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DISCUSSION ARTICLE

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Developing linguistic literacy: a comprehensive model*

DORIT RAVID
Tel Aviv University

LILIANA TOLCHINSKY
University of Barcelona

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ABSTRACT

This is a position paper modelling the domain of linguistic literacy and its development through the life span. It aims to provide a framework for the analysis of language development in the school years, integrating sociolinguistic and psycholinguistic notions of variation, language awareness, and literacy in a comprehensive model. The paper focuses on those aspects of literacy competence that are expressed in language as well as aspects of linguistic knowledge that are affected by literacy competence, tracing the route that children take in appropriating linguistic literacy as part of their cognitive abilities and examining the effect of literacy on language across development. Our view of linguistic literacy consists of

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one defining feature: control over linguistic variation from both a user-dependent ('lectal') and a context-dependent (modality, genre, and register) perspective; of one concomitant process: metalanguage and its role in language development; and of one condition: familiarity with writing and written language from two aspects: written language as discourse style – the recognition that the kind of language used for writing is essentially different from the one used for speech; and written language as a notational system – the perception and growing command of the representational system that is used in the written modality. Linguistic literacy is viewed as a constituent of language knowledge characterized by the availability of multiple linguistic resources and by the ability to consciously access one's own linguistic knowledge and to view language from various perspectives.

INTRODUCTION

The topic of literacy has been of concern to psychologists, anthropologists, philosophers, historians, linguists, clinicians, and teachers in recent years. The term 'literacy' has taken on a broader sense than its etymological meaning: it no longer entails just the ability to read and write, but 'has instead come to be considered synonymous with its hoped-for consequences' (Aronoff, 1994: 68). 'Literacy' today has taken on a wide range of meanings and implications, from basic reading and writing skills to the acquisition and manipulation of knowledge via written texts, from metalinguistic analysis of grammatical units to the structure of oral and written texts, from the impact of print on the history of mankind to philosophical and social consequences of Western education (Goody & Watt, 1963; Chafe & Danielewicz, 1987; Olson, 1991; Ong, 1992). Literacy has even been identified with the ideals of Western thought and considered responsible not only for amplifying our cognitive powers as well as our linguistic or interpretational capacities (Bruner, 1966; Cole & Griffin, 1981; Olson, 1994), but also for qualitative changes in human evolution (Donald, 1991).

We intend to show in this paper that acquiring literacy is part of what is termed 'later language development', linguistic acquisition beyond preschool years. In the past thirty years, researchers have conducted a number of studies exploring the nature and time course of language acquisition, and most would agree that children growing up in a monolingual environment have access to the vast majority of morphological and syntactic structures of their language before they enter school age. Nonetheless, a five-year-old hardly matches an adult or even a twelve-year-old in linguistic proficiency. Besides increasing vocabulary, one significant aspect of later language development is the ability to recruit different morpho-syntactic structures and to use them flexibly for diverse communicative purposes. This includes

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knowing and fluently using the particular features that distinguish different discourse genres as well as producing syntactically denser structures and creating hierarchically organized texts (Berman, 2000). These changes are linguistic in nature, yet they depend on a rich interaction between the developing child, written language, and literacy activities.

This paper focuses on literacy from two perspectives. One is a linguistic perspective – those aspects of literacy competence that are expressed in language (thus excluding computer literacy, visual literacy, and so on), as well as aspects of linguistic knowledge that are affected by literacy competence. The domain of our concern is thus linguistic literacy. A second perspective is developmental in nature – tracing the route that children take in appropriating linguistic literacy as part of their cognitive abilities and examining the effect of literacy on language across development. Though we view developing linguistic literacy through the prisms of Hebrew and Spanish, there is evidence that the proposed model applies beyond these two specific languages.

In attempting to model this particular domain of knowledge, we are interested not only in describing what children have to learn in order to become linguistically literate, but also in their current state of knowledge and their ideas about written language in the process of becoming literate. A major discovery of recent literacy research is that children construct ideas about writing and written language as they do in other symbolic systems well before they receive formal instruction in that domain, and they proceed to construct knowledge throughout the learning process. It is clear to us that what children know or think they know at any step in their development functions as an interpretative system of what they are currently engaged in. We thus assume this developing knowledge functions for the researcher on the one hand as a window on children's state of knowledge, while for the child it serves as the underpinning for establishing new schemas.

A second point relates to the representational status of developing literacy. Ours is not a dichotomous model of accessibility of knowledge in terms of implicit/unconscious versus explicit/conscious knowledge. Rather, we assume that there are multiple levels between the two extremes as suggested by Culioli's (1990) definition of the 'epilinguistic' level, and as most clearly expressed in the multilevelled model of Karmiloff-Smith (1986, 1992). As a final background point, we use the term RECOGNITION to refer to implicit identification and AWARENESS to refer to conscious access, which does not necessarily imply knowledge that can be verbally explained or justified.

Linguistic literacy : a framework for analysis

Linguistic literacy is viewed as a constituent of language knowledge characterized by the availability of multiple linguistic resources and by the ability to consciously access one's own linguistic knowledge and to view language

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from various perspectives. To be 'linguistically literate' means to possess a linguistic repertoire that encompasses a wide range of registers and genres. Once literacy is part of an individual's cognitive system, it interacts with other components of linguistic knowledge to shape the emergence of its key property, which we call RHETORICAL FLEXIBILITY or ADAPTABILITY. Inspired by Slobin's (1977) idea of being 'rhetorically expressive', this defining feature of linguistic literacy derives from the communicative need of speaker-writers to hold the attention of their addressee. And it involves being able to produce interesting and varied linguistic output that is attuned to different addressees and communicative contexts. Rhetorical flexibility develops along with core language abilities and with an increasing ability to think about and analyse domains of language so as to create 'flexible and manipulable linguistic representations' for metalinguistic reflection (Karmiloff-Smith, 1992: 32). These two concomitant processes are enhanced by a growing command of the writing system and of written language.

Language can be represented and used in any modality – spoken, written (including tactile writing, as in Braille), thought, or signed. It is associated with a variety of communicative conditions and is used in different socio-cultural contexts (Chafe, 1994). For example, spoken language expresses illocutionary force through stress and intonation patterns, and is better suited to express speakers' affective and audience-directed intentions through non-verbal channels, while written language promotes consciousness of the implicit structure of spoken language (Olson, 1994). A linguistically literate person possesses knowledge of the two major linguistic modalities – speech and writing.

Developing linguistic literacy means gaining increased control over a larger and more flexible linguistic repertoire and simultaneously becoming more aware of one's own spoken and written language systems (Olson, 1994). Our view of linguistic literacy thus consists of one defining feature: control over linguistic variation; of one concomitant process: metalanguage; and of one condition: familiarity with writing and written language.

The defining feature : linguistic variation

Language is a heterogeneous entity. Whatever the universal underpinnings of language and its acquisition, languages differ from one another in the presence or absence of grammatical categories, as well as in the ways they allocate grammatical resources to shared semantic domains. They thus affect the thinking of their users in a manner describable in the frame of a 'modified Whorfian hypothesis' (Lucy, 1996; Slobin, 1996). There is a body of evidence showing that the structural and lexical options typical of specific languages and language typologies bias users' linguistic perceptions and may contribute to their conceptualization of non-linguistic entities (Berman &

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Slobin, 1994; Bowerman, 1996; Gathercole & Min, 1997; Imai & Gentner, 1997; Gillis & Ravid, 2000).

Variability is universal. Linguistic variation affects every linguistic domain from phonology to syntax, as well as style. Within the same language, language contact and language change are reflected in constant synchronic variation (Ravid, 1995). Speakers of a language will vary their pronunciation, morpho(phono)logy, choice of lexical items and syntactic structures depending on geographic and social motivation, and also for situationally determined reasons. Different language users will formulate their thoughts differently under similar circumstances, while a single speaker will use different linguistic forms on different occasions. Children learning the same language may also develop linguistically along different paths (Lieven, 1997).

In literate communities, variation obviously involves both written and spoken language. However variation characterizes both preliterate and illiterate communities. For example, communities with a very restricted use of reading and writing nonetheless display a variety of poetic and narrative genres (Derive, 1994). Near-illiterate adolescents are able to recognize 'the language of books' and are able to reproduce it in particular circumstances (Blanche-Benveniste, 1982). Preliterate children growing up in a linguistic community become familiar with changing styles and codes through interaction with their environment (Lieven, 1997). But linguistic literacy renders variability both accessible and controllable (Bialystock, 1986). Specifically, linguistic literacy brings about an awareness of one's own particular linguistic identity, a corollary of which is the recognition of the existence of other linguistic identities, entailing awareness of those features that constitute the difference between one's own and other linguistic systems. And it also leads to control of one's linguistic repertoire so that it can be adapted to different addressees and circumstances. Recognition of variation and the ability to make differential and appropriate use of language under different circumstances should thus constitute a major goal of educational systems.

In sociolinguistic perspective, linguistic variation exists at two levels or dimensions: that of the language user, or the 'lectal' level, and that of linguistic context, defined in terms of register, genre, and modality (Halliday & Hassan, 1985/1989). The two types of variation are related, since user type affects linguistic production and processing under different circumstances on a continuum, including a variety of features interacting simultaneously. Both can be thought of as multidimensional spaces within which speakers and writers move, and which can be defined at different depths of focus: for example, the dialect of a village versus the tribal dialect, or the genre of a highschool physics textbook versus the less specific genre of natural sciences. The boundaries of these language varieties are permeable, constantly changing and evolving.

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Linguistic variation at the user level : a developmental perspective

A linguistic community is in a constant state of flux since it consists of language users from different backgrounds. One well known user-related distinction is dialect, as a regional variation in language (Chambers & Trudgill, 1980). Long-established communities typically display dialectal differences in contrast to a recently consolidated language like Hebrew (Bar-Adon, 1975). Yet, all languages manifest sociolectal variations, related to the sociological patterning of a community (Ravid, 1995). Ethnic variation also has linguistic expression, e.g. Black English (Labov, 1972). Dialectal, ethnic and sociolectal differences occur in all linguistic domains – lexicon, phonology, morphology, and syntax. They interact with gender-related factors, such as women's tendency to use more standard and less stigmatized forms (Brown, 1998), as well as women's ability to adopt innovative linguistic forms in more stable and traditional, compared with mobile, communities (Nichols, 1998).

These user-determined differences in the language community are recognized by language users as they come into contact with speakers of other dialects, sociolects, ethnic and gender-related variations (Andersen, 1996; Miller, 1996). Speakers of any language learn to recognize different ways of speaking and become able to identify whether a linguistic variety is considered more prestigious than others. This is crucial to literacy acquisition in those cases where a prestigious linguistic variety constitutes the standard language of schooling (Ravid, 1995; Cheshire, 1998; Berman, 2000). When this is the case, children may well need to preserve their own dialectal or sociolectal identity, while also learning to participate in school-based activities in the standard language.

The ability to switch codes between one's own and another linguistic variety depends on the opportunity to participate in diverse social situations (Hymes, 1974). Literacy makes a crucial contribution to the perception and manipulation of linguistic variation. Access to written representations provides a yardstick against which linguistic features of different varieties can be analysed in reflective interaction with texts. This in turn yields a more analytical perception of those linguistic features that constitute the difference. Thus, linguistically literate speakers of different sociolects can go beyond merely recognizing that 'others' speak differently to identifying exactly which sounds are pronounced differently, or which constructions are used in which variety, as in the cases of differential use of negation in Black English versus Standard American, or present perfect aspect in Peninsular versus South American Spanish (Labov, 1972; Acuña, 1997).

There is a complex interrelation between two varieties of a given language among speakers of one or both of these varieties. Morgan (1996) argues for re-

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cognition of dialectal differences between African-American (Black English) and Standard American English in members of the African American community, expressed in their language play. In contrast, Ravid's (1995) analysis of morphophonological differences between Israeli sociolects demonstrates that speakers of a nonstandard variety fail to perceive the difference between their usage and other varieties. Speakers of the standard variety of Hebrew ARE sensitive to deviations from their usage, and are often aware of those other, nonstandard usages which they even employ for purposes of social adaptation. For example, Hebrew-speaking youngsters of army age (18;0 to 21;0) adopt 'stigmatized' forms when talking among themselves, but abandon them for the more standard variety when talking to their parents.

The 'discontinuity' between language uses at home and language and literacy practices at school is a controversial issue. Some scholars claim that such discontinuity leads to failure at school (Heath, 1983), while others show that certain discontinuities in literacy practices need not compromise success at school (Gregory, 1999). There is also evidence that as a consequence of education, speakers of a nonstandard variation can learn standard practices and become more flexible in their usage, so they can switch from one code to the other (Lahire, 1995).

Linguistic control and freedom of linguistic choice – switching from the 'restricted' to the 'elaborated' code – is grounded in linguistic literacy, as demonstrated from Bernstein (1970) to Biber (1995). The linguistic knowledge of illiterates, or near-literates, is sufficient to recognize different users and circumstances and to react to them appropriately, assisted mainly by the roles of memory and ritual (Carruthers, 1990). This, however, does not exclude the role of register and genre themselves as powerful factors promoting attention to different linguistic features in both speech and writing. Literate users are more likely to gain conscious control over their reactions as a function of their linguistic literacy. It would be difficult to provide empirical evidence to the different abilities of literate and illiterate communities regarding rhetorical flexibility; however, we strongly believe that literacy fosters the ability to recognize and apply precise, context-appropriate linguistic features in speech. Following empirical studies that have been carried out on the adaptation processes of speakers of nonstandard variations to standard uses of language at school, it is reasonable to assume that linguistic literacy and adaptation interact in a complex way (Heath, 1982; Lahire, 1995).

In sum, linguistic literacy provides language users with a more articulate 'lectal' identity, on the one hand; and with the ability to participate in activities conducted in the standard variety, to monitor its adaptation to variability at the user level, and to use language under diverse circumstances,

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on the other. This brings us to the second dimension of linguistic variation: context-related variation.

Linguistic variation at the contextual level: early development

Language users do not participate in uniform linguistic circumstances. Rather, they need to vary their production to mark three situationally defined varieties: REGISTER, GENRE, and MODALITY (Ferguson, 1994; Berman, 2000). The terms 'genre' and 'register' have been used interchangeably by various scholars in different domains of research (Biber, 1995; Guenthner & Knoblauch, 1995), in many cases using the same features (Miller, 1984). All three terms involve the adaptation of linguistic and discourse structures to a situation defined by a complex of social, cultural, and communicative factors, and each of the three has been characterized both as distinct and as the same by different researchers (Ventola, 1984; Paltridge, 1997). Here, we focus on the characteristics of register, genre, and modality in relation to the development of linguistic literacy (Berman, in press).

Register, genre, and modality form the complex framework for the production of texts. The differing constraints they impose on language users result in texts with distinct characteristics in the domains that have been traditionally termed 'top-down' (global planning and organization) and 'bottom-up' (construction) respectively. This constraining effect emerges early on, as shown in studies of emergent literacy in preschoolers and first graders, and in studies of early sociolinguistic variability. But acquisition of linguistic literacy systematizes these differences and makes them more consistent, more integrated, and more accessible across contexts and types of texts.

Register. Register distinctions mainly express social dimensions such as power, authority, distance, politeness, and intimacy, which explore the boundaries of familiarity and formality. Andersen (1996: 126) specifies that the acquisition of register knowledge involves (i) possessing the appropriate alternative linguistic items, patterns, and constructions; (ii) identifying situational coordinates such as discourse participants and setting; and (iii) appropriately mapping linguistic forms onto the social situation. Cross-linguistic studies indicate that register knowledge emerges early on in interaction with language-specific conventions. According to Andersen, American and French children aged as young as 4;0 discriminate a wide range of social relations and express them linguistically through phonology and a systematic variation of social words, pronouns, directives and discourse markers. In Japanese, a language with multiple gender-related linguistic distinctions, young children are sensitive from early on to contextual information such as speaker/addressee age, gender, and familiarity, as well as topic of conversation (Nakamura, 1997). The work of Ervin-Tripp and her

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associates shows that children are sensitive to family roles and to the structure of social relations in their close environment, and vary their linguistic forms accordingly (Ervin-Tripp, O'Connor & Rosenberg, 1984). Register knowledge however extends beyond early marking of social relations to choice of advanced vocabulary and marked constructions in formal text production. Differences in linguistic register, in the sense of choice of higher-level alternative forms of linguistic expression appropriate to more formal contexts, are late to develop, they interact importantly with genre and especially with modality, and they vary from one country to the next, presumably due to different cultural norms (Berman, 2000). Mastering such register-appropriate usage is a protracted process, which is not complete by highschool (Berman, 2000; Gayraud, 2000).

Genre. For our purposes, we regard genre knowledge as essentially textual in nature. Genres range across text types broadly defined by function, social-cultural practices, and communicative purpose – conversation, narration and exposition, information and poetry. Mature, literate language users contextualize their textual production in genre-appropriate forms, and genre-specific texts differ in thematic content, global structure, and in privileged rhetorical and grammatical constructions (Berman & Slobin, 1994; Berman, in press). A changing, open-ended complex of historical, social, cultural and communicative factors provide the frame for an array of specific text types or subgenres such as commercials, contracts, drama, field notes, instruction manuals, internet chats, jokes, legislative documents, lists, literary reviews, manuals, medical case reports, myths, personal letters, personal narrative, petitions, prayers, recipes, resumés, riddles, scientific writing, textbooks – to name only a few (Paltridge, 1997).

In contrast to the vast number of genre studies from literary and philosophical perspectives (e.g. Strelka, 1978; Ryan, 1979; Genette, 1986), less is known about the development of children's ability to acquire genre-appropriate constructions and to deploy them appropriately across a large array of genres and subgenres. Yet this ability, coupled with register knowledge, is indeed one of the main characteristics of becoming linguistically literate. Most developmental studies of genre-specific language to date have focused on the internal structure and features of specific genres, e.g. scripts (Nelson & Gruendel, 1986) and narratives (McCabe & Peterson, 1991; Berman & Slobin, 1994; Berman, 1995), jokes and riddles (Ashkenazi & Ravid, 1998; Nerlich, Todd & Clarke, 1998), poems (Dowker, 1989), and school essays (Peled, 1996).

Research on young children acquiring different languages reveals early sensitivity to genre differences. In a pioneering study, Ferreiro & Teberosky (1979) found that Spanish-speaking preschoolers aged 4;0 to 6;0 were sensitive to genre mismatches: for example, when they were read a story with a typical narrative opening using a newspaper as the 'printed support'

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material, they reacted with surprise. Relatedly, Hebrew-speaking preschoolers (5;0–6;0) and first graders (6;0–7;0) asked to retell well-known stories and to describe one of their elements, were able to distinguish narratives from descriptions, as shown by the text layout, the distribution of stative vs. dynamic predicates, and by children's preference for noun listing in descriptions vs. full clauses in narration (Sandbank, 2001). A study of Portuguese-speaking children aged 5;0 to 9;0 showed that they could distinguish between stories, personal letters, and newspaper reports. Moreover, children were able to identify newspaper subgenres such as news and stories before they could identify letters (Albuquerque & Spinillo, 1997).

Few studies to date have looked at how children are able to vary and contextualize their linguistic production across genres or text-types. Studies of French and Hebrew-speaking children aged 6;0–12;0 show that the ability to distinguish text types increases with age and schooling (Peled, 1996; Schneuwly, 1997). Initial findings, results of a large-scale cross-linguistic study of the development of text production across genres and in speech and writing (Berman, 2000, in press; Ravid, van Hell, Rosado & Zamora, 2002), indicate that 4th graders (9;0 to 10;0) are already able to distinguish narratives from expository texts in their productions at the phrasal, clausal, text segment and discourse levels in Dutch, Hebrew, English and Spanish, and that the difference between these two genres becomes more linguistically marked with age. In addition to discourse structure and clause type, such linguistic distinctions include verb types (e.g. modal vs. lexical) and nominal constructions (e.g. pronominal vs. lexical) (Tolchinsky, Perera, Argerich & Aparici, 1999; Berman, 2000; Ravid *et al.*, 2002.).

Modality. Register and genre dimensions interact with modality, specifically with the particular restrictions imposed by speaking versus writing. Language production in different circumstances is shaped in each modality under constraints and principles of human information processing such as speed, clarity, economy, and expressiveness. For example, long silences hinder spoken production since they distract the listener and may lead to loss of turn by the speaker (Slobin, 1977; Strömqvist & Wengelin, 1999). Processing language is thus different in different modalities. Production modality constrains on-line processing along three main dimensions: (i) the presence or absence of an audience during production; (ii) the stability of the language signal; and (iii) the degree of control of the language user over linguistic output.

Audience. Any spoken text is inherently interactive, since the listener provides feedback cues both verbally and nonverbally, and may seek clarification on the spot. Moreover, the presence of a listener in face-to-face interaction allows speakers to make use of nonverbal channels such as gestures and facial expressions, which are powerful information sources

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about speaker / addressee identity, health, intentions and affective state. In addition, the spoken modality employs prosody as a linguistic dimension that is lacking in the written production. Finally, in the spoken modality there is a lot of background information that addressees typically share with speakers.

The language signal. On-line processing constrains the amount and type of verbal information that can be transmitted and processed in speech. This has powerful linguistic consequences such as what Chafe (1994) terms 'the light subject constraint', i.e. syntactically simplex subjects with little new information, typical of spoken texts (Ravid *et al*., 2002). Finally, control over linguistic output is potentially higher when writing, both because writing usually takes longer than talking, and because the stable and visually accessible written text permits writers to view the text as a whole, while the ephemeral nature of spoken language leaves a tight window for processing. Processing texts in different modalities thus results in different end products.

In terms of global top-down organization, a text produced under on-line processing constraints is less well-planned, less thought out, and less organized and cohesive than a written text. It is also more associative, and contains more 'collateral' non-informative material (Clark, 1996) such as hedges, false starts, unfinished constructions, discourse markers, hesitation markers and repetitions than a written text. As a result, spoken texts are typically longer than written ones, although written clauses contain more information and longer, more complex phrases, and are thus longer than spoken clauses (Berman, 2000; Cahana-Amitay & Ravid, 2000).

In terms of specific bottom-up architecture, real-time processing in speech allows the retrieval of frequent, salient, standard lexical items and syntactic constructions, while writers can afford to look for the right word, and for syntactic constructions that provide a different perspective such as passive voice. From a lexical perspective, spoken texts tend to be more 'loose', less verbally informative than written texts. This is expressed in lexical density (the proportion of lexical content words versus function elements), lexical diversity (the proportion of types versus tokens), the internal distribution of lexical classes, lexical specificity, the amount of repetition as expressed in type / token counts, and the degree of reliance on deictic cues. This effect of processing on the lexical content of texts follows a developmental path. A study with French-speaking schoolchildren and adults (Gayraud, 2000) showed that lexical density (i.e. a greater proportion of content words per text) is higher in the written than in the spoken modality among adults, but not among children aged 9;0–10;0.

From a syntactic perspective, scholars differ on which modality entails more 'complex' structures. The stability of the written text permits the production of longer and denser information packages in hierarchically complex syntactic constructions, which can be re-read and re-analysed by readers without the pressures of on-line processing (Chafe & Danielewicz.

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1987; Chafe, 1994). Learning to write in a sense means learning to deal with a new syntax, with producing and organizing larger linguistic units with the view of the text as a whole (Verhoeven & van Hell, 2000). Writing thus involves learning how to control and shape the flow of information in texts through linguistic means (Ong, 1992; Olson, 1994). Ravid *et al*. (2002) found a higher rate of lexical and lexically complex NPs at subject position in expositions rather than in narratives, and in written rather than spoken texts.

However, Poole & Field (1976) found a higher index of embedding in speech than in writing; and Halliday (1979) found more complex sentence structures in terms of number of clauses per sentence in speech. Similarly Tolchinsky & Aparici (2000) found in Spanish a higher proportion of centre-embedded relative clauses in subject position in spoken rather than written expository texts, but a higher index of embedding in written rather than spoken narratives. As suggested by Biber (1995), the mixed picture that emerges from these different studies may be due to failure to control for the combined impact of register, degree of formality, and planning.

Linguistic variation at the contextual level: the interface with formal literacy

So far we have looked at three dimensions of context-determined variation and at evidence of emerging abilities of children to make register and genre distinctions. Why is it possible for young children to make these distinctions before the onset of formal literacy? Following Vacheck (1932) and Ludwig (1983), we draw a distinction between two facets of written language knowledge: written language as discourse style and writing as a notational system. Written language as discourse style involves the variety of genres appropriate for 'language in writing', such as legal discourse, academic writing, or newspaper reporting, each with its typical thematic content, global structures and linguistic features. Writing as a notational system, in contrast, involves an ordered set of graphic signs used for composing messages in the written modality (Harris, 1995). In the present context, becoming linguistically literate means gaining control of both written varieties through text-related activities.

From a socio-historical perspective, the use of writing fostered the emergence of a range of linguistic varieties characterized by lexical, grammatical and rhetorical devices partially conditioned by the medium. However, once these discursive forms initially associated with writing were established, they were detached from writing and began to circulate, modality-free, in the linguistic community, governed by communicative circumstances. Thus high-register, formal, normative language normally associated with writing is occasionally used in speech, while oral conversations representing different 'voices' in the text appear in written narratives. Therefore, for an individual currently growing up in a literate community,

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learning to read and write is not an absolute prerequisite for gaining access to 'language in writing' or to different genres of written prose. Nearly illiterate individuals are able to react to and also, to a certain extent, produce formal language when constrained by particular communicative circumstances.

However, appropriate register knowledge extends beyond conversational interaction and the family circle to a much wider range of situations, and requires a vast reservoir of linguistic alternatives (Biber, 1995); genre knowledge goes far beyond mere recognition and production of different texts; and users learn to overcome on-line processing constraints in various modalities and to make efficient use of time and cognitive resources while writing. This is where linguistic literacy comes in. Initial findings of a cross-linguistic study of text-production abilities indicate that the ability to deploy register distinctions both appropriately and consistently across different contexts of usage emerges late, during adolescence, relies on natural development in language and familiarity with a variety of text types, and interacts with formal schooling in language-specific conditions (Berman, in press). For example, Berman's (1999) analysis of written and spoken English-language expositions by a seventeen-year-old shows both everyday colloquial practice and highly literate skills presumably acquired in the course of protracted experience with reading and writing academic prose. It includes high-register Latinate vocabulary items and connectors, heavy generic noun phrases, passivization for distancing purposes, nonfinite subordination, and complex auxiliary constructions.

The ability to overcome on-line processing constraints in speech, on the one hand, and to make efficient use of time and cognitive resources while writing, on the other, constitutes part of becoming linguistically literate. A study of developing text production in different contexts showed, for example, that spoken texts of younger subjects had lower type / token ratios than those of older subjects, indicating a smaller range of readily available lexical items. Moreover, written texts of children and younger adolescents contained more agreement errors than those of older adolescents and adults. Adults especially were able to produce longer and heavier NPs in spoken discourse, which younger subjects could not do so (Berman, 2000).

Other studies suggest that the ability to identify formal, marked constructions and even to produce them under certain conditions may emerge as early as in preschool, but appropriate and consistent integration of such features in suitable contexts may be delayed until adulthood (Peled, 1996). Thus for example, Levin, Ravid & Rappaport (2001) show that knowledge of highly formal, optional bound morphology and of specific types of noun phrases increases in Hebrew-speaking children from 5;0 to 7;0; but it is only college-educated adults, as well as some older adolescents, who are able to deploy this knowledge appropriately in texts (Cahana-Amitay & Ravid, 2000).

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Mastery of both user-determined and context-determined linguistic variation is thus graded and takes a variety of forms. The ability to take part in the production and comprehension of context-appropriate texts is curtailed by speakers' socio-linguistic background and their ability to go beyond this specific background so as to create and access a reservoir of schemas and forms. Mastering written language multiplies language users' access to registers and genres without being constrained by space, time, or immediate acquaintances. Reading and writing provide users with the chance to reflect, to review, to segment in different ways, to try different readings, to clarify ambiguous statements and constructions, to segment so as to facilitate reading. The relatively stable written text and the awareness of an absent, unknown reader enable writers to view the text as a whole. Written text conventions promote metalinguistic thinking in various linguistic domains such as sound / letter correspondence, word and sentence boundaries, and appropriate grammatical constructions (e.g. past perfect in English, passé simple in French, or optional bound morphology in Hebrew).

This is not to say that either written or spoken language is primary in any sense, but rather that the reciprocal character of speech and writing in a literate community makes it a synergistic system where certain features (e.g. basic syntax) originate in the spoken input, while others, such as complex syntax and advanced and domain-specific lexical items, originate in the written input. Together, however, they form a 'virtual loop' where speech and writing constantly feed and modify each other (Clark, 1997). While a literate native speaker employs spoken language resources, written language constitutes a constant alternative and a source of linguistic information both due to its status and omnipresence in all kinds of literacy activities, as well as interfacing with spoken language in the same mental space of the language user.

The concomitant process : language awareness

Language knowledge, like knowledge in many other domains such as face recognition or geometry, is essentially implicit. This complex system is typically used rather than addressed as a separate body of knowledge. The most natural use for language is the conversational modality (Chafe, 1994). When conversing, speakers' minds are occupied with the topic of conversation and with their roles as participants in the interaction (Hutchby & Wooffitt, 1998). In this natural context of discourse, speakers normally focus on maintaining or changing the discourse topic and their role as speaker or addressee, rather than on the linguistic form. The purpose of a linguistic transaction is usually informative, and so language users focus on content to achieve their communicative goals. Therefore, while talking, as in performing any other 'natural' and authentic linguistic act where language is used rather than analysed, linguistic knowledge is applied holistically, to construct (or

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comprehend) a totality that integrates phonology, morphology and lexicon, syntax and semantics in a given context. Naïve language users may pay explicit attention to discourse topic, to prosodic features or to lexical choice, but not to choice of syntactic construction or morphological form. While language users may be aware of their tone and intonation, pitch and volume during conversation, they are not aware of NP structure or verb aspect in the same way. These three features of language use – implicit, holistic and content-directed – constitute part of the natural linguistic heritage of any language speaker, and characterize speech from early on.

However, side-by-side with the development of implicit language knowledge, and with increasing experience in different linguistic contexts, language users develop another linguistic facet of explicit and analytic awareness (Gombert, 1992; Karmiloff-Smith, Grant, Sims, Jones & Cuckle, 1996). Research shows that young language users are already able to look at language as a separate domain of analysis or object for exploration, and that they are able to distinguish certain parts of it while disregarding others (Clark, 1978; Karmiloff-Smith 1986, 1992). Much of the metalinguistic research has typically focused on the onset and development of phonological awareness in preschoolers by investigating children's ability to form mental representations of distinct abstract phonological elements such as phonemes, syllables and sub-syllables, disregarding the meaning unit in which they appear (Perfetti, 1987; Goswami, 1999). More recently, researchers have begun to look at morphological awareness, a knowledge domain that involves introspecting about the morphemic structure of the word (Wysocki & Jenkins, 1987; Carlisle & Nomanbhoy, 1993; Ravid & Malenky, 2001). Other types of metalinguistic awareness – lexical, syntactic, pragmatic, textual – all involve representing, introspecting about, analysing and discussing various linguistic dimensions as separate domains of analysis (Gombert, 1992).

Language awareness and linguistic literacy

Linguistic awareness relates to linguistic literacy in a number of ways. First, cognitive control over the form of linguistic production always involves language awareness. Control implies a certain detachment from content, and the ability to select appropriate linguistic forms, morpho-syntactic constructions and lexical expressions, to weigh alternatives, and to access non-default, less productive, marked options. Control is usually associated with the written modality, which is more stable and so allows and even encourages revision, rewriting, and editing. Being able to reflect on one's own usage of structures and their meanings in various contexts is necessary for the cognitive activities associated with writing.

Secondly, language awareness is not a uniform phenomenon. It increases in explicitness and concurrently involves REPRESENTATIONAL REORGANIZATION

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into more coherent and more accessible forms (Karmiloff-Smith, 1992). For example, perception of the consonantal root elements in Hebrew emerges early on, but becomes more explicit in older subjects (Ashkenazi & Ravid, 1998; Ravid, in press). The changing nature of linguistic awareness is a combined result of development, language experience, and school instruction. For example, Ravid (1996) shows that educated, literate Hebrew-speaking adults, and they alone, are able to make full conscious use of phonological information in the form of diacritics in text comprehension, and that only literate adults possess both normatively prescribed as well as currently standard forms in their mental lexicon. In addition, only literate adults are able to use optional bound morphology appropriately in their written Hebrew texts (Cahana-Amitay & Ravid, 2000). Being able to represent and access linguistic form and meaning at will is the result of a complex, unified, coherent body of linguistic knowledge that is possessed only by linguistically literate adults.

Finally and most importantly, various types of oral language awareness are correlated with both basic and advanced literacy skills and general school achievement at different levels of schooling. As noted above for the relationship between speech and writing, we do not claim that there is a unidirectional, cause-and-effect relationship between oral language awareness of any dimension, on the one hand, and linguistic literacy, on the other. Rather, specific aspects of language awareness, especially phonological and morphological awareness, both promote and are promoted by learning to read and write. They do so by establishing links between the internal representation of phonemes, syllables and morphemes and their written representations (Rubin, 1988; Fowler & Liberman, 1995; Goswami, 1999). Concomitantly, written representations modify these very same internal linguistic representations (Gillis & de Schutter, 1996; Tolchinsky & Teberosky, 1998; Levin *et al.*, 2001). Abilities requiring more integrated knowledge such as reading comprehension are also related to analytic metalinguistic skills (Demont & Gombert, 1996; Yuill, 1998). For example, in examining Hebrew-speaking nine-year-olds, Appel-Mashraki (2001) has found that language awareness mediates between text comprehension and appropriate prosody in oral reading: the higher the language awareness score, the better the correlation between comprehension and prosody. Sensitivity to specific language domains, such as derivational morphology, has been shown to play a significant role in reading ability in both the early school years and in highschool as well as among college students (Henry, 1993; Mahony, 1994; Smith, 1998). Metalinguistic development is thus clearly related to the acquisition of literacy and school-based knowledge.

Young children display emergent metalinguistic awareness in natural interaction through spontaneous self-repairs, 'practice' sessions, questions and observations about language (Clark, 1978). Children's ability to perform

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structured linguistic tasks such as inflectional changes in non-natural, experimental contexts implies a rudimentary metalinguistic capacity (Ravid, 1995). However, tasks requiring controlled, analytical, explicit verbalization of linguistic processes and constructs are beyond the capacities of young children, and may not be fully achieved before adolescence (Ashkenazi & Ravid, 1998; Nippold, 1998). Moreover, metalinguistic insights reflect different perceptions of language at different ages (Nippold, Uhden & Schwarz, 1997). Such insights and perceptions become possible with the increasing command of written language as both discourse style and notational system.

The degree to which different components of linguistic awareness – such as phonology, morphology, and syntax – interface with literacy is mediated by the specific nature of the language typology and the extent to which these units are represented saliently and regularly in the orthography (Gillis & Ravid, 2000).

The enabling condition : mastering writing and written language

We have claimed above that mastering written language involves two aspects: written language as discourse style – the recognition that the kind of language used for writing is essentially different from the one used for speech; and written language as a notational system – the perception and growing command of the representational system that is used in the written modality. Below we elaborate on linguistic literacy in the context of these two aspects of written language.

The development of language as written style

In discussing linguistic variation above we focused on the role of social, cognitive and linguistic abilities in learning about the characteristics of texts distinguished by register, genre, and modality. In this section we discuss the development of a written language style in children, which derives from their realization that language should be used appropriately in different circumstances, for different communicative purposes, and with varying degrees of formality. There is no doubt that interaction with written language as a distinct discourse style before being formally taught to read and write plays a crucial role in fostering awareness of particular features of written language. The language of younger children is more uniform than that of older language users, since they are exposed mostly to everyday speech. Yet even young children are aware of other styles of language that are appropriate to different genres and registers, and especially to the written modality (Andersen, 1996). Infants are intelligent participants in book-reading activities. From eight to eighteen months of age, children engaged in the

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'reading' of picture books progress from an attempt to eat the page to being able to participate fully in verbal dialogue while looking at the book. Children grasp the physical acts involved in reading (gazing, pointing, monitoring), but they also become familiar with the typical language style associated with books (Snow & Ninio, 1986; Bus, van Ijzendorm & Pellegrini, 1995). The children who perceive written language as a separate style are those who are read to, who watch television, play computer games (e.g. of the 'quest' type), go to the movies and see plays – all distinct genres in different modalities. Michaels & Collins (1984) found that spoken narratives produced by children who were familiar with written style differed from those produced by children who were not, even in the way they introduced the narrative characters. Those children who were familiar with written language introduced the character using presentative constructions with indefinite nouns, whereas children who were not familiar with written style tended to use definite NPs.

Text-related activities, in their broadest sense, promote not only a general perception of written language as a distinct style, but also an analytic grasp of what units this style consists of. Toddlers and preschoolers already have a notion of discourse in terms of a unit that can be transmitted and separated from a larger discourse. This metalinguistic ability is demonstrated, for example, by children's ability to quote. A number of studies have investigated the developmental changes in children's quotation style in different languages (e.g. Hickman, 1985 on English; Tolchinsky, 1992 on Hebrew and Spanish). They have found that, from three years of age, children are able to reproduce the talk of different characters in a story by shifting pronouns and verb tenses when they move from the story line to the quotation of the character (Wolf & Hicks, 1989). In retelling the story of Hansel and Gretel children shift from third person to first person and from past to present. The quotation, however, is performed without any framing, and there is no mention of the interlocutor or the speech act for introducing the quote. After age seven or eight children start using speech verbs (*say*, *tell*) and begin to mention the interlocutor explicitly. This behaviour suggests that children approach the learning process with the capacity to distinguish between two levels in the utterance: the matrix and the quotation (Orsolini & Pontecorvo, 1996). But, being able to lexically frame the different levels, qualifying one of them as said by someone, is an outcome of children's increasing experience with text, as well as a growing command of linguistic forms and meanings.

Written language style and schooling. Awareness of written language style is fostered mainly at school, where literate activities constitute the main school-day events. Children realize that the stability of written symbols, together with the higher degree of formality resulting from a distant addressee / reader, involve a different style from that of speech: a more organized and better planned, less spontaneous discourse rhetoric, free of the pressures of

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on-line production. This permits the use of prefabricated ('frozen' or semi-frozen) lexical units, alternative and lexically specific items, marked syntactic constructions, and 'heavy', hierarchically complex structures that demand attention and patience in both production and comprehension. Children are not able to make use of the advantages provided by the attendant circumstances of writing from early on, so that those aspects of written text production and comprehension that require processing abilities remain undertapped in the early years of school (Berman, 2000). With growth and with growing experience with literate activities, written discourse style becomes part of the linguistic competence of users.

Acquiring written language as a notational system

The development of linguistic literacy involves not only learning to manipulate the written modality as a distinct discourse style, but also understanding the nature of writing as a notational system (Karmiloff-Smith, 1992). The notational system we are describing consists of two main properties: spelling and punctuation. According to this model, spelling relates to the rules within the intra-word domain, while punctuation relates to the rules defining the boundaries of the inter-word domain, including word, phrase, clause and text segmentation, as well as page layout.

Spelling. Languages with alphabetical systems represent phonological (rather than semantic) units as the basic components of the writing system (Coulmas, 1989). Alphabetical systems evidence four types of knowledge dimensions that must be mastered by children, so that they can become 'linguistically literate' (Blanche-Benveniste & Chervel, 1974; Ravid, 2001 b): Phonology, orthographic conventions, morpho-phonology, and morphology.

The phonological dimension is where the grapho–phonemic link is established. The interface of phonological awareness and the process of learning to read and write is universally recognized (Frost, 1992; Goswami, 1999). However, languages differ in the degree to which phonological segments are represented in the writing system. In many writing systems, learning the grapho-phonemic link is not enough for conventional or 'correct' orthographic spelling: disrupted phonology / orthography links resulting from neutralization of phonological segments (e.g. Dutch final devoicing) or from historical processes (e.g. 'silent' morphology in French, Hebrew historical neutralizations of emphatic stops) leads to homophonous representations. As a result, reaching conventional spelling is in many languages a protracted process (Ravid, 1995, 2001; Totereau, Theverin & Fayol, 1997; Gillis & Ravid, 2000).

The graphic-orthographic dimension concerns the internal character of the notational system, and the conventions of the phonological–orthographic

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mapping associated with it. Alphabetical orthographies have differing internal principles and internal consistencies in representing linguistic information that have to be figured out by learners, apart from the principled link to phonology (Treiman & Cassar, 1996). These include, first of all, differing fonts for the same grapheme, used in different contexts (e.g. casual note, formal text). Since many orthographies have dual, triple and even quadruple font systems, this means that all phonological units are mapped onto multiple graphic representations. Secondly, children have to learn which phonological units are represented in the orthography, e.g. the overrepresentation of consonants in Hebrew and Arabic and the specific ways in which these systems mark vowels (Shimron, 1993; Ravid, 1996). Evidence has been accumulating that the developmental paths in learning to represent consonants vs. vowels are essentially different (Tolchinsky & Teberosky, 1998; Gillis & Ravid, 2000; Levin *et al.*, 2001). Thirdly, in many cases, lexical and syntactic information is marked by graphic means, e.g. capital letters in English marking proper nouns and sentence initial position, German capitals denoting the category of noun, so-called 'final' letters in Hebrew marking word-final position. Finally, function words are represented in a variety of ways, attached, semi-attached or detached from content words (Ravid, 2001). This means that learning to segment words is related to understanding the role of function words, and that this dimension bridges intra- and inter-word domains in defining word and sentence boundaries.

The morpho-phonological dimension involves morpho-phonological regularities that may serve as recoverability cues in cases of homophonous letters resulting in 'deep' representations. These are again language-specific. For example, American English flapped *writer* and *rider* sound the same, yet are spelled by *t* and *d* respectively. The free stem forms *write* and *ride* can be used to reconstruct the underlying phonological segment and the correct spelling. Number distinction in French third person pronouns ⟨*il*⟩ vs. ⟨*ils*⟩ is expressed in writing alone, but *liason* with the opening vocal of the next word provides a clue to the existence of an underlying distinction (*il a* vs. *ils ont*) (Totereau *et al.*, 1997). Such cues are, however, complex, often indirect, and not robust. In many cases they require linguistic insights on the part of the speller. Some of these cues (like French *liason*) can be taught as formal grammatical rules in school, while others require linguistic instruction and are not part of teachers' cognition. Studies indicate that learning to use morpho-phonological pointers for spelling is also a lengthy process that is delayed until the age of about 12;0 (Ravid, in press).

The morphological dimension. Homophonous units may have different morphological values, which can be used by language users to help in making spelling decisions. For example, English *passed* and *past* share a final *t*, however in *passed* this *t* represents past tense, which is associated with the consistent spelling ⟨*ed*⟩. Learning to identify, disambiguate and spell ⟨*-ed*⟩

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correctly takes several years into the middle of gradeschool (Nunes, Bryant & Bindman, 1997). This may be associated with the fact that the consolidation of morphological segments in the mental representation of English-speaking children takes place about this time (Jones, 1991). There are indications that the age at which children start making use of morphological cues in spelling is determined at least in part by the degree of syntheticity of their oral language system and the ways in which morphology is reflected in the orthography. In Hebrew, a highly synthetic language with a morphologically motivated orthography, children make earlier and more use of morphological cues in learning to spell than in Dutch, a language with sparse morphology and a relatively transparent orthography (Gillis & Ravid, 2000).

Thus learning about orthographic conventions necessarily entails constructing an internal model of spoken language and its units – phonological, morphological, lexical, syntactic and discursive. However, as pointed out by Olson (1994: 260) different writing systems draw attention to different aspects and units of language. For example, users of Chinese script tend to segment sentences into syllables (Read, Zhang, Nie & Ding, 1986). And when asked to orally segment cognate words in Spanish and Hebrew, Hebrew-speaking first and second graders pronounced bare consonants, e.g. *p-c* for *pizza*, while their Spanish-speaking counterparts pronounced syllables *pi-ca*, or else named letters (Tolchinsky & Teberosky, 1998). We interpret these results to reflect a growing perception of the particular linguistic units modeled by the specific features of Semitic vs. Latin script: the prominence of consonantal, non-voweled roots in the Hebrew alphabet enhances root perception in Hebrew speakers (Ravid, in press).

Punctuation. In addition to learning to process phonological and morphological information in alphabetic orthographies, linguistically literate individuals have to learn about another aspect of written language, a notational system for text management expressing supra-segmental, syntactic, semantic and pragmatic information in the form of non-alphanumeric devices (Nunberg, 1990). Punctuation marks are taken here in their broadest sense, including emphasis markers, conventions for word separation and text layout including blanks at the beginning and at the end of a line as well as those that produce paragraphs (Catach, 1989; Parkes, 1992). This rather heterogeneous set constitutes a notational system that complements the information provided by the alphabetic system.

Punctuation in a sense corresponds to linguistic and paralinguistic features of spoken language such as gestures, voice intensity, pitch, and intonation. It upholds intertextuality and permits language users to actively participate in the literate community, since readers follow punctuation marks in the text so as to process it according to the author's intention and, conversely, writers punctuate appropriately so as to assure message comprehension. In fact, by punctuating a text language users explicitly relate to their absent audience,

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since the primary function of punctuation is to reveal structure and to resolve structural ambiguities in a text, signaling nuances of semantic significance which might otherwise not be conveyed at all. Punctuation delineates rhetorical structure, so that a reader can be explicitly alerted to certain formal contrivances relevant to the communicative significances embodied in a text.

We propose a psycholinguistic framework, which regards punctuation as multifunctional linguistic system in its own right, expressing as much and as diverse linguistic information as possible. Note, firstly, that all punctuation marks have double, triple and multiple functional values, comparable to other multi-functional linguistic constructs such as polysemic words and multifunctional function words and morphemes. For example, the colon serves as a quotation marker, a listing marker, and also substitutes a verbal marker of elaboration such as *i.e.* Secondly, punctuation marks are ordered in a hierarchical scale of strength. For example, the full stop indicates a stronger division than the semicolon, and the semicolon is stronger than the comma (Simone, 1996). The proposed framework makes it possible to make predictions about developmental processes of learning to segment and mark discourse. It has three components: (i) message organization; (ii) message modulation; (iii) message compression.

Message organization. This component contains punctuation marks expressing two types of organizational information: one is the conceptual–referential function of language (Jakobson, 1960) at the general level of text organization, including segmentation markers such as tabs, inserts, paragraph segmentation etc. The other type expresses syntactico-semantic organization at the level of words, paragraph organization, including blank spaces between words, prototypical connection / division marks such as the period and comma (Fayol, 1997), and other gradation markers marking relative linkage to text content such as parentheses, slash and asterisk. The message organization component is associated with the 'what' of the message – its conceptual content, and more generally with the semantic and syntactic facets of language. It is therefore predicted to develop slowly, in accordance with increasing perception of and experience with different types of discursive and syntactic functions.

Message modulation. This component is associated with the 'how' of the message, and more generally with the phonological and pragmatic facet of language. Punctuation marks related to message modulation include prosodic markers of two types – intonation markers (e.g. question mark, exclamation mark); and markers with a rhetorical and personal or non-literal message (e.g. quotation marks, colon). These also include topicalization markers such as bold, underline, font colour etc., which fulfill Slobin's 1977 linguistic maxims for 'being clear' and 'being processible'. On the whole, punctuation marks of this domain enable text producers to colour the text in their own personal way (termed 'attitudinal colouring' by Nystrand, 1987), thus

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modulating the text from the affective, rhetorical, nonliteral and personal perspective (Jakobson, 1960), and fulfilling Slobin's (1977) requirement for linguistic systems being 'rhetorically expressive'. This part of the framework is predicted to be acquired earlier than the others, due to its link with prosody and with speech acts.

Message compression. These markers answer to Slobin's (1977) maxim of 'being quick and easy', conventions which permit transmitting a maximal amount of information in minimum time and effort in two senses. One type of message compression markers, the apostrophe, directly links casual speech processes, which delete phonological units and obscure phonological boundaries, with the orthographic system. A second type of message compressors (e.g. periods, hyphens) operates system-internally on the orthography by shortening the number of letters in a word while transmitting the same message orally (e.g. *Dr*.).

In spite of the psycholinguistic and educational relevance of punctuation, relatively little work has been done on how children learn to punctuate (Hall & Robinson, 1996). Earlier studies showed that preschoolers distinguish between punctuation marks and letters (Ferreiro & Teberosky, 1979; Zuchermaglio, 1991) but that first graders disregard most punctuation marks when they are requested to copy a text that contains them (De Goes & Martlew, 1983, quoted in Hall & Robinson, 1996). In a study of French schoolchildren in the first years of school, Fayol (1997) shows that punctuation marks start emerging in the second year, increase in frequency and diversify towards the fifth year. However, Cahana-Amitay & Katzenberger (1999), studying written Hebrew narratives produced by 4th, 7th, and 11th graders (aged 9;0 to 10;0, 12;0 to 13;0 and 16;0 to 17;0 years respectively) compared with adults, show that children start demarcating episode boundaries graphically by periods and line endings only around 7th grade. In a series of recent studies on Spanish, Portuguese and Italian speaking children aged 6;0 to 10;0, Ferreiro & Pontecorvo have found the all punctuation marks, including those rarely used in expert writers' texts such as the semicolon, occur at least once in children's written productions. Early marking is found at transition sites, such as text beginning and end, story segments, and direct speech, and proceeds from text boundaries internally. Interestingly, no relation was found between story quality and level or precision of punctuation (Ferreiro, Pontecorvo, Ribeiro Moreira & Garcia Hidalgo, 1996; Ferreiro & Pontecorvo, 1999).

Another aspect of punctuation that has been studied from a developmental perspective was the graphic marking of words. Studies in Spanish and other Romance languages (for a review see Tolchinsky & Cintas, 2001) show that four-year-olds usually draw long strings of letters without any internal spacing. Strings of letters representing the names of the characters in a story or other proper names are separated earlier than any other category of word,

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and in general children tend to separate content words earlier and more frequently than function words. Segmentation behaviour in the early stages of learning to write is not very stable and depends on the type of task and the texts children are required to write. Increasing experience with writing eventually leads children to obey the conventions of the punctuation system they are exposed to, rather than general linguistic considerations.

CONCLUSION

In this paper we have proposed a conceptual framework for analysing the development of linguistic literacy. One contribution of this paper is the definition of linguistic literacy in development. We point at rhetorical flexibility as the main feature of linguistic literacy; at awareness of spoken and written language as concomitant processes of rhetorical flexibility; and at increasing familiarity with written language and writing as the enabling condition. Rhetorical flexibility alludes to children's ability to go beyond perceiving their own linguistic identity re variation in their language and in the language of others. It also refers to their ability to monitor their linguistic repertoire appropriately in different modalities, registers and genres as contexts. The model posits that this monitoring ability is facilitated by having explicit access to the linguistic features that account for variation. Within this framework, it is assumed that the use of written language helps to overcome restrictions of space, time and social status, so that interacting with a diversity of discursive forms and motives enriches the linguistic resources of language users. It is not just a matter of accumulating information or empowering memory; it is the whole perception and conceptualization of language that is affected by increasing familiarity with a diversity of written styles.

A second contribution of this paper concerns the implications of literacy for the study of language acquisition. Literacy and oral language knowledge are two components of the linguistic knowledge of language users. Literacy interfaces with language acquisition at all stages, from birth to maturity, though the relative weight of each component and its internal construction is determined by the developmental stage or phase: in young, preschool learners, oral language acquisition is the foreground developmental task, and the critical changes children's language undergoes have been well described in the developmental literature. Literacy development at this stage is backgrounded and less visible, though not less active. Preschoolers' perception of the notational system and its relationship to spoken language is the literate component that undergoes dramatic changes during this period.

Schoolage children and adolescents continue to acquire new linguistic constructs and new functions for existing constructs within contexts that have so far not been of central concern in developmental psycholinguistic

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inquiry: for example, grammatical forms that occur in formal or specific communicative settings, advanced or domain-specific lexical items, and alternative linguistic expression of similar functions. These constitute a crucial component of language knowledge in mature language users, and characterize what Berman & Slobin term a 'proficient speaker' (1994: 597). During this developmental phase, linguistic literacy is the foreground task at hand, involving all three dimensions discussed in this paper: control over linguistic variation; metalanguage development and familiarity with writing and written language both as discourse style and as a notational system. At this stage, the links between oral language knowledge and literacy become so complex, dense and accessible, that it is no longer possible to discern what knowledge belongs in which domain.

Thus we believe that any investigation of later language acquisition in children should take the factor of literacy into account, since it cannot be claimed that children have or have not acquired a given linguistic construction without having granted them the variety of contexts and circumstances in which this construction would be appropriate.

Many predictions stemming from this model have already been borne out by current research on the development of text-related activities, of genre sensitivity, and of phonological and morphological awareness. We are strongly committed to the idea that the contribution of literacy is not only to make us rhetorically more powerful, convincing and precise, but also more flexible.

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