Introduction

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This volume grew out of the Seventeenth Annual University of Wisconsin-Milwaukee Linguistics Symposium, which was held in Milwaukee on April 8-10, 1988. The theme of the conference was the relationship between linguistics and literacy; the richness of this subject became apparent in the wide range of topics addressed by presenters at the conference, and in the lively discussions that followed. In this volume, we have chosen to present a selection of papers which cluster around three of the major themes that developed during the conference: the linguistic differences between written and spoken genres, the relationship between orthographic systems and phonology, and the psychology of orthography. The volume concludes with a solicited paper by Walter J. Ong which draws together the various strands considered in the other sections of the book and addresses the broader question of the social and psychological consequences of literacy.

Part I: Written language and spoken language compared

In order to reach an understanding of what it means to be literate, we must first take care to discover those linguistic properties that distinguish written language from its spoken counterpart. What linguistic traits mark a text as non-spoken? To what extent are those traits common to all written genres? Are these traits arbitrary markers of mode, or do they arise naturally from the distinctive circumstances in which written texts are produced, and the distinctive uses to which they are put? It is these questions that are addressed by the papers in the first section of this volume.

Ford's chapter, "Variation in the intonation and punctuation of different adverbial clause types in spoken and written English", begins the discussion with a reminder that both spoken and written texts are subject to common semantic constraints, although the linguistic reflection of those constraints may differ in texts of the two types. As Ford shows with a comparison of examples drawn from conversational transcripts and unedited essays by college freshmen, the semantic bond between an event and its temporal setting outweighs the bond between the event and its cause, and this discrepancy is reflected consistently across texts of both types. Although the cohesive devices (intonation and punctuation) differ from mode to mode, the same semantic bonding hierarchy emerges in both cases.

In other cases, however, we can see profound and regular linguistic differences in both the sentence-level structure and the devices that effect the overall coherence of texts of the two types. As Chafe ("Information flow in speaking and writing") points out, though, many of these differences will be apparent only in natural texts, invisible in the isolated, artificial sentences often elicited by linguists as a basis for grammatical description. Those of us who have badgered informants to give us the equivalents, in their language, of sentences like "The farmer kills the duckling" have failed to appreciate that sentences of this sort are in fact rarely used in speech. Yet, in order to refine our understanding of the differences between written and spoken language, we must pay careful attention to details of precisely this sort. It is not enough to concentrate simply on what it is *possible* to say, as opposed to what it is *possible* to write. Rather, it is of supreme importance to study what people *actually* say and write, for it is in these tendencies of "performance" that we will begin to be able to discern the essential differences between written and spoken language, and to link these differences to their social and psychological sources.

Basing his proposals on actual samples of "prototypical" spoken English, i.e., conversation, Chafe suggests that the form of spoken language is limited by two constraints that do not apply to written language. First, each intonation unit may contain no more than one "new idea". Second, grammatical subjects are typically restricted to expressing "given, or at best accessible information", as opposed to information that is being introduced into the conversation for the first time. These constraints are not arbitrary, Chafe argues, but rather arise quite naturally from the limited cognitive capacities of speaker and hearer. Because we are capable of focusing on

only a limited amount of information at a time, spoken language must conform to constraints such as these in order to ensure fluent speech production and comprehension.

Written language, by contrast, is typically produced under less time pressure than is speech, and readers are typically free to set their own pace in assimilating the text. For this reason, written texts differ from spoken texts in not only such features as vocabulary choice and syntactic complexity, but also in their failure to conform to principles such as the "one new idea" and the "light subject" constraints. The differences between written and spoken language, in other words, are not arbitrary but derive, at least in part, from the different circumstances under which they are produced and received.

The social circumstances surrounding the use of oral and written language may also be decisive. As Ford points out in her chapter, the social negotiation and the *interactive* construction of meaning that are possible in conversational contexts also have linguistic consequences. They pave the way, for instance, for the use of linguistic constructions like independent causal adverbial clauses, which are stigmatized in writing and rarely find their way into even relatively unedited texts. These differences between modes pose interesting challenges for those who would create (written) literature, especially if writers hope to *involve* their readers in what they have written, and to convey to readers their own involvement in the subject of their writings. Accomplishing this sort of mutual involvement requires the writer to overcome what Chafe (1985) has called the characteristic "detachment" of written texts, the effacing of personal identity that reaches its height in such written genres as legal documents and academic prose. The final two papers in this section, those of Tannen and Berry, address this question of the relationship between literary and conversational discourse.

Tannen ("How is conversation like literary discourse? The role of imagery and details in creating involvement") demonstrates that it is possible to create involvement within a text without recourse to the most obvious and straightforward linguistic devices — use of first and second person pronouns, explicit evaluative markers (Labov 1972), etc. One of the most powerful devices for effecting involvement, detail, accommodates itself easily to the constraints of what might seem to be the most disparate of genres: conversation and literary discourse. And yet it is highly effective in both conveying and eliciting involvement. By including details, speakers/writers reveal themselves as having attended to the subtleties they are recounting,

and in doing so they further bolster the authority of their telling. The use of details also triggers in hearers/readers similar details stored away from their own experiences, details which allow them to join the "author" in producing a personally meaningful text. With the use of this technique, written language can be rescued, in spite of the fact that writer and reader are not face to face, from an absence of involvement.

Not all involvement devices exploited in conversation are so easily carried over into literary discourse, however. Berry ("Modern American poetry and modern American speech") concentrates on the work of three American poets (Robert Frost, T.S. Eliot, and William Carlos Williams) committed to writing in a language close to ordinary contemporary speech. As Berry eloquently demonstrates, this is not an easy task, for it requires attention not only to the traits that make conversational speech distinctive, but also to the expectations and conventions that govern the poetic genre. As Berry puts it,

> Conversational-seeming poetic language must *appear* interactive but *be* edited; its content must *seem* situated but *be* abstract (i.e., convey a universal theme); and its style must seem immediate, though it is, of course, not even reported, but fictional.

These conflicting demands result in language that incorporates only *some* of the features of conversational language, avoiding others entirely. While the use of questions, commands, personal pronouns, contractions, and even final prepositions contributes to the conversational feel of the poetry Berry examines, other characteristic traits are rare or absent. Features such as afterthoughts, hesitation fillers, general hedges, and loosely connective *and*'s, for example, occur infrequently; while they may pass nearly unnoticed in conversation, they are very salient for the trained reader of poetry, accustomed to exactness and precision. Repetition, essential to both genres, but of different values in each, is also used with care. Successful conversational-sounding poetry is, we come to realize, a delicate balance between the host and the embedded genre.

Part II: Orthographic systems

The second section of this volume addresses important questions about how orthographic systems develop and about the nature of the relationship

between orthography and phonology. In his chapter, "Segmentalism in linguistics: The alphabetic basis of phonological theory", Aronoff questions the argument that the existence of alphabetic orthographies is sufficient reason to cast phonological theory in terms of linear chains of phonemic segments. He examines the influence of Sapir, who wrote that people "feel themselves to be pronouncing and hearing...'phonemes'" (Sapir 1949: 47). Aronoff argues that since Sapir's informants were far from naive (they had undergone rigorous training in phonetic transcription), it is not surprising that Sapir came to this conclusion. Like Sapir, Saussure also advocated the psychological reality of the phoneme. It is Aronoff's contention that despite the more sophisticated notion of psychological reality embraced in Chomsky and Halle's *Sound Pattern of English* (1968) (SPE),

> the only innovation, in phonological representation and the major difference between Saussure and SPE, was the introduction of distinctive features for individual segments...the linear model of item and arrangement remained unquestioned.

In his conclusion, Aronoff applauds more recent developments in phonological theory, in which nonlinear phenomena have finally begun attracting attention.

Several of the chapters in this section elaborate on the notion that the phonemic segment-representative alphabet may not be, as Daniels puts it, "the acme and goal of the development of writing systems". As an alternative to the segment, a number of chapters point out the psychological salience of the syllable and suggest that phonological theory would benefit from greater attention to syllable-sized units. Daniels ("The syllabic origin of writing and the segmental origin of the alphabet"), for example, describes a number of syllable-based writing systems, all of them independently devised by "unsophisticated" creators unskilled in the use or decipherment of other writing systems. These "grammatogenists" developed syllabaries rather than alphabets, Daniels argues, because syllables, not phonemes, are the most salient unit of the stream of speech. Although the syllable may be difficult for the linguist to define, it is easy for the listener to recognize and identify; in this regard it clearly differs from the phoneme. Development of a syllabary is especially likely when the language to be represented (such as Sumerian, Chinese, or Mayan) is one in which most words are monosyllabic. In such cases, Daniels argues, the most salient unit of language (the word) coincides with the most salient unit of

the speech stream (the syllable), facilitating recognition of the rebus principle, which can be used to develop symbols for words denoting non-picturable concepts.

Faber's thesis stands in close agreement with those of Aronoff and Daniels. In her chapter ("Phonemic segmentation as epiphenomenon: Evidence from the history of alphabetic writing"), she uses historical analysis to argue that phonemic segmentation is epiphenomenal. Faber considers and rejects the claim that the phoneme is a valid unit of linguistic analysis. Like Aronoff, she notes that a major argument for the linguistic validity of the phoneme is the existence of alphabetic orthographies, the standard assumption being that such orthographies would not have arisen if humans were unable to segment the speech stream into phoneme-sized units. Faber calls this argument into question, concluding that the development of the alphabet was more an historical accident than evidence of the linguistic primacy of phonemes.

In her analysis, Faber finds that only orthographies in the Greco-Latin line of descent are based on exhaustive linear coding of phoneme-sized units. Unlike other offshoots of the Phoenician orthography, Greco-Latin writing systems came to represent vowels with symbols at the same level as those representing consonants rather than with diacritic markings. Faber argues that the Greeks' development of the alphabetic principle, rather than reflecting a natural human linguistic ability to segment speech into phonemes, was an accidental result of the structural differences between Phoenician and Greek phonology. Faber concludes that unlike the syllable, the phoneme is best categorized as a metalinguistic rather than a linguistic unit. She ends with an admonishment that the mere fact that it is *possible* to describe phonological systems in terms of phonemic segments should not compel linguists to describe phonological systems in this way.

In spite of the fact that the syllable may be a very natural unit into which to parse the stream of speech, though, not all existing syllabaries provide regular, consistent representations for all phonologically distinct syllables in the language. As Scancarelli's chapter, "Aspiration and Cherokee orthographies," points out, the syllabary devised by Sequoyah for Cherokee systematically ignores the features of pitch and vowel length, and it represents the distinction between aspirated and unaspirated consonants only irregularly. In fact, this "unsophisticated grammatogenist" might be said to have stumbled upon an autosegmental approach to the representation of Cherokee phonology. The details of Scancarelli's analysis, which

attempts to explain the "irregular" treatment of aspirates, also demonstrate the swarm of competing considerations which assail the creator of any sound-based orthography. Economy is of course an important consideration, and in Sequoyah's case, the number of symbols required was reduced by eliminating information about pitch and vowel length, and in some cases, aspiration. Distinct symbols for both aspirated and unaspirated syllables were included, however, when both syllable types occurred with high frequency in the Cherokee vocabulary, or when the contrast was relevant for the recognition of words with a very high semantic load, words such as *tlha?* 'no, not'. Although the resulting system is not a "perfect syllabary", its "deficiencies" are clearly not the arbitrary work of a clumsy creator.

In the next chapter ("Interpreting Emai orthographic strategies"), Schaefer is inspired not by the debate between the phonemic view and the syllabic view, but that between the phonemic view and the logographic view, as recently reviewed by Sampson (1985). In his chapter, Schaefer reports observations of the spelling behavior of the Emai people of southern Nigeria, who are in the early stages of developing an orthography. His goal is to characterize the orthographic strategies used by the Emai to represent vowel elision, a central process in their phonology whereby one of two vowels, occurring at a word boundary within a syntactic constituent, is not pronounced. Schaefer has discovered that the Emai generally rely on spelling strategies that fall into six types. Although the types are distinct, all six demonstrate a consistent absence of the elided vowel, and several demonstrate an absence of representation of juncture between lexical units. Based on this evidence, it appears that Sampson's (1985) assumption that lexical juncture is transparent fails to hold consistently in the Emai case. However, a comparison of the relative opacity of Emai representation of the logographic level and their representation of the phonemic level leads to the conclusion that the lexical level, though not entirely transparent, is more transparent than the phonemic level.

In a very different vein, McCawley ("Linguistic aspects of musical and mathematical notation") describes some interesting parallels between orthographic systems designed for representing language and the notational systems designed for representing music and mathematics. McCawley points out that like linguistic notational systems, both musical notation and mathematical notation provide explicit ways of representing constituent structure and dependency structure at various levels. For example, in mathematical notation, parentheses and brackets are used to represent con-

stituent structure. Subscripts and superscripts can be regarded as representations of dependency structure, in that they function as "modifiers" of arguments and operands, which are written on a line. In addition, details of "syntax" are also indicated in mathematical notation according to certain rules, as when coefficients are written before, not after, the symbols standing for variables (e.g., ax + b, not xa + b). Through his detailed consideration of the notational systems that humans have devised for representing mathematics and music, McCawley encourages us to take a new and broader perspective when we study the notational systems that humans have devised for representing language.

Part III: The psychology of orthography

In the third section, the relationship between orthography and cognitive processing is explored. Several chapters in this section present evidence that literacy has profound effects on the cognitive processes involved in producing and comprehending speech, effects that have been largely ignored in linguistic theorizing. Other chapters focus on how the nature of one's orthography affects representation in the mental lexicon and the processing strategies used in reading.

In the first chapter ("Orthographic aspects of linguistic competence"), Derwing's goal is to demonstrate that the range of influence of literacy on linguistic competence is far greater than has been assumed by many linguists. Arguing against the notion that linguistic competence is driven by innate factors, Derwing marshals several lines of evidence, much of it gathered from experiments conducted in his laboratory. First, he argues that phonological rules such as English vowel shift do not arise spontaneously due to exposure to spoken forms, but depend on exposure to rules that relate sound to spelling. Second, he shows that judgments about phonemic structure appear to proceed with reference to orthographic knowledge. For example, on average, adults judged *pitch* to have 3.7 phonemes, whereas they judged *rich* to have 3.0 phonemes. Third, Derwing shows that knowledge of orthographic similarities plays a substantial role in morpheme judgments. Fourth, he argues that grammaticality judgments depend largely on the subjects' level of training and experience with written language. In short, Derwing effectively delineates the irony of basing linguistic theory on phonemic, morphemic, and grammaticality judg-

ments, when in fact such data are not nearly as "uncontaminated" as we would like.

Like Derwing, Ohala ("The costs and benefits of phonological analysis") makes a strong case for devoting more attention to psychological processes in the devising of linguistic theories. It is Ohala's thesis that for too long, generative phonologists tended to neglect the need to constrain their theories in accordance with the nature of the cognitive processes that subserve language use. In deciding between competing phonological theories, simplicity is not a sufficient criterion; an even more important criterion, in Ohala's view, should be how well a phonological theory fits in with economic constraints on the construction of the mental lexicon. On this view, it is assumed that speakers will not represent information in their mental lexicons if there is little use for such information, especially if there is little opportunity to obtain the information in the course of normal production and comprehension of language. As one example of how generative phonology violates this constraint, Ohala notes that SPE assumes accurate location of morpheme boundaries, when in fact psycholinguistic research has shown that subjects show substantial confusion about the location of morpheme boundaries. Ohala advocates an alternative "cut and paste" theory that operates on surface pronunciations rather than on underlying forms; he posits that a phonological theory of this type has the advantage of compatibility with existing psycholinguistic evidence.

The chapters by Feldman, Frost, and Cowan report the results of laboratory experiments on word recognition, most of which are concerned with the effect of orthography on reading strategies and on representations in the mental lexicon. As her title implies ("Morphological relationships revealed through the repetition priming task"), Feldman uses the repetition priming technique to investigate the effects of morphological structure on lexical access during reading. In this technique, the subjects make lexical decisions to items presented on a computer screen, responding by pushing a "yes" button when the item is a word (e.g., *mark*) but a "no" button if it is not (e.g., *marl*). In Feldman's experiments, some items are repeated (e.g., *mark* may have been preceded by *mark* sometime earlier in the list) whereas others have been preceded by a morphological variant (e.g., *mark* preceded by *marks*). It has been established that prior occurrence of *mark* causes a decrease in the response time to the second occurrence of *mark*, suggesting prior activation of a representation of *mark* in the mental lexicon. Feldman's experiments hinged on the assumption that if *marks* causes

a decrease in the response time to *mark*, then *marks* must have activated a representation of its stem morpheme, *mark*. Interestingly, Feldman found that although a shared stem morpheme does appear to underlie the morphemic priming effect (e.g., the facilitative effect of *marks* on *mark*), the phonological and orthographic transparency of the prime-target relationship did *not* modulate the size of the effect. It therefore appears that the morphemic relationships captured in the mental lexicon are not limited to those formed productively from transparent and semantically compositional combination of bases and affixes.

In his chapter ("Orthography and phonology: The psychological reality of orthographic depth"), Frost outlines some of the ways that the nature of one's orthographic system affects one's cognitive processing during reading. Frost begins by reviewing the issue of whether access to the mental lexicon during reading proceeds via a phonological route (utilizing spelling-sound conversion) or a direct orthographic route (based on the visual form alone). Most psychologists agree that both routes exist, but there is controversy about the relative efficiency of the two routes. Frost's method of attack is to examine the role of the phonological route in a case where the correspondences between spelling and sound are "deep" in that they are not transparent (Hebrew), and to compare these results to a case where the correspondences between spelling and sound are "shallow" (Serbo-Croatian). He finds that the results with Hebrew stand in marked contrast to the results with Serbo-Croatian; in reading Hebrew, the direct visual route prevails, but in reading Serbo-Croatian, the phonological route not only prevails, but is obligatory. Thus, it appears that orthographic depth determines the preferred processing strategy in reading.

Like Frost, Cowan ("A model of lexical storage: Evidence from second language learners' orthographic errors") finds that cognitive processes appear to be modulated by orthographic differences. Specifically, Cowan reports experimental evidence suggesting the possibility that differences in orthographic systems can impede second language learning. In Cowan's experiment, English-speaking adults learning Hebrew (which represents vowels with diacritic marks, if at all) were compared with English-speaking adults learning German, and it was found that in a recall test in the second language, the adults learning German performed better than the adults learning Hebrew; this difference was attributed to the closer similarity between English and German orthographies than between English and Hebrew orthographies. Support for this interpretation came from the find-

ing that the Hebrew learners tended to make vowel confusion errors, whereas the German learners did not.

Part IV: Consequences of literacy

Having considered the linguistic peculiarities of written language, the various orthographic systems that have been used in producing it, and the challenge that its decipherment poses for the reader, we turn with the last chapter in the volume (Ong's "Writing is a technology that restructures thought") to the broader implications of literacy, for society and for the individual.

Ong's thesis is that the advent of literacy within a society has radical consequences, not only for the scope of the information that we can store and transmit, but also for our habitual patterns of thought and *oral* language use. As one of the most pervasive effects of writing, Ong points to its ability to separate the knower from the known, by interposing a text between the two. This results in the objectification of the known; it is no longer within the province of the individual, interpreting mind, but rather in an impersonal form, available for de-coding by any literate individual. This effect, and others that Ong details, have in sum so profound an influence on our ways of thinking that we who have grown up in a thoroughly literate society may in fact be unable to discern it. Although writing is a relatively recent innovation within human history and is, by comparison with spoken language, an artifical technology, it has made possible the "protracted, intensive linear analysis" that we see in the thought of individuals like Plato's Socrates. This sort of thinking is unavailable, Ong maintains, for totally oral people.

The advent of literacy also changes the way in which oral language is used, even in genres, like informal conversation, which one might suppose to be the least written-like. As Ong puts it,

> Simple queries for information acquire a new status, for oral cultures typically use words less for information and more for operational, interpersonal purposes than do chirographic and typographic cultures.

While earlier chapters in the volume have made it clear that literacy is much more than an optional overlay on oral language and culture, these observations of Ong's take us one step further, demonstrating the complex *mutual* dependency between language in the two modes.

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