

statements of the discipline are explainable). Different theoretical disciplines might have different sorts of subject-matters, methods, and basic principles; but all of them have ends of the same type, namely, knowledge. Thus, the subject-matter of mathematics is abstract, invariable, and universal, whereas that of ethics, though universal, is neither abstract nor invariable. The method and basic principles of mathematics may be described as deduction and as form and abstraction, whereas those of ethics may be described as inquiry and as excellence and the soul. However, the end of mathematics and that of ethics, albeit specifically different from each other, are both knowledge.

The elements of a theoretical discipline may be regarded, to some extent, from the standpoint of language. The end of such a discipline, which is typically a body of conclusions, consists of universal or, at least, highly general statements that are expressed. In some cases, for example, logic and physics, the media for setting forth the final statements of theoretical disciplines are often "artificial"; in other case, for example, history and aesthetics, the media are frequently "natural." Artificial or natural, however, they are linguistic; for they are, *inter alia*, subject to the rules of logic, meaning, and grammar. The subject-matter of a theoretical discipline, which may be concepts, events, things, or something else, always may be designated and discussed through a language. The method is constituted by directives, and these always may be presented by virtue of language. The concepts and statements making up the basic principles always are expressible linguistically.

The linguistic media whereby the elements of a field, theoretical or not, appear are tantamount to the language of the discipline. These media include (among other things) signs, formulas, and arguments. The signs (e.g., the terms of a language) are mainly for expressing the concepts and denoting the objects relevant to the field. The formulas, which consist of ordered signs, are primarily for presenting the statements pertinent to the field. And the arguments, consisting of ordered formulas, are largely for setting forth and defending claims within the language. Some of the signs, formulas, and arguments of a linguistic field may be original to the field. The original signs of an area are those whose meanings are determined, partially if not completely, by the area. The original formulas are those whose meanings come, to some extent, from the area. And the original arguments are those whose respective standards of acceptability lie, to a degree, within the area. Thus, the term "tort" is original to the language of law; the formula, " $2+2=4$," is original to the language of mathematics; and the ontological argument for the existence of God is original to philosophy. While a set of signs, formulas, and arguments might be original to a language, it might pertain to another language also. Indeed, it seems that some of the signs, formulas, and arguments of a linguistic field usually derive from another field. Philosophy is notorious for utilizing elements from everyday discourse and the languages of many other disciplines, including productive and practical, as well as theoretical, ones. The sciences long have borrowed from mathematics and from each other. And the language of everyday life is stocked occasionally with items from the languages of the sciences.

The languages of the theoretical disciplines have a distinctive difference from those of the productive and practical disciplines. The subject-matters, methods, and basic principles of the productive and practical disciplines, like those of the theoretical disciplines, may be designated and discussed through language, but their ends, unlike those of the theoretical disciplines, might not be identifiable with linguistic elements. The end of a productive discipline, which is a product (fine or utilitarian), might, as in the case of a poem, consist of matters that are linguistic, but it need not, as in the case of a pair of shoes. Similarly, the end of a practical discipline, which is action, might be matters of language, as when it is speech acts, but it

INVITED ADDRESS

READING IN THE DISCIPLINES: COMPREHENDING PROPOSITIONS

ROBERT D. HESLEP
University of Georgia

General reading consists of the information and skills that are useful in the reading of everyday language, e.g., the language of comic books, newspapers, magazines, and romantic novels. Special reading embodies the information and skills that are useful in the reading of the language of the special fields of study. It is sometimes held that reading teachers, who teach general reading and often take it to be the only kind, are the only ones qualified to teach reading and that subject teachers, therefore, who also frequently regard general reading as the only kind, do not have a responsibility to teach the special reading relevant to their respective fields. My aim is to dispel this contention. I propose to do so by providing an overview of the place of reading in the theoretical disciplines and then by taking a look at the connection between teaching reading in a theoretical discipline and teaching the discipline's content.

A familiar scheme for analyzing the theoretical disciplines is Aristotle's. According to it any intellectual discipline—theoretical, productive, or practical—may be regarded as having four elements: an end (that which is attained within the discipline), a subject-matter (that which is investigated), a method (the way whereby the end is to be attained), and basic principles (the concepts and statements by which all other concepts and

need not be, as when it is an activity for exercising the body. Perhaps it is because of their close tie to language that the theoretical disciplines often are spoken of as embodied in language, and maybe it is because of this tie they usually are identified by behaviorists with verbal behavior.

In any event, the linguistic aspect of the theoretical disciplines is clearly where reading has its place in them. A major way to learn the contents of the theoretical disciplines is to read about the disciplines, which means, more specifically, to read about their subject-matters, their ends, their methods, and their basic principles. This approach is appropriate whether students are to become merely acquainted with the theoretical disciplines or whether they are to become experts in them. Besides being an instrument whereby the theoretical disciplines may be learned, reading occupies another instrumental role in such disciplines. It is a major vehicle by which the practitioners of the theoretical disciplines carry on their work. It is the vehicle whereby current practitioners learn what their predecessors accomplished, and it is the vehicle by which current practitioners most often learn what each other is doing. Of these two roles, the former should be especially interesting to the subject teacher. If students are to learn the contents of the theoretical disciplines, they practically must be able to read the various languages of those disciplines; and if they are to be able to read these languages, they must learn them on their own or through the assistance of teachers versed in them, who are not reading teachers but teachers of the theoretical disciplines.

Because the language of a theoretical discipline is special to that discipline, the reading pertinent to learning the discipline's content is special, not general. It might be, of course, that some general reading will be helpful in reading about a theoretical discipline; for the language of the discipline might contain elements from everyday language. Nevertheless, the ordinary linguistic elements that might appear in a theoretical discipline's language will not make complete sense as components of that language until they are linked to the language's other components. Thus, while the language of history contains much that is derivative from common language, it is not just one part everyday language and one part technical language; rather, it is an intermixture of the common and the technical. If a theoretical discipline's language were merely one part everyday and one part technical, a teacher of the discipline might protest rightly that he is not responsible for teaching the general reading integral to his field. But because the language of any theoretical discipline is special even if it contains ordinary linguistic elements, not even the teacher of a subject whose language embodies common linguistic components can shift the total responsibility for teaching the general reading related to his field to the reading teacher. The latter does not have the information or the skills to relate any ordinary linguistic elements that might be involved in a theoretical discipline's language to the special context of that language.

According to the foregoing it follows that the teaching of reading the language of a theoretical discipline is distinguishable from teaching the discipline's content. It might be that a person can teach the content by relying solely upon speech or some other medium other than print. It might be that a teacher has students who are bright and motivated enough to learn on their own to read the discipline's language and, therefore, might not need to be taught to read the language while they are being taught the content. Because teaching the reading of a theoretical discipline's language is distinguishable from teaching the discipline's content, it might prompt someone to believe that students of the subject must be taught its language separately from their being taught its content. It would be a mistake to believe this, however. Not only can the language of a theoretical discipline be taught along with the content, but it has to be. We will attempt to justify this position by focusing upon the teaching of the cognitive content of the theoretical disciplines.

As already explained, the end of a theoretical discipline is knowledge, which means that to teach the discipline's content is, among other things, to teach the knowledge which has been attained in the discipline. In its standard sense knowledge is justified true belief, i.e., true belief grounded upon adequate evidence. The object of a true belief is a proposition, or a proposed state of affairs that is either true or false. If the proposition that one believes is false, then one's belief is false; if it is true, then one's belief is true. Knowledge, then, is justified belief in a true proposition; and to teach the knowledge attained in a theoretical discipline is to teach the propositions which have come to be known in the discipline. Teaching a proposition requires that the teacher communicates the proposition, and communicating it requires that the teacher presents an expression of it (his own or someone else's). A characteristic of teaching is that it is a communicative act, which implies that it embodies some language. And a characteristic of propositions in a theoretical discipline is that they are expressible. The medium through which a proposition is expressible is language, and the language through which the propositions known in a theoretical discipline are expressible is the language of that discipline. Accordingly, to teach the propositions known in a theoretical discipline is to communicate them through the discipline's language. It is obvious, then, that a person may teach the reading of the language of a theoretical discipline while teaching the propositions known in the discipline; for in teaching the propositions he also may teach the elements of the discipline's language by which the propositions are expressed.

With little reflection it should be further evident that a person can teach these linguistic elements *only* in conjunction with teaching the relevant propositions and other factors of the discipline. The linguistic structures for expressing propositions are formulas, of which sentences and equations are familiar examples. While reading formulas in some contexts might amount to nothing more than recognizing the symbols and the relations ordering them in the formulas, reading the formulas expressing the propositions known in a theoretical discipline involves two other matters. 1) The function of the formulas as formulas in the discipline's language is to express certain propositions. Hence, reading the formulas includes recognizing that they do express propositions and comprehending the propositions expressed. 2) The propositions expressed by the formulas are grounded on evidence. Consequently, the formulas, when read, must be connected with the formulas stating the evidence such that the latter formulas can be seen as stating evidence for the propositions. In other words, the formulas expressing the propositions must be read in the way that the formulas stating the conclusions of arguments are to be read.

While our contention that teaching the reading of an intellectual discipline's language must be in conjunction with teaching the discipline's contents is directed at teaching the propositions known in the discipline, it may be seen as applicable to teaching the other contents of the discipline, namely, its subject-matter, method, and basic principles. The subject-matter of an intellectual discipline is what the discipline's knowledge is about, and statements about the subject-matter are to be made in the discipline's language. The method of the discipline is the way whereby the discipline's end is to be attained, and statements about the method are to be made in the discipline's language. The basic principles of the discipline are the concepts and statements whereby all other concepts and statements of the discipline have to be understood, and statements about them are to be made in the discipline's language. Accordingly, the language of an intellectual discipline serves not only to communicate propositions known in the discipline but also to express statements about the discipline's subject-matter, method, and basic principles. If, therefore, a person is to teach the reading of the elements of an intellectual discipline's language

whereby statements about the discipline's subject-matter, method, and basic principles are made, he or she has to present the elements to the student so that they are seen as having the function which they do have and are understood further as expressing the statements which they are employed to make. Thus, teaching the reading of these linguistic components must go hand in glove with teaching the discipline's content.

In sum, we have tried to show that subject teachers have a responsibility to teach the special reading of their respective fields. In providing an overview of the place of reading in the intellectual disciplines, we maintained that reading the languages of such disciplines is a major vehicle for learning the disciplines. The point of this contention was that the students in the theoretical disciplines greatly need to be able to read the special languages of such disciplines. In examining the connection between teaching the reading of an intellectual discipline's language and teaching the content of the discipline, we insisted that teaching the reading must go along with teaching the content. The point here was that, because the subject teacher (not the reading teacher) is the one versed in the language along with its content. We are tempted to continue and expand our argument to include the productive and practical disciplines, but one should not always attempt to do what one is tempted to do.