
INTRODUCTION

The eye-voice span (EVS) is the distance that the eye is ahead of the voice in reading aloud. The distance between the voice and the eyes is measured by time, letters, letter spaces, ems (a printer's measure), syllables, or words, which is the most common index. The EVS enjoys a long and useful history in the annals of educational and psychological research. Quantz (1897) was the first to publish a study on the EVS. Huey discussed the phenomenon in his important and foresighted book, *The Psychology and Pedagogy of Reading* (1908). Woodworth gave the EVS substantial coverage in 1938 in *Experimental Psychology*. A large-scale research program on the EVS was reported by Buswell in 1920, and we lean heavily on his excellent work.*

The EVS has been measured in only a few ways; the history of the methods are described in chapter 2. There are

* Readers may experience their own EVSs by starting now to read aloud

basically two empirical paradigms. In the simplest procedure, the one most often used in contemporary research, the subject reads a text aloud and at some predetermined point the text is made unavailable by covering it, removing it, or turning off the light. The reader reports what he has seen beyond the word he was saying aloud—often called the “critical position”—when the text was removed. The other method, which was used extensively before 1930 and only occasionally thereafter, involves the simultaneous measurement of the reader’s eye movements and voice. The second method yields more detail and was appropriate when researchers were interested in the detailed “anatomy” of the EVS.

As may be expected, the popularity of each method was related to the interest in the EVS then dominant. The focus has changed during the eighty years that the phenomenon has been studied. At first, it was a curiosity to be described. Then, researchers became concerned with what the EVS could reveal about the reader: its relation to the reader’s general reading skill or age. Such information made the EVS a useful tool for individual educational diagnosis, though there were unfortunate digressions when readers were trained to develop long EVSs under the mistaken belief that this would improve reading. There was actually some early concern with the ways that the reading materials influenced the EVS: the kind of type, the complexity of the text, or the reader’s position on the line. The most recent interest in the EVS reflects the psychologists’ and educators’ attempts to understand the *process* of reading. This concern has been translated into many studies in which the text is varied in

and observing that they turn the page before their voices reach the last word on the page.

systematic ways in accordance with our increased sophistication in describing the grammatical and semantic natures of written materials. Such topics are treated in the second half of this book, and, if we may venture a prediction, future research on the EVS will reflect our growing knowledge about how to analyze texts and, in turn, to ask how such materials are read by different readers.

Said another way, the first researchers were interested in the EVS itself. More recently, they have used the EVS as one of several indicators as to the nature of the reading process.

Almost from the first it was recognized that most readers' EVSs varied from task to task. A reader does not carry around an EVS of fixed size as characteristic as the color of his eyes. Rather, the EVS operates like an accordion, bellying in or out for different parts of the same text. The fundamental research goals, then, are to find out what creates the changes. Though answers to these questions are not now complete, and probably never will be, we can state some things that the EVS is not.

The EVS is not simply guesses about the text beyond the word being read aloud. EVSs may be as long as eight or ten words. The likelihood is remote that readers are able to guess correctly eight words in order. Besides, a direct test of guessing indicated that adult readers make such guesses at the rate of about one word per thousand (Levin and Kaplan 1968).

The voice and eyes are close to each other, but the eyes pick up cues about upcoming words in peripheral vision. The studies measuring both the voice and eye movements show

that the eyes are in advance of the voice. In addition, recent research on peripheral vision in reading indicates that only a limited number of words can be seen in the area of the fovea (clear vision) and that peripheral cues such as word length, word shapes, and first letters are inadequate to reproduce the string of words making up the EVS (McConkie and Rayner 1975).

What is Reading?

Ultimately, our interest in the EVS is the knowledge that this particular reading behavior has given us about the general processes of reading. Therefore, we will make clear what we believe reading to be and what principles govern reading behavior. This point of view informs our choice of materials covered in this book, their organization and interpretation, especially in the later chapters, which emphasize our own research.

Reading is extracting information from text.¹ Reading is an active process, self-directed by the reader in many ways and for many purposes. Some active approaches are as follows:

1. A flexibility of attentional strategies (at least for mature readers) in reading for different types of information.
2. A shift of strategy with characteristics of a text, such as difficulty of concepts and style.
3. A shift of strategy with rate of gain of knowledge as the reader progresses (e.g., he slows down under some circumstances, skims under others).
4. A shift of strategy with new or old information.

5. A shift of strategy with the reader's personal interests, his educational objectives, and with instructions.

In the development of reading there is a trend toward economy of processing:

1. The reader will direct his attention to processing textual material in the most economical way he can.

(a) The information relevant to the reader's purpose is selected for priority of attention.

(b) Information that is irrelevant, not wanted, or not useful for the task is ignored.

(c) The largest units appropriate for the task are processed. A reader can attend to features of letters, words, phrases, and even clauses as units.

(d) The least amount of information compatible with the reader's task is processed.

2. Adaptive reading is characterized by continual reduction of information.

(a) Processing is reduced in proportion to the number of alternatives that could follow in the ensuing information as the reader proceeds through the text.

(b) Alternatives are reduced by the application of rules and constraints.

(c) Alternatives are reduced by using old information to comprehend new information.

These principles of the reading process apply to the EVS, and in the concluding chapter the findings about EVSs will be summarized in light of these principles.

The Plan of This Book

Early researchers on the EVS often recorded eye movements and voices by ingenious electromechanical devices; the measurements are now simple to carry out by electronic technology. Nevertheless, the early findings still hold up well, and the basic empirical paradigms have remained the same throughout the history of research on the EVS. The early methodologies and research designs are the subjects of chapter 2. The EVS involves reading aloud. Our interests in reading, however, are directed to silent reading, and in chapter 3 we compare oral and silent reading in order to decide to what extent one may generalize between the two. Chapter 4 takes up some characteristics of the text: typography, line position, and languages other than English. Next, we focus on certain characteristics of readers as they influence the EVSs: age, reading skill, reading rate, etc.

Telegraphy, typewriting, and reading music have certain characteristics in common with reading aloud, and spans on those tasks are discussed in chapter 6. The two final chapters are devoted to what we consider the most important research on the EVS: the effects of grammatical structure and meaning.