

*This article provides a review of behavioral objectives in a historical and philosophical setting which has been overlooked all too often in the heat of contemporary activity on the subject of accountability. In addition, the article quotes physical scientists writing in current scientific journals who question what is measurable; their thoughts are relevant to a proper perspective of the role of behavioral objectives. I undertook this intensive review as a result of basic contradictions which were apparent to me in the contemporary views of advocates of behavioral objectives and the growing number of scientists and philosophers of science who place limits upon measurability.*

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## Behavioral Objectives Is the Tide Turning?

Behavioral objectives have been acclaimed by numerous individuals in the past decade as means by which the learning process may become substantially more effective and efficient.<sup>1</sup> More recently, however, the climate surrounding educational attitudes and objectives appears to be in the midst of new controversy and change. The purpose of this article is to review in perspective the rationale underlying behavioral objectives in education and the criticisms which have been raised regarding their validity and application.

Objectives have been expressed by educators for a very long time, no doubt, for as long as there has been formal schooling. (Plato discusses educational objectives in the *Republic*.)<sup>2</sup> Persons stressing the widespread application of behavioral objectives are disenchanted with general statements of educational objectives which have been used for years such as: "The student will learn to think critically." What is *critical thinking*? How do students attain it? How do we know when students have achieved this objective or even come part of the way toward attaining it?

Advocates of behavioral objectives demand that educational objectives be expressed in explicit, quantifiable form. The behavioral objective specifies a desired outcome of learning in terms of measurable behavior which the learner will display if the objective has been attained. Be-

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<sup>1</sup>See, for example, Robert M. Gagné, *The Conditions of Learning* (New York: Holt, Rinehart & Winston, Inc., 1965).

<sup>2</sup>Frances MacDonald Cornford, *The Republic of Plato* (New York: Oxford University Press, 1955), pp. 66-94.

havioral objectives frequently include action verbs like: *classify, construct, calculate, and distinguish.*

For example:

After you have studied this exercise you should be able to 1. IDENTIFY and NAME properties of an object or situation by using at least four of the senses.<sup>3</sup>

Objectives stated in behavioral form are purported to serve several functions in education which include: use as criteria for evaluating outcomes of instruction and for selecting, analyzing, and revising learning experiences. Some advocates of behavioral objectives in the late 1960's have implied that such performance objectives are the *only* objectives of real worth in education. They have urged teachers in all fields to state their objectives in behavioral terms rather than to use more conventional qualitative statements of objectives.<sup>4</sup>

#### A HISTORICAL PERSPECTIVE

The behavioral objectives movement of the 1950's and 60's was the second major movement in the 20th century which has emphasized the need for specifying objectives in precise terms. At the turn of the century the influences of scientific thought were being felt in education. Psychologists studying transfer of learning were developing theories and data which weakened the position held by the *faculty* psychologists who had been dominant until that time.<sup>5</sup> (According to faculty psychologists the mind could be exercised by intensive study of certain subjects such as Latin and mathematics; the faculties strengthened in this manner could then be used more effectively in other areas of human activity.) One of the men whose educational theories were influenced by scientific thought at the time was Franklin Bobbitt; his book, *The Curriculum* published in 1918, became an influential factor in the subsequent thinking of many educators. In it he stated that curriculum objectives "will be numerous, definite, and particularized."<sup>6</sup> In later books of this era Bobbitt, Ralph Tyler, and others enumerated literally thousands of specific objectives. Since transfer of training had been shown to be quite limited, teachers were encouraged to teach for definite outcomes and curricula were to be designed only after such objectives had been defined.

By the 1930's many prominent educators had become unhappy with the massive bulk of educational objectives which had been developed and which some felt were too extensive for teachers to handle in the class-

<sup>3</sup>American Association for the Advancement of Science, *Science — A Process Approach Commentary for Teachers* (Washington: American Association for the Advancement of Science, 1968), p. 35.

<sup>4</sup>See, for example, W. James Popham, *Educational Objectives* (Los Angeles: Vimec Associates, 1966).

<sup>5</sup>Edward L. Thorndike and R. S. Woodworth, "The Influence of Improvement in One Function upon Efficiency of Other Functions," *Psychological Review*, Vol. 8 (1901), pp. 553-564.

<sup>6</sup>Franklin Bobbitt, *The Curriculum* (Boston: Houghton Mifflin Co., 1918), p. 42.

room. Concurrently the "Progressive Education" movement had begun to place emphasis on the individual child in the learning process. The child was to have a role in developing his own learning objectives, and an educational process of this sort was incompatible with one in which objectives had been developed previously by persons outside the immediate learning environment.<sup>7</sup>

Curricula during and following the Second World War acquired an increasingly technological orientation reflecting the larger technological culture. Textbooks in science, for example, became to a large extent, compendiums of practical applications. During the late 1950's and in the 1960's resurgence of emphasis around academic fields of study occurred in public education, and the formulation of specific educational objectives became once more a worthy activity for theorists<sup>8</sup> (if not for teachers). With the advent of Sputnik in 1957, natural scientists came to play a very active role in curriculum development in public education under the aegis of the National Science Foundation, and under their influence techniques of the natural sciences began to permeate the thinking of funded curriculum developers. Definitions, objectives, and strategies were inferior unless they were measurable in the "operation" tradition of the physical sciences. (Operationalism, first espoused by physicist, P. W. Bridgeman, asserts that terms are meaningless unless they are defined in precise, measurable operations "which can be unequivocally carried out by any competent observer."<sup>9</sup>)

In 1969 the Director of Program Planning and Evaluation in the U.S. Office of Education wrote (in unofficial capacity):

The move toward greater specification of anticipated or sought-after outcomes stems not only from the requirements of development as a process, but also from the character of the support which is necessary for development . . . [The expense is] so large as to mandate some caution in regard to its allocation. And that caution should find expression in the form of statements about the intended outcomes of given projects in terms which will (1) allow adequate evaluation of those projects before funding to insure that they serve the highest priority national, state, and local requirements and (2) provide the basis for the kinds of anticipated performance specifications . . . which will insure that adequate feedback and formative evaluation procedures can be brought to bear during the life of the project.<sup>10</sup>

This quotation is indicative of contemporary thinking in this *operational* era in which great reliance has been placed upon the measurement of quantities throughout education. An implicit assumption has been that significant objectives in education can be measured, and emphasis has been placed upon those objectives written because they were readily

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<sup>7</sup>See, for example, Department of Supervisors and Directors of Instruction, National Education Association and Society for Curriculum Study, *The Changing Curriculum, Tenth Yearbook* (New York: Appleton-Century Crofts Co., 1937).

<sup>8</sup>See, for example, Benjamin S. Bloom, Ed., *Taxonomy of Educational Objectives, Handbook I: Cognitive Domain* (New York: Longmans, Green & Co., Inc., 1956).

<sup>9</sup>Carl G. Hempel, *Philosophy of Natural Science* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966), pp. 89-90.

<sup>10</sup>Hendrick D. Gideonse, "Behavioral Objectives: Continuing the Dialogue," *The Science Teacher*, Vol. 36 (January, 1969), p. 54.

measurable. This phenomenon in education is a reflection of the larger society which values those things which can be counted and which has come to rely heavily upon scientific authority.

During this era numerous new courses have been developed, particularly in the sciences. One of these, *Science — A Process Approach*<sup>11</sup> sponsored by the American Association for the Advancement of Science (AAAS) is organized around hundreds of precisely stated behavioral objectives. According to one critic, the list of goals “looks like a caricature of the subject field in question.”<sup>12</sup>

In the late 1960's and in the early 1970's articles written by scientists as well as by educators have begun to appear with increasing regularity indicating disenchantment with precise and explicit statements of educational goals. Although it is difficult to be entirely objective when dealing with the contemporary scene, it would appear that forces of change are at work to reorient educational objectives around needs of the individual learner in a more non-directive manner than at present. As an indication of these winds of change, consider the following excerpts from an editorial published in the December 1970 issue of *Physics Today* (a journal of the American Institute of Physics).

For years biologists and psychologists have struggled to make their disciplines conform to the ideal model of objectivity they saw exemplified by physics. It is interesting that now, at a time when public interest is turning to the organic needs of life, we find that philosophers of science are concluding that the higher disciplines such as biology cannot be reduced ultimately to the language and concepts of physics and should not be striving to this end . . .

But on a more practical level the point at which other disciplines and perhaps the whole culture have been misled is embodied in the notion that to be truly objective and scientific one's observation must yield numbers that can be manipulated with mathematics. There is nothing about the scientific method that requires the data to be quantitative as opposed to qualitative . . .<sup>13</sup>

This editorial represents a major shift from the position taken by most physicists in the 1960's. Although these attitudes are not shared by many contemporary physicists, the editorial would most probably never have been published in a journal of the American Institute of Physics a decade earlier.

It is apparent that the educational objectives of an era mirror, at least partially, the values of the society of that era. Presently we may well be in the midst of a “revolution” of thinking concerning objectives in education. Although the contemporary scene is complex, educators are presently caught between ardent advocates of explicit, behavioral objectives in education and those who question the validity of operational

<sup>11</sup>American Association for the Advancement of Science, *Science — A Process Approach* (New York: Xerox Education Division, 1970).

<sup>12</sup>J. Myron Atkin, “Behavioral Objectives in Curriculum Design,” *The Science Teacher*, Vol. 35 (May, 1968), p. 29.

<sup>13</sup>Harold L. Davis, “Are Physicists to Blame?,” *Physics Today* Vol. 23 (December, 1970), p. 80.

objectives and on the contrary, advocate implicit, more general statements of objectives.

#### OBJECTIONS TO BEHAVIORAL OBJECTIVES — I

Critics within educational circles have raised numerous objections to behavioral objectives in the past several years. At the risk of oversimplification, these objections will be summarized and the response of behaviorists to such criticism will be reviewed.<sup>14</sup>

*Objection 1:* When educational goals are stated in precise, explicit terms, they appear very often to be trivial.

*Response 1:* We will never be aware that our objectives are trivial until we state them precisely for careful analysis. If they are irrelevant, discard them.

*Objection 2:* Prespecified goals may cause the teacher to be inattentive and hence unresponsive to significant, unanticipated behavioral outcomes.

*Response 2:* Unanticipated outcomes will occur and teachers should attempt to evaluate them and pursue them when appropriate. This is not a reason to discard the rigorous prior planning of explicit educational objectives.

*Objection 3:* Planning how the learner should behave before the teacher interacts with the student is undemocratic and dehumanizing; the learner should participate in the formulation of objectives.

*Response 3:* The classroom is not a laissez faire democracy. Teachers always work toward some kind of goal and such goals are generally supported by society. Perceptive teachers will involve students in the development of goals. Define *dehumanizing* operationally so that we can discuss the term objectively.

*Objection 4:* Even "good" teachers rarely specify goals in behavioral terms; behavioral goals are unrealistic for the classroom.

*Response 4:* Teachers should specify goals in behavioral terms; when they do not do so inferior education results. What is to be learned should be clearly defined in the mind of the student and the teacher.

*Objection 5:* Teachers do not have the time or training to develop adequate systems of behavioral objectives.

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<sup>14</sup>For samples of such criticisms and responses, see the following sources: Elliott W. Eisner, "Educational Objectives Help or Hindrance," *The School Review*, Vol. 75 (Autumn, 1967), pp. 250-260. (This issue of *School Review* includes critical comments on the article by three individuals and a reply by the author to their remarks.)

J. Myron Atkin, *op. cit.*

Charles A. Koepke, "Reply to Atkin on Behavioral Objectives," *The Science Teacher*, Vol. 35 (November, 1968), pp. 12-14.

P. W. Jackson, *The Way Teaching Is* (Washington: National Education Association, 1966).

*Response 5:* True, but they should be trained and given assistance to this end. Professional writers could develop a spectrum of objectives from which teachers could select those which were appropriate.

*Objection 6:* Teachers will not be able to handle effectively the multitude of explicit objectives which can be stated for a particular course. Statements of general objectives are more desirable.

*Response 6:* General objectives are of little direct use to the teacher in the classroom. Education is the tedious process of achieving a multitude of discrete steps. Let's stop the loose talk and discuss these steps in explicit terms.

*Objection 7:* Teachers may be evaluated on their ability to get students to attain behavioral objectives.

*Response 7:* Teachers today are often evaluated on the instructional *means* they use in the classroom. They should be held accountable for the *ends* they achieve or fail to achieve. Properly written behavioral objectives provide a realistic criterion upon which such accountability can be based.

*Objection 8:* There are many desirable outcomes for education in addition to behavioral changes in the student such as attitudes of teachers and parents.

*Response 8:* True, but let's start with the student; he is at the center of education.

*Objection 9:* "Programming" through behavioral objectives damages creativity.

*Response 9:* The use of behavioral objectives will not damage creativity any more than conventional teaching; in fact, carefully employed behavioral objectives will help teachers focus upon elusive goals such as creativity.

*Objection 10:* The most significant outcomes of education are in the "affective domain" and are very difficult to operationalize; hence they will be underemphasized in favor of the more explicit and obvious goals of the "cognitive domain".

*Response 10:* Although it may be difficult to identify behavioral goals in the affective domain, teachers still do make judgments about affective behavior, and good operational objectives can be established with effort — even in the arts and humanities. Teachers have an obligation to be explicit about their evaluative criteria and to scrutinize their objectives.

In the process of reviewing positions taken by proponents of behavioral objectives and their critics it is apparent that there is frequently a communications failure between the people involved. Few behaviorists are

as rigid in posture as their critics would imply, and conversely, their critics generally, are not as totally opposed to measurement as the behaviorists would indicate. Sometimes the individuals involved appear to misunderstand one another and argue for similar positions. Occasionally there is a real difference of position taken by both parties to the issue, but quite often the advocates of one point of view substantially misconstrue the position of their antagonists.<sup>15</sup> This misrepresentation may be due to the fact that the behaviorists and their critics organize their thought about different paradigms and their vocabularies and interpretations of experience are incompatible.<sup>16</sup>

#### OBJECTIONS TO BEHAVIORAL OBJECTIVES — II

There are some very fundamental differences between the advocates of behavioral objectives and their critics. These differences which have philosophical implications are frequently not recognized by those who are closest to the issue. Any statement of objectives is necessarily theory laden and is based upon a more fundamental philosophy, psychology, and value system. The fact that students may or may not attain certain operational objectives does *not* provide an indication of the validity of such objectives or the validity of the paradigm underlying them.

Behavioral objectives do not bring us closer to solving curricular problems of how to teach specific concepts or in what order to present them. They may, on the other hand, accelerate our efforts to solve such problems. Even in the physical sciences, methods for stimulating creative insights have not been found to be prescribable, and similarly, specific techniques for creating insights among curriculum developers have not yet been prescribed.

Teachers must prepare students for an uncertain future, largely through activities developed through the prior experience of men. Discussing history and accumulated knowledge is one way to prepare for the unknown. Can behavioral objectives indicate whether the history is overemphasized?

One of the basic, unstated assumptions of behavioral objectives advocates is that with effort all objectives in education can be identified and stated in precise, measurable terms. R. L. Ebel, a Vice President for Educational Treating Service, Inc., in 1963 wrote that distinction could not be made between measurable and non-measurable outcomes of education. A "reason for the denial of measurability of some important educa-

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<sup>15</sup>See, for example, Myron J. Atkin, *op. cit.* and Charles A. Koepke, *op. cit.*

<sup>16</sup>Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: The University of Chicago Press, 1970), pp. 10-11.

tional outcomes may be the opportunity it provides for committed anti-scientists to reemphasize the limitations of scientific method."<sup>17</sup>

As was mentioned previously in the historical overview,<sup>13</sup> in the recent past even some physical scientists have come to seriously question this behavioristic position. Another physicist to speak out on the subject has written:

I have a suspicion that there is some sort of loosely held feeling in society that everything is amenable to the 'scientific approach,' and that this feeling may be having a pernicious effect on education . . . I believe that there is a great deal in education which is unmeasurable. Education is a nonscience because although measurements are made, they do not tell us . . . everything we need to know . . . I can produce no experimental evidence for the unmeasurable. If I could, I would, but then it wouldn't be unmeasurable. In conclusion, I repeat: Not everything in education is amenable to measurement, so we cannot use the criterion of measurability to determine the worth of all aspects of education.<sup>18</sup>

This position expressed by D. G. Ivey, which is atypical for physicists through the late 1960's, and the position held by advocates of behavioral objectives for all learning outcomes are obviously antithetical; the positions represent different paradigms. No doubt, another paradigm will arise which will supersede the contemporary ones, but the resolution of the issue is not clear at the present time.

#### IMPLICATIONS FOR TEACHING AND CURRICULUM DEVELOPMENT

Teachers and curriculum developers cannot operate effectively if they are isolated from the society surrounding them. They must recognize contemporary priorities and values if they are to deal with them in a meaningful way. At present our technological culture places substantial emphasis upon measurement and accountability. If individuals believe that certain aspects of education are not amenable to comprehensive measurement, then voices must be raised to make that fact clear to society.

Although behavioral objectives will not solve the problems of instructional priorities, they may well be very helpful to researchers who are trying to clarify some of the many complex issues in education. Beyond that, operational objectives may help to focus the awareness of classroom teachers upon specific outcomes which they may wish to help students achieve. A course defined by behavioral objectives can be changed in precise ways. Teachers must recognize, however, that the effects of the classroom experience will be substantially broader than any specific behavioral objective which may or may not have been attained.

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<sup>17</sup>Robert L. Ebel, "The Relation of Testing Programs to Educational Goals," in *The Impact and Improvement of School Testing Programs*, 62nd Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago Press, 1963), p. 38.

<sup>18</sup>D. G. Ivey, "The Nonscience of Education," *The Science Teacher* Vol. 35 (March, 1968), pp. 18, 19, 21.

Education will profit from efforts to make discussions about educational issues more precise and from careful analysis of educational activities. It would appear that there has been an overabundance of poorly defined terms and issues on the subject of education. Yet, educational goals ultimately should be based upon needs and philosophies; special emphasis should not be placed upon certain outcomes merely because they are easily measured.

*Should teachers encourage individuality in student behavior or provide an environment which tends to reduce individual differences?*

*Should curriculum developers establish a multitude of specific, explicit objectives or should they define more general, implicit directions?*

*Can all educational objectives be stated in explicit and measurable terms?*

The questions are complex and many variables impinge upon them. In spite of the noise currently generated by the ardent advocates of one position or another, the theory and evidence available at this moment are inadequate for a definitive resolution of these issues. Behavioral objectives have definite value for certain applications, but, at least for the present, final judgment on these larger issues must be suspended.