reading development (Bravo & Orellana, 1999; Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003; Ehri, 1998; Vygotsky, 1931/1993).[1] These three types of cognitive processes are phonological, orthographic, and semantic (Alegría, 2006; Bravo, 2003). Together they form the precursors of literacy that are the focus of the current work.

1.1.1. Phonological processes

Phonological processes are related to the ability to voluntarily segment and manipulate phonological units in oral language, which is generally referred to as phonological awareness (Alegría, 2006; Bravo, 2003; Ehri, 2003). This skill does not develop spontaneously. Adrián, Alegría, and Morais (1995) conducted a study with 15 illiterate individuals and 32 rudimentary Spanish readers, and observed that the former had very low levels of voluntary phonological processing, even though they were able to discriminate phonetic units and identify rhyme. In contrast, the rudimentary readers reached a much higher performance in the tests used. This result indicates that skills such as phonological awareness are not the result of mere cognitive or linguistic maturation, but rather require a certain degree of educational experience that exposes the individual to the alphabetic code, as is the case of rudimentary readers.

Learning to read in an alphabetic system such as Spanish requires phonological skills, because letters refer to phonemes, but learning to read also promotes these phonological skills (Alegría, 2006). To be more precise, alphabetic reading and phonological sensitivity are reciprocally related (Burguess & Lonigan, 1998). Although phonological sensitivity is not the same as phonological awareness (Adrián et al., 1995), it corresponds to a type of phonological process that influences the development of individual differences in reading skills. In turn, these abilities also influence the development of the higher levels of phonological sensitivity, which correspond to phonemic awareness (Burguess & Lonigan, 1998).

Greenberg, Ehri, and Perin (1997) conducted a study in phonological and orthographic processing tasks, comparing 72 students of an adult literacy program with 72 children at an equivalent reading level. The adults performed much worse than the children in segmentation and spelling of phonemes and in reading of non-words. A possible explanation is that the adults suffered from severe phonological deficits in their youth, which reappeared during their participation in the program. A subsequent analysis by these authors (Greenberg, Ehri, & Perin, 2002), showed that the differences between children and adults were not only quantitative, but also qualitative. Both groups tended to use different cognitive processes and approaches to solve the tests, including compensatory strategies to palliate their weaknesses. In this regard, the children tended to use phonological strategies much more often than the adults, whereas the adults resorted to orthographic strategies much more frequently than the children.

Jiménez and Venegas (2004) carried out a study with 103 low-literacy adults in Spain to establish whether word decoding is affected by phonological awareness. Their findings suggest that phonological skills are related to the ability to decode words, specifically the ability to segment phonemes, because, as noted above, Spanish is a phonologically transparent language in which most phonemes are represented in the spoken lexicon of individuals.

1.1.2. Orthographic processes

Orthographic processes are part of the recognition of pronounceable graphic signs within an orthographic context (Bravo, 2003). For children who learn to read normally, the development of visual orthographic recognition is based on phonological proficiency that enables them to relate phonemic and orthographic aspects.

It has been pointed out that phonological and orthographic processes are the two faces of decoding, with the latter focusing on letter processing and memory, and the former on the sounds of words (Greenberg et al., 1997). Studies have identified early connections between the knowledge of letters – a rudimentary form of reading – and phonological sensitivity, an early form of phonological processing (Burguess & Lonigan, 1998). In some articles, decoding is identified with orthographic strategies, and is measured only through word recognition and knowledge of the letters (see Jiménez & Venegas, 2004). However, the fact that individuals preferentially choose to use phonological or orthographic processes in spelling and reading tasks seems to be connected to their degree of familiarity with the words presented (Carpio, Defior, & Justicia, 2007). In any case, compared to research in linguistic comprehension processes, decoding has been neglected by adult literacy researchers (Greenberg et al., 1997), even though it is a central aspect of reading and appears to explain the reading difficulties of adults with a low schooling level.

In a study by Greenberg et al. (1997), adults performed better than children in some tasks connected with orthographic processing, such as reading sight words. In contrast, children were more proficient spellers and detected rhyming–spelling word discrepancies better.

[1] In the higher levels of reading development, written language turns into internal language directly, without an oral language step (Vygotsky, 1931/1993, 1934/1991).