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Contents

Abstract

This paper reviews studies done during the last decade in one small area of cross-language research, that of cross-orthographic Stroop interference tests. Although these studies may at first seem distant to discussions of basic literacy skills, the insights they provide may be critical to furthering our understanding of human acquisition and use of written language. The purpose of this article is two-fold. First, by critiquing one of the first cross-orthographic Stroop studies in the context of related studies, this paper describes how cross-orthographic Stroop studies have been used to explore cognitive mechanisms involved in reading and the possibility that those mechanisms might be constrained by the orthography of a language. Second, this paper reviews some conceptual and methodological flaws in the research, flaws that underscore the difficulty in empirically verifying hypotheses about how humans might make meaning from and with written language. As debates intensify about the role of empirical studies in research on written language, it becomes increasingly important that researchers relying on empirical methods increase their efforts to weed their experimental designs of potential rival hypotheses. This weeding is particularly difficult in cross-language studies because investigators are often hampered by a lack of sufficient knowledge about the languages they are using as experimental materials. Despite their faults, however, the studies reviewed here, along with others, provide evidence that readers of different orthographies may invoke different cognitive processes at the base of their reading strategies.

Leading-edge Research or Lost Cause?: The Search for Interscriptual Stroop Effects

Philippa Jane Benson

What is "Stroop Interference?"

The original version of the Stroop test, developed by J. R. Stroop in 1935 (Stroop, 1935), was done with a color-naming/word-naming task to study cognitive processing mechanisms for visual and verbal stimuli. In the original test by Stroop, subjects were presented with incongruent color words, for example BLUE printed in red ink (i.e., BLUE), and were asked either to name the color (in this case "red") or read the word (in this case "blue"). The original version of the Stroop test revealed that subjects took longer and made more errors when naming colors than when reading color names printed in black i.e., BLUE) or naming the color of color patches (i.e.,■).[1] Experimenters measured the time difference between the presentation of the color-word and the subject's response to a color-naming or word-reading instruction and called the measure that of "Stroop interference" or the "Stroop effect."

The theory behind the test was that in order to respond to a Stroop stimuli, in which visual and verbal material are presented together but are not congruent, subjects may need to go through a series of cognitive steps such as encoding verbal stimuli, encoding visual stimuli, comparing the visual and verbal material, selecting a response and executing it. Because the tests consistently showed that there were significant differences between the response times of subjects in color-naming and word-reading tasks, researchers hypothesized that there may be some kind of interference between the processing of the visual and the verbal information. The ensuing questions were where and why does the interference take place and what do the answers to those questions tell us about human information processing?

Since 1935, researchers have conducted studies using Stroop interference tests both to look for answers to questions about the processes behind the Stroop effect and to explore other cognitive processes. (For a review of the first three

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decades of work, see Jensen and Rohwer, 1966.) Stroop himself hypothesized that the interference occurs when a subject is in the process of selecting a response to a prompt to name a color or word. More recently, Keele (1972) supported the hypothesis that the interference takes place during the response process, when he found his subjects exhibited a Stroop effect both when they responded to Stroop stimuli physically (by pressing a key) as well as when they responded verbally. Seymour (1974) discussed the possibility that the interference may occur in the comparison stage if incongruous visual/verbal stimuli cause the subject to judge the "truth" of the match between the semantic meaning in a visual display and the display itself. For example, if "Above" is printed above "Above," the match is true; however, if "Below" is printed above "Above," the match is false as shown to the right. Seymour's intention was both to give additional evidence of the locus of Stroop interference and to use that evidence to further the understanding of the cognitive processes involved when readers are comparing sentences and pictures.

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Another example of the application of the Stroop paradigm is the study of hemispheric lateralization by Morikawa (1981), who compared the Stroop effect of Japanese reading logographic and syllabic Japanese characters with identical pronunciation. Because there were signficiant differences in the amount of Stroop effect subjects exhibited when reading these different kinds of characters, Morikawa placed the locus of Stroop interference in the encoding (perceptual) process and used his results to support the hypothesis that different cerebral hemispheres are responsible for processing different kinds of stimuli. In addition to the studies mentioned above, researchers have used Stroop tests to explore other areas of language processing such as automaticity of word recognition (Liu, 1973; Samuels, 1976; Schandler and Thissen, 1981) and speech recoding in reading (Martin, 1978; Naish, 1980). Many of the Stroop studies have had the dual purpose both of developing understanding of the processes and furthering the effort to pinpoint the locus of Stroop interference.

A Comparison of Cross-Orthographic Stroop Studies

In his recent text, Coulmas (1989) distinguishes the relationship between writing and speech: "Every writing system

makes a selection of the linguistic units to be graphically represented (not language specific). [The units selected might be, for example,] words, morphemes, syllables, phonemes [or] phonetic [elements]. Every script makes a specific selection of the possibilities of a given [writing] system in accordance with the structural conditions of a given language. [Examples of such selections are] Chinese script, Arabic script, [and] Greek script. Every orthography makes a specific selection of the possibilities of a script for writing a particular language in a uniform and standardized way, [for example,] Chinese/Taiwanese orthography [or] Standard German/Swiss-German orthography." These distinctions are useful here to point out that studies across orthographies do not look just at a writing system, or at a particular style of script but rather look at specific manifestations of a script type as orthographies that have been adapted and conventionalized in particular cultural, social and temporal settings.

Along with single language Stroop studies, cross-language, and in particular cross-orthographic Stroop studies have been used for a number of different research goals, ranging from exploring specific cognitive processes, such as Morikawa's (1981) hemispheric lateralization study, to promoting more general hypotheses, such as the idea that reading different types of scripts might activate different kinds of cognitive processes (e.g., Fang et al., 1981; Hung and Tzeng, 1981). Researchers using variations of the original Stroop test to study the cognitive processes of readers of different orthographies have studied:

- languages represented by logograms, such as Chinese,
- languages represented by the Roman alphabet, such as English and Spanish,
- languages represented by combinations of systems, such as Japanese, which uses both logograms [*kanji*] and phonetic symbols [*kana*],[2] and Korean, which uses logograms, a phonetic syllabary [*hangul*] and romanization.

One of the first Stroop studies to compare a language represented by logograms (Chinese) with a language represented by an alphabet (English) was by I. Biederman and Y. Tsao in 1979. In their study, the authors found that their Chinese subjects exhibited significantly greater Stroop interference in naming the color of incongruent color words than did native English speakers in an equivalent English version of the same test. The differences between the Chinese and English

speakers were unexpectedly large, in both the experimental and the control conditions. Biederman and Tsao speculated that their Chinese subjects had larger Stroop effects because "there may be some fundamental differences in the perceptual demands of reading Chinese and English which can have widespread implications for human information processing." Specifically, they suggested that because both the perception of color and the recognition of meaningful patterns (i.e., logograms) are processes attributed to the right cerebral hemisphere, the large Stroop effect exhibited by their Chinese subjects may have been due to competition for the same perceptual capacity.[3] (Generally, language processing is attributed to the left hemisphere.)

Although these explanations are provocative enough in themselves, Biederman and Tsao supposed further that Chinese readers may automatically activate configurational processing of logograms when reading, unlike readers of English who, according to Biederman and Tsao, automatically activate an abstract sound-to-grapheme rule system when reading. To support their hypothesis that there may be fundamentally different perceptual demands in the reading of languages represented by logograms and alphabets, Biederman and Tsao also cited a "widespread belief" that Chinese characters might provide more direct access to meaning than English words, quoting W.S. Wang's well known article on the Chinese language (1973): "To a Chinese the character for 'horse' means horse with no mediation through the sound 'ma.' The image is so vivid that one can almost sense an abstract figure galloping across the page."

Mǎ (Horse), simplified character

Biederman and Tsao finally supposed that their Chinese subjects exhibited such large Stroop effects in both experimental and control conditions because the predisposition of logographic readers toward visual imaging of printed information may be the "more natural."

Although subsequent researchers have acknowledged that Biederman and Tsao's hypotheses are intriguing, most are quick to point out the flaws in the study and to underscore that there is no support for a cognitive base to the claim that, for normal readers, the orthography used for Chinese languages provide more direct access to a meaning than does the orthography used to represent English. In the following sections, I discuss potential rival hypotheses to

Biederman and Tsao's conclusions by reviewing the study in the context of related research. I point out both the importance and the sometimes subtle nature of these rivals by specifically focusing on the selection of test materials, the bilingualism of subjects and issues of phonological recoding in reading.

Selection of Test Materials

Like many cross-orthographic researchers, Biederman and Tsao seem not to have controlled for the equivalence of their test stimuli across languages. An obvious lack of equivalence, for example, is in syllable length of words: two of the color words they choose are bi-syllabic in English ("yellow" and "purple") and monosyllabic in Chinese ("huang" and "zi"). Biederman and Tsao also claimed that the color words they selected, blue and green along with yellow and purple, have equal "focal" status in Chinese and English, a supposition for which they gave no evidence and which is questionable at best. Consider, for example, the cultural differences in the symbolism of "yellow": in China, yellow is the color of royalty; in American culture, yellow is more often asssociated with the idea of "cowardliness." Another example is that of the color "green": to Americans "green" is quickly associated with the notions either of "Earth" or perhaps of jealousy or money, while in China it is the symbolic color for youth. Arguments about the potential of rival hypotheses based on cultural factors could clearly be greatly extended here but these few examples are enough to point out here that these kinds of amorphous elements could effect the soundness of experimental results.

Another absence in the Biederman and Tsao study was the lack of control for the size of the test stimuli used in the experimental conditions. This variable should be mentioned at the very least, considering results of research in readability and document design that support the relationship between legibility of print and the ability of readers to comprehend text (Smith, 1979; Rehe, 1981). The essence of this research (which comes from investigations of human factors and document design rather than reading research) is that for some readers information printed in small type sizes is more taxing to read and is not remembered as easily or accurately as information printed in easily legible type. Putting issues of automatic word recognition in the background for a moment, in the case of these cross-orthographic studies one

could argue that it might take any reader a few milliseconds longer to recognize the traditional character for *lan* 'blue' (18 strokes) than to recognize "BLUE" or even to recognize the character for *hong* 'red' (9 strokes) (both shown to the right) than to recognize "RED."[4] In addition, using a variation of the original Stroop stimuli, Besner and Coltheart (1979) have shown that skilled readers of English use different mechanisms to read numbers and words and that these mechanisms seem to be affected by the physical size of presented stimuli, but only when the numbers are presented logographically (e.g., 1 1, 2 2), not alphabetically (e.g., one one, two two). Considering that there is evidence suggesting that subject responses to logographic stimuli in Stroop conditions may be affected by the size and legibility of the characters, the lack of mention of the size of test stimuli somewhat weakens Biederman and Tsao's conclusions.

Lan (Blue), 18 strokes, traditional character.

Hong (Red), 9 strokes, traditional character.

Many cross-orthographic researchers have avoided this weakening factor by at least attempting to control for equivalence in cross-language test materials (for examples see Chu-chang and Loritz, 1977; Fang et al., 1981; Chen and Ho, 1982; Zhang and Simon, 1985). Many of these subsequent studies include examples of the actual Chinese logograms used as stimuli and/or specify the size of the characters that were presented, thus avoiding possible rival hypotheses about legibility of complicated characters. In attempting to control for as many factors as possible to make test stimuli equivalent, researchers also began to acknowledge the difficulty in truly controlling for linguistic, semantic or other levels of equivalency; for example, even if a single character Chinese word appears to be monosyllabic, it is so only "in nature" because Chinese words have tone which either lengthens or shortens their articulation (Fang et al., 1981). Though variations in visual complexity, number of syllables and "focal status" of words in cross-orthographic Stroop studies may not have profound effects on results, controlling for them can reduce the potential for a study's results to be questioned on these grounds.

Bilingualism and Stroop Effects

Another deficiency in the Biederman and Tsao study is the lack of sufficient discussion of the bilingualism of their subjects. Biederman and Tsao briefly consider bilingualism as a possible explanation for the differences of the Stroop results

of their Chinese and English subjects, but rule it out by showing similarities between their results and data from other cross-language (but not cross-orthographic) Stroop studies (Preston and Lambert, 1969; Dyer, 1973), and by showing how various statistical analyses could smooth out the unusually large differences between the results of the Chinese and English subjects. Their explanations did not, however, touch upon a number of facets of bilingualism which, if considered, might show bilingualism as a significant cause of the unusually large Stroop effect exhibited by Chinese subjects.

For example, in their report Biederman and Tsao note only that their Chinese subjects were "native speakers of Chinese" from Taiwan; they do not specify that their subjects are all native speakers of Modern Standard Mandarin, the language in which the experiments were almost surely conducted. Although generally all Chinese students on the graduate level can speak and understand Modern Standard Mandarin, it is very likely that some of the subjects were native speakers of one of the several Taiwan topolects (e.g., Fujianhua) rather than Mandarin; Mandarin then would be the second language for these subjects, and English the third. Some part of the strong latency in the Chinese data may reflect interference between the subject's encoding of the experimental and control stimulus first in their native dialect and then transposing it into Mandarin, again certainly the requested language for the experimental response.

Hung and Tzeng (1981) commented on the lack of adequate attention to the issue of bilingualism in the Biederman and Tsao study, but say that the study should be replicated with a more general subject population. In a follow-up study to his 1981 paper on Stroop effects with Japanese readers, Morikawa (1987) explored reasons why Biederman and Tsao's Chinese subjects had such dramatic Stroop effects in both experimental and control conditions—but did so by testing a more specific rather than a more general subject popluation. Morikawa supposed that one possible reason the Biederman and Tsao bilinguals had such high interference measures might be because they were not in their native language environment. To test this idea, Morikawa conducted Stroop tests with Koreans reading alphabetic, syllabic or logographic representations of their language. Half the subjects were Korean university students in Korea, the oth-

ers were Korean students in Japan. When Morikawa found no significant difference between his two subject groups, he discounted the possibility that environment could be an influencing factor in the Biederman and Tsao results and took his investigation of that point no further.

In a related study of bilingualism, Fang et al. (1981) conducted modified Stroop color-naming tests with Chinese-English bilinguals in which the stimulus and response languages were either the same or different. Their purpose was to see whether bilinguals would exhibit as much Stroop effect if the written forms of the two languages they were switching between were orthographically similar (i.e., English and Spanish, both alphabetic) or different (i.e., English and Chinese, Chinese being logographic). Their results showed not only that subjects had greater within language interference than between language interference, but also that there was an inverse relationship between amount of interference and degree of similarity between orthography of the two languages. In other words, the findings of Fang and his colleagues showed that the more similar the orthographies of the two languages of a bilingual, the more interference he or she is likely to exhibit in processing incongruent color words. Fang and his colleagues did suggest that there may be fundamental differences in the processing mechanisms of languages represented by logographic and alphabetic orthographies, but their conclusions seemed considerably more constrained than Biederman and Tsao's and, therefore, more credible because they did not inflate their claims to suggest that one orthography may be "more natural" than another or may be capable of triggering specific kinds of cerebral processing.

Another aspect of bilingualism not addressed by Biederman and Tsao was taken up by Chen and Ho (1986) in their study of reverse Stroop effects. In their review of bilingual Stroop studies, Chen and Ho note that the longer subjects have been working in a second language environment, the less Stroop interference they exhibit with materials in their first language and the more interference they show with materials in the second language they are acquiring. If one inspects the Biederman and Tsao data, it seems quite possible that their subjects may have differed widely in their degrees of bilingualism not only because they specifically mention that their subjects were bilingual "to varying de-

grees" but also because there was a wide distribution of response times within their Chinese subject group, with only six of sixteen subjects equally distributed around the mean. Therefore, it seems possible that Biederman and Tsao's subjects may have differed so widely in their response times to Stroop stimuli due to different levels of adaptation to working with alphabetic language materials and/or individual differences in degree of proficiency in Mandarin Chinese. In studies across languages and orthographies, then, the language background and proficiency of subjects, slippery parameters themselves, may also be important, if not critical, factors to attempt to take into account.

Speech Recoding, Short-Term Memory (STM) and the Stroop Effect

Biederman and Tsao's interest was whether the "application of a system where the names were directly associated to the configuration of the stimuli, as in Chinese, would result in more Stroop interference than the application of an abstract sound-to-grapheme rule system," as exists for English. Prior to Biederman and Tsao's study, however, several researchers had already investigated the relationship of sound-to-grapheme in various orthographies and implications of those relationships to visual information processing (Chu-chang and Loritz, 1977; Erikson et al., 1977; Tzeng et al., 1977). These earlier investigations all explored speech or phonetic "recoding" in reading. Biederman and Tsao, however, touch upon the notion of speech recoding only as a rhetorical step in their argument that there may be fundamental differences in the perceptual demands of reading Chinese and English. They do not take up the issue of speech recoding nor the possibility that Chinese readers may rely—to some degree at least—on the recoding of print information into sound en route to meaning. The acknowledgement of this possibility may have led Biederman and Tsao to reconsider their hypothesis.

When Biederman and Tsao wrote their 1979 article, the investigations of speech recoding by cross-language researchers had yielded some strong evidence that was counter to their argument of the primacy of visual encoding in the processing of logographic characters. For example, independent studies with native readers of Japanese (Erikson et al., 1977), Chinese and Spanish bilinguals (Chu-chang and Loritz, 1977), and Chinese alone (Tzeng et al., 1977) to-

gether provided strong evidence that proficient readers of these orthographies use phonetic mediation in reading, though the readers' awareness of their use of phonetic recoding differed. These studies all tested subjects' recall of homophonic and non-homophonic words, finding that subjects recalled non-homophonic words better than homophonic sets of words regardless of orthography, indicating that sound as well as sight may play a part in storing the word sets in memory of written language.

Specifically, these studies linked phonetic activity in reading to the functioning of short term or "working" memory (STM). For example, Erikson and his colleagues (1977) theorized that readers use a phonetic storage in STM to hold information while other linguistic processes are going on. This phonetic "buffer" or "workspace" in memory may be necessary as a place "in which a representation of a sentence can be stored and updated during the course of linguistic processing" (page 394). Chu-chang and Loritz (1977) proposed a two-stage model of reading proficiency, suggesting that at earlier stages of learning to read, STM representation of written material is primarily visual, while at more developed stages STM for written material becomes primarily phonological. On the other hand, Tzeng and his colleagues (1977) cautioned against exaggerated interpretations of cross-orthographic data supporting theories of phonological recoding in reading, pointing out that phonological recoding may be just one of several strategies readers may use to access the meaning of a linguistic symbol and that other factors such as difficulty of material and reader purpose may effect a reader's reliance on phonemic recoding. Yet, at the same time, Tzeng and his colleagues also suggest that the data from experiments may indicate similarity rather than difference in the visual processing of Chinese characters and English words and that "both processes involve phonetic recoding of visually presented symbols" (page 626).

In additional to the studies mentioned above, a more recent study by Zhang and Simon (1985) supports the role of phonetic recoding in working memory. In a series designed to reconcile two competing hypotheses about the capacity of STM, Zhang and Simon used homophonic and non-homophonic Chinese radicals and characters to test STM span. Their results showed both that Chinese readers made a

substantial number of homophone errors in recall of stimuli (that is, their memory of logographic stimuli was phonetically correct but graphemically incorrect) and that the STM span for unnamed radicals and homophonic characters was about half of that for characters and radicals with distinct names. Their conclusion, similar to those of the authors mentioned above, is that STM utilizes both acoustic and non-acoustic encodings. Zhang and Simon (1985) remark: "These results with Chinese language materials are especially interesting because it has often been claimed that Chinese readers, unlike readers of alphabetic languages, encode the ideographic characters directly from visual to semantic without going through an intermediary acoustic encoding. The high rate of homophonic intrusion in Experiment 1 and the low measured span of nonacoustic STM make this claim dubious. It would appear that the oral language is an essential intermediary in the extraction of meaning from both kinds of texts." In light of the research that had already been done concerning the issue of speech recoding in the reading of Chinese characters, the lack of citations of these works by Biederman and Tsao underscores the complexity of research into psycholinguistic aspects of reading processes and the need for active collaboration between authors among divergent, yet critically overlapping, fields of inquiry.

In all, it seems clear that Biederman and Tsao did not adequately address a number of important variables that undermine both their findings and their ideas about the "widespread implications" of their data. On the other hand, other studies[5] support Biederman and Tsao's notion that there are some differences on some level between readers' abilities to perceive visual and verbal information. Perhaps the best way to reconcile the disparate mixture of data indicated by these studies is to investigate more vigorously the possible models for how meaning of written information might be mediated through a combination of visual and acoustical routes. At the same time, it is unfortunate that more cross-orthographic Stroop research has not emphasized the quest for the locus of Stroop interference, for such evidence could address the question of whether the differences in Stroop effects shown by readers of logographic and alphabetic orthographies are due to fundamental differences in human information processing mechanisms or to differences in the learned patterns of attention to features of language by readers. If the latter is indeed the case, it could in turn lead

to further work, initially to capture and describe how first language perception and production might affect the learning of reading and writing skills in second languages, and then to develop teaching methods that incorporate an understanding of those differences in the teaching of second languages, particularly when the languages are represented by different orthographies. Whatever the goal of the research across languages and cultures, however, rival hypotheses in studies such as those reviewed here emphasize the necessity for investigators to consider the social and cultural factors that lie on the trail to understanding language and cognition.

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Endnotes

1 If this paper has been duplicated, the two examples above that should be printed in red ink, the first "BLUE" and the square color patch, may not have been duplicated in color.

2 Written Japanese is increasingly incorporating alphabetic symbols in daily use, but far from the extent that it is a necessity for literacy. For more information on this topic, see Saint-Jacques, 1987.

3 For evidence of this, Biederman and Tsao primarily cite studies of Japanese aphasics, e.g., Sasanuma, 1975, 1977.

4 This argument is also made by Unger (1987) in his text exploring relationships between artificial intelligence, the Japanese writing system and the development of computer technologies. Readers should also note that stroke count is only one way of "measuring" the visual complexity of these kinds of logographic characters. The frequency of part or the whole of the character, for example, may also effect visual recognition time.

5 For example, see Paradis, Hagiwara and Hildebrandt's text (1985) on neurolinguistic aspects of the Japanese writing system.

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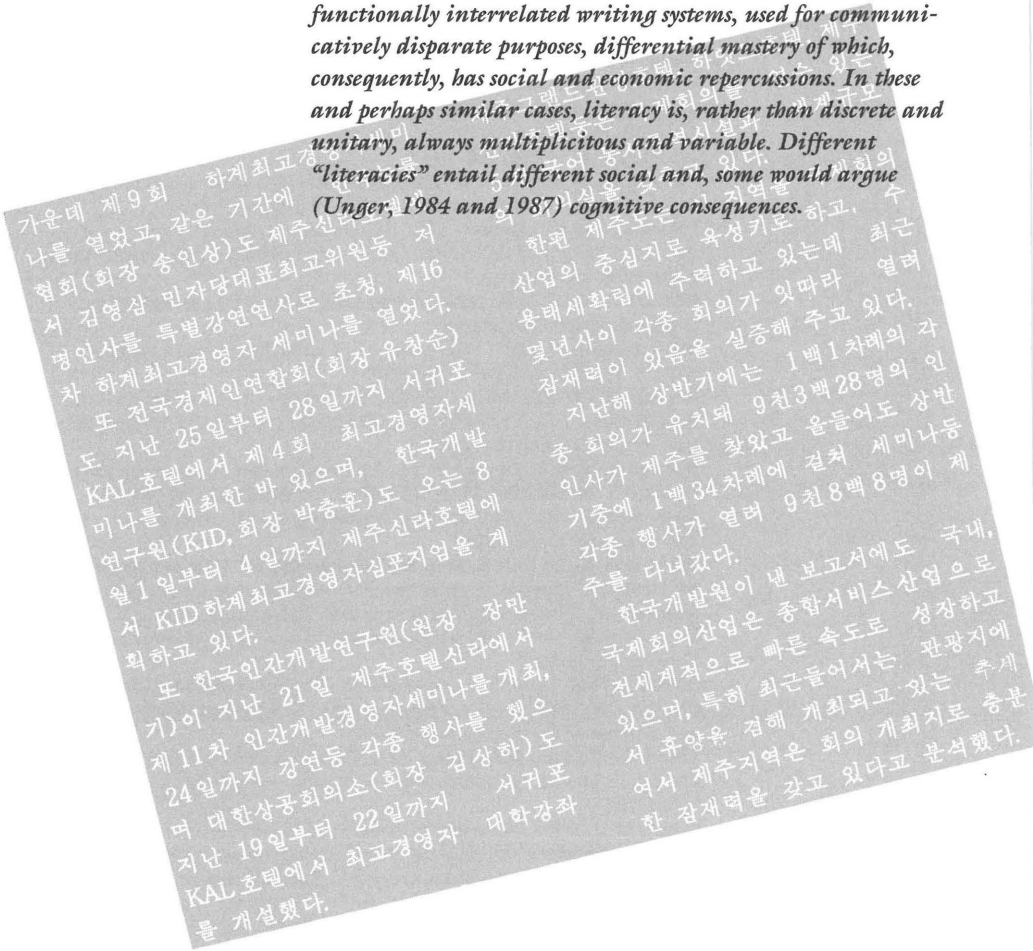
Abstract

Literacy studies within both "autonomous" and "ideological" traditions, to use Street's (1984) terminology, have tended to focus on Western alphabet using societies and assume that literacy, however defined, is an all or nothing matter. Societies in which varieties and degrees of literacy are possible (indeed ordinary) have hitherto largely been ignored. Japan and South Korea are such cases, with separate but functionally interrelated writing systems, used for communicatively disparate purposes, differential mastery of which, consequently, has social and economic repercussions. In these and perhaps similar cases, literacy is, rather than discrete and unitary, always multiplicitous and variable. Different "literacies" entail different social and, some would argue (Unger, 1984 and 1987) cognitive consequences.



Literacy Assessments in Polyscriptal Societies: Chinese Character Literacy in Korea and Japan

R.A. Brown

Higher levels of literacy are generally thought to be, if not prerequisites to national development, at least positively correlated with it. Since national development is assumed to be a good thing, many people, it appears, deduce from this that literacy qua literacy is invariably and necessarily good, and therefore that more literacy is better than less. High literacy levels become, in and of themselves, objects of national pride and sources of national prestige.[1]

Japan, for example, is frequently praised for its ninety-nine percent literacy rate, which, if accurate, is indeed impressive, given the notoriously labyrinthine writing system used in that country. Not wishing to be outdone by their archnemeses, Koreans are increasingly claiming that they too, have equally, or almost equally, impressive levels of literacy.

The problem is that there are no reliable figures on literacy levels in either Japan or Korea. The ninety-nine percent literacy figure so often and guilelessly quoted (see for example Vogel, 1979:161) is provided by the Japanese Ministry of Education and represents nothing more than elementary school enrollments. But being enrolled in an elementary school is not the same as learning 1,500 to 3,200 *kanji*. The Ministry assumes that all who are enrolled will eventually go on to learn what they are supposed to. This, as Rohlen (1983) shows, does not always happen.

It is highly improbable that elementary school enrollments can serve as a valid measure of literacy in Japan. Incipient acquisition of literacy (literacy being defined minimally as the ability to read a newspaper with comprehension) begins at that time but is not complete until at least the ninth, but more probably, the twelveth grade (see below). Equating elementary school enrollment with literacy presupposes that: those who are enrolled actually attend, those who attend actually learn what they are taught and those who learn what they are taught retain what they have learned. It is far from obvious

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Visible Language, 25:1
R.A. Brown, pp. 18-39

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that all three conditions are met in fact, as DeFrancis, (1984:217) points out.

Korean literacy rates are frequently cited as ninety-eight percent *Korea Herald* (April 26, 1988); *Time* magazine (August, 1988); Yearn (1987:325); or even higher (Choi, 1989). These, following the Japanese example, probably also represent elementary school (*kukminhakyo*) enrollments (at best; however, the three concerned departments within the Korean Ministry of Education (*Daehakhaegongkwa, Changhakshil* and *Chundungkyoyukkwa*) all deny having any information on the subject (personal correspondence, June 13, 1989).

However, even if those levels could be reliably ascertained, little could be inferred from them because both literacy (what skills are required in order to be, or to be called, literate) and (what might be termed) "metaliteracy" (what one can do with those skills) are very different in Japan and Korea. "Korean literacy," however defined, is incommensurable with anything found in Japan, because, *inter alia,* the Korean and Japanese orthographic systems, though superficially similar, are used in very different ways.[2] Comparison are consequentally nugatory.

It should be noted that the notion of literacy itself (the ability to read and write) as commonly used in relation to Korean and especially Japanese, is unclear since "reading" and "writing" involve different kinds of skills and levels of capability in those countries, where "knowing" a character is a matter of degree. Writing a character (being able to reproduce it manually), pronouncing it, knowing the "meaning" it is likely to contribute to a novel word-formation and knowing the actual words it is in fact used to write, are different and independent abilities.

The concept of literacy is especially nebulous in Japan, where two distinct but intertwined writing systems are concomitantly used, actually two coextensive but functionally differentiated scripts, i.e., *hiragana* and *katakana*[3] (Backhouse, 1984; Miller, 1967), along with morphosyllabic *kanji* (DeFrancis, 1984). One may be "literate" in one, two or all three scripts. One may be able to read and write, or merely read. In the case of *kanji*, where characters generally represent several morphemes, one may be familiar with all or merely some of them. Indeed, the Education Ministry counts as literate anyone who is able to handle in the most minimal sense any of the three

scripts[4] (Sakamoto and Makita, 1973:444). Since virtually nothing is written in just one script, one could, by government criteria at least, be "literate," yet be able to read almost nothing.

Measuring Korean literacy is considerably less problematic,[5] primarily because *hanja* (Chinese characters) are no longer extensively used in mass communication print media. Moreover, even when they are used, they are used in a less integrated ("mixed"), and more consistent, hence more predictable fashion: only nouns are written in *hanja*, and nouns of a limited sort, under certain conditions; with few exceptions, each graph has exactly one pronunciation (see Kim[a], 1987:334-6; Kim [b], 1987:334-5; Grant, 1982:338 for lists of these exceptions). *Hanja* and *hangul* are not combined within the same lexical unit, as *kanji* and *kana* are in Japanese, to distinguish different words. In contrast, Japanese *kanji* are used to write most verb and adjective stems, most nouns and many adverbs. In addition, most *kanji* have multiple pronunciations and meanings, many of them completely arbitrary (Horodeck, 1987:81; Paradis et al, 1984:1-18). (Sixty percent of the *jooyoo kanji* have both Sino-Japanese and native Japanese readings; thirty-eight percent have monosyllabic Chinese based *on*-readings only; two percent have native Japanese *kun*-readings only: see Backhouse, 1984:223.) Unlike Japanese *kanji*, individual *hanja* do not represent different morphemes.

Uses of Literacy

In Japan, reading material and documents of the most mundane sort, such as bank books, rail pass applications, registration forms (of which there are many), menus, racing forms, scandal sheets, flyers promoting illicit services, comic books, sports news, movie subtitles, not to mention magazines and newspapers (see figures 1, 3, 5 and 7), all contain *kanji*, varying only, across vocabulary items, by the estimated age of the target readership. All presuppose a recognition knowledge of, if not the 1,945 *jooyoo* and 166 supplemental "name" *kanji*, much less the 3,213 that actually occur in print (Horodeck, 1987:76), at least 1,500 of them (which suffice to read almost anything that will ever appear in Japanese print). With the exception of telegrams, no variety of text is systematically written in other than the normal *kanji kanamajiribun* style, with *kanji, hirgana* and *katakana* each performing their usual grammatical and lexical function (see Backhouse, 1984:219-228 for a brief introduction).

明治牛乳浜松販売所 …… 44-1878 浜松11
明治牛乳藤沢銀座販売所 …… 22-2340 藤沢1026
明治牛乳藤沢販売所 …… 22-5166 藤沢633
明治牛乳藤沢本町販売店 …… 25-0781 藤沢神明5-6-3
明治牛乳六会販売所 …… 81-0580 鳥井野1853
明治ヤム寮行団地店 …… 81-2265 寮行2-25-19
森永牛乳横浜南販売店 …… 36-6014 横浜南区1-1-13
森永牛乳湘南支店所長宅 … 48-1221 茅ヶ崎2992
森永牛乳寮行駅前販売所 … 81-2180 藤沢4173
森永牛乳寮行駅前販売所 … 81-7952 寮行1-25-13
森永牛乳大船販売店 …… 26-5150 大船1-3-27
森永牛乳長後販売所 …… 44-0054 高倉550
森永牛乳辻堂第二販売店 … 33-2328 辻堂新町1-9
森永牛乳藤沢販売店 …… 25-5150 本1-3-38
雪印牛乳飯島販売所 …… 36-7308 横浜飯島町2-5-6
雪印牛乳辻堂販売店 …… 87-1800 辻堂1348
雪印牛乳湘南台販売所 … 36-0955 羽鳥5-4-6
雪印牛乳橋通販売所 …… 22-3148 藤沢橋1-15-2
雪印牛乳長後販売所 …… 44-2004 下土棚463-3
雪印牛乳辻堂仲町販売所 … 36-3687 辻堂1459
雪印牛乳販売所 …… 内 26-3701 本1-5
雪印牛乳藤沢販売所 …… 22-7560 藤沢桐原町2-1-35
吉田牛乳店 …… 36-5966 辻堂東風町2-2-18
和田牛乳店 …… 22-5415 片瀬3-14-46

▶ 三浦市(0468) ◀

神奈川ベンディング㈱ … 82-4388 小網代594
三浦海岸店 …… 88-4153 上宮田3259
草間郷 …… 86-1450 松輪288
新倉牛乳店 …… 88-0501 上宮田1178
名間牛乳三崎販売所 …… 81-4086 関533
明治牛乳上宮販売所 …… 81-6352 六合94
森永牛乳下宮田販売店 … 88-1814 下宮田46
山森商運 …… 88-0342 上宮田3500
雪印牛乳油壺販売所 …… 82-3520 諸磯1422
雪印山戸牛乳店 …… 88-3764 和田2735
吉田牛乳店 …… 81-3240 諸磯1118

▶ 横須賀市(0468) ◀

荒井牛乳店㈱ …… 48-5663 野比250
井出四郎 …… 36-3758 大津2-27
井出牧場 …… 41-0518 浦賀7-29
飯島牛乳店 …… 22-2751 若松1-12
飯島敬司 …… 内 48-0108 深入弁83
石島牛乳店 …… 41-7131 二葉1-8-11
岩崎福次 …… 56-3419 長坂2-8-15
上野商事㈱ …… 41-0796 浦賀1-22
鬼沢牛乳店 …… 51-1389 池上3-1-2
榎ケ谷牛乳店 …… 51-0377 友呂岐1-63
春日牛乳店 …… 65-5719 浦賀1-49
神奈川デイリー㈱ …… 51-0020 公郷4-1-13
川尻牛乳店 …… 36-8614 大津3-16
久木雪印牛乳店 …… 36-1667 逸見1-11-6
黒田牛乳店 …… 51-0595 池上4-1-30
小林牛乳店 …… 48-1833 野比501
後藤九平 …… 22-5113 西逸見1-7
後藤牛乳店 …… 51-2185 公郷1-32-10
込山敬三 …… 61-3765 田浦3-6
近藤牛乳横須賀営業所 … 22-3174 富士見2-78
佐久間牛乳店 …… 36-3710 大津4-37
沢登牛乳店 …… 61-4214 船越5-75
新藤牛乳店 …… 22-2854 上3-33
新藤忠利 …… 22-2725 坂本2-47
須田牛乳店 …… 48-4827 ハイランド4-26-17
鈴木牛乳店 …… 23-0173 吉倉1-34
全酪牛乳横浜販売センター 内 65-5474 浦賀5-2931
高梨牛乳
上町直売店 …… 22-2854 上3-33
逸見直売店 …… 65-5719 浦賀1-49
江林直売店 …… 65-0161 追浜南3-3
下浦直売店 …… 48-2334 長沢2140
下町直売店 …… 23-1027 本小森町2-5
武山直売店 …… 56-0997 太田和1-1-9
堀内内直売店 …… 36-4177 鷹取3-14-28
逸見直売店 …… 22-5113 西逸見1-7
高梨販売㈱横須賀営業所 内 34-4511 大津3-19
常見牛乳店 …… 51-5077 平作4-6-3
常見保仁 …… 51-5077 平作4-6-3
常見雪印牛乳店 …… 51-1885 平作4-6-3
中西牛乳店 …… 22-3520 若松2-22
中村牛乳店 …… 56-8306 秋谷1-20-4
永井牛乳店 …… 22-5886 東逸見2-23
野北英夫 …… 22-5084 上4-76
又泉定巳 …… 36-5785 長坂4-34-2
三ツ堀三郎 …… 22-2588 上2-3
横川牛乳店 …… 61-3293 船越3-47
[illegible] …… 36-4177 鷹取1-14-28

飯塚牛乳店 …… 75-0479 東戸398
飯塚智久 …… 75-2062 神田957
前田牛乳店 …… 75-0974 一之江1372
名間牛乳寒川販売所 … 75-0292 宮山413
森永牛乳寒川町販売店 … 75-0974 一之江1372
雪印乳業寒川販売所 …… 75-2062 神田957

▶ 葛山町(0468) ◀

石井清高 …… 78-7121 上山口2527
鈴木喜一郎 …… 75-1108 一色1818
鈴木牛乳店 …… 75-1108 一色1818
長谷川福一 …… 75-1031 堀内1235
名間牛乳葛山販売所 …… 75-1031 堀内1235
明治牛乳一色販売所 …… 75-1108 一色1818
明治牛乳葛山販売所 …… 75-0460 堀内988
森永牛乳上山口販売店 … 78-7121 上山口2527
雪印牛乳葛山特約店 …… 75-0645 堀内910

牛馬販売

⇒「家畜商」(180 ページ)をごらんください。

許認可申請手続

⇒「行政書士」(274 ページ)をごらんください。

魚貝類

⇒「鮮魚店」(578 ページ)をごらんください。

魚群探知機

⇒「電子応用装置」(669 ページ)をごらんください。

漁業

▶ 鎌倉市(0467) ◀

池利丸 …… 31-4043 津越2-12
池寅丸 …… 31-3890 夏越2-16
助浜丸 …… 31-6297 夏越1-4
源金丸 …… 31-4672 夏越1-4
源三郎 …… 23-2821 坂ノ下3
平澤丸 …… 32-1091 夏越2-24
細井廣雄 …… 31-6687 夏越2-7
三浦和男 …… 22-6138 坂ノ下15
森進丸 …… 32-2126 夏越2-25
森下丸 …… 32-6362 夏越2-25
和神丸 …… 23-0106 坂ノ下24-19

▶ 逗子市(0468) ◀

谷鶴水産 …… (0467) 25-0254 小坪5-6
実丸 …… (0467) 23-2114 小坪4-19

▶ 茅ヶ崎市(0467) ◀

青柳繁雄 …… 82-0929 汐見台4
加藤明 …… 82-8289 萩園6-3
加藤忠右エ門 …… 82-6496 萩園5-8
兼調地びき網 …… 82-8289 萩園6-3
北村作蔵 …… 82-1755 鶴嶋屋敷12
富田春雄 …… 82-3043 共恵1-15
富政商店 …… 82-3043 共恵1-15
新網 …… 51-5581 小和田1-13
忠右エ門丸 …… 82-6496 萩園5-8
仁井網 …… 51-7611 小坪8
新倉善吉 …… 51-5581 小和田1-13
西網 …… 52-7568 小坪4
浪網 …… 82-0929 汐見台4
和助丸 …… 83-2509 萩園6-2

▶ 藤沢市(0466) ◀

秋岡正三郎 …… 23-2102 江の島1-1-17
甘粕惠義 …… 23-1716 片瀬1-1-13
江ノ島片瀬漁協 …… 22-4671 片瀬海岸2-20-25
片野昌吉 …… 23-2046 江の島2-1-15
[illegible] …… 23-8158 江の島2-1-12

市外局番は市

Figure 1.
Page from the Tokyo telephone directory. Every listing is comprised of Chinese characters (*kanji*).

Figure 2.
Page from the Seoul telephone directory. No listing comprises Chinese characters (*hanja*).

Figure 3.
Japanese pay statement. With the exception of two words ("code" and the name of the company which has been eliminated), every word is written with *kanji.* No word is written in *kana,* and only one *kana* actually appears.

所属（06）　人名コード（514）

殿

振込銀行名 第一勧業　虎ノ門

銀行口座No.　　）

出勤日数	17 日	時間外勤務時間	H
欠勤日数	日	休日出勤時間	H
有休消化日数	日	深夜勤務時間	H
有休残日数	日	時間割時間	H
特休日数	日	労働時間	H
		遅刻早退	2.50 H

給与支払明細書

61年 1月分 1/25 日支給　　社名 (株)

支給

	基本給	職能手当	役職手当	調整手当	手当	手当	手当	手当	手当
250000	250000	100000							
手当	欠遅早手当	時間外手当	休日出勤手当	深夜勤務手当	時間割手当	通勤手当		精算額	支給合計
	-5647					3697			348050 344353

控除

健康保険	厚生年金	雇用保険	通勤費非課税	課税対象額	所得税	住民税	財形控除	持株会控除	協害保控除
			3697	344353	27520				
生命保控除	米保険控除	返済1控除	返済2控除	返済3控除	控除	控除		精算額	控除合計
									27520

時間単価　2,259 円

時間外単価　2,823 円

金種内訳	万	五千	千	五百	百	五十	十	五	一

前月端数控除	当月端数加算	差引支給額
		320530

Figure 5.
Japanese saving account passbook. *Kanji* are copiously used, in the normal mixed fashion.

定期預金記帳方法のご案内

この通帳への記帳は次により行ないます。おわかりにくい点は当店窓口へご照会ください。

・この通帳にお預りした定期預金には、それぞれ「お預り番号」を表示して記帳します。
お支払いのさいは、その預金の「お預り番号」を表示して記帳します。

・ご継続の場合は、ご継続前の定期預金の「お預り番号」を引続き表示してご継続後の定期預金のみを記帳します。

・2年定期預金の中間払利息で作成する中間利息定期預金は、もとの2年定期預金と同じ「お預り番号」を表示して記帳します。

・2年定期預金と中間利息定期預金を自動的にご継続する場合は、それぞれのお利息を含めた合計金額により記帳します。
また、両方の定期預金を同時にお支払いする場合は、元金の合計金額により記帳します。

・ご継続(お支払い)の場合、ご継続前(お支払前)の定期預金には、ご継続済(お支払済)の表示は行ないません。

Figure 4.
Korean pay statement.
Every word is written in
hangul. No *hanja* are used.

※급 호: 조교수 A 13-2

※입금계좌번호 : 1990. 7

지급내역	급여	직위급여	직무수당	초과강의료	연구비
	409950	74500	0	0	795400
	급량비				계
	50000	0			1329850
	정근수당( )%	상여			총계
		484450			1814300

공제내역	갑근세	재형출연금	주민세	방위세	교직원회비
	67230	0	5040	6720	2000
	교원공제회	연금	공제금	기념금	의료보험
	0	43270	93480	0	14120
	재형저축	노조사무비		공제액계	차인지급액
	0	0		231860	1582440

Figure 6.
Korean saving account
passbook. No *hanja* are used.

자 유 저 축 예 금 약 관

1. 예금을 하실 때나 찾으실 때에는 그 금액을 통장에 기입하겠으니 이 통장을 반드시 지참하여 주십시오.
2. 예금은 현금 이외에 당행이 인정하는 수표·어음으로도 예입하실 수 있읍니다. 이 예금은 현금으로 바꾸어진 후에 지급에 응하겠으며 만일 부도될 때에는 그 예금은 취소하겠읍니다.
3. 예금을 찾으실 때에는 당행이 제정한 청구서에 금액 년월일을 명기하시고 기명 날인하여 통장과 같이 제출하여 주시면 청구액을 통장에 기입하고 통장을 지참하신 분에게 청구금액을 지급하겠읍니다. 위 절차에 의하여 지급된 금액이 훗날 인감의 도용 그외 어떠한 사고가 발견되어도 당행은 그 책임을 지지 아니합니다.
4. 이 통장 또는 계출하신 인장을 분실하신 때 또는 개명·개인·주소 변경을 하셨을 때에는 신속히 당행에 통지하여 주십시오. 신고하시기 전에 발생한 손해에 대하여는 당행은 책임을 지지 아니 합니다.
5. 이자는 매년 4회 당행소정의 이율을 적용하여 선입선출 방식에 의거 계산합니다.
6. 이 예금은 실명의 1인 1계좌에 한하여 허용하며 중복계좌로 판명되었을 때는 최초 개설계좌를 제외한 나머지 계좌는 보통예금으로 처리됩니다.
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8. 이 예금은 매매·양도·질권의 대상으로 할 수 없읍니다.
9. 온라인으로 타점에서 무통장 입금시킨 수표나 어음등이 부도되었을 때에는 무통장입금표 소지인에게 부도실물을 반환하고 해당예금을 취소하겠읍니다.

韓国人は今こう考える 「総体的難局」の原因はどこに(1)

今週から好評であった「韓国人は今こう考える」の連載を再開する。この連載は韓国の新聞に掲載された世論調査の結果を新聞の解説記事そのままに翻訳して紹介していこうというものである。

激動する韓国の中で韓国の人びとが今、何をどう考えているかを見ていただきたい。

今回は『東亜日報』五月八日付けに掲載された世論調査（済州島を除く全国一六〇〇名の電話アンケート）の結果を紹介する。

民自党の発足後も不動産の暴騰、労使紛争の頻発と盧泰愚政権にはいいところはまったくなかった。その前日に行なわれた「時局収拾の特別談話」で盧泰愚大統領はその事態を「総体的難局」と表現せざるをえなかったほどである。

詳しくは今後の調査結果を見ていただきたいが、盧泰愚大統領が「とてもよくやっている」とみる人はわずか一%、つまり百人に一人でしかなく、「よくやっている方だ」という人を加えても九%に満たない。

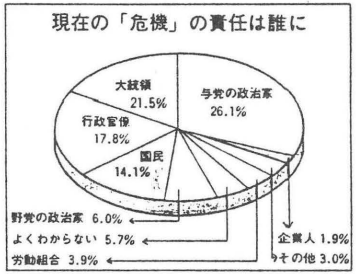
また、与野党三党が連合して「民自党」を発足させ、国会の議席も三分の二以上を占めるにいたっているにもかかわらず、その支持率がわずか一三・九%でしかなく、野党の平民党、あるいは党首の去った仮称・民主党のそれぞれよりも低い数字という何とも惨憺たる結果となった。

こうしたことは発足早々、与党である民自党が大きな壁に直面していることを伺わせるが、だからといってそうした野党勢力の支持率もけっして高くはなく、人びとは「総体的危機」の中で頼るべき物（者）のない極めて不安な状況に置かれているようである。

以下の文章は例によって『東亜日報』の解説記事をできる限り直訳した。（編集部）

●総体的難局の責任は誰に

今回の世論調査ではまず韓国がいわゆる「総体的難局」に直面するようになったその責任が主に誰にあるかという質問をしてみた。その回答をみると年齢が高くなればなるほど「大統領」（五〇代は二八・四%、二〇代が二〇・〇%）の責任を多く指摘している。



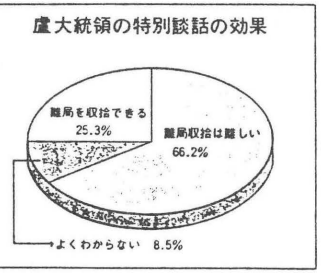
その一方、若い層であればあるほど「与党の政治家」（二〇代が三一・六%、五〇代が一四・八%）にその責任があると答えている。

●大統領特別談話の効果はあるか

また盧泰愚大統領の時局収拾特別談話（五月七日）の発表後、それでいわゆる「総体的難局」と指摘された国家の危機的状況がうまく収拾されるであろうかということについては若い層であればあるほど否定的な反応が多かった（二〇代が七四・一%、三〇代が六九・〇%、四〇代が五九・七%、五〇代が四八・七%）。

一般的に既得権層ということのできる経営管理専門職の従事者までも一〇名中の七名以上がやはり時局収拾は難しいと答えており（七三・四%）、その難局の収拾が非常に困難であると分析している。

このような難局に対処するためには「政府が強力に法を執行しなければならない」という意見がもっとも多かった（四一・二%）が、これは政府の民生治安体制の確立、法の厳正な執行を望む国民の声であるとみることができよう。



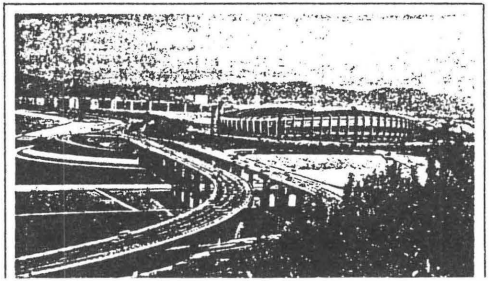


Figure 7.
Typical magazine style
Japanese newspaper (kanji
throughout).

No. 87/830 Approved as Third Class Mater (ga) on March 4, 1989 Weekly *Korea Panorama* (코리아 파노라마) July 30~August 5, 1990 7

濟州, 会議-세미나 開催地로 각광

올들어 전국규모이상 각종회의 134차례

제주지역에서는 피서철을 맞아 전국 규모의 회의, 세미나등 각종 행사가 잇따라 열려 국내와 국제회의 개최지로서 밝은 전망을 보여주고 있다.

관련업계에 따르면 최근 몇년사이 이지역에서 각종 국내외회의가 계속 열려 회의 개최지로서의 잠재력을 발휘하고 있다는 것이다.

7월들어 이지역에서 계획되고 있거나 이미 개최된 전국 규모 이상의 회의를 보면 한국공업표준협회(회장 김선홍)가 지난 24일부터 27일까지 서귀포 프린스호텔에서 조순 전부총리, 박용도 공업진흥청장등이 참석한 가운데 제9회 하계최고경영자세미나를 열었고, 같은 기간에 한국능률협회(회장 송인상)도 제주신라호텔에서 김영삼 민자당대표최고위원등 저명인사를 특별강연연사로 초청, 제16차 하계최고경영자 세미나를 열었다.

또 전국경제인연합회(회장 유창순)도 지난 25일부터 28일까지 서귀포 KAL호텔에서 제4회 최고경영자세미나를 개최한 바 있으며, 한국개발연구원(KID, 회장 박충훈)도 오는 8월1일부터 4일까지 제주신라호텔에서 KID하계최고경영자심포지엄을 계획하고 있다.

또 한국인간개발연구원(원장 장만기)이 지난 21일 제주호텔신라에서 제11차 인간개발경영자세미나를 개최, 24일까지 강연등 각종 행사를 했으며 대한상공회의소(회장 김상하)도 지난 19일부터 22일까지 서귀포 휴양지로 각광을 받고 있는데다 회의시설도 훌륭해 전국 규모나 국제회의를 치르는데 불편이 없기 때문이다.

제주도내에는 현재 30개 관광숙박업소 가운데 25개소가 각종 회의를 열수 있는 큰 회의실을 갖추고 있고 제주그랜드관광호텔, 하얏트호텔, 제주신라호텔등은 국제회의를 열수 있는 5개 국어 동시통역시설과 세계규모의 회의실을 갖추고 있다.

한편 제주도는 이 지역을 국제회의 산업의 중심지로 육성키로 하고, 수용태세확립에 주력하고 있는데 최근 몇년사이 각종 회의가 잇따라 열려 잠재력이 있음을 실증해 주고 있다.

지난해 상반기에는 1백1차례의 각종 회의가 유치돼 9천3백28명의 인사가 제주를 찾았고 올들어도 상반기중에 1백34차례에 걸쳐 세미나등 각종 행사가 열려 9천8백8명이 제주를 다녀갔다.

한국개발원이 낸 보고서에도 국내, 국제회의산업은 종합서비스산업으로 전세계적으로 빠른 속도로 성장하고 있으며, 특히 최근들어서는 관광지에 [illegible]

NEWS FLASH

◇한국관광공사는 지난 24일 상오 11시 16층 소회의실에서 미주지역 취급여행사와 특급호텔 관계자들이참석한 가운데 업계간담회를 개최.

한편 관광공사는 지난 21일부터 24일까지 미국 뉴올리언스에서 개최된 '90세계국제회의협회(IACVB) 연차총회에도 참가한데 이어 7.28~8.6일까지 하와이 호놀룰루에서 열리는 하와이 한국특산품전에 부스를 설치하고 한국관광을 홍보.

◇대한항공은 사할린에 전세기를 운항, 지난 26일 상오 10시 사할린동포 위문단등 60여명을 태우고 김포를 출발, 소련 유즈노 사할린스크공항에 하오 3시30분 도착.

이 공연단은 사할린에 머물며 위문공연을 한후 다시 전세기편을 이용해 8월1일 7시 서울로 돌아온다.

◇제주新羅가 신혼부부들을 대상으로 허니문 패키지프로그램을 개발 오는 8월21일부터 내년 3월까지 판매.

사파이어, 에메랄드, 루비, 다이아몬드A, 다이아몬드B등 5종류의 허니문패키지는 각각 아침이나 저녁식사를 포함하고 있으며, 1박2일에 10만8천원부터 3박4일까지 최고 68만5천원으로 다양한데, 그급승용차서비스, 샴페인 및 와인 무료서비스등이 따른다.

◇미국의 3大항공사인 아메리칸, 유나이티드, 델타 항공사가 89년도 미국 항공여객의 43%를 수송..

이들 3대사는 2000년대까지 미국 전체여객의 50%까지 수송할 것으로 항공업계에서는 전망하고 있는데, 그것은 현재 미국 전체항공사들이 새로 주문한 2천1백51대의 최신 제트여객기의 60%가 이들 3사에서 차지하고 있기 때문.

◇中国 水中오락공원이 8월2일 북경북동부 교외에 오픈된다고.

중국 최초의 이 수중 용궁은 길이 1백48m, 폭 11m, 높이 6.5m의 터널과 약 2천㎡의 궁으로 돼있다는 것.

따라서 이 수중공원은 중국인은 물론 외국인관광객의 주요 관광지가 될 것이라고 중국정부는 보고 있다고.

台湾, 対外항공연계망 확충강화

2년내 国際航空社 4개사로 늘려

(台北 CNA=聯合) 대만 정부가 최근들어 보다 융통성있는 항공정책을 추진, 많은 나라들과의 항공연계망을 확충하는데 적극적으로 나섬에 따라 앞으로 수년뒤에는 대만의 하늘이 지금보다도 더욱 복잡해질 것으로 전망

이처럼 대폭적인 노선 확장이 가시화되고 있는 것은 대만 정부가 현재 항공협정을 맺고 있는 국가들과 상호간에 복수의 항공사를 취항할 수 있도록 허용하는 방향으로 협정을 대체하려는 노력을 강화하고 있는 때무o

Figure 8.
Typical magazine style Korean newspaper (*hanja* only in headings).

<—— top

Kana alone may be used when the intended readers are too young to have learned the *kanji* that would ordinarily be used. For example, in some train stations there are signs saying *yameyoo senro asobi* (don't play on the tracks), with all characters written in *hiragana* (i.e., やめようせんろあそび). Normally, this would be written using four *kanji*, with *kana* for the suffixes, since the character for *aso-bi* (i.e., 遊び) is taught in the third grade, the characters for *senro* (i.e., 線 and 路) in the fourth grade. Thus, anyone who has made it that far will know, or at least be expected to know, these characters. Yet the sign is written entirely in *hiragana*. Apparently, the railway authorities feel that those who are most likely to be tempted to play on train tracks are just those people who, by reason of youth, have not yet made it past the third grade.

Nevertheless, children are introduced to *kanji* as soon as they are able to read *hiragana*, sometimes sooner (Sakamoto, 1975:243-244). *Manga* (comics) serve this purpose well.[6] *Furigana* are invariably appended, thereby redeeming the material as "educational" rather than merely entertaining. Sakamoto and Makita (1973:446-447) cite one study, done as early as 1954, to the effect that "children" (the number was not specified) could "read" (what that meant was not operationalized), even before their first year of elementary school, on average: 30 *hiragana*, 5.8 *katakana*, 5.4 *kanji* and 7.9 Arabic numerals. They conclude (somewhat redundantly) that "family concern for the reading of children greatly affects their reading ability at this stage."

In Korea, *hanja* are not widely used (see figures 2, 4, 6 and 8). This was not always so. According to Kim (1970:79): ". . . . more than half the entire population today cannot manage more than the bare minimum number, say a thousand, of Chinese characters, while nearly all the significant reading material including newspapers and periodicals . . . . is packed with what in the old days passed as 'real letters' or 'true scripts.'" Between 1957 and 1964 and again between 1970 and 1972 *hanja* were banned by government decree (Kim, 1978:247). Instruction in public schools was not resumed until 1974. *Hanja* have been taught as a required subject for middle and high school students since that time (see Brown, 1990).

Hanja appear without annotation in college textbooks and scholarly treatises, on the writer's assumption that potential

readers are or should be able to decipher them. But the great majority of mass circulation publications contain no, or very few, *hanja*. Magazines, as a rule, contain none. With one exception, newspapers use *hanja*, but relatively few, limited to names of well-known places, people, political groups or government agencies, and certain topical politico-economic and sociological concepts, such as *t'ongil* (unification) and *t'ugi* (land speculation). The proportion of *hanja* to total nouns varies according to subject, but is more or less consistent across papers. *Hanja* are used to underscore the importance of the topic under discussion; articles about more important topics contain more *hanja*, and the presence of more *hanja* implies that the topic is more important. *Hanja* are also used much more copiously when the topic is "traditional," or "cultural," as opposed to contemporary or popular (in roughly the way *kanji* and *katakana* are used in Japan to establish product images).

A typical newspaper article on a subject of moderate gravity will contain 260-340 monomorpheme noun tokens; of these, fifteen to twenty percent will be printed in *hanja*. The following articles concerning a proposal to develop two small cities on the outskirts of Seoul, appeared in the May 28, 1989 editions of all of the major Korean daily newspapers and they are typical in their character usage. One article, in the *Chosun Ilbo*, contains 262 single morpheme noun tokens of which thirty-eight (14.5 percent) are expressed in *hanja*, 44 percent occuring more than once; of the 106 multimorpheme nominal expressions, sixteen (15 percent) are written in *hanja*. Another, in the *Segye Ilbo*, contain 335 single morpheme noun tokens of which seventy (21 percent) are expressed in *hanja*, 43 percent occuring more than once; of the eighty-six multimorpheme nominal expressions, thirty (35 percent) are written in *hanja*. Those that appear most frequently, in both articles, represent the names of the two cities whose development is under consideration. Other newspapers (such as *Kukmin Ilbo, Seoul Shinmun* and *Hankuk Ilbo*) tend to more closely resemble the *Segye Ilbo*. (Table 1 contains a summary.)

Table 1 **_Hanja_ Use in Korean Newspapers**

Newspaper	Single Morpheme Noun Token Totals	*Hanja* Use	Multiple Occurence of *Hanja*	Multiple Morpheme Noun Token Totals	*Hanja* Use
Chosen Ilbo	262	14.5% (38)	44%	106	15% (16)
Segye Ilbo	335	21.0% (70)	43%	86	35% (30)

Even relatively uneducated people (those with nine or fewer years of schooling; as of 1985, 39.5 percent of the population, Korean Educational Development Institute, 1987:23), can read most of these *hanja*, since all that is required is an ability to recognize a few recurring characters in narrowly circumscribed topical domains. Since the graphs usually occur in combinations of two, three or four (individually representing morphemes, together forming a word), recognizing just one is frequently sufficient to identify the intended word, in turn making it possible to surmise the other characters. In the *Chosun Ilbo* article mentioned above, there are only two single-graph tokens, that is, two occurences of (盧) (pronounced '*no*'), the family name of the present president of South Korea, along with two occurences of his full name, (盧泰愚), each time accompanied by *daetongnyong* (대통령) 'president,' written in *hangul*. The *Segye Ilbo* article contains four occurences of the same graph, in addition to one occurence of (校) (*kyo*), three occurences of (市) (*shi*) and (洞) (*tong*) and two occurences of (郡) (*kun*) and (邑) (*up*), all, in effect, bound morphemes. It might further be assumed that readers of particular articles will have suitable lexical resources on hand. For example, anyone interested enough in the problem of real estate speculation to read an article about it would certainly be familiar with the word "*t'ugi*." It also seems likely that they will be able to recognize two *hanja*—in that unique combination—used to write it, particularly when it is used in the context of a report on that very matter.

This conjecture can be tested rather simply by giving readers a *hanja* close test,[8] deleting the relevant *hanja*, and asking the reader to supply an appropriate replacement word. And in fact, the results of just such an experiment conducted by this writer indicate that readers can often infer the missing words or adequate equivalents. To spell it out, *hanja*-illiterate readers are generally able to read with little loss of comprehension materials (newspapers, at least) that contain the customary number of ordinarily used *hanja* (see note 13). Table 2 shows the results of such a test using an article on the subject of education, containing fifteen deletions (two or more *hanja* forming a single word are counted as a single deletion). Thirty-six percent of the missing characters, or semantic equivalents, were correctly supplied by the test group as a whole (i.e., 51 subjects x 15 items; 275 correct out of 765 possible responses).

Table 2

Percentage of deleted characters inferred in cloze test with Chinese characters.

	A	Gloss	B	C	D	E	F
1	學位	diploma	90%	0%	8%	2%	90%
2	大學	university	61	20	18	2	81
3	履修	finish course	65	29	4	2	94
4	歷史	history	0	0	65	35	0
5	言語學	linguistics	0	0	59	41	0
6	哲學	philosophy	2	0	49	49	2
7	文學史	literary history	16	71	12	2	87
8	語	language	67	4	22	8	71
9	帝國	empire	27	0	69	4	27
10	自由人	liberal person	14	0	84	2	14
11	大學	university	9	0	71	17	9
12	物理學	physics	22	0	49	29	22
13	大學	university	22	0	51	27	22
14	理學士	scientist	22	2	59	18	24
15	農學	agricultural science	0	0	41	59	0

A = target character(s)
B = exact character(s)
C = semantically equivalent characters
D = incorrect characters
E = no response
F = total of B + C

(See endnote 14 for remarks on category D.)

Subjects numbered fifty-one.

A second similar but shorter test using a book review concerning the origins of the Korean War, containing nine deletions, is confirmatory (table 3). Here, sixty-eight percent of the deleted or equivalent characters (as above) were correctly supplied by the test group (54 subjects x 9 items; 329 correct out of 486 possible responses).

A third test concerning automobile exports yielded similar results: slightly more than fifty-two percent of the deleted or equivalent characters were correctly supplied (74 subjects x 24

Table 3

Percentage of deleted characters inferred in cloze test with Chinese characters.

	A	Gloss	B	C	D	E	F
1	冷戰	cold war	67%	0%	26%	7%	67%
2	韓半島	Korean Peninsula	29	44	33	2	73
3	要因	cause	50	39	9	2	89
4	代價	cost	61	2	31	6	68
5	韓半島	Korean Peninsula	30	6	48	17	36
6	南侵	invasion south	78	11	6	6	89
7	南韓	South Korea	76	2	18	4	78
8	要因	cause	56	17	18	9	73
9	韓半島	Korean Peninsula	17	41	31	11	58

A = target character(s)
B = exact character(s)
C = semantically equivalent characters
D = incorrect characters
E = no response
F = total of B + C

Subjects numbered fifty-four.

items; out of 1,767 possible responses; 958 (54.2 percent) were correct (see table 4).

This leaves open the further possibility that even with major portions of the text missing, a good deal of "comprehension" can occur, based on inferences from real-world knowledge and "commonsense." Extracting (or constructing) meaning from texts is not, after all, algorithmic.[9]

(Precisely the same test could be done using Japanese subjects and texts; since this has not been done, we say nothing about the capacity of *kanji*-illiterate Japanese readers to read normal Japanese texts.)[10]

Table 4

Percentage of deleted characters inferred in cloze test with Chinese characters.

	A	Gloss	B	C	D	E	F
1	現代	hyundai	24%	0%	72%	1%	24%
2	現代	hyundai	66	0	31	3	66
3	韓國	Korea	80	0	16	4	80
4	現代	hyundai	92	0	8	0	92
5	現代	hyundai	96	0	4	0	96
6	自動車	car	7	91	3	0	7
7	立志	determination	40	0	35	25	40
8	現代	hyundai	96	1	3	0	97
9	説	public opinion	51	21	26	3	69
10	現代	hyundai	59	11	25	5	70
11	自動車	car	76	3	6	14	79
12	位相	status	16	0	69	16	16
13	現代	hyundai	85	3	8	4	88
14	自動車	car	75	1	12	11	76
15	精工	microengineering	76	4	9	11	80
16	北韓	North Korea	30	0	63	7	30
17	分架作業	subcontractor	8	1	82	8	8
18	現代	hyundai	97	0	0	3	97
19	現代	hyundai	93	1	3	3	94
20	自動車	car	74	4	12	10	78
21	美國市場	US market	26	4	40	30	30
22	苦戰	hard struggle	24	0	32	43	24
23	後繼	succession	0	54	18	28	54
24	內紛	internal trouble	0	23	49	29	23

A = target character(s)
B = exact character(s)
C = semantically equivalent characters
D = incorrect characters
E = no response
F = total of B + C

Subjects numbered seventy-four.

Even when *hanja* are not used within the text itself, they are often found in headlines, not, as is the case in Japan, because they save space (one *hangul* syllable group occupies the same space as one *hanja*), but (more probably) because they are visually "grabby" to borrow Mehrabian's (1976:250) apt expression (see figure 8).

It is also widely believed, not entirely erroneously, that elided expressions are less ambiguous when written in Chinese characters. In Korea, as in Japan, multisyllabic compounds of both Sinic and Western origin are frequently clipped, by omitting certain segments. Thus, in Japanese, *tokubetsu koogekitai* (special attack group) becomes *tokkotai*, mass communication becomes *masukomi*, personal computer becomes *pasokon*, word processor becomes *wapuro*. In Korean, *motsaenggigeetaionani* (ugly person) becomes *motnani*, personal computer becomes *poskom*, mass communication becomes *meskom* (actually via Japanese), *Iwha yoja taehakkyo* (Ewha Women's University) becomes *Idae*. This sort of process may in fact create homonyms which the Chinese characters can differentiate not (as most Japanese and many Korean appear to believe) because they are inherently meaningful, but simply because they are graphically distinct. In the same way, prior to 1946, *kana* spellings were used to distinguish homonyms (Horodeck, 1987:60). But the decision to do this is not obligatory. The newspaper articles mentioned above contain essentially the same vocabulary, a good deal of it Sinic, hence potentially able to be written in *hanja*. In one, the *Hankyore Shinmun*, as a matter of editorial policy, no *hanja* are used.[11] Essentially the same vocabulary set is involved. The existence of such a paper is a telling argument against the indispensability of *hanja*. It would be highly farfetched to claim that publishers print and readers buy newspapers that can not be read, in the ordinary sense of that word.[12]

Impressionistically, such homonyms seem to create fewer cases of ambiguity in Korea than in Japan, perhaps because the less frequent, less variegated, and more structurally restricted use of *hanja* in Korea inhibits the proliferation of contextually undisambiguable homonyms. It may also be that these homonyms are less prevalent than is generally supposed. While there may be genuine cases of homonymic confusion, as Martin (1972:99) says, it is also true that they can be rather simply circumvented, given the lexical and syntactic resources any native or otherwise capable speaker will by definition have.

It is also worth remarking that, up until the relatively recent inundation of English into Japanese and especially Korean, these truncated expressions arose in connection with the Chinese characters, having invariably been constructed out of Chinese morphemes which were borrowed into Japanese (and Korean) along with the graphs used to write them. It was not the case that the characters were necessary to distinguish homonymic expressions, but rather that the characters allowed these particular juxtapositions of morphemes to serve any potentially communicative purpose in the first place. This may of course change in the future as greater numbers of English loans find their lexical niches in both countries, perhaps supplanting Chinese as major lexical donor (see Ishiwata, 1989:17-21). The same clipping processes occur with English loan compounds, sometimes with consequent homonymization, but without, obviously, *kanji* to disambiguate.

Conclusion

Proportionally fewer people in Korea than in Japan are Chinese character-literate, due to: different school enrollment rates and the different grade levels at which those characters are taught (for details, see Brown, 1990a). At the same time, Chinese characters are less necessary for reading in Korea than in Japan, but more necessary for demonstrating minimal levels of education in Japan than in Korea. In Korea, but not in Japan, full, meaningful and successful participation in society does not require Chinese character-literacy. Upward mobility may be associated with a knowledge of *hanja*, but only because that knowledge is a by-product of education, which is the *sine qua non* for social (and as a rule) economic advancement and, Koreans believe, for happiness as well (Shin, 1986). It is not a prerequisite to that education and advancement. Unlike Japan, admission to a good university does not hinge on knowing many Chinese characters; in Japan all of the questions about every subject, and the test instructions themselves, are written in the standard *kanji* and *kana* mixed style (*kanji kanamajiribun*); in Korea, *hanja* are essentially limited to a brief section specifically about *hanmun* (Chinese literature), and even here, they are multiple choice questions requiring only recognition; it is not required that anything be written in *hanja*. One can in principle enter the most prestigious Korean universities without being able to read or write a single Chinese character.[13] This would be impossible in Japan.

Like speech varieties, at least partially overlapping writing systems may coexist within the same sociolinguistic community. Japan and South Korea are two such cases. Measurements and assessments of literacy and generalizations therefrom that fail to take this into account will at best be dimly illuminating.

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Endnotes

1 See Cook-Gumperz (1986) and Street (1984) for discussion and criticism of the assumption that literacy equals progress.

2 In Korea, morphophonemic *hangul* are used, sometimes but not always in combination with 'Chinese characters,' collectively and individually referred to as *hanja*; in Japan, syllabic (actually, moraic—*kana* represent morae rather than syllables (Horodeck, 1987:29) *kana* are used in elaborate combination with the same Chinese characters, referred to, as above, as *kanji*.

3 Korean and Japanese do not have obligatory number marking on nouns. Therefore, we will throughout this paper use the following to denote both singular and plural, and on occasion, indeterminate forms; *kanji, kana, katakana, hiragana, furigana, okurigana, kanbun, hanja, hangul, hanmun.*

4 According to Sakamoto and Mikita "[in 1964] the Ministry of Education of Japan reported that the problem of illiteracy had been completely solved. By definition, an illiterate person in Japan is one who cannot read or write *kanji, hiragana* and *katakana* at all." Obviously, no one who has attended even one year of elementary school is illiterate by this definition. In fact, according to one study, reported in Sakamoto (1975:240-241), ninety-one percent of four-year-old preschoolers are literate, in the sense that they could read at least a few characters (the average child could read fifty-three percent of the forty-six basic *hiragana*).

5 Assuming that elementary school enrollment correlates perfectly with literacy is patently implausible in Japan but less so in Korea because *hanja* are not widely used: it is more reasonable to suppose that children who are enrolled in (and attending) elementary school will soon be able to read and write anything that normal people of a given age are expected to be able to (or, to read anything that they can understand spoken and to write anything they can say). The reason is that the *hangul* system, while not as regular as most Koreans apparently believe, is nevertheless extremely easy to learn. (At least from the adult foreigner's point of view, *hangul* is far easier to learn and retain than Japanese *kana*; whether, or in what sense, *hangul* are easier for Korean children is a different question. An analysis of spelling errors made by matched samples of young Japanese and Korean school children would yield interesting data.) Of course, there are many more *kana* than *hangul*. There are forty-six basic *hiragana* and forty-six corresponding *katakana* graphs, plus two diacritics (*daku-on/ten*), and several basic spelling conventions (*choo-on, soku-on and yoo-on*). These form two structurally equivalent but functionally differentiated systems, each of which suffices to write all of the 102 morae of Japanese. In the *hangul* system, there are forty characters, twenty-one for vowels and nineteen for consonants. All were reputedly designed to be maximally memorable (see for example Yi, 1983:49), who says the *hangul* graphs are 'based on the appearance of the respective organs of speech involved in their articulations'). Whether or not this is historically correct, articulatorily related consonants are represented with visually related graphs, which serves a mnemonic purpose; in a lenis/fortis constrastive pair (of which there are five), for example, the first is taken as primary, the second written with the same graph doubled and halved in size (see Lukoff, 1982:xv-xxx). Note however, that these are not germinates. Thus, only nine graphs and two writing conventions serve to write the Korean consonants. Vowels and dipthongs are somewhat less transparent.

6 For example, two pages from a children's comic, (called Nazo Nazo Champion Book), contain the following characters:
食 *ta* (eat); 十 *juu* (ten); 年 *nen* (year); 前 *mae* (before); 作 *tsuku* (make); 化 *ka* (change); 石 *seki* (rock); 大 *oo* (large); 気 *ki* (spirit); 二 *ni* (two); 回 *kai* (times); 分 *bun* (part). All are among the 416 taught during the first three years of schooling; (according to Henshall, 1988, the 996 *kyooiku kanji* are taught in the following sequence: 76 in the first grade, 145 in the second grade, 195 per year in grades 3 through 5, and 190 in grade 6).
7 For instance, one market researcher with many years experience in Japan observes: '. . . the use of *katakana* or *kanji* instantly tells the Japanese consumer the nature of the product. Thus the drug may serve exactly the same symptoms—and at times even be constituted similarly—but if the name is in *katakana*, it originated from Western style laboratories. If the name is *kanji*, then it is a herbal remedy based on thousands of years of Oriental wisdom. The images generated for the two drugs are vastly different' (Fields, 1985:85).
8 'Cloze test' is actually a class of procedures for constructing tests through systematic deletions. See Williams (1970) or Cohen (1980) for nontechnical introductions.
9 Winograd and Flores (1986) offer a provocative view of textual meaning that draws heavily on the hermeneutic theory of Gadamer, Habermas and Heidegger.
10 A more comprehensive project concerning the readability of mixed script texts in Japanese and Korean, using cloze procedures, is currently in progress.
11 *Han Kyore* ambiguously means 'Korean people' and 'one people,' referring to Koreans on both sides of the Demilitarized Zone. In North Korea, of course, *hanja* have not been used since 1946 (see Brown, 1988).
12 It is possible, however, that some individuals may do precisely this, in order to keep up literate appearances. This is what Unger (1987:200), claims happened in Japan following the war.
13 The *hanmun* section of Korean college entrance examinations contain thirty-nine multiple choice questions and seven brief response questions. With infrequent exceptions, no *hanja* need be written. (For example, the 1988 examination includes one item requiring that a four morpheme phrase be written in *hanja*; the 1989 and 1990 examinations include none.) The latter seven are called "subjective" (*chugwanshik*), but in fact only one is, in the ordinary sense (the final question in the *hanmun* section of the 1990 entrance examination presents a five clause Chinese poem of thirty-one characters and asks the student to explain the underlined portion (of six characters) in Korean, i.e., *hangul* (*taum manjang ui mit'chul ch'inbubun ul urimal haesok hasio*).
14 Deletions 4, 5, 6 and 15, which no subject correctly inferred, respectively denote "history, linguistics, philosophy" and "agricultural science." In the text, these are simply listed as examples of academic disciplines; all subjects who ventured to do so, made plausible guesses, viz., of other academic disciplines such as sociology, English, home economics, physics, etc.

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Abstract

This exploratory study examined the relationship between stages of orthographic development (Henderson, 1990) and writing fluency. It was hypothesized that subjects in the beginning stages of orthographic development would copy less fluently than subjects at more advanced levels of orthographic development and reading acheivment. Forty-one first- through third- graders copied seperately four nonsense sentences: two sentences used a legal orthography, two used illegal letter strings. A standardized reading achievement test and a 20-word developmental spelling inventory were administered. Based on the results of the spelling inventory, subjects were placed in one of two stages of developmental word knowledge. Reading achievement and spelling performance predicted copying speeds, and copying speeds prompted significant, increasing linear trends across the two groups of word knowledge. The beginning readers and spellers approached the orthography in a linear fashion, and tended to copy in smaller units, often copying letter-by-letter. Children with a more sophisticated knowledge of words copied in larger units, and often at the whole word level. The results support the hypothesis that the graphemic output lexicon of beginning readers and writers is not sufficiently detailed to allow a fluent output.

Copying Fluency and Orthographic Development

Donald R. Bear

The relationship between reading and learners' theories of how words are written, learners' orthographic knowledge, has been explored in some detail recently (Ehri, 1987a, 1987b; Stanovich, 1988). A number of parallels between reading and orthographic knowledge have been observed particularly during the beginning stages of development, (Chomsky, 1970; Ferroli & Shanahan, 1987; Foorman & Liberman, 1986; Juel, 1988; Morais, Bertelseon, Cary & Alegria, 1986; Morris & Perney, 1984; Schreiber, 1980). Beginning readers have been characterized as slow, word-by-word, and disfluent readers who tend to read aloud to themselves and fingerpoint read (Bear, 1989; Clay & Imlach, 1971; Clay, 1979). Several researchers have observed that the development of reading fluency must wait on the development of orthographic awareness and word knowledge (both in terms of the depth of the lexicon and the automaticity in recognition) (Bear, in press; Brown, 1981; Freud, 1891/1953; Perfetti, 1985; Schreiber, 1980.)

In a number of studies, spelling development, as a measure of orthographic knowledge was related to reading development (Bear, in press; Bear & Barone, 1989; Beers, 1980; Ehri, Wilce & Taylor, 1988; Gill, in press; Henderson, 1981, 1990; Invernizzi, 1985; Mann, Tobin & Wilson, 1988; Morris, 1981; Zutell & Rasinski, 1989). Most of these studies have drawn on the spelling stages formulated by Henderson. Six stages of spelling development have been described (Henderson, 1981). The developmental sequence of the first four stages is evident in the invented spelling of *sick* and *soap:*

Stages:	*sick:*	*soap:*
Preliterate	34ndm	/>2)dl
Prephonetic	s, sk	s, sp
Letter Name	sek	sop
Within Word Pattern	sik, sick	sope, soap

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The final two stages involve syllable combinations and roots, and have been labeled, therefore, as the Syllable Juncture and Derivational Constancy stages. For a detailed description of these stages, see Templeton and Bear (in press). Of the six stages, the Prephonetic and the Letter Name stages have been most closely related to beginning reading. In terms of a reading and writing connection, Bear (1989) found that the movement from Letter Name spelling to Within Word Pattern spelling paralleled the movement from disfluent to more fluent reading. Children in Prephonetic and Letter Name stages of spelling were disfluent oral readers, even with a familiar text.

A potentially important relationship has not been examined, however, and this is the relationship between handwriting speed and orthographic awareness. If a common developmental pattern were found, a simple or integrated view of literacy development would be supported theoretically (Bear, in press; Juel, 1988); and pedagogically, this finding would be useful to teachers in diagnoses and for gauging writing production in a designated period of instruction. If, indeed, a developmental pattern were found, it would suggest that the verbal planning prerequisite to a coherent written production may be constrained in part by the writer's orthographic knowledge (cf. Barone, 1989; Deese, 1980).

Recently, Bradley (1983) examined the relationship between copying speed and accuracy, and reading ability. In this study, 62 disabled readers were matched with two groups: 30 younger normal readers at the same reading level, and 30 normal readers matched for chronological age. Disabled readers were significantly slower in copying than the normal readers, and like the younger normal readers matched for reading ability, they copied in a letter-by-letter fashion. While the longitudinal nature of the study is unclear, Bradley observed that, over time, the younger readers (6-year-olds) began to copy in larger units, but that the backward readers (9-year-olds) continued to use a letter-by-letter strategy. Bradley concluded the discussion of copying by attributing the disabled readers' difficulties in copying to an "inability to organize their written copy into meaningful, spatially distinct units" (Bradley, 1983:252). While subjects were matched on the basis of reading scores, Bradley did not study word knowledge qualitatively, that is, in terms of orthographic development. It is possible that what is considered a "spatially distinct unit" can be described explicitly by examining devel-

opmental stages of word knowledge.Other researchers have examined writing fluency and, occa- sionally, beginning writers have been described as disfluent or word-by-word writers and copiers (Dyson, 1985; Graves, 1983) who, like disfluent beginning readers, are constrained by word knowledge and orthographic knowledge (Luria, 1980).

The neuro-biological foundations of handwriting and reading appear to be similar in several respects. In terms of an information processing model, research in handwriting suggests that there is a linear as well as a parallel structure (Van Galen, Meulenbroek, & Hylkema, 1986). Writing movements work from a base of phoneme-grapheme correspondences at the same time that higher level processing takes place; e.g., syntactic or semantic levels of processing. Within each language system, the information has to be stored and held in waiting order until the motor output is completed. Researchers have suggested that a graphemic buffer may hold information from either a phoneme-grapheme conversion mechanism or from a graphemic output lexicon. The graphemic buffer allows processing time for integrating information and consequent output through either a letter name conversion mechanism for oral spelling or an allographic, or algorithmic conversion mechanism for written spelling (Caramazza, Miceli, Giampiero, & Romani, 1987). From a developmental perspective, Simner (1986) has observed a relationship between early reading achievement and writing form accuracy. Timing is an important factor in motor programming, and developmentally, it would seem that fluency would be affected by the writer's ability to "chunk at higher levels" (Huey, 1908/1968). It is clear from eye movement research that visual processing is related to reading achievement (Levin & Addis, 1979).

The study reported in this paper examined the relationship between writing production and copying fluency of orthographically legal and illegal "sentences," reading achievement, and orthographic knowledge as observed in invented spellings. The aim was to explore the possible parallels between reading and orthographic development observed in previous research with the inclusion of copying fluency. Assuming that writing, like reading, is a motor activity which is supported by both a phonological and graphemic output lexicon, it was hypothesized that the developmental stage of word knowledge, as reflected in spelling, could predict relative fluency in copying. Specifically, it was hypothesized that children in the early

stages of spelling developmental would be more disfluent in copying that students in the more advanced stages of spelling.

Method

Subjects

The sample was comprised of 43 subjects as follows: 19 subjects were able readers in a multigrade classroom covering first through third grade; 24 subjects were disabled readers achieving between a first- and third-grade level, and enrolled in a summer tutorial program. Ages ranged from 6 years, 11 months, to 9 years, 11 months (mean age = 8.24), and the mean score on the Gates-MacGinitie Reading Test (MacGinitie, 1978) was 2.60. The children in this study represent diverse academic abilities and socioeconomic backgrounds. All subjects were enrolled in a public school district in the west.

Materials and Procedures

All subjects participated in four copying tasks, a spelling task, and a reading achievement test. Subjects in the multigrade classroom were tested in June and subjects enrolled in the tutorial clinic were tested during the fifth week of the summer session in August.

Copying. To examine copying fluency and the influence of orthographic structure on copying, subjects copied two orthographically legal and two orthographically illegal nonsense "sentences." In the two legal sentences, all words were pronounceable and followed legal forms in English. The words in the illegal sentences did not follow standard orthographic rules and were unpronounceable. Sentences were on the average five words long, or 25 characters long, with two three-character words, one four-character, and one five-character word.

In watching people copy, it is difficult to determine how often a writer looks at the stimulus. Some copiers kept an eye on the stimulus while continuing to copy. In this study, a 10" x 10" board was placed between the stimulus and the subjects for the third and fourth sentences. The board was high enough to deter simultaneous reading and copying, and thus, it was easier to note when the subjects were glancing at the sentences. The board was placed to the left of right-handed children and to the right for left-handed children. A pilot study indicated that while the board facilitated the examiner's

recording, subjects' took more time to copy. Given these factors, it was predicted that copying speeds would be slower than without the board. The copying tasks were administered individually, and took about 10 minutes.

Subjects were instructed to copy as fast as possible, and they were told that they would not see real words. Subjects were given as much time as needed to copy the sentences. copying times were recorded, and scores were obtained based on the characters copied per second. The examiner made a running record of the number of characters subjects wrote between glances at the stimuli, and made anecdotal records of general copying strategies.

Spelling inventory. To determine a level of spelling development for each student, a 20-word spelling inventory was administered. Based on Schlagal's qualitative spelling inventory (1982), the developmental spelling inventory was designed to generate errors typical of each of the spelling stages described by Henderson (1981, 1990). The spelling list, procedures for administration, and the scoring followed Bear and Barone (1989). Subjects were tested in small groups or individually and were instructed to spell each word the best they could. The total number of words spelled correctly was tabulated.

To determine a spelling stage score, the researcher and an experienced rater conducted a spelling-by-stage assessment (Bear & Barone, 1989). The goal of this assessment was to identify each student's place on a continuum of developmental spelling knowledge in which the five stages were divided into thirds:

14	*High* Derivational Constancy
13	*Middle*
12	*Low*
11	*High* Syllable Juncture
10	*Middle*
9	*Low*
8	*High* Within Word Pattern
7	*Middle*
6	*Low*
5	*High* Letter Name
4	*Middle*
3	*Low*
2	*High* Prephonetic/Preliterate
1	*Middle*
0	*Low*

Students' spelling inventories were scored on a 15-point scale which placed each subject's work in either a late, middle, or early level of one of the stages of spelling. (In this sample, no subjects performed at the Preliterate stage of spelling.) For example, the Letter Name stage was divided into three stages where three represented early Letter Name, and five represented late Letter Name spelling.

Since the major hypothesis in this study was to differentiate copying speeds between beginning and more advanced stages of word knowledge, subjects were divided into two groups. Group I consisted of 20 Prephonetic and Letter Name spellers, and Group II consisted of 21 Within Word Pattern, Syllable Juncture, and Derivational Constancy spellers.

Reading Achievement. In small groups, subjects were administered the Gates-MacGinitie Reading Test, Levels A-C, Form 1. Subjects in the multigrade classroom took the test in June and subjects enrolled in the clinic took the test in August.

Results

General Findings

The raters' spelling-by-stage assessment were reliable, with an inter-rater reliability correlation of .92 and a correlation of .94 between the number of words spelled correctly and the spelling-by-stage assessment, (p's < .001). As can be seen in table 1, the two developmental spelling groups were closely matched for age. The intercorrelations reported in table 2 were all significant. Univariate tests of differences documented that, again, except for age, the groups were significantly different. (Up to four cases were omitted in some analyses for missing data.)

Table 1 **Descriptive Statistics**

	Variable	Group I Mean (sd)	Group II Mean (sd)	F	(p)
1.	Legal	.5496 (.38)	.7523 (.36)	10.58	(.0024)
2.	Illegal	.4335 (.24)	.6455 (.31)	9.70	(.0035)
3.	LegBoard	.4459 (.20)	.6527 (.30)	10.08	(.0029)
4.	IllBoard	.3365 (.20)	.5191 (.22)	10.24	(.0028)
5.	SpxSt	4.0000 (.93)	8.4550 (2.06)	78.78	(.0000)
6.	RdgAch	1.7059 (.30)	3.4773 (1.54)	22.85	(.0000)
7.	Age	8.106 (1.04)	8.3680 (.92)	.06	(.8099)

Variables:
1. Legal copying, characters/sec.
2. Illegal copying, characters/sec.
3. Legal copying with board, characters/sec.
4. Illegal copying with board, characters/sec.
5. Spelling by Stage Assessment, scale from 0-14.
6. Reading Achievement, Gates-MacGinitie Reading Test.
7. Age

Group 1, (N=19), is composed of Prephonetic and Letter Name stage Spellers.
Group 2, (N=22), is composed of Within Word Pattern and above.

Table 2 **Correlations**
Copying, Writing, Spelling and Reading Achievement

Variable	1. Legal	2. Illegal	3. Legal Board	4. Illegal Board	5. Spelling by Stage	6. Gates	7. Age
1. Legal	—	—	—	—	—	—	—
2. Illegal	.74**	—	—	—	—	—	—
3. LegBoard	.75**	.81**	—	—	—	—	—
4. IllBoard	.75**	.85**	.88**	—	—	—	—
5. SpxSt	.56**	.54**	.60**	.57**	—	—	—
6. RdgAch	.53**	.55**	.61**	.59**	.81**	—	—
7. Age	.21	.25	.15	.27	.14	.22	—

N = 43 * = p<.005. ** = p<.001.

Copying The copying speeds, reported in charaters per second in table 1, were faster for legal that for illegal sentences. The intercorrelations among the copying tasks were significant, but the differences between the legal and illegal copying speeds were also significant ($p < .05$), as were the differences in the copying speed with the board placed between the subject and the legal and illegal sentence stimuli ($p < .001$).

Generally, the copying task was an easy, if somewhat boring activity. Subjects were quite accurate in their copying. However, four subjects did delete whole words. The characters per second measure took omission into account.

The differences between groups were also significant for all copying tasks. For example, copying speed of the legal sentence, the task most like a typical copying task, was .55 characters/second for Group I subjects, and .75 for Group II students, ($\underline{F}(1,39) = 10.58$, $\underline{p} < .003$). Copying speed increased significantly across the two groups of developmental word knowledge ($p < .005$).

Spelling and Copying
Overall, the mean spelling-by-stage score was 6.32, which would place this sample in the early Within Word Pattern stage of spelling. However, there were significant differences between groups, with the Group I mean in the middle range of Letter Name spelling, and the Group II mean solidly in the Within Word Pattern stage. Analyses of variance showed that all four copying tasks prompted significant, increasing linear trends across the two groups of word knowledge ($p < .05$).

The trend was also observed for the total number of words spelled correctly.

In a regression analyses of the spelling-by-stage assessment, the spelling-by-stage assessment accounted for approximately 36 percent of the variance; for Legal Copying, $\underline{F}(1,41) = 22.01$, and on Illegal Board Copying, $\underline{F}(1,41) = 28.43$, $\underline{p}$'s $< .001$. As expected, spelling and reading achievement were highly related, and spelling scores were significantly related to age. A Discriminant Function Analysis significantly discriminated among the groups. As can be seen in table 3, spelling group membership classified 76 percent of the subjects' copying speeds correctly; ten of the 41 cases in this discriminant analysis were classified incorrectly.

Reading Achievement

Significant differences between Groups I and II on the Gates-MacGinitie Reading Test were noted; $\underline{F}(1,39) = 22.81$, $\underline{p} < .001$. Univariate tests between these two groups revealed significant differences between copying speed and reading achievement for all four copying conditions; (e.g., for the Legal Board Copying task, $\underline{F}(1,40) = 25.45$, $\underline{p} < .001$).

Table 3

Discriminant Analysis Summary Table
Legal and Illegal Copying Tasks Grouped by Spelling Stages

Number of cases classified into groups by copying speed:

	Predicted Group Membership		
Form Group	Letter Name and Below	Within Word and Above	Total Cases
Letter Name and Below	15	4	19
Within Word Pattern and Above	6	16	22

Number of grouped cases correctly classified: N = 31; 76 percent

Variable	Wilks' Lambda	F	Significance
Legal	.893	4.664	.0370
Illegal	.833	7.826	.0080

Canonical Correlation=.4129 Wilks' Lambda = .8296 Chi-Squared = 7.1007, p = .0287

Discussion

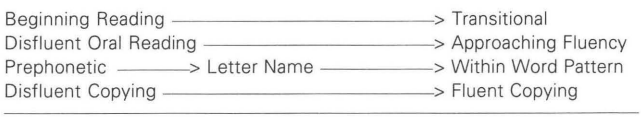
The results indicate that, indeed, the beginning readers and spellers in this study were less fluent in copying than the children who were at more advanced levels of reading and orthographic development. In the exploratory study, the significant findings relating reading achievement, copying speed, and orthographic development give some support for an elaboration of integrated, developmental models (Bear, in press; Henderson, 1985; Templeton, 1989).

The idea that readers use their knowledge of the orthography was substained by the differences between the legal and illegal copying tasks. Given the differences in copying speed between the spelling groups, this research suggests that one's knowledge of the orthography plays a facilitative role in copying.

Obviously, the ecological validity of the copying tasks in this study must be questioned. Children bring a number of pragmatic functions to copying which, in turn, direct the semantic orientation (Dyson 1985). In this study, the procedure for copying encouraged subjects to approach copying as a speed task. The differences across copying conditions indicate that the board made it easier for the examiner to observe copying strategies, but increased the difficulty of the copying. Observations in a naturalistic environment, as in Dyson's work, need to be included in studies relating writing to orthographic awarness. Accordingly, as part of a larger study, and in addition to the copying tasks in this study, subjects were asked to write about a familiar incident. The total number of syllables written was modestly related to copying speed, but not to spelling development. In preliminary analyses, the writing production seems to be quite variable in the summer clinic group.

Just as it is not quite accurate to say that beginning readers read "word-by-word," (Bear, 1989; Clay & Imlach, 1971), "letter-by-letter" copying does not accurately describe the children in this study. (Although Bradley did observe a predominance of letter-by-letter copying among the lower level readers in her study.) Subjects copied the legal sentences in slightly larger units than the illegal sentences, but even the subjects in the early Letter Name stage of spelling copied two to four letters in a single glance,

Figure 1 **Synchrony among reading, spelling and writing**



approximately 50 percent of the time. The results in this exploratory study lend support to a model of literacy development where there is a synchrony among reading, spelling and writing. This relationship is illustrated in figure 1.

The copying strategies of two subjects, one from each developmental spelling group, illustrate the typical differences observed among subjects (see figure 2). Michael, who was placed in Group I, copied slowly, but often included several letters between glances. Brandon (Group II), on the other hand, recorded several characters between glances in the Legal copying task, and in the Illegal copying, he often copied letter-by-letter.

Figure 2 **Legal and Illegal Copying Stimuli**
Copying Strategies of Two Subjects

Legal Stimulus		
Legal w/o Board:	San gob penk yown reff breet	
Legal w/Board	Fam bol clen screll mien	
Copying Strategy (letters/glance):		
Michael[a]:	S/AN/GOB/P/E/N/K/Y/OWN/REFF/BR/EE/T 1-2-3-1-1-1-1-1-3-4-2-2-1	50"
Brandon[b]:	SAN/GOB/PENK/REFF/BRE/ET 3-3-4-4-4-3-2	35"
Illegal Stimulus		
Illegal w/o Board	Lmert psfrt rga lihmb	
Illegal w/Board	Cgrml tpwde ffecsb jko epgrh	
Copying Strategy (letters/glance):		
Michael:	L/ME/RT/P/SF/RT/RG/A/L/IH/MB 1-2-2-1-2-2-2-1-1-2-2	58"
Brandon:	LM/ER/T/P/S/FR/T/R/G/A/L/I/H/M/B 2-2-1-1-1-2-1-1-1-1-1-1-1-1-1	48"

aMichael: Age - 9.8, Letter Name-4 bBrandon: Age - 9.0, Within-Word Pattern-8

Several studies have examined the ballistic movements in handwriting (cf. Kao, Van Galen & Hoosain, 1986); this study did not make such fine-grained analyses, but speed was the dependent variable. It was clear that the more advanced spellers were faster copiers; in the records of students' copying strategies, the children who approached the orthography in a linear fashion in spelling tended to copy in smaller units, often copying letter-by-letter, and students with a more sophisticated knowledge of words, and who worked with the orthography at a more abstract level, copied in larger units, and often at the whole word level.

The impetus for this study came from teachers' observations of beginning writers. Teachers often commented that most beginning writers were unable to write more than a few lines during freewriting periods. This limited production has been frustrating to some teachers. What can be done to improve writing fluency and production? The results of this study confirm these teachers' observations, and suggest that it would probably be best to have students expand their writing with drawings and Language Experience dictations. The dictations, in particular, allow children to express themselves fully with teacher support.

The theoretical implications of this study suggest to teachers that they can expect greater writing fluency as students begin to chunk the orthography at higher levels. The results reported support the hypothesis that the graphemic output lexicon of beginning spellers is not sufficiently detailed to allow a fluent output. Luria expressed similar ideas when he noted that "(t)he process of articulation (speaking aloud), which plays a decisive roll in the early stages of education has little to do with the highly automatized form of writing." In regard to familiar words, writing "no longer requires acoustic analysis but is performed as a complex motor stereotype," (Luria, 1980, p. 529). This line of reasoning is not new to reading research. Interestingly, some time ago, Freud hypothesized that "sound images" were the detailed result of "kinaesthetic word images." In modern parlance, automaticity in word recognition, sophistication in visual imaging of words, and orthographic knowledge, more generally, are needed for fluent production. With invented spellings serving as a window to orthographic awareness (Morris, 1981), it is now possible to investigate qualitatively and quantitatively what power in orthographic knowledge is prerequisite to orchestrating a steady movement across text in reading and across the page in writing.

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Abstract

A special issue of Visible Language *(Winter 1978, 12:1) was devoted to the interface between reading and listening. It is significant that, among the six articles in that issue, there is no mention of punctuation or of intonation. These two topics are among the least-studied aspect of visual and auditory language. This article represents an effort to explore one aspect of the relationship between intonation and punctuation. The historical development of marks of punctuation is outlined, and uses and prescriptions for the comma from the sixteenth century onwards are described. Prescriptive recommendations for the comma in the twentieth century are examined in detail and compared with what is known about the divison of connected speech into intonation-groups. It is suggested that, where syntactic prescription and intonational usage conflict, a return to more elocutionary punctuation would in many cases aid intelligibility.*

Intonation and the Comma

Alan Cruttenden

Historical Background

Pre-printing

Greek rhetorical theory divided discourse into sections of different lengths called κομμα κώλον and περιοδος. According to Sandys (1903:125) and Brown (1974-82:274), Aristophanes of Byzantium (approximately 260 B.C.) was the first to use a system of punctuation which was related to these rhetorical divisions; the three relevant marks were known as υποστιγμε, "subordinate mark,"μεσε στιγμε, "intermediate mark" and τελεια στιγμε, "full mark." Υποστιγμε (at the end of a κομμα) involved a point after the middle of the last letter of the section, μεση στιγμε a point after the bottom of the letter and τελεια στιγμε a point after the top of the letter. The names for the lengths of sections were eventually used also for the different heights of points. (But, according to the *Oxford English Dictionary,* even as late as the eighteenth century, "comma" was still sometimes used in English with the meaning "a group of words in a sentence" rather in the way that a phrase like "measured periods" is used today.) No system of punctuation ever appears to have been in regular use in Greek and Latin manuscripts, single dots, double dots, treble dots and virgules (see below) being in use variously for purposes of word separation, pausing, indicating ends of sentences and larger sections (Skelton, 1949:157-9). By the ninth century, commas and inverted semi-colons appeared in Greek manuscripts, as did the ordinary semi-colon used as a question mark, a usage which continues into modern Greek.

The situation in early English prior to the invention of printing appears to have been similar to that in the later Greek manuscripts (Husband and Husband, 1905:17-31 and Strang, 1970:343-5). As early as A.D. 900 Manuscript Hatton 20 of King Alfred's translation of Pope Gregory's *Cura Pastoralis* has a dot (present-day comma), inverted semi-colon (present-day semi-colon) and semi-colon (full stop). On the other hand, the Cotton Manuscript of

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Beowulf (circa 1000) uses only the dot at low and middle levels, and this only erratically; the Laud Manuscript of the Peterborough Chronicle (circa 1150) is similar. The Douce Manuscript of Wycliffe's translation of the Bible (circa 1380) uses / . . : although it is difficult to determine on what system. None of these manuscripts uses the simple comma; indeed, despite the fact that Campbell (1959:13) says that the comma is used freely in Old English, it appears to have been used mainly in combination in the semi-colon.

Although the most common equivalent of the present-day comma in classical and early English was some sort of dot (often a middle-height dot), there was certainly no prescriptive usage laid down. The dot (and indeed every punctuation mark) was used on an ad hoc basis to aid intelligibility (and of course to aid reading aloud).

Early Post-printing

The earliest books printed in English are sparsely and arbitrarily punctuated (compared with the elaborate punctuation used for contemporary Latin and Greek printing, e.g., the *Gutenberg Bible,* 1455). Caxton, printing at Westminster from 1476-91, used only three marks (and these only irregularly): full stop, colon and virgule (/ from Latin virgula, "rod"), which served as a comma. In 1490, Manutius founded the Aldine Press in Venice and his grandson Manutius the Younger described the system of punctuation used by the Press in *Orthographiae Ratio,* 1561 (partially translated in Appendix B of Husband and Husband, 1905). The marks , ; : . ? were used with approximately their present values. By Shakespeare's time (see Hart, 1551, 1569), this system of punctuation was as widely used in England as it is today, although the single dot continued to be known as the "period," until the term "full stop," became more common in the late nineteenth century. In this first century of printing, guidance on the use of marks (including the comma) was mainly elocutionary (i.e., concerned with reading aloud), e.g., "comma . . . is in reading the shortest rest" (Hart, 1569:200). But there was already hints of syntactic prescription, e.g., "the comma . . . does not indeed close a complete sentence, but it separates names, or words, that differ only slightly from each other, as, when we say, An upright, and learned man: or By dint of earnestness, exertion, and effort: and in

other cases." (Manutius, 1561, translated in Husband and Husband, 1905:131, keeping Manutius' punctuation).

Elocutionary Punctuation in Post-printing

From the start two principles have been in conflict in English punctuation, the elocutionary (i.e., how to read aloud) and the syntactic (often called logical). In three famous texts Simpson (1911), Pollard (1920) and Wilson (1921), the idea was put forward that the punctuation of Shakespeare's plays, in both the quartos and the first folio, was principally elocutionary. According to Pollard, ". . . in Shakespeare's day, at any rate in poetry and drama, all the four stops . . . could be and (on occasion) were, used simply and solely to denote pauses of different length, irrespective of grammar and syntax" (1920:90). Wilson (1921), having asserted that the punctuation of both quartos and first folio was partly Shakespeare's own, but stemmed partly from other members of his playhouse and also partly from compositors, went on to say that this punctuation is dramatic, and quite independent of syntax. According to Wilson, a comma indicates a short pause, a semi-colon a longer one, a colon one longer still, and a full stop a *full* stop [Wilson's emphasis], which sometimes occurs in the middle of a sentence. Further, absence of punctuation, where a modern reader would expect it, implies rapid delivery. A.C. Partridge (1964) took issue with Wilson in suggesting that the first folio, as opposed to the quartos, represented a compromise between an elocutionary and a syntactic system. Partridge considered that playhouse pointing was, for many plays, the basis of the first folio; but he also suggested that much was later grafted on to it, and in the process older punctuation marks were not always deleted, which produced overstopping, and sometimes confusion. (There have been others who have doubted the theory of pausal punctuation altogether, e.g., Fries, 1925.) Contemporary Elizabethan and Jacobean grammarians, when describing punctuation marks, gave at least equal weight to the phonetics associated with each mark as to its syntactic uses. Table 1 displays the phonetics and the meaning associated with each mark in Butler (1634). It can be seen that the phonetic correlates of each mark are described principally in terms of pitch and pause; and in no sense is the meaning associated with each mark as prescriptively syntactic as is the case today. Although Butler's writing (and other's) gives

Table 1 **Semantics and Phonetics of Each Punctuation Mark in Butler (1634)**

	Semantics	**Phonetics**
Period, page 58	Period is a point of perfect sens, and perfect sentence:	which, in the last woord, falleth the tone of the voice below its ordinari tenour, with a long paus
Colon, page 58	Colon is a point of perfect sens, but not of perfect sentence:	which falleth the tone of the voice, with a shorter paus
Semicolon, pge 59	Colon is a point of imperfect sens, in the midle of a Colon or Period: commonly, when it is a compound axiom; whose parts are joyned together, by a dubble, and soomtime by a single conjunction:	and it continueth the tenour or tone of the voice to the last woord, with a Colon-paus
Comma, page 59	Comma is a point of more imperfect sens, in a simple axiom, or in either part of a compound:	which continueth the tenour of the voice to the last, with the shortest paus
Erotesis, page 61 *(Question mark)*	Erotesis is a note, not only (1) of Asking; . . and (2) of Urging or instance in reprehension: . . but also (3) of earnet Avouching the contrari; wheither the Interrogation bee affirmative or negative	Erotesis, if it be pure, raiseth the common tone or tenour of the voice in the last word; unless Emphasis draw it: but if it begin with an interrogative; as [who, what, how, where, when, why, &c;] it falleth as a Period, and raiseth the tone in the Interrogative . . . . This point, in the 2 last uses thereof, straineth the sound of the voice thoorowout the whole Interrogation
Ecphonesis, page 61 *(Exclamation mark)*	Ecphonesis is a note of Exclamation: when soom great passion of the minde is pathetically uttered: wheither it bee in Admiration, Indignation; Exoptation, Desperation; Exultation, Lamentation; Terrour, Commiseration; or the like	Ecphonesis falleth as a period, and raiseth the tone in the particle of Exclamation, . . or, for want of such, in soom Emphatical woord: and always reqireth a louder sound; and, when it makes perfect sens, pauseth as a Period
Parenthesis, page 61	Parenthesis is 2 semicircles enclosing one or more woords of perfect sens, in a sentence; for the perfecting thereof: without which yet, the sens is perfect	Parenthesis is wholly sounded with a lower voice: & always endeth with a comma; unless the part precedent of the sentence bee noted with some other simple point: for then it is according to that point
Parathesis, page 62 *(Square brackets)*	Parathesis is 2 semiqadrats, enclosing one or more woords of Imperfect sens, for distinction or declaration of that which goeth before; and wherewith it is construed by Apposition	And it is wholly sounded as Parenthesis; ending as his simple point: or, if it have none, as a Comma

the impression of being written primarily for the reader (and especially the reader aloud), such writing also makes clear that any writer of that period would not have been governed by the details of syntax to the extent that he is today.

Syntactic Punctuation in Post-printing

It is often claimed that syntactic punctuation became uppermost during the eighteenth century (Skelton, 1949:165). But not all the grammarians writing in the eighteenth century are quite as rigorous in their grammatical prescription as is often claimed today. To consider one example: in 1785, Joseph Robertson published *An Essay on Punctuation* (reprinted 1969) which is described in a note at the beginning of the book as being the earliest systematic survey of English punctuation. One chapter is devoted to each of the marks of punctuation. Chapter two gives forty syntactic rules for the use of the comma; but these rules are very often not absolutely prescriptive. So, for example, sentences should "generally" have a comma before a conjunction (page 52); two substantives "connected by the disjunctive 'or' *may* admit of a comma between them" (page 23, my emphasis). Moreover, the application of a syntactic rule is often dependent on the length of particular syntactic constituents. Thus Robertson tells us that great regard must be paid to the length of clauses: "where the clauses are short and closely connected, the comma may be omitted" (page 75). We are even told that a long sentence, where "the nominative case is accompanied with inseparable adjuncts, may admit of a pause before the verb." *The navigation of the ancient Romans, was chiefly confined to the Mediterranean area.* Robertson, 1969:73

In another passage Robertson notes that "An ingenious writer has observed, that not half the pauses are found in printing, which are heard in the pronuncation of a good reader or speaker; and that, if we would read or speak well, we must pause, upon an average, at every fifth or sixth word" (1969:75). These passages make it clear that Robertson, even if he does see punctuation as mainly syntactic, also sees marks of punctuation as saying something about pausing, even if not marking all the pauses. Thus, in a period which is often said to be the high watermark of syntactic punctuation, elocutionary punctuation had not been forgotten. Indeed, around the same time as Robertson was writing, opposition to syntactic punctua-

tion began to appear in the form of "rhetorical" (elocutionary) punctuation. At first this was considered an *alternative* type of punctuation for the purposes of reading aloud (see, for example, Walker, 1781, II:8) but later practitioners (chiefly phoneticians, who at that time called themselves professors of elocution) wished to supplant existing pronunciation practice. Alexander Bell (1835:xviii-ix, not to be confused with his son, Alexander Melville Bell or his grandson, Alexander Graham Bell) wrote: "It is certain, and cannot be denied, that the mode of punctuation, at present in use, is worthless, in so far as it bears on Eloquence," and "Punctuation, is the art of dividing a written composition into sentences, or, parts of sentences, by means of certain signs agreed upon, for the purpose of regulating the pauses of the voice in reading, and of rendering more intelligible, and perspicuous, the construction, and meaning of the sentences." As can be seen from these extracts, Bell practised what he preached. But rhetorical punctuation never really took off and, then as now, printers (and later publishers) were the prime arbiters of punctuation, and syntactic punctuation is easier for printers and publishers because it can be carried out by rule.

The Modern Period

Prescriptive punctuation seems to have gathered strength in the late nineteenth century, and in the twentieth century even more so. Punctuation is today generally described in syntactic terms, although it is occasionally indicated that, in special circumstances, such punctuation by syntax may be overruled. Manuals of style vary in the amount to which they allow such special circumstances. *The Chicago Manual of Style* (1982:137) states: "There are a few rules governing its [the comma's] use that have become almost obligatory. Aside from these, the use of the comma is mainly a matter of good judgment, with ease of reading as the end in view." But, in general, special circumstances are less frequently mentioned than they were, for example, in Robertson (see above); writers are generally more concerned to stress the priority of syntax. Carey (1957:vi) says: "Punctuation should serve the eye before the tongue and ear . . . therefore the best punctuation is based on the structure, or syntax, of the sentence, not on the need to pause for breath." Vallins (1955:126), offers the sentence:

The only students I have ever met who ever believed their ears were blind.

He proscribes the use of a comma after ears, saying: "In

general, punctuation for the convenience of the reader should not clash with the punctuation demanded by the syntax. The reader has to play his part; indeed, to over-punctuate is sometimes to underrate his intelligence and insult him." E. Partridge (1953:97) considers that "It is better to avoid difficulties syntactically than to have to resolve them by subtle punctuation; if they are syntactically unavoidable, punctuation has to be especially good." Quirk, Greenbaum, Leech and Svartvik (1972:1055) write that ". . . punctuation practice is governed primarily by grammatical considerations and is related to grammatical distinctions. Sometimes it is linked to intonation, stress, rhythm, pause or any other of the prosodic features which convey distinctions in speech, but this is neither simple nor systematic, and traditional attempts to relate punctuation directly to (in particular) pauses are misguided . . . Punctuation marks tend, therefore, to be used according to fairly strict conventions and even in the peripheral areas where universal convention does not obtain, each individual publishing house imposes one for all materials that it puts forth in print."

Comma prescription according to syntax falls into two categories. First, there are contexts in which the use of a comma is absolutely disallowed. For example, it is generally held that no comma may intervene between subject and predicate; it would not be acceptable, say, to put a comma between *that* and *was* in the following example.

The first man who ever did that was John Armstrong.

But one might insert a parenthetical element, in which case it would be proper to separate off the parenthetical by means of a pair of commas. *The first man who ever did that, I'm pretty sure, was John Armstrong.*

Second, there are contexts in which the commas is allowed, e.g., between sentence adverb and clause remainder. *Unfortunately, their best player was injured.*

In such contexts two factors may make the use of the comma the preferred option. The first is potential ambiguity, or wrong signposting. Potential ambiguity is illustrated in a sentence like the following. *He didn't do it really.*

Really may be a verb modifier (He didn't do it in actual fact), or a sentence modifier (I am definitely telling you he didn't do it). The latter use usually involves a comma before really. Wrong signposting is what Fowler and Fowler (1931:273) call a "false scent" and illustrate with the following example.

After that, having once fallen off from their course, they at length succeeded in crossing the Aegean, and beating up in the teeth of the Etesian winds, only yesterday, seventy days out from Egypt, put in at the Piraeus.

The problem here is the omission of a comma after *and*.
The second factor that may influence use in optional position is style, particularly the length of the constituents on one or both sides of the comma. Wood (1962:56) states that excessive use of commas should be avoided, because it produces a chopped-up impression, and reproduces the following quotation from Fowler and Fowler (1931:241).

Jeannie, too, is, just occasionally, like a good girl out of a book by a sentimental lady novelist. The Times

(Compare the rhetorical punctuation mentioned at the end of the previous section.)

The principal way in which modern punctuation is often said to differ from eighteenth and nineteenth century punctuation is this: that in the optional positions the comma is omitted unless ambiguity or wrong signposting is involved, or unless very long constituents are involved. With sentence adverbials, for example, the tendency today is to omit commas, producing so-called "light" punctuation as in the following. *Unfortunately he didn't come.*
The exception is where such adverbials are very long.

On Monday January fifth, nineteen hundred and fifty-four, it was decided . . .

To summarize comma prescription, we have structural positions where comma useage is:
A disallowed
B allowed, particularly for the sake of
  a disambiguation or avoidance of wrong signposting
  b stylistic reasons
It is to be noted that, where A is involved, a comma is not allowed for a or b, i.e., disambiguation or stylistic reasons do not affect the absolute proscription. Indeed some, like E. Partridge, quoted above, suggest that, where a comma would be required for disambiguation, syntax should rather be rewritten to avoid breaking prescriptivist punctuational rules. A comma is not allowed even in sentences which are almost inevitably misread on first reading if there is no punctuation. *Disease that could spread like wildfire.*

Disallowance and Allowance

This section summarizes briefly what recent prescriptive writing disallows or allows in the use of the comma (for a more detailed survey of present-day usage and prescription, see Meyer, 1987). Current prescription is dealt with here by dividing this section into three subsections:
1 commas between major clause constituents i.e., subject, verb, object (or complement) and sentence adverbial;
2 commas within these major clause constitutents;
3 commas between clauses.

Commas Between Major Constituents

Almost all writers disallow use of a comma between subject and verb, or between verb and object (or complement). Fowler (1965:587) warns against "separating inseparables." Others among many who proscribe such use are E. Partridge (1953), Quirk et al. (1972), and Vallins (1955). So a comma is not allowed in the following.

The man over there in the corner, is obviously drunk.* Quirk et al.,1985:1619

(Proscribed commas are indicated by an asterisk following the comma.) A restrictive relative appended to the subject forms part of this proscription.

My entirely unscientific opinion poll of over 400 Europeans who visit the USA frequently, produced an overwhelming number of votes for San Francisco as the country's most pleasant city.* Quoted in Perera, 1984:175

Also a "fronted" direct or indirect object or similar normally late-occurring phrasal constituent takes a comma.

Someone from a Public School, they will readily accept.*
With this group, the Archbishop is out of sympathy.* Carey, 1957:9
To the very top of the mountain, they climbed.* Quirk et al.,1985:1627

Wood (1965:56) is one of the few who allow a comma in these positions for stylistic reasons, saying, for example: "It is legitimate to put a comma after a long, diffuse or intricate subject."

Commas are generally allowed (and by some writers are actually made obligatory) around various types of parentheticals which intervene between subject and verb such as non-restrictive relatives, vocatives, appositional phrases, verbless clauses used adjectivially, and sentence adverbials.

Their hostess, radiant as ever, was awaiting to greet them. Nash: 1986:119

He, very ably, made the whole thing sound as simple as in fact it was. Partridge, 1953:99

Commas are also allowed after or before sentence adverbials which occur in initial or final position. But style is often invoked to condemn the over-use of commas in such

positions. Carey (1957:9) condemns "too much hedging of adverbs and adverbial phrases."

In 1879, a treaty was made with Great Britain.*

Vallins (1955:132), following Carey, recommends that all adverbs and adverbial phrases at the beginning of sentences should not be comma'd off unless there is a likelihood of wrong signposting or ambiguity. Wrong signposting is potentially present in a sentence like the following. *Shortly after, twelve of them turned up.*

Ambiguity is often present in final position where an adverb can be taken as sentence-modifying or clause-modifying. *He wasn't speaking, honestly.* (versus) *He wasn't speaking honestly.*

Commas Within Major Constituents

The use of a comma under this heading always involves some sort of cumulative, or alternative, listing. Commas are generally allowed between each item of a list, which may involve a variety of constitutents, such as nouns in subject or object position or following a preposition, adjectives or prepositions before a noun, and adverbs modifying a following adverb or adjective.

Towers, spires, chimneys, rose on the skyline. Nash,1987:116

A great, wise, and beneficient measure. Hart, 1967:36

He slowly, carefully moved the chair. Quirk et al.,1972:1064

People with generally similar, but generally more proficient, abilities.

Two particular problems regarding the use of the commas arise in such listings. The first problem, much discussed by all writers on punctuation, concerns whether there should be a comma before an ***and*** which occurs before the last two items of the list. All agree that actual usage is variable, but some, quite arbitrarily, prescribe use with or without the comma. Collins (1979:351), gives the example *potatoes, peas,* and *carrots* stating: "The comma after peas is Oxford University Press practice, and logically justified."

The other problem is whether a comma should be written between the last item in a list and any "head" word or phrase (the term is used loosely here but the way I am using it will be apparent from the examples). Most writers do not mention the problem although Nash (1986:117) calls it an "expressive option," while Carey (1957:9) calls it "questionable." Examples of the sort of context in which this problem arises follow.

Jars, tins, pots, packages, tumbled out of the cupboard. Nash, 1986:117

A typewriter, a portable wireless, and a fishing-rod, comprised my luggage. Carey, 1957:9

A second, closely-related, issue . . . Characteristics of, and interpretation of, that stage. Many, if not most of, the customs . . .

Prescription appears to be completely capricious in this area (no recommendations are ever made which are in any way related to any distinction in syntax, e.g., between subject . . . verb versus adjective . . . noun, between presence of a "deleted" item or not, or between the presence of a list-final *and* or not).

Use of a comma within major constituents where no sort of listing is involved is proscribed. No comma is allowed between indirect and direct object.

He gave the leading lady, a bouquet.* Quirk et al, 1972:1063.

Similarly, my own prescriptive intuition suggests that a comma is not allowed in comparisons with *with.*

She contrasts the difficulty prelingually deaf children have learning oral language, with the ease with which they learn manual signs.*

Commas Between Clauses

In this area the use of a comma or commas is always allowed (and with some constructions is obligatory). Commas may occur between clauses linked by *and, but* and *or;* between adverbial clause and main clause; and where a clause is used as a fronted direct or indirect object.

What thoughts went through my mind, I leave you to imagine. Nash, 1986:122

(But fronted objects which are not clausal are not, by most writers, permitted to take a comma—as mentioned above.)

Commas are obligatory before tag questions.

Voltaire wrote Candide, didn't he? Nash, 1986:118

They are also obligatory around parenthetical clauses (of which non-restrictive relatives are a subtype).

If I were a millionaire, which I am not, I would . . . Wood, 1962:169

In such positions dashes or parentheses may be used instead of commas. Commas are also obligatory with "absolute constructions," which refers to constructions where a noun is not subject, object, or governed by a preposition, but is attached to a participle or an infinitive.

Summoning all his strength, he rose from the chair. Nash, 1986:120

To secure the boat, a stern-line . . . Nash, 1986:121

But these objections were overruled, and the accused, having pleaded not guilty, the hearing of evidence commenced. Fowler, 1965:588

It should by now be clear that the basis of present-day prescription for the comma is syntactic, with some secondary influence from semantics (in particular, disambiguation), and from stylistics (in particular, length of constituents). It will also be remembered that, in the seventeenth century, prescription based on syntax was less apparent (and certainly less detailed) than it is today. Guidelines on punctuation were related to length of pause, and only indirectly, via notions of assisting "sense," to syntax.

Intonation

The term "intonation" is today often used by many writers (particularly psychologists and syntacticians) to refer to anything which is not accountable for in the usual phoneme-size units of phonological analysis. Others (particularly phoneticians) limit the term principally to pitch variation. This pitch variation is often seen as performing three general functions (see Cruttenden, 1986):
1 dividing connected speech into intonation-groups;
2 making one syllable (and hence one word) especially prominent within each group—this syllable is often called the tonic or nucleus; and 3 by use of different tonal contours—often called tones—making differences of meaning which sometimes appear more discoursal, sometimes more attitudinal. Tones obviously bear a relationship to the comparative uses of full stop, question mark and exclamation. The nucleus is generally not marked by punctuation, unless indicated by capital letters, underlining or italic. Intonation-Groups (IGs) are obviously related to all the marks of punctuation, the occurence of any mark generally indicating an IGB (Intonation-Group Boundary). The actual phonetic exponents of an IGB include the pitch of the syllable before the IGB, that of the syllable after the IGB, and the relationship between these two pitches; the lengthening of the syllable before the IGB and the shortening of any unstressed syllables following the IGB; and the potential use of a pause at the IGB. These exponents (in particular, pause) are obviously very close to those described in Butler (1634) as shown in table 1.

We have, then, a triangular relationship between punctuation, syntax and IGBs. In Shakespeare's time punctuation was related to both syntax (this indirectly via "sense") and intonation (if we count pausing as an exponent of intonation). In the twentieth century punctuation is prescribed

directly and almost solely by syntax. But it is also true that our study of intonation has today developed much further, and in much more detail, than it had in Shakespeare's time. It is therefore worth asking the question: would punctuation by intonation lead to a different result than punctuation by syntax? More particularly, within the limits of this article, we can ask the question: would using commas at IGBs lead to a different punctuation from punctuating by syntax? We can formulate the question in still another way: do IGBs occur at the same places in syntax as commas? The following sections describe the typical places in speech where IGBs occur and compare the occurence of IGBs in speech with prescriptions concerning the comma in writing.

Intonation-Group Boundaries (IGBs)

The occurence of IGBs will be surveyed in the same way as comma prescription: 1 between major clause constitutents; 2 within major clause constituents; 3 between clauses. But at the onset it has to be said that IGBs can, under special circumstances, occur anywhere; what I am describing here are the typical positions where they occur and do not occur. (Further detail on the occurence of IGBs, in English particularly, can be found in Cruttenden, 1986, and in Altenberg, 1987: the former has references to the acoustic cues (e.g., silence, syllable duration, fundamental frequency of unstressed syllables) to perceived IGBs. (Another summary can be found in Freund, 1975.)

Boundaries Between Major Constituents

IGBs commonly occur between the subject and verb, particularly when the subject is long and/or when the subject is postmodified. *That man over there in the corner/is obviously drunk.* (An IGB is marked here by a slash; what earlier centuries was called a virgule). This includes cases where the subject is postmodified by a restrictive relative clause. *The man I want to see/is John Armstrong.* Fronted direct and indirect objects also commonly take a separate group. *John/I hate/whereas his wife/I just love.* However, an IGB will almost never occur between verb and object or complement. *I just love/* his wife.* (Atypical IGBs will be marked with an asterisk following the slash.)

Separate IGs are commonly given to all types of parentheses intervening between subject and verb, including sentence adverbials, which also commonly receive a separate

IG in clause-initial and clause-final position (see Allerton and Cruttenden, 1974, 1976, 1978).

Unfortunately/their best player didn't turn up.
John/Ithink/would prefer to do otherwise.
They go to London/usually.

Whether a particular adverbial is being used as a sentence modifier or as a verb modifier is regularly indicated by whether or not it is given a separate IG.

He didn't like doing it seriously (versus) *He didn't like doing it/seriously.*

Boundaries Within Major Constituents

Separate IGs are commonly given to items in a list, whether these be nouns, or verbs, or adjectives, or adverbs.

They bought apples/pears/and oranges.
When they got there/they washed/ate/andslept.
A very wise/charming/and beautiful/girl.
He slowly/carefully/cautiously/opened the door.

In most cases (as in those above) the last item listed, whether or not an *and* is included, is given a separate IG from its "head." Contrary to comma prescrption IGBs commonly occur between indirect and direct objects and in comparisons with *with.*

He gave the leading lady/a bouquet (but not He gave a bouquet/* to the leading lady). *Contrast what I am doing/with what he did.*

Boundaries Between Clauses

IGBs occur regularly between clauses, both when coordinate clauses are involved, and when main and subordinate clauses are involved.

I ran to the station/and caught the train.
Because I was off sick/I wasn't aware of the latest development.

An IGB is regularly used except where a subordinate clause is introduced by a main clause which is very short. In such cases a single IG may span both clauses (although when the clauses are reversed, both an IGB (and a comma) seem likely. Clausal subjects are likely to have an IGB following them.

I will if I can.
If I can, I will.
Everything I have ever worked for/is lost.

Clausal complements are not followed by an IGB.

I imagined what the outcome would be.

This reflects the more general allowance of an IGB between subject and verb, but not between verb and complement.

All types of parenthetical clause are regularly given a separate IG (they are also commonly spoken with a lower pitch range—this was pointed out as early as Butler,1634—see again table 1). *If I were a millionaire/which I am not/I would . . .*
A separate IG is also regularly used for "absolute constructions." *Given the need to provide linguistic background so briefly/. . .*

Table 2 **Correspondences Between the Occurence of Commas and the Occurence of Intonation-Group Boundaries.**

	Comma allowed Yes/No	**IGB typical Yes/No**
Between major constitutents:		
Between subject and verb[1]	No	Yes
Between subject + restrictive relative and verb	No	Yes
Around a parenthesis intervening between subject and verb:		
Non-restrictive relative	Yes	Yes
Vocative	Yes	Yes
Appositional	Yes	Yes
Verbless adjectival	Yes	Yes
Sentence adverbial	Yes	Yes
Between verb and object or complement	No	No
Between fronted direct or indirect object and clause remainder	No	Yes
Between initial or final adverbial and remainder of clause	Yes	Yes
Within major constitutents:		
Lists of nouns or verbs or adjectives or adverbs or prepositions	Yes	Yes
Between last item of list and a head word	Yes	Yes
Before last item of list	Yes	Yes
Before *and* + last item of list	Yes	Yes
Between direct object and indirect object	No	Yes
Comparisons with *with*	No	Yes
Commas between clauses:		
Between coordinate clauses	Yes	Yes
Between main clause and adverbial clause	Yes	Yes
After clause used as fronted direct or indirect object	Yes	Yes
Before tag questions	Yes	Yes
Around parenthetical clauses	Yes	Yes
'Absolute constructions'	Yes	Yes

1 The number of constructions included is not comprehensive, but based on those referred to in the guides to punctuation surveyed.

Commas, Intonation-Groups and Meaning

A comparison of prescribed uses of the comma in writing and of IGBs in speech is laid out in table 2. It is clear that in the majority of cases there is agreement between where a comma is allowed in writing and the typical occurence of an IGB in speech. However, what table 2 does not entirely show is that this agreement is of at least four different types (some overlap exists between items three and four):

1 where both the use of a comma and the occurence of an IGB are disallowed, e.g., between verb and following object or complement.

2 where both the use of commas and the occurence of IGBs are not only allowed but obligatory, e.g., around parentheses, whether clausal or not; between an "absolute construction" and main clauses; between main clause and tag; between each item in a list, including before the last item in a list if not linked by a conjunction.

3 where commas are allowed but often omitted, whereas the occurence of IGBs is very typical, i.e., before *and, but,* and *or* in lists; before and introducing a coordinate clause; between the last item in a list and its "head"; between a fronted direct or indirect object clause and the remainder of the main clause; and between a subordinate clause and a main clause.

4 where commas are allowed and IGBs are typical, e.g., if a long constituent and/or wrong signposting is involved, i.e., between a sentence adverbial in initial or medial position and a main clause. (Wrong signposting may also be an additional factor in some of the optional uses of the comma mentioned under item three.)

There are only a few cases where there is a clear difference between comma prescription and occurence of an IGB: between subject and verb (including subject plus restricted relative and verb); between a non-clausal fronted direct or indirect object; and in comparisons involving *with.* Of these the disallowance of commas as opposed to the common occurence of IGBs between subject and verb is by far the most frequent type, even more so if cases involving a restrictive relative are included. Written examples like the following are not at all uncommon.

> *The question whether it is ever legitimate to use a comma to mark the end of a long and complicated subject is an arguable one.* Fowler, 1965:588.

In this example, comprehension of the sentence would have been speeded by the use of a comma, as it would even more so in an (invented) example like the following.

All those who could hit the target.

It would seem to be a sensible reform of punctuational practice that the use of a comma should be allowed in all cases where it serves to avoid wrong signposting, and, further, in any case where more efficient understanding of the structure of a sentence would be produced. The use of question marks and exclamation marks is now accepted as discoursal or attitudinal rather than grammatical. *You didn't? You didn't! You didn't.* Pragmatic rather than prescriptive use of commas would seem more sensible. Indeed current nonprescriptive practice is already spreading such a change: how often does one see a comma between subject and verb in newspapers, in personal letters, in student essays, or indeed, in articles submitted to journals? More widespread acceptance of this sort of use of the comma would of course represent a return to a more elocutionary usage, i.e., use of the commas to accord with IGBs.

Although in many cases syntactic and elocutionary punctuation coincide, a too stringent (and often misinformed) concentration on prescriptive syntactic punctuation can undoubtedly hinder what should be the basic principle of punctuation: aiding communicative clarity. Historically, printed text was seen as something to be read aloud; even though today it is not, more regard for elocution (unfettered by the prescriptions imposed by publishers and grammarians) would enable use of the comma to return to this basic principle of communicative clarity.

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Abstract

Three-linguistically-motivated algorithms for assigning between-word space sizes were compared for their impact on text readability: a computer-implemented heuristic analysis assigned extra spaces between word groups corresponding to major phrases; a phrase-structure analysis assigned each space a size proportional to the depth of the phrase structure at that point; a prosodic analysis assigned space sizes proportional to the between-word pauses indicated if the sentences were spoken; finally, an even-spacing algorithm, assigned a constant amount of space between each word on a line. The readability of the formats were contrasted using the Cook-Chapman find-the-odd-word test in a paragraph version. The readability results showed the following significant ordering of increasing difficulty: heuristic—>phrase-structure=prosodic=even-spaced. The reason that spacing based on the heuristic parser results in better comprehension than based on the complete phrase structure may be that good readers guide their eye movements by a similarly crude initial parse of texts. These results suggest that the readability of text can be improved with the aid of a rudimentary automatic parser.

Spacing Printed Text to Isolate Major Phrases Improves Readability

Thomas G. Bever, Steven Jandreau, Rebecca Burwell, Ron Kaplan & Annie Zaenen

It is intuitively clear that text is easier to read if it is formatted with linguistic structure in mind. Over the past two millenia, the development of phonemic alphabets has involved a consistent trend to reveal more of the surface phrase structure in the way text is printed: the introduction of spaces between words, special characters to begin and end sentences, the comma, and the addition of extra space after a period and comma, have all contributed to a representation of the prosodic segmentation which sentences would have when spoken. These developments are of both practical and theoretical significance. Practically, they suggest that reading performance can be improved by using a more complete reflection of linguistic structure in printing: theoretically, they suggest that certain kinds of prosodic information are important aids to normal sentence comprehension.

Various authors have suggested that linguistic structure could be advantageously reflected in the physical characteristics of print, rather than through the introduction of new types of punctuation marks (Bower and Bever, 1974). For example, various studies have shown that if propositions are arranged on separate lines, comprehension is improved in the general reading population (Miller and Anglin, 1979). A consistent line of research has shown that people with good vocabulary but with reading disabilities, read text normally if it is printed with extra spaces between propositions (Cromer, 1970). Cromer argues that the nature of much reading disability is a specific deficit in the use of segmentation strategies which group together words which are likely to be in the same proposition: providing extra spaces around propositions makes up for this deficit.

In our review of the literature, which we limited to studies done in English (see References), we found 24 distinct experiments on the effect on text readability of formats that separate phrases, compared to more traditional formats. Of the 12 studies which assess reading comprehension or verbatim recall,

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all report an improvement in the phrase-marked format (with a subject-weighted mean of +12.7 percent compared to a normal format for the 10 significant studies.) Of the 12 studies which recorded reading rates, 8 reported increased reading speed in the phrase-marked format (with a subject-weighted mean of +9.9 percent for the 6 significant studies).

Most of the previous research has used linguistic analysis imposed by hand, often based on relatively untutored intuitions about where phrases begin and end. Recently, Frase and Schwartz (1979) and Jandreau et al (1986) used simple structure-assigning algorithms which were implemented in computer programs. Frase and Schwartz's program identifies markers which are likely to signal the boundaries of propositions (conjunctions, punctuation marks, and so on): they showed that arranging propositions identified in this way on separate lines lead to better reading performance. Jandreau et al used a program, "cyclephrase," to identify major phrases (it is basically an ATN sensitive to a few hundred function morphemes—we describe it in more detail below). They found that adding extra space between major constituents identified in this way improved reading performance significantly.

These results suggest that enriching the amount of linguistic information about phrases in printed text can improve readability. But the previous studies have not implemented a complete linguistic phrase analysis of any kind. The present study contrasted three kinds of linguistically based information: a hand constructed phrase structure analysis, a prosodic-phrase analysis (Selkirk, 1982) and a "phrasetree" analysis adapted from "cyclephrase" used in Jandreau et al.

The phrase structure analysis involved assignment of a surface constitutent structure, motivated largely within the context of lexical-functional grammar. The prosodic analysis had as input the phrase structure analyzed text. We used an implementation of Selkirk's rules for prosody, which operate on a combination of lexical and phrase structure information, to assign relative between-word pause durations in a spoken version of the text. The phrasetree analysis was done by the program, "phrasetree," which is an extremely simple tree structure-assigning algorithm—it uses less than 300 lines of code, and in its original version ran satisfactorily on a TRS-80 Model II computer. It recognizes about 270 function words, grouped into about twenty conventional classes (preposition, deter-

miner, etc.): content words are not identified. The essential algorithm takes in a sentence (defined by puntuation), and breaks the sentence into two parts near the center: it uses an ordered set of patterns to impose the breaks, first searching for conjunctions, then for particular kinds of pair sequences of word types. The algorithm iterates on each of the two parts of the sentences (hence, the original name "cyclephrase"), until phrases less than three words in length are defined. The output is an unlabelled tree structure.

The purpose of our experiment, therefore, was to examine the effects of these three different ways of spacing text upon readers' comprehension.

Method

Materials

The Cook-Chapman find-the-odd-word test was printed in each of these three ways (see figures 1, 2 and 3), together with an even-space control condition. This text has been used as a standard in the printing industry to assess the readability of different fonts and page format styles (Coleman and Kim, 1961). Subjects read 26-35 word paragraphs each with a word that did not make sense in the context. One such paragraph with the odd word in italic is shown below:

> We worked all day in the shop making a chair. When night came it was nearly done and to finish it we needed only one small piece of *glass*.

The subjects' task is to strike out the odd word in each paragraph. The test is time-limited, so the number of paragraphs a subject gets through is a measure of the readability of the text. There are two paragraph sets, each with 25 paragraphs. One set is intrinsically harder and is given after the other set to counteract for any practice effect. The standard technique is to present the first text in one format style, and the second in another: this gives a basis for comparing each subject on two formats. As is standard in the use of the test for assessing formats, the short paragraphs in each group were run together into one large paragraph, with a special mark indicating the beginning of the next story.

We adapted the test so that there were eight experimental versions. The first set was always formated in the standard right-ragged manner, with equal sized spaces on each line (note that the average size of the space on each line varied somewhat according to how many words filled it.) The second subtest

was formated in accord with one of four algorithms described below. In each of the following cases, the space size was varied according to one of the linguistic algorithms described previously. In each case, the average space size on each line was the same as in the corresponding lines in condition four below, the equal condition. That is, the space sizes were varied by adding and subtracting fractional amounts of space from the equal-spaced format condition. The four versions were thus:

1 Phrasetree controlled. The space following each major constituent identified by phrasetree was varied proportionally according to the number of words in that constituent.

2 Phrase-structure controlled. Each space after a word was varied according to the number of constitutents that ended at the word.

3 Prosody controlled. Each space after a word was varied according to the indicated pause length for that position.

Figure 1
Phrasetree format, large spacing, second materials set.

We started to cut down a tree in our front yard but after working for two hours we gave it up because our hammers were no good. # Jack never seems to look where he is going and is always bumping his toes and falling over things. I think anyone who does that is rather smart. # The farmer said we could have two quarts of milk and a quart of cream tomorrow but we would have to bring a couple of bags to put them in. # Some people have what is called a sweet tooth. They like sweet things, put lots of salt in their coffee and often eat candies for the same reason. # John did his work so well and got such good grades during the whole year that his teacher thought he would be sure to fail the test. # When one goes on a picnic and takes along a big pail of lemonade it is very upsetting to find out that someone has left the pencils at home. # The old teacher was cruel to the boys and beat them when they made mistakes, so when he left all the boys were sad. # When my mother saw the marks of dirty shoes on the floor and all over the nice clean beds, she was surprised to see how careful the children had been. # When the little boy next door had both of his legs broken by a car we were afraid he might never be able to see again. # When it began to get cloudy and the rain began to fall, Mr. Jones went back to his home for his umbrella because he did not want to get sunburned. # One day we rented a boat and went fishing. After we had caught enough we went back to the house where we cooked the chickens and had them for dinner. # The poor people of Holland wear heavy wooden shoes and as they walk the sound of their shoes makes it very quiet in the streets. # The other day we forgot all about our little kitten and were gone all day. When we returned, we found him on the back porch barking to be let in. # We are interested in what is happening in America and the other great nations of the world, so each morning we read the comics with great care. # The river was so wide and the current so strong that we always kept a boat with oars and a sail ready for use whenever we wanted to walk across. # Mary said she mailed a letter to me at the postoffice yesterday, but the milkman did not leave anything for me when he came this morning. # In order to be sure to have enough food to last them through the cold winter, the settlers planted large fields of rocks in the fertile land of the valley. # John is going to town with his mother to buy a new suit, for he is going to a party tomorrow where everybody must appear in their worst clothes. # When the house caught fire one of us called the fire department, and in less than five minutes the policemen were hard at work putting it out. # Frank hopes to be a great baseball player when he grows up. He plays all the time and never goes out in the afternoon without taking his cane with him. # On rainy afternoons we have fun by cutting things out of paper and cardboard. Dolls and soldiers and even playhouses can be easily made with a pair of pants. # There was a great deal of rain and wetness in that country, so the poor people who lived there could grow no plants because of the dryness of the land. # In order to make the garden in the front of our house more beautiful we were careful to plant many weeds there. We worked all day in the shop making a chair. When night came it was nearly done, and to finish it we needed only one small piece of glass. # We were out in the middle of the water, everywhere we could see nothing but big waves, except when a train passed close to us, going in the opposite direction. # One hot afternoon this summer we all got so thirsty that we sent one of the children down to the nearby river to get a big pail of stones. # People put grease on the wheels of their wagons to make them turn more easily, so we never drive without having a can of sand ready for use.

4 Equal-spacing. This is the same standard formatting as for the first set. For every one of the three preceding conditions there was a corresponding even-spaced formatted version, with the same line lengths and the same average space size.

The experimental materials were varied with two degrees of variation in space size. In the "large" variation condition, the space size could be as large as 2.5 full spaces; in the "small" variation condition, the space size could be as large as 1.75 full spaces. (Figures 1-3 are examples of the materials used.)

Subjects

Subjects were eighty undergraduates at Monroe Community College, Rochester, New York, who volunteered for paid participation. Subjects were recruited from six different courses. In each course, we randomly distributed a.1 equal (or

Figure 2
Phrase-structure format, large spacing, second materials set.

We started to cut down a tree in our front yard but after working for two hours we gave it up because our hammers were no good. # Jack never seems to look where he is going and is always bumping his toes and falling over things. I think anyone who does that is rather smart. # The farmer said we could have two quarts of milk and a quart of cream tomorrow but we would have to bring a couple of bags to put them in. # Some people have what is called a sweet tooth. They like sweet things, put lots of salt in their coffee and often eat candies for the same reason. # John did his work so well and got such good grades during the whole year that his teacher thought he would be sure to fail the test. # When one goes on a picnic and takes along a big pail of lemonade it is very upsetting to find out that someone has left the pencils at home. # The old teacher was cruel to the boys and beat them when they made mistakes, so when he left all the boys were sad. # When my mother saw the marks of dirty shoes on the floor and all over the nice clean beds, she was surprised to see how careful the children had been. # When the little boy next door had both of his legs broken by a car we were afraid he might never be able to see again. # When it began to get cloudy and the rain began to fall Mr. Jones went back to his home for his umbrella because he did not want to get sunburned. # One day we rented a boat and went fishing. After we had caught enough we went back to the house where we cooked the chickens and had them for dinner. # The poor people of Holland wear heavy wooden shoes and as they walk the sound of their shoes makes it very quiet in the streets. # The other day we forgot all about our little kitten and were gone all day. When we returned, we found him on the back porch barking to be let in. # We are interested in what is happening in America and the other great nations of the world, so each morning we read the comics with great care. # The river was so wide and the current so strong that we always kept a boat with oars and a sail ready for use whenever we wanted to walk across. # Mary said she mailed a letter to me at the postoffice yesterday, but the milkman did not leave anything for me when he came this morning. # In order to be sure to have enough food to last them through the cold winter, the settlers planted large fields of rocks in the fertile land of the valley. # John is going to town with his mother to buy a new suit, for he is going to a party tomorrow where everybody must appear in their worst clothes. # When the house caught fire one of us called the fire department, and in less than five minutes the policemen were hard at work putting it out. # Frank hopes to be a great baseball player when he grows up. He plays all the time and never goes out in the afternoon without taking his cane with him. # On rainy afternoons we have fun by cutting things out of paper and cardboard. Dolls and soldiers and even playhouses can be easily made with a pair of pants. # There was a great deal of rain and wetness in that country, so the poor people who lived there could grow no plants because of the dryness of the land. # In order to make the garden in the front of our house more beautiful we were careful to plant many weeds there. We worked all day in the shop making a chair. When night came it was nearly done, and to finish it we needed only one small piece of glass. # We were out in the middle of the water, everywhere we could see nothing but big waves, except when a train passed close to us, going in the opposite direction. # One hot afternoon this summer we all got so thirsty that we sent one of the children down to the nearby river to get a big pail of stones. # People put grease on the wheels of their wagons to make them turn more easily, so we never drive without having a can of sand ready for use.

nearly equal) number of each version. We do not have exact information on their reading ability, because most of the students do not know their verbal SAT scores, given that they took the test at all. The Monroe Community College must admit anyone with a high school diploma who applies: their performance on the test suggested a median SAT score around 450.

Procedure

Subjects were run in groups of 6 to 19. They were instructed in the use of the Cook-Chapman test using the standard printed instructions that come with the test, printed in a ragged right format with much smaller print than the actual test (this was to avoid giving them pre-training on a paticular format). Subjects read the first set (always even-spaced), crossed out all the odd words they could in the time allotted

Figure 3
Prosodic format, large spacing, second materials set.

We started to cut down a tree in our front yard but after working for two hours we gave it up because our hammers were no good. # Jack never seems to look where he is going and is always bumping his toes and falling over things. I think anyone who does that is rather smart. # The farmer said we could have two quarts of milk and a quart of cream tomorrow but we would have to bring a couple of bags to put them in. # Some people have what is called a sweet tooth. They like sweet things, put lots of salt in their coffee and often eat candies for the same reason. # John did his work so well and got such good grades during the whole year that his teacher thought he would be sure to fail the test. # When one goes on a picnic and takes along a big pail of lemonade it is very upsetting to find out that someone has left the pencils at home. # The old teacher was cruel to the boys and beat them when they made mistakes, so when he left all the boys were sad. # When my mother saw the marks of dirty shoes on the floor and all over the nice clean beds, she was surprised to see how careful the children had been. # When the little boy next door had both of his legs broken by a car we were afraid he might never be able to see again. # When it began to get cloudy and the rain began to fall Mr. Jones went back to his home for his umbrella because he did not want to get sunburned. # One day we rented a boat and went fishing. After we had caught enough we went back to the house where we cooked the chickens and had them for dinner. # The poor people of Holland wear heavy wooden shoes and as they walk the sound of their shoes makes it very quiet in the streets. # The other day we forgot all about our little kitten and were gone all day. When we returned, we found him on the back porch barking to be let in. # We are interested in what is happening in America and the other great nations of the world, so each morning we read the comics with great care. # The river was so wide and the current so strong that we always kept a boat with oars and a sail ready for use whenever we wanted to walk across. # Mary said she mailed a letter to me at the postoffice yesterday, but the milkman did not leave anything for me when he came this morning. # In order to be sure to have enough food to last them through the cold winter, the settlers planted large fields of rocks in the fertile land of the valley. # John is going to town with his mother to buy a new suit, for he is going to a party tomorrow where everybody must appear in their worst clothes. # When the house caught fire one of us called the fire department, and in less than five minutes the policemen were hard at work putting it out. # Frank hopes to be a great baseball player when he grows up. He plays all the time and never goes out in the afternoon without taking his cane with him. # On rainy afternoons we have fun by cutting things out of paper and cardboard. Dolls and soldiers and even playhouses can be easily made with a pair of pants. # There was a great deal of rain and wetness in that country, so the poor people who lived there could grow no plants because of the dryness of the land. # In order to make the garden in the front of our house more beautiful we were careful to plant many weeds there. We worked all day in the shop making a chair. When night came it was nearly done, and to finish it we needed only one small piece of glass. # We were out in the middle of the water, everywhere we could see nothing but big waves, except when a train passed close to us, going in the opposite direction. # One hot afternoon this summer we all got so thirsty that we sent one of the children down to the nearby river to get a big pail of stones. # People put grease on the wheels of their wagons to make them turn more easily, so we never drive without having a can of sand ready for use.

(our pretest with this population indicated that allowing two and one-half minutes for each sub-test would give a suitable range of performance.) They then did the same on the second experimental test.

Results

Subjects' performance on each set was scored in terms of the number of words he or she read. This number was calculated by counting the number of words to the critical word in each passage. The measure of format difficulty we used was the difference in the score on the standard even-spaced format subjects read first, and the experimental format they read second. Table 1 presents the results for each condition expressed as percentage improvement. As expected, there was little improvement in the readability of the second set of even-spaced materials. The greatest numerical advantage was for the phrasereed materials, the next greatest for the phrase-structure materials and there was no advantage for the prosodic materials. Since there was no obvious effect nor any interaction involving the magnitude of the space variation, we collapsed across magnitude for specific significance tests. They showed that the phrasetree materials are read significantly better than the even-spaced format (X-square= 3.96 $p<.05$, by subject), better than phrase-structure format (X-square=5.22, $p<.025$) and better than the prosodic materials (X-square=8.29 $p<.01$).

Strictly speaking, the design of the Cook-Chapman materials requires that one look only at the number of subjects who show an improvement on a particular format. This equalization is reflected in the fact that 50 percent of the subjects performed better (and 50 percent performed worse) on the second sub-test when it was in the even-spaced condition, a substantial confirmation of its beneficial effect.

Table 1	**Magnification in percent**			**Percent of Ss who showed gain on second test**
	Small	*Large*	*Mean*	
Even-spaced	7.5	1.0	4.3	50.0
Phrasetree	13.0	15.0	14.0	80.0
Phrase-structure	1.5	8.0	4.8	45.0
Prosodic	4.3	-4.3	0.0	35.0

Table 2 **Percent Improvement by Group and Format Condition**

	Low	*High*
Even-spaced	+ 9.97	+5.29
Phrasetree	+37.43	+5.67
Phrase-structure	+11.81	-0.27
Prosodic	+ 1.59	-4.29

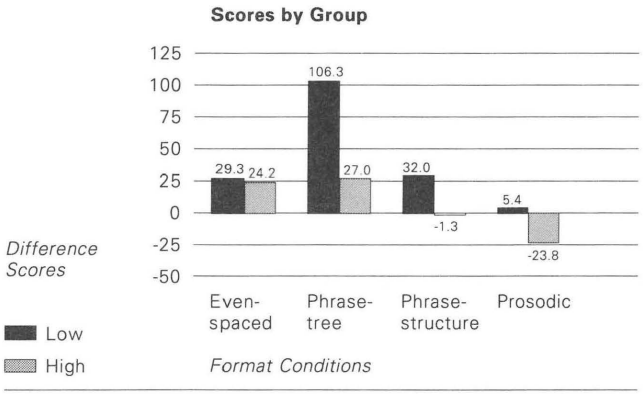
Previous research had suggested that subjects who are most helped by linguistic formats tend to be poor readers (Cromer, 1975; Jandreau et al, 1985, see also Muncer and Bever, 1984). Although we did not have access to independent tests of the reading ability of our subjects, we used their performance on the initial set of sentences as a relative measure of reading skill. We examined their improvement in performance on the second set against their performance on the initial set. Table 2 presents the data for the subjects who scored in the top (*high*) and bottom (*low*) 40 percent on the first text set. (We examine the lowest and highest 40 percent because it turned out that this gave us groups whose initial performance was comparable in the different experimental conditions.) The relative improvement caused by the phrasetree materials for the *low* readers is considerably greater than for the *high* subjects.

We performed an ANOVA in the difference scores for the low and high subjects. The results are shown in figure 4. Using planned comparisons among the low group, the phrasetree condition was significantly better than the even spaced condition ($p<.05$), while the other two formats were not significantly different. There were no significant differences in the high group.

Discussion

The study confirms the finding of Jandreau et al that the phrasetreed materials are read more efficiently than standard right-ragged format. However, neither the phrase-structure based treament nor the prosody-based treatment resulted in any significant improvement, unlike the phrasetree treatment. This is surprising, since prima facie the reason that phrasetree is effective at all, is because it approximates a realistic reflex of linguistic structure, either phrase structure directly, or as indirectly expressed in prosodic structure. The major visual feature

Figure 4



of phrasetree is that individual constituents are isolated by relatively large spaces: the major feature of the phrase-structure and prosodic structure formats is that the constituents are separated by gradations. The preliminary implications of our study is that clear separation of major constituents is of greater value than continuously varying separation. It is further striking that the prosody materials actually came close to making the text less readable than normal. There are several possible reasons for this. First, Selkirk's rules or our adaptation of them may be wrong; second, it may be the case that the prosodic information actually slows subjects down because it evokes auditory processing strategies, which reading can obviate.

This study and others demonstrate that isolating major phrases within extra spaces faciltiates reading, especially among poor readers. The implications of these results suggest that the value of an automatic analysis of linguistic structure for formatting is to isolate the major phrases of sentences. Phrasetree and other simple algorithms can approximate this, but fail in some cases. Accordingly, we expect that refined improvements in the readability of text will be possible with the use of a more powerful parser than phrasetree.

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Research Summary of Reading Speed and Comprehension or Recall

Reading Speed Significant Studies		Phrase	Non-Phrase	Λ%	Ss	Design	Ph. Size	Sp. Size
Bever et al	a.	431.0	393.0	+ 9.4	40	B	L	1-3
	(b.	398.0	325.0	+22.5)				
Frase & Schwartz (1979)	3	22.7	27.7	+18.0	16	W	S	lines
	2	20.8	23.7	+15.0	16	W	S	lines
	1	18.6	21.3	+12.6	8	W	S	lines
Hartley (1980)		12.3	14.17	+16.3	18	B	L	lines
		15.0	17.5	+14.3	12	B	L	lines
Jandreau et al (1986)	1	403.0	347.0	+16.1	36	B	L	1-3
Jandreau et al (1986)	2	465.0	388.0	+19.7	44	B	L&S	1-3
Mason & Kimball (1979)		62.0	42.0	- 48.0	22	B	L	line
North & Jenkins (1951)		8.55	7.55	+13.2	120	B	S	1
Nonsignificant Studies								
Carver (1970)		54.0	49.0	-12.3	18	W	S	>4
Coleman & Kim (1961)		261.2	260.0	+ 1.2	64	W	S	1
Keenan (1984)		15.8	18.9	- 16.0	24	B	S	lines
Klare et al (1957)		7.8	7.5	- 3.6	214	B	S	>4
Taylor, Wade & Yekovich	a.	31.0	30.0	+ 3.3	22	B	L	line
(1985)	b.	76.0	74.0	+ 2.7				
Comprehension and/or Recall Significant Studies								
Anglin & Miller (1968)		53.0	42.0	+26.0	12	W	L	line
Brozo et al. (1983)		17.5	16.8	+ 4.0	58	B	S	slash
Cromer (1970)		59.0	45.0	+14.0	64	W	L	~3
		50.4	22.4	+28.0)	30	W	?	?
Gerrell & Mason (1983)		72.3	66.0	+ 9.5	32	W	S	line
Graf & Torrey (1966)		5.47	4.18	+30.9	22	B	L	line
Mason & Kendall (1979)		62.0	52.0	+19.0	20	B	S	slash
Negin (1982)		9.3	8.1	+16.1	120	B	S	1
North& Jenkins (1951)		494.0	448.0	+10.9	48	W	L&S	5
O'Shea & Sindelar (1983)		68.1	63.4	+ 7.4	85	B	S	slash
Stevens (1981)		65.0	54.0	+11.0				
Non-Significant Studies								
Coleman & Kim (1961)		14.0	13.2	+ 6.0	64	W	S	1
Hartley & Burnhill (1971)		4.61	4.37	+ 5.5	49	W	L	lines

Phrase, Non-Phrase = self-explanatory
Λ% = percent difference between conditions
Design = B: between subjects, W: within subjects
Ph. Size = phrase size, L: only major boundaries; S: only minor boundaries
Sp. Size = spacing size: number of regular spaces inserted

Formatting Summary (experiments listed above)

The following studies report a significant improvement as a function of phrase-based spacing of printed or displayed text.

Bever et al. (in preparation). Forty community college subjects responded to two subtests of the Cook-Chapman test; the first subtest was normally formatted, while the second was formatted normally or phrased. The score represents the percent improvement on the second test as a function of format: a. is the score for all subjects, b. is the score for poor readers. Phrased texts were assigned and spaces added as in experiment 1 of Jandreau et al.

Frase and Schwartz, (1979). College graduates read Bell System technical documents, then made true/false decisions about new sentences, with access to original text. Numbers are average time taken to verify whether a test sentence is true or false. Phrased texts presented a proposition on each line, non-phrased texts were in standard format. Experiments 1 (8 subjects) and 2 (16 subjects) had materials which indented each phrase as well as placing it on a separate line. Experi-

ment 3 (their number 5, 16 subjects) had a left-justified format.
Hartley, (1980). Experiment 1—Modified replication of Frase and Schwartz (1979). Subjects answered all questions at once. Numbers are time in minutes. 18 subjects in each condition. Materials were also indented. Experiment 2—Materials not indented, 12 subjects in each condition. N.B. The overall ANOVA did not reveal a significant effect of format, but t-test comparisons were significant.
Jandreau et al., (1986). Eighty subjects divided into 4 groups (experiments 4 and 5) read one version of Cook-Chapman, find-the-odd-word materials, in one of four formats. Numbers refer to the mean number of words read in 2 1/2 minutes while performing the task. The phrased materials in experiment 1 had extra spacing only at major phrase boundaries (space size was a positive function of the word length of the preceding phrase); in experiment two proportional extra spacing was added following minor and major phrase boundaries. Phrase structure was assigned by the computer program, cyclephrase, with a full space variation.
Mason and Kendall, (1979). Two groups of 11 fourth graders, classified as poor readers, read three 69-word paragraphs, either all in the phrased or normal format. Large phrases were presented on separate lines; the control format was standard. A is the percentage of comprehension questions answered correctly; B. is the time in seconds to read each passage.
North and Jenkins, (1951). Two groups of 60 college freshman read either one phrased or normal *Readers Digest* articles, each in two minutes. a. is the number of words read; b. is the number of correct content questions; c. is percent correct on questions on material actually read. Phrased texts added an extra space between major phrases (='thought units' but not necessarily propositions).
Anglin and Miller, (1968). Twelve subjects read two essays, one phrased and one non-phrased. Phrases were presented one at a time; phrases were major, 4-7 words, usually proposition-bearing units. Numbers are number of words recalled a. after one and b. three trials (read from their figure 1).
Brozo, Schmeler and Spires, (1983). Fifty-eight college students, good readers (>75th percentile) read either phrased or non-phrased subtest from the Minnesota reading assessment test. Numbers are the mean performance on comprehenssion questions. Phrases were assigned and marked as in Stevens (1981).
Cromer, (1970). Sixty-four junior college students read both phrased and normal texts grouped in 4 sets of 5 stories from a standard test for college-high school students. Number reports percentage of the scores above or below the overall subject mean number of questions on comprehension test (Cromer reported his results in terms of normalized z-scores by subject, which we converted back to percentages of distribution above and below the mean—assuming normal distribution). Numbers are a. for all readers; b. for good readers (164 on the ETS cooperative English test); c. for poor readers. Phrased text placed three extra spaces between propositions, (='thought units').
Gerrell and Mason, (1983). Thirty 5th grade students read both standard and phrased reader texts presented on a computer screen and answered content questions. Numbers refer to percentage correct on those questions. Phrased texts had extra 'spaces' placed between 'intuitively arrived at phrases.'
Graf and Torrey, (1966). Thirty-two undergraduates read both phrased and antiphrased test essays, presented one text line at a time, moving down the page. Reading speed was adjusted to be slightly too fast for each individual subject. Values report mean correct on a post text comprehension test. Phrased texts presented major phrases on each line, (not necessarily propositions) antiphrased texts presented sequences bounded by minor boundaries: the two treatments were equated for even number of letters per line, about 3-5 words per line.
Negin, (1987). Two groups of 10 hearing-impaired subjects read either phrased or non-phrased texts. Numbers are comprehension test scores. Phrases were assigned as in Klare et al, and marked with blue slashes.
O'Shea and Sindelar, (1983). Forty-eight 1st and 3rd graders read two 200-word stories, one normal and one phrased, in counterbalanced

order, in a maze reading task. At selected points in each paragraph, subjects had to choose which word is appropriate, given three choices. Numbers are the average scores on the test. Phrased text followed Klare et al, and used 5 spaces between phrases.
Stevens, (1981). Eighty-five high school students read one phrased and one non-phrased form of the Gates-Macginitie test (level f). Numbers are scores on following comprehension tests. Phrased texts had slashes at each phrase point. Phrases were intuitively assigned small units.

The following studies tested some kinds of phrase-based spacing but did not report significant results.

Coleman and Kim, (1961). Sixty-four Johns Hopkins undergraduates read both phrased and normal 1500-word complex texts and answered content questions. Numbers are: a. average number correct on those questions; b. reading speed in words per minute. Phrased texts had one extra space placed between short phrases.
Klare et al., (1957). One hundred and seven airmen read normal and another 107 read phrased versions of a 1200-word text on engine repair, followed by comprehension questions. Numbers are mean time to read the text (they do not report comprehension performance). Phrased texts were marked by at least four extra spaces between short phrases.
Carver, (1970). Eighteen college students read short passages from a reading test, both phrased and normal: a. is average number correct answers to a comprehension test; b. is average reading time. Phrased texts had at least four extra spaces placed between short phrases, following Klare et al.
Keenan, (1984). Four groups of 6 clerical staff (Bell Labs) each read 4 short texts (120 words) in one of four formats: phrased-printed, normal-printed, phrased-screen, normal-screen. Each text was followed by comprehension measures. Numbers report reading rate in characters per second. Phrased text was presented as in Frase and Schwartz, 1/2 with short phrases on separate lines, 1/2 with propositions on separate lines.
Taylor, Wade and Yekovich, (1985). Two groups of 111 fifth grade students read 200-word passages. The numbers are the percentage of 'idea units' recalled: a. in free recall, and b. in both free and cued recall (from their 'no-practice' condition). Phrased texts had one 'idea unit' per line.
Hartley and Burnhill, (1971). Volunteers in a first year psychology course read two 2500-word scripts taken from Radio Three broadcasts, Each script had eight written comprehension questions. Numbers represent the average number of correct answers.

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Abstract

The impact of Russian avant-garde, especially the cubo-futurist artists' books of Kruchenykh, Klebnikov and David Burliuk (with illustrations by Goncharova, Kulbin, Malevich and others) played a signficant role in determing the shape of early structural linguistics. This happened primarily through Roman Jakobson's association with these artists at a time in his life when he was formulating a series of revisions to the linguistic concepts of Ferdinand de Saussure and the neogrammarians before him. Jakobson's artist colleagues began working in interdisciplinary art forms (the artist's book), as he was attempting to articulate a theory that would encompass the irrational in discourse focused on the relationship between sounds, and between sound and meaning, thus trying to retain a role for reason.

SHa + [illegible]
CHa P[illegible]
but Bo + Zo, Aetius,
KHo of Rome,
So Mo Ve + Ka So,
Lo SHa of the
steppes + Cha.

Bastard in the Family
The Impact of Cubo-Futurist Book Art on Structural Linguistics

Harry Polkinhorn

Art and Theory

Roman Jakobson's work, although rigorous and empirical when considered on a molecular level, in some ways is antisystematic and fragmentary. To compensate for this, he continually returns to the theme of the "science of language," and even late in his career he feels it necessary to defend his project against anti-science charges.[3] I will demonstrate in the following discussion that at the heart of this polemic lies a knot of forces pertinent to the establishment of modernism. Jakobson excelled at the short, allusive essay whose closures always lead one into other relations. There is a hieratic visuality implicit in the forms of his expression, a figuration much akin to the silent film's imposition of stylized gesture upon its bearers. The dim flickering of lighting, the alternatively accelerated or frozen moments, the broken quality caused by interruptions for the intertitles all contribute to a filmic structure by means of which innovative ratios of perception/cognition are communicated. Jakobson himself comments on this: looking back from 1932 he says, "the first decades of the cinema have already become an 'age of fragments.'"[4] However, he chooses not to focus on this quality but characteristically on interrelationship; he notes in "the montage, the semiotic interrelation of things [in film]."[5] However, one could as well focus on the emptiness by means of which interrelationship is configured. That is, in order to save the illusion of narrative for the new medium of film, to reinstall some form of presence, the illusion must be attenuated; the narrative erodes within the matrix of its technical generation. Imperfections emerge from a form of idealism against which features are measured (or marked) and found to be wanting. Such a gapping lies at the heart of high and low modernism and finds its earliest and purest expression in the figure of the artist in denial (of society, of the past, of the present, of art, of the family or of himself through suicide).

Ceux ont exercé sur moi le plus d'influence, ce sont des artistes, non les savants . . . [1]

Roman Jakobson

When singers have been killed and their song has been dragged into a museum and pinned to the wall of the past, the generation they represent is even more desolate, orphaned, and lost . . .[2]

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Visible Language, 25:1
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Jakobson, I suggest, understood all this perfectly. From Saussure he accepted complex revisioning of neogrammarian positions worked out in an ultimately unsatisfactory binarism he himself applied to analyses of language (to which I will return),[6] yet his focus throughout was not on replacing an allegedly outmoded hierarchy with a more streamlined one; rather, what seems to have fascinated him was the binary functioning of reasonable discourse (i.e., his own) which extends its hegemony only at the expense of having to acknowledge its own innermost teleology: truth statements generated from within the model of the socratic dialectic make sense only within the self-defined domain of that process. This awareness emerges throughout, but I will concentrate on one scene in the linguist's early career, his futurist moment. Succumbing perhaps to an old man's nostalgia for the fire of an earlier, more committed posture, Jakobson looks back on his beginnings as heroic: "Young unorthodox linguists heeded the rallying slogans of the avant-garde poets, and we were at one with the brave and moving call jointly launched by Xlebnikov, Krucenyk, Burljuk and Majakofskij: 'To stand on the boulder of the word WE amid a high sea of catcalls and hatred.'"[7]

Yet what were these so-called rallying slogans; why did Jakobson make repeated if provocatively undeveloped references precisely to this period, to these artists? In "My Favorite Topics," he says, "Yet what must have primarily influenced my approach to poetics and liguistics was my proximity to the poets and painters of the avant-garde."[8] This will be the most significant approach to the necessary concealment which enabled structural linguistics. *Primarily,* he says, showing the important locus of the fascination, the exact point where the difficult new verbal/visual and abstract art objects came into contact with his nascent efforts to rethink Saussure. Winter goes so far as to say that this fascination never left Jakobson.[9] Yet he also says *must have,* as if there were the possibility of misjudgment. Even at the end of his career he reaffirms the importance of his affiliations with the artists of the Russian avant-garde, as if rounding out the story by echoing its beginning. When asked about the relation between Klebnikov's poetry and the painting of Malevich, he responded, "Of course, of course. Artists such as Malevich discussed the relation between *zaum* . . . [nonsense or abstract poems]

and abstract painting. Oh, we discussed this a great deal!"[10] In perhaps a franker moment, however, he admits, "Although I have belonged to the ardent and active adherents of abstract painting from the time of the first Russian steps in this direction (Kandinskij, Larinov, Malevich, Rodchenko, etc.), I feel completely exhausted after five or ten minutes of watching such [avant-garde] films."[11] In his impassioned reaction to Mayakovsky's suicide in 1930, Jakobson gave us a glimpse of the horror which his work evades:

> The simplistic formalist literary credo professed by the Russian futurists inevitably propelled their poetry toward the antithesis of formalism—toward the cultivation of the heart's "raw cry" and uninhibited frankness. Formalist literary theory placed the lyrical monologue in quotes and disguised the "ego" of the lyric poet under a pseudonym. But what unbounded horror results when suddenly you see through a pseudonym, and the phantoms invade reality . . .[12]

Thus Jakobson's contradictory understanding of Russian cubo-futurism gives us a grasp on how structuralism was generated out of the major intellectual, aesthetic and political conflicts of the early twentieth century.

Jakobson acknowledges his debts, a doubly ironic move that pulls both ways, since the "tradition" to which he binds himself explodes a connection to tradition.[13] Jakobson's debts fall into two distinct categories: intellectual in a conventional sense (Saussure, Peirce, Sapir, among others), and aesthetic/artistic. Whereas his uses of philosophers, linguistics and literary theoreticians take more familiar forms, one senses in his references to the Russian avant-garde the dissatifaction of a mind aware that its products can never settle what he feels are the greater complexities and challenges of art. An analysis of Russian cubo-futurism, specifically as it may have shaped Jakobson's early modifications of Saussurean concepts, will provide an understanding of structuralism's origins in the linguistic innovations which set it up as the key intellectual current of the modernist moment in western European thinking.

Early Structural Linguistics

Jakobson seems to have been primarily impressed by the enabling assumptions of a Saussurean binarism. In Saussure's *Cours,* assembled from lecture notes by stu-

dents, we are told that *"Le signe linguistique unit non une chose et un nom, mais un concept et une image acoustique"* (The linguistic sign unites not a thing and a name, but a concept and an acoustical image.) and that this latter is *"l'empreinte psychique de ce son, la représentation que nous en donne le témoignane de nos sense."*[14](the psychic imprint of this sound, the representation which has been given us by the evidence of our sense.) In this first attempt to break language free from an unproblematized nominalization, Saussure invokes the metaphor of the "acoustical image," revealing a secondary splitting within the initial splitting upon which his theory will be erected. The evidence of the senses, in any event, cannot be trusted but must be completed by a conceptual overlay; what we *know* must be brought to bear on what we *perceive.* At stake is the notion of identity, specifically in Saussure's advances over the neogrammarian position achieved by Osthoff and Brugmann.

> . . .the real fault of Saussure's contemporaries was that they failed to ask themselves fundamental questions about what they were studying: questions about the nature of language itself and its individual forms, and important methodological questions about identity in linguistics, both synchronic and diachronic. . . . for Saussure . . . only by thinking about signs and their nature could one begin to discriminate between the functional and nonfunctional aspects of language and attain an appropriately relational concept of linguistic units.[15]

Saussure therefore develops his notion of the sign: *"Nous appelons* signe *la combinaison du concept et de l'image acoustique . . ."* (We call sign the combination of the concept and the acoustical image.) and *"Nous proposons de conserver le mot* signe *pour désigner le total, et de remplacer* concept *et* image acoustique *respectivement par* signifié *et* signifiant . . ."[16] (We propose to retain the word *sign* to designate the whole, and to replace *concept* and *acoustical image* respectively with *signified* and *signifier.* . .) This famous complexification of language function is then extended through Saussure's notion of the arbitrariness of the sign: *"le signe linguistique est arbitraire."*[17] Thus the sign subsumes the split upon which signifier/signified is based, and in this gap lies the arbitrary (eventually extended by Jakobson), dialectically called forth by the linguist's strictly rational approach to the analysis of language. The importance of these formulations cannot be overestimated in setting up the major schools of linguistics

in the twentieth century.[18] Saussure's subsequent detailing of synchronic and diachronic dimensions, closely related to the interlocking *parole* and *langue* (and very reminiscent of Jakobson's metaphoric and metonymic poles), show him moving further away from an applied or descriptive linguistics through acknowledging the idealizing gestures of theory, or the faculty of knowing, and inserting them directly into a materialist dynamic. Although Jakobson did not accept these reformulations wholesale, but tested them out against the empirical data of his own field work and research, thereby enabling him to rethink Saussure's understanding of the temporal and spatial dimensions in language,[19] the Saussurean prying apart of word and meaning and their rearticulation through an analysis of the sound/meaning component of language had a lasting and formative impact on the development of Jakobson's approach.

That Saussure himself must have been aware of a fundamental contradiction in this project is borne out by a consideration of his fascination with anagrams, constituting as they do an *irrational* matrix for language function.[20] This interest can be found as well explicitly detailed in Jakobson, who says:

> It is difficult to find in history a cultural epoch of as numerous and patent contradicitions, not only within a society but also within any single thinker typical of that time, as the decades bordering the last and present centuries. The question of antinomies was a favorite topic of authoritative representatives of the epoch such as Ferdinand de Saussure, but even this great linguist's treatment of these internal contradictions remained inherently discordant. One of the general principles of his *Cours—"caractère linéaire du signifiant"*—is at variance with the only work of the same period, which he planned and prepared for publication, namely his voluminous inquiry into the paratexts of Latin, Greek and Vedic poetry.[21]

Jakobson finds this unique but displaces its unacceptable implications by moving immediately into a discussion of what he called "poetic language," that which acknowledges the irrational but subsumes it through repatterning. Yet the unsettling qualities continue to attract his attention, as seen in his comments on glossalalia (and the linguistic forms of taboo as well as of magic in oral tradition). The necessity for interdisciplinary approaches simply reinforces a conclusion that the analytics upon which the discourses of reason are established will not do the job.

"No matter what the results of the joint work of linguists and psychologists were in this case [the glossalalia of Mlle Muller-Smith], it should be seen as a stimulus for further interdisciplinary steps, and in particular for a bilateral structural analysis of glossalalia also in its individual, delirious manifestations."[22] Jakobson's avant-garde artist colleagues entered into the delirium.

Cubo-Futurist Theory and Practice

In a radical move, its theorization embedded in the objects' structures, the Russian cubo-futurists situated their energies at the divide between word and image, between the aural-sensible-cognitive of figured language and the visual-cognitive of painting. This divide was shared with other avant-gardes (dadaism, Italian futurism, ultraismo). The Russians contributed a unique, coherent political dimension the implications of which will be detailed in due course. The decentering of aesthetic activity, however, was the first step, which paralleled and in part furthered the move to demystify art so as to permit its access by the masses. It would no longer serve for the writer to acheive new forms with language, for the painter to evolve different styles from within; hybridization among media became necessary. There was a "physical inter-development of literature and painting which is one of the most outstanding characterstics of the cubo-futurist and subsequent schools of abstract painting which developed in Russia during the years 1910-1921."[23] Although the futurists may have traced certain lines of descent from a purported symbolist fascination with the autonomous development of art, it is clear that the purifying which the new art sought could only be brought about by a reversal of the directions of concentration which symbolism espoused. Pike recognizes these concerns and dwells on the peculiar conjunction between painting and poetry:

> In the case of the Russian futurists, both the beginning of their movement in impressionist/post-impressionist ('primitivist') painting and the symbiosis of painting and literature within the movement is shown by a number of factors. First, several leading futurists (e.g., David Burliuk, Kruchenyk and Mayakofsky) began their public existence as professional painters and all of the most significant futurists at one time or another worked in both paint and ink. Second, there was very close collaboration, particularly at the height of 'pure' futurism (1913-1914) between the leading avant-garde artists (especially Mikhail Larionov and Natalia Goncharova, the chief proponents of primitivism-futurism) and the

Burliuk brothers (David, Nikolai and Vladimir). Third, futurist poetry itself constantly emphasized the visual aspects of its existence in its experimentation with handwriting and typography, in its use of primitivism-futurist paintings as illustrations and in the very materials of its books, e.g., the repeated printing of poetry on wallpaper.[24]

Gray also sees the interconnections between poetry and painting as somehow significant to futurism,[25] as does Jakobson himself, although at the same time he curiously disavows any broader importance they may have had: ". . . there was only the question of their close interconnections; there was the possibility of making publications of poems with montage, with collage, of including different non-representational attempts at graphics or painting. Yet I would not say that this produced some questions of high sociological import."[26] This disingenuous statement seeks to cover up the scandalous revelations which the new art manifests, namely, that one could not defend a special-status claim for art objects, and that instead of being a mysteriously motivated genius the artist was a social agent whose task it was to better society through the means appropriate to his or her particular medium.

What is the nature and functioning of this hybridization? Is it enough for the poet to "illustrate" his or her texts? After all, what about the *editions de luxe* which only wealthy dealers and collectors could afford? What is insufficiently emphasized is that writers/artists who had previously been satisfied to work in terms of individual pieces now felt compelled to turn to *the book* (a limited series and specifically that kind which combined both verbal and visual features) as an aesthetic form and to subvert it through conscious deployment of primitive-seeming materials and techniques. The argument here is that the book as a cultural form was identified as the most secure bridge (affordable, mass produced, repository of cultural experience) between an elite which had monopolized literacy and knowledge, and the illiterate and oppressed masses whom the Revolution was empowering. However, a new language of the book was felt to be necessary; how this worked itself out as the noisy cubo-futurist period gave way to constructivism's greater sobriety and geometricism (El Lissitzky Rodchenko) can leave no doubt about the essentially *political* thrust of the entire project, as set within the context of the October Revolution and a phi-

losophy of historical materialism. That is, art was to enlighten the masses not as to the nature of beauty but on the subject of power relations among social classes.

Thus the books produced by the Russian artists came into existence in the highly charged social ambience which preceded and accompanied the Revolution. The symbolism which futurism simultaneously extended and challenged had recently been favored by increased publishing, professional reviewing and more little magazines, in other words, by quick growth in the support systems for literary culture. For this reason, as well as for those mentioned above and because books were public objects (multiples), small and capable of being produced with a minimum of technology, artists chose this cultural form. However, at the same time these artists were engaged in a variety of other art activities, which form a social context for the book. The post-symbolists occasionally resorted to shock tactics in order to motivate interest in their projects:

> Malevich and his friends once posed for a group photograph beneath a grand piano suspended from the ceiling upside down; Kamensky showed a mousetrap at an art exhibition in Moscow in 1915; Goncharova, Larionov and others walked about Moscow with their faces decorated with Rayonist designs; Mayakovsky donned his famous yellow vest and paraded through downtown Moscow; Kruchenykh threw hot tea into the laps of his audience.[27]

Such antics were shared with Italian futurism and dadaism, among others. In a negative configuration, they point to an acute dissatisfaction with the channels of culture, manifesting a desire to forge a more direct link with the audiences of the new art. The cult of personality at least in the case of some was pursued in the service of a highly sophisticated form of political art (one in which the artist's life itself became the material; the public dimension of one's life was thus frankly acknowledged and worked with, as the class division between public and private was attacked through performance).

Along with these public demonstrations and acts of cultural provocation, the artists were proceeding with their other intermedia experiments.

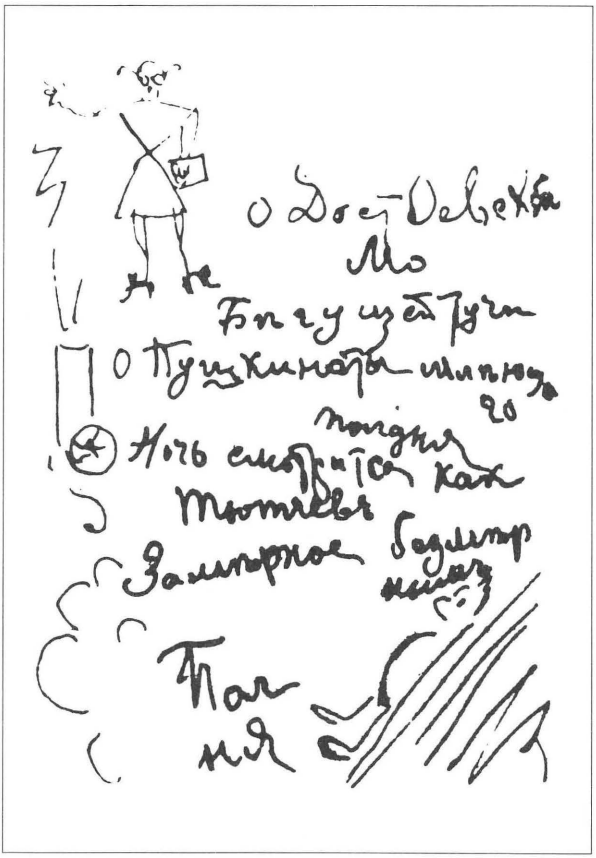
Even a cursory glance at key publications of the Russian cubo-futurists (e.g., *Vzorval/Explodity* by Kruchenykh with illustrations by Goncharova, Nikolai Kulbin, Malevich and Rozanova/St. P., 1913, *Slovo kak takovoe/ The Word as Such* by Kruchenykh and Khlebnikov with illustrations by Malevich and Rozanova/M., 1913, and *Porosiata/Piglets,* by Zina V. and Kruchenykh with cover by Malevich. St. P., 1913) demonstrates immediately sharp contrasts with preceding artistic and typographical methods.[28]

Bowlt goes on to list other examples: "*Pomada* (*Pomade* by Kruchenykh with illustrations by Larionov, M., 1913), *Dokhlaia luna* (Crooked Moon by D. Burliuk et al with illustrations by David Burliuk et al, M., 1913) and Vladimir Mayakovsky's *Vladimir Mayakovski: Tragediia* (Vladimir Mayakofsky: A Tragedy with illustrations by D. and V. Burliuk, M., 1914."[29] Janacek sees Kruchenykh as the most important innovator in book art.[30] Primitivism, abstraction, typographic experimentation, collaboration, the importance of emphasizing the materials of art, accident or chance methods of generation, a mix of graphic qualities summed up by Bowlt as "impropriety, disorderliness and vulgarity"[31]—all these elements combined to form the unique contribution made by a class of aesthetic objects perhaps best termed "anti-books."

As a visual and tactile object, then, the book's appeal to the intimacy of touch makes Pike's theory that formalism and futurism are chiefly related through a focus on sound all the more insightful. He says, "It was in sound, the meeting place between the academic linguists and the Bohemian futurists, that the formalists gained entry to literature."[32] Language was approached as raw sound; articulatory phonetics was invented to describe language in terms of the smallest units or phonemes (allophones as variations thereof) which were defined through contrast with related sounds. Thus a *sound* was constituted of a series of phonemic contrasts, thereby achieving a kind of negative identity. Jakobson confirms his entry into the systematizations of structural linguistics through the door of poetic art: "It was the analysis of verse which enabled me to descry the foundations of phonology."[33] However, he goes on to offer a more revealing formulation of what he means by a focus upon sound as such: "It is not bare sounds but 'linguistic values which prove to be the building blocks of verse, and precisely the role which prosodic

elements fulfill in a given linguistic system is the determinant of verse.' The constituents of the poetic meter are relational concepts, and the relations concerned are not mere contingencies but genuine oppositions."[34] Thus Jakobson has found the underlying, hidden dimension which, through incorporating invariance by binding it to variability, achieves a status analogous to what he sees as scientific law. "The theme of the rallying, cohesive invariance, bound by innermost indissoluble ties with a permanent manifold variability, has been my leading theme both when approaching the sound pattern of language and when treating versification."[35]

The relative precision of this analytic/descriptive process was not felt to be as possible in visuality. Bakhtin, nevertheless, does acknowledge sight but only in broad terms. "The problem of seeing occupies a very important place in



Worldbackwards, page by I. Rogovin, poem by V. Khlebnikov, 1912-13.

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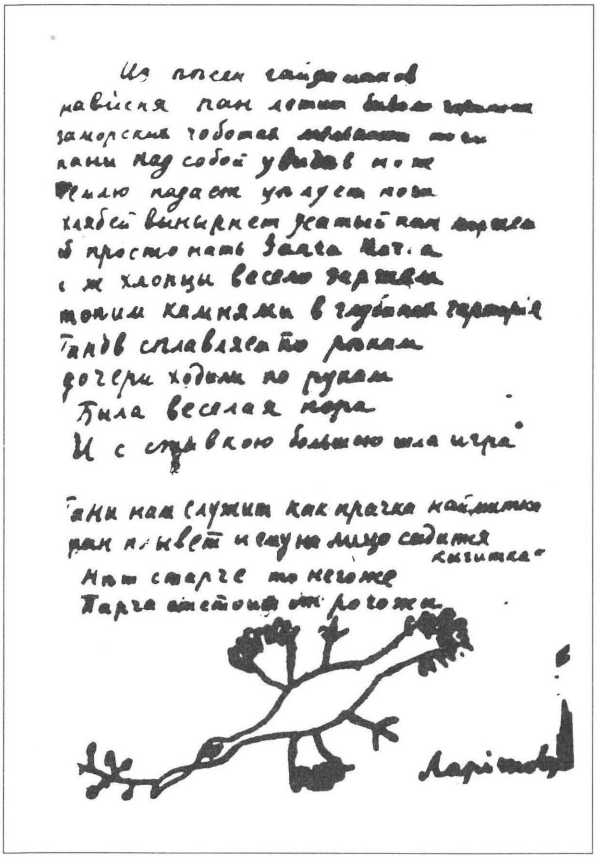
European formalism. The work does not exist for thought, or for feelings or emotions, but for the sight. The concept of seeing itself underwent extensive differentiation. The perception of form, the perception of the quality of form (Gestaltsqualität), became one of the most important problems of not only art scholarship, but of theoretical aesthetics and psychology. Here too, the basic tendency was to assert the inseparability of significance and meaning from the sensually perceptible quality."[36] If such a motive fragmented verbal language, its deployment in a graphic environment necessarily entailed a fuller aesthetics based *as well* in seeing. Bakhtin goes on to expand his context: "The major aim of art, according to European formalists, is to comprehend visual, audial and tactile qualities."[37] Yet we get no comprehensive theory which relates verbal and visual dimensions as they were being explored in the artists' books produced by the cubo-futurists. The formalists'



Worldbackwards, page by M. Larionov, text by V. Khlebnikov, 1912-13.

efforts remain in the realm of phonology, prosody and language-based processes.

> The formalists were ultimately concerned with the way in which the individual work of art (or *parole*) was perceived differentially against the background of the literary system as a whole (or *langue*). The structuralists, however, dissolving the individual unit back into the *langue* of which it is a partial articulation, set themselves the task of describing the organization of the total sign-system itself.[38]

Thus the *failure* of formalism as a whole to account for the pressures of the visual dimension of this new art jammed the development of the intellectual enterprise. Art's perceived difficulty was addressed in the case of literature by Shklovsky,[39] but "making strange" receives too much attention as a separate, allegedly new approach; he was simply a man of his age in that he received a tradition, a convention of discourse, and then he proceeded to recast certain features in a techno-mechanical terminology. To speak of "devices" in literature forces a closer dealing with texts but ultimately merely replaces one opacity with another, in this case through turning to a machine metaphor. Although I wouldn't go so far as to apparently completely reject *ostranenie* ("making strange") as Wellek does, he has a point when he says,

> "Making strange" serves as an obvious apology for any and all experimentation with language: for the fanciful etymologies of Khlebnikov, for the graphic arrangement of poems on the printed page, for anything that strikes the fancy of the poet and may shock the reader. It serves also as a criterion of value which is central to any avant-garde group, "novelty," the break with tradition, revolt.[40]

However, one must acknowledge that the criterion of value which is implicit to the critical posture here is that art must be serious business; we aren't helped in the process of distinguishing useful shock from mere shock; and so on. One needs as well of course to remember that the "apology" belongs in the realm of arts discourse: artists make art, which is its own defense. Therefore to level the above criticism appropriately, the enunciators of *ostranenie* must themselves be interrogated. Whereas it is Welleck's main intention to assess the contributions of formalism, he slides into a conjunction with the *art* which serves as the object whereby criticism as a valorizing subject get posited.

Beaujour sees the urgency of this distinction between art-making and its theorization, extracting it from artists themselves (who, it must be admitted, like critics often "step out of character"). "It was the poetic practice of the archaist Khlebnikov, aiming at the creation of a new international language which he called *zaum,* that briefly transformed Russian poetry at the beginning of the century. It was not the theory or poetry of the anarchist-theoreist Kruchenykh or his followers."[41] In their manifestos the artists sought to recapture the process of valorization which the academy and centralized publishing had preempted. These efforts parodied the exclusionary, hierarchizing, canon-building gestures of criticism. However, the manifestos and statements would remain curiosities, bizarre forms of rather unsophisticated criticism were it not for the informing context of the book-objects themselves. This "transformation" mentioned by Beaujour, that is, the hybrid art objects produced by the cubo-futurists, should therefore retain center stage. This of course is not a call for another formalist reading but for the opportunity for art of a relatively new and highly unusual kind to change the shape of attempts to theorize it.

Art and Politics

The interconnections between art and criticism, practice and theory, entered a phase of complexification precisely with early modernism, reaching a crisis state in Barthes, the Derrida of *Glas,* and the post-structuralists. As the early modernist poets drove deep into non-sense, the formalist critics strove to keep pace in their theorization. If so-called experimentation with raw sound, with the building blocks of grammar, with color and form distorted and ripped from their traditional aesthetic matrices seemed from the viewpoint of a positivist epistemology to break away from a usable (i.e., socially consumable) relation to revolutionary social developments, and for which the artists were all too soon to be choked off by the state, then analogously in criticism, "Formalist a-sociologism was a matter of methodological expediency rather than of esthetic principle, a proposition about the critic's main sphere of interest rather than about the nature of literary art."[42] Regardless of the finer points of their position and in spite of any truth contained in Ehrlich's analysis, the critics of the Moscow Linguistic Circle and of Opoyaz were themselves squelched, the most notorious case being

that of Shklovsky. In light of this shameful historical development, who can question the politically revolutionary implications of the early Russian avant-garde? As well, who can deny that their activities changed the category of politically revolutionary art?

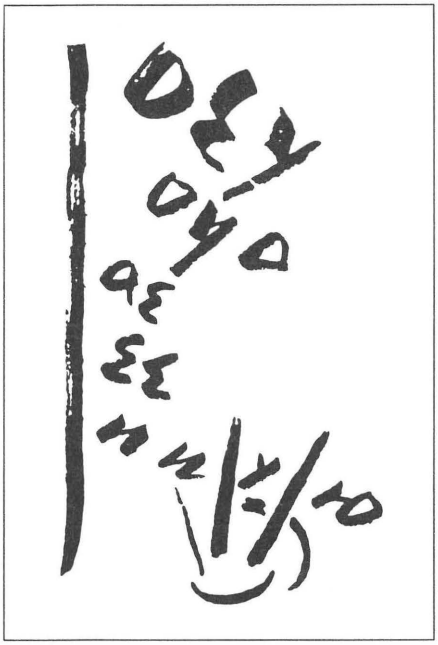
Birth Pangs of Structural Linguistics

No wonder Jakobson was unsettled and excited with the implications which the multi-media works of Klebnikov, Kruchenyk, Mayakovsky and others motivated. By applying the above model or method of aesthetic processing to language, Jakobson was able to reach a conclusion remarkably similar to that embedded in the art itself, but one which begs the most important questions raised by the art. Thus, cognitive and perceptible dimensions are disaggregated, later to be reunified in a theory of interrelationship.

Three pages from *Expodity,* A. Kruchonykh, 1913-14.

> The basic difference between the two [*signans* and *signatum*], from a linguistic point of view, is that the *signans must necessarily be perceptible whereas the signatum is translatable.* In both cases the principle of equivalence obtains. In the domain of the *signans* the relative equivalence must be externally perceivable; it can be ascertained, however, only in respect to the function of these sound relations in a given language. We recognize such distinctive features and, by means of a spectrograph, we are able to translate them from the acoustic field into the visual level. And like the *signans*, the *signatum* too must be studied in a purely linguistic and objective manner.[43]

This is an extraordinary effort to maintain the subject/object dichotomy which cubo-futurism had overturned. That is, in order to save the tradition in which Jakobson had been trained, under the pressures of verbal-visual innovation he was forced to move the enterprise to a higher level, to create a meta-theory in which *signans* and



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signatum are dialectically conjoined and *interpreted* from the vantage point of the *signatum,* which thereby retained its hegemony over discourse. Ergo structuralism, which could only have been worked out in the "science of language," linguistics, whose coming into being in the form we know it in the twentieth century ironically undoes the positivist foundations of science. In this it is the key "science" of our time. Waugh sketches the main outlines of Jakobson's linguistics:

> . . . the relative autonomy of language itself as well as of all of its parts; the teleological foundation of language and of all of its parts and the means-ends relationship between code and message; indissoluble ties between the static and dynamic aspects of language; the opposition between selection and combination as two relatively autonomous axes upon which given items operate; the linguistic sign, implying the intimate connection between the signans and the signatum and the strictly linguistic, discrete nature of both sound and meaning; the logical structure of binary oppositions in a hierarchized and mutually implicating relationship; the relational invariance of any facet of language from the largest to the smallest, each one built on the strictly relational nature of language; and markedness, and in particular the unequal hierarchical relation between the marked and unmarked members of any opposition. All these are interrelated. . .[44]

This excellent summary makes clear how Jakobson reinstalls hierarchy through focusing on the structure of interrelationship within language.

The best example of how Jakobson recuperates the mystification of critical discourse through concealing the contradictions upon which it is based can be found in his discussion of similarity and contiguity disorders. Importing categories of classical rhetoric, Jakobson begins thus:

> Every form of aphaisic disturbance consists in some impairment more or less severe, either of the faculty for selection and substitution or for combination and contexture. The former affliction involves a deterioration of metalinguistic operations, while the latter damages the capacity for maintaining the hierarchy of linguistic units. The relation of similarity is suppressed in the former, the relation of contiguity in the latter type of aphasia. Metaphor is alien to the similarity disorder, and metonymy to the contiguity disorder.[45]

Thus we are to believe that the entire field of language behavior is divided into two connected dimensions, each of which necessitates the other in an analog/digital modeling process. Jakobson calls this the "bipolar structure of

language (or other semiotic systems)"[46] and tries to extend his model to account for nonverbal data as well, but much less successfully, since in order to perform the operation he must first construe the material semiotically (i.e., from within a languaged convention):

> The same oscillation occurs in sign systems other than language. A salient example from the history of painting is the manifestly metonymical orientation of cubism, where the object is transformed into a set of synecdoches; the surrealist painters responded with a patently metaphorical attitude.[47]

Yet Jakobson senses something wrong with this, as he acknowledges in a note to the above: " . . . the crucial problem of the two polar processes awaits a detailed investigation."[48] Perhaps the difficulty lies on the very structuring capabilities of language itself, which Jakobson alludes to elsewhere: "One of the important contributions of symbolic logic to the science of language is its emphasis on the distinction between OBJECT LANGUAGE and METALANGUAGE."[49] Or perhaps it lies with the essentially reductive qualities of his intellectual move, alluded to by Cook:

> *Image,* too in addition to symbol for all its complexity, is less slippery than a term like *metonymy,* that current jack-of-all-work which is also a jack-in-the-box of tautology, since references named in a sequent language must perforce be contiguous to each other, and almost any kind of contiguity can be called metonymy.[50]

Thus we are able to see how even though perceptible and cognitive can first be disaggregated and then reunified in a theory of the sign, this operation may work more successfully when the object language is *verbal language* but not at all successfully when it is a combination of verbal and visual data in a single artwork. Jakobson was unable to evolve a semiotic or any other theory of the image sufficiently flexible to account not only for the new artists' books as presumed aesthetic objects with formal laws and structures of their own but also for their embeddedness in a social context. In this connection, Benjamin's analysis seems especially telling: " . . . nowhere do these two—metaphor and image—collide so drastically and so irreconcilably as in politics. For to organize pessimism means nothing other than to expel moral metaphor from politics and to discover in political action a sphere reserved one hundred percent for images."[51] This expulsion of moral metaphor from politics was not achieved by Jakobson;

consequently the organization of his pessisim foundered precisely through going to the extreme of hyper-organization.

Jakobson's early exposure to cubo-futurist books posed a genuine challenge to the cognitive tools he was evolving to think about art with. Stankiewicz has rightly said that "one cannot fail to notice that Jakobson's most original contributions to Slavic studies aimed at a reassessment of Slavic literature . . . and at a theoretical vindication of the boldest experiments of the Russian avant-garde."[52] However, the above discussion has demonstrated that "theoretical vindication" was slipperier than either Stankiewicz or Jakobson may have realized. The struggle which Jakobson was involved in stemmed from the unacceptable contradiction I have detailed. According to Ivanov, ". . . an inner avant-gardism was a part of him, which is never a part of any established science. This is an interesting aspect that makes the majority of Jakobson's works on the history of science autobiographical."[53] Structural linguistics' aversion from the object itself (individual word, sound or meaning) and subsequent move towards its constellation within a field or context of relations to other objects in effect was a compromise which saved discourse as a mystifying procedure by removing it from the politically radical subversions being worked by the art of the Russian avant-garde.

Endnotes

1 "The artists had the greatest influence on me, not the scholars . . . " Roman Jakobson, quoted in Thomas G. Winner. 1977. "Roman Jakobson and Avantgarde Art," *Roman Jakobson: Echoes of His Scholarship.* Daniel Armstrong and C.H. Van Schooneveld, eds. Lisse: The Peter De Ridder Press, 512.

2 "On a Generation that Squandered Its Poets." 1985. *Verbal Art, Verbal Sign, Verbal Time.* Minneapolis: University of Minnesota Press, 132. (This essay was written in 1930.)

3 See Jakobson's rejection of Culler's putative anti-scientism with regard to his own attempts to establish linguistics as a science in *Selected Works,* Vol. III. 1979. The Hague: Mouton, 787-8.

4 Roman Jakobson. "Is the Film in Decline?" in *Selected Works,* Vol. III, 732.

5 "Is the Film in Decline?" 734.

6 "Saussure's great merit was to have understood clearly that in the study of the phonatory act, when we raise the question of phonetic units and that of demarcating the sounds in the speech chain, something extrinsic is unconsciously brought into play." Jakobson, Roman. 1978. *Six Lectures on Sound and Meaning.* Cambridge: The MIT Press. (Written in 1942-43.)

7 "Acknowledgements and Dedication." *Selected Writings,* Vol. II, p. vii. Indeed, Jakobson himself "wrote futurist poetry under the pseudonym Alyagrov." Juliette R. Stapanian. 1986. *Mayakovsky's Cubo-Futurist Vision.* Houston: Rice University Press, 3-4. This is confirmed as follows: ". . . in 1916 under the pseudonym Aliagrov he contributed poems to Zaumaia Gniga, a milestone book of Russian futurism produced in collaboration with A. Kruchenykh and O. Rozanona." *The Avant-Garde in Russia 1910-1930,* note p. 18.

8 In *Verbal Art, Verbal Sign, Verbal Time,* 7.

9 "The fundamental ideas which so interested Jakobson, the eighteen-year-old zaum poet and friend and associate of Majakovskij, Xlebnikov, Krucenyx and Malevic, never lost their fascination for him." Winter, 512.

10 Shapiro, David. 1980."Art and Poetry: The Cubo-Futurists: An Interview with Roman Jakobson by David Shapiro." *The Avant-Garde in Russia 1910-1930: New Perspectives.* Stephanie Barron and Maurice Tuchman, eds. Los Angeles: Los Angeles County Museum of Art, 18.

11 "On the Relations between Visual and Auditory Signs." *Selected Writings,* Vol. II, 341.

12 *Verbal Art, Verbal Sign, Verbal Time,* 127.

13 How Jakobson incorporates this conflict is a long tale culminating in his "Two Aspects of Language and Two Types of Aphasic Disturbance."

14 de Sausssure, Ferdinand. 1985. *Cours de Linguistique Générale.* Charles Bally and Albert Sechehaye, eds. Paris: Payot, 98.

15 Culler, Jonathan. 1986. *Ferdinand de Saussure.* Ithaca: Cornell University Press, 81.

16 *Cours de Linguistique Générale,* 99.

17 *Cours de Linguistique Générale,* 100.

18 Indeed, an account of structural linguistics as inaugurated by Saussure can include the major schools of modern linguistics. Thus, Giulio Lepschy's *A Survey of Structural Linguistics* covers the Prague School (Roman Jakobson, Nikolai Trubetzkoy and others), the Copenhagen School (Louis Hjelmslev and other 'Glossematicians'), the 'Functionalists' (Jakobson, Emile Benveniste, André Martinet, and some contemporary British linguists), American Structuralism (Leonard Bloomfield and his followers), and even Noam Chomsky and other transformational grammarians. Only this last group has altered in a fundamental way the concept of linguistics as bequeathed by Saussure." Culler, 95.

19 "Futurism, with the theory of relativity, exercised a profound influence on his ideas about time and space as factors intrinsic to language. They prompted him to challenge the formulation of this problem given in Ferdinand de Saussure." Krystyna Pomorska and Stephen Rudy, "Preface," *Verbal Art, Verbal Sign, Verbal Time,* ix.
20 Starobinski, Jean. 1971. *Les Mots Sous Les Mots: Anagrammes de Ferdinand de Saussure.* Paris: Gallimard.
21 *The Sound Shape of Language,* 221.
22 *The Sound Shape of Language,* 215.
23 Pike, Christopher. 1979. "Introduction: Russian Formalism and Futurism." *The Futurists, the Formalists, and the Marxist Critique.* C. Pike, ed. London: Ink Links, 4.
24 "Introduction: Russian Formalism and Futurism," 4.
25 "Introduction: Russian Formalism and Futurism," 107. ". . . almost all the poets came to their writing from painting." In *The Russian Experiment in Art 1863-1922.* New York: Harry N. Abrams, 1962.
26 *The Avant-Garde in Russia 1910-1930,* 18.
27 Bowlt, John. 1986. "A Slap in the Face of Public Taste: The Art of the Book and the Russian Avant-Garde." In *Russian Samizdat Art.* Charles Doria, ed. New York: Willis Locker and Owens Publishing, 19.
28 "A Slap in the Face of Public Taste. . ." 11.
29 "A Slap in the Face of Public Taste. . ." 18.
30 "The importance of these six booklets [Old-Fashioned Love, A Game in Hell, Worldbackwards, Pomade, Half-Alive, Desert Dwellers] in the history of the Russian Avant-Garde cannot be overestimated." Janecek, Gerald. 1984. *The Look of Russian Literature: Avant-Garde Visual Experiments, 1900-1930.* Princeton: Princeton University Press, 84.
31 "A Slap in the Face of Public Taste. . ." 18.
32 *The Futurists, the Formalists, and the Marxist Critique,* 10.
33 *Selected Works,* Vol. V, 572.
34 *Selected Works,* Vol. V, 574.
35 *Selected Works,* Vol. V, 599.
36 M.M. Bakhtin/P.M. Medvedev.1985. *The Formal Method in Literary Scholarship: A Critical Introduction to Sociological Poetics.* Cambridge: Harvard University Press, 49.
37 *The Formal Method in Literary Scholarship. .* , 50.
38 Jameson, Fredric. 1972. *The Prison-House of Language: A Critical Account of Structuralism and Russian Formalism.* Princeton: Princeton University Press, 101.
39 See *Factory.* Note Khlebnikov's comments below: "I here offer the first experiments in beyonsense language as the language of the future (with one reservation, that vowels in what follows are incidental and serve the purposes of euphony): Instead of saying: 'The Hunnic and Gothic hordes, having united and gathered themselves about Attila, full of warlike enthusiasm, progressed further together, but having been met and defeated by Aetius, the protector of Rome, they scattered into numerous bands and settled and remained peacefully on their own lands, having poured out into and filled up the emptiness of the steppes.' Could we not say instead: 'SHa+So (Hunnic and Gothic hordes), Ve Attila, CHa Po, So Do, but Bo+Zo Aetius, KHo of Rome, So Mo Ve+Ka So, Lo SHa of the steppes+Cha.'" Velimir Khlebnikov, *The King of Time: Poems, Fictions, Visions of the Future.* Cambridge: Harvard University Press, 1985, 150-151.
40 Wellek, René "Russian Formalism." *Russian Formalism: Culture and the Avant-Garde, 1900-1930.* George Gibian and H.W. Tjalsma, eds. Ithaca: Cornell University Press, 1976, 43.
41 Beaujour, Elizabeth Klosty. 1972. "Zaum." *Dada/Surrealism,* 2:17.
42 Ehrlich, Victor.1955. *Russian Formalism: History—Doctrine.* The Hague: Mouton, 96.

43 "Sign and System of Language." In *Verbal Art, Verbal Sign, Verbal Time,* 30.
44 Waugh, Linda R. 1976. *Roman Jakobson's Science of Language.* Lisse: The Peter de Ridder Press, 101.
45 "The Metaphoric and Metonymic Poles." *Fundamentals of Language,* with Morris Halle. 1975. The Hague: Mouton, 90.
46 "The Metaphoric and Metonymic Poles," 93.
47 "The Metaphoric and Metonymic Poles," 92.
48 "The Metaphoric and Metonymic Poles," 92, note 25.
49 "Similarity Disorder," 81.
50 Cook, Albert. 1985. *Figural Choice in Poetry and Art.* Hanover, New Hampshire: University Press of New England, 19.
51 Benjamin, Walter. 1978. "Surrealism: The Last Snapshot of the European Intelligentsia." In *Reflections.* New York: Harcourt, Brace Jovanovich, 191.
52 Stankiewicz, Edward. 1983. "Roman Jakobson: Teacher and Scholar." In *Tribute to Roman Jakobson 1896-1982.* Berlin: Mouton, 21.
53 Ivanov, Vjaceslav V. "Roman Jakobson: The Future." 56.

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Books, first reference:

1 Rosenthal, Peggy. 1984. *Words and Values: Some Leading Words and Where They Lead Us.* New York: Oxford University Press, 110.

Subsequent reference:

4 Rosenthal. *Words and Values,* 187.

Articles, first reference:

2 Kinross, Robin. 1985. "The Rhetoric of Neutrality." *Design Issues* 2(2):18.

Subsequent reference:

11 Kinross. "Rhetoric of Neutrality," 21.

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