

Behavior Analysis in Contemporary Educational Psychology

Silvia Perini
Istituto di Psicologia
Università di Parma
Via Borgo Carissimi, 10
43100- PARMA
ITALY
tel. 521.239017 - fax 521.289555

SUMMARY

The inner debate on the topics of Educational Psychology dates back in time, but is still a stimulating subject; the philosophy of the science underlying the different psychological approaches to education, emphasizes specific pedagogical standpoints. As regards this matter, one of the basic problems is the fact that the experimental analysis of behavior contribution to education, is sorely misunderstood and mischaracterized for external and internal conceptual problems regarding basic and applied science and philosophy. The main aim of the paper is to help make them more clear. They will be analyzed in their historical background, as well as in the context of the recent advances.

Key words: Experimental and Applied Analysis, Behavior, Education.

Nearly a quarter of a century has transpired since Sidney Bijou asked in the Journal of Applied Behavior Analysis: "What Psychology has to offer Education-now". His answer was detailed and clear, even if he admitted that his views were those shared by only a minority of psychologists. It is perhaps for this reason that his question is still of great relevance today.

Bijou (1970) wrote that psychology puts at our disposal: "...a set of concepts and principles derived exclusively from experimental research, a methodology for

applying these concepts and principles directly to teaching practices, a research which deals with changes in the individual child (rather than inferring them from group averages), a philosophy of science which insists on observable accounts of the relationships between individual behaviour and its determining condition" (p. 66).

Later on I will be dealing with relationships in greater detail as their functional characteristics form one of the main themes of contemporary educational psychology. I feel however, that we cannot

ignore the fact that the Bijou's question is still without a unanimous answer not only because the answer was given by a member of a small, but respected minority of psychologists.

According to Morris (1992), behavioral analysis in its two specific experimental branches, applied and conceptual, is misunderstood for reasons linked to external and internal conceptual problems. This misunderstanding and incomprehension often stems from misleading literature. A startling example of this can be seen in the open letter which Catania (1991) writes to Mahoney commenting on his article *Scientific Psychology and Radical Behaviorism* (1989). The letter was signed by a considerable number of important representatives belonging to that same small minority of psychologists referred to previously. Catania writes: "Dear Michael, I have read your paper in *American Psychologist* (Mahoney, 1989), and the extent to which it is laden with errors of fact and interpretation compels me to respond" (p. 61). The errors which Catania mentions refer to conceptual aspects of general behavioral theory.

This same view is held by Axelrod (1992) who with regard to misunderstanding in applied analysis writes: "The language and the practices of applied behavior analysis run counter to the language and the perceived practices of American culture. The language of our culture is one of freedom, independence, and psychoanalysis... Thus, when we use terms like consequences, control, reinforcement, and punishment, we are seen as coercitive and controlling" (p. 32). This quotation has a direct relevance when applied to Italian culture. Bailey (1991) adds: "Teachers...won't buy into a seemingly mechanistic and deterministic technology of behavior change. This is foreign to them and inconsistent with the rest of their training" (p. 446).

As far as internal, conceptual problems are concerned Morris (1992) maintains that: "We have generally sought to change the behavior of our critics without analysing the variables controlling their behavior...The

critics of behavior analysis are right. They are right in Skinner's sense, in the sense that...behavior is lawful-including that of our critics. If it is lawful, we might analyse it and alter its controlling variables". Morris concludes that perhaps "We might ask what our critics see and hear or, perhaps more importantly, what they do not see and hear that causes their misunderstanding and mischaracterization....the variables that control our external and internal conceptual problems, that is the behavior of our internal and external critics....One factor...is that we have sometimes been economical to a fault in describing the aim, progress, and evolution of behavior analysis (p. 5).

It is probably due to all of these reasons that the answer Bijou gave in the seventies was misinterpreted to such an extent that from time to time it was necessary for that still small minority of behavioral educational psychologists to put forward their answers. Picking up on Morris' invitation I will be trying to put forward in relative detail, thoughts and reflections concerning the contribution of behavior analysis when applied to education. Particular reference will be made to the role of a philosophy of science based on observable environmental-behavioral interactions.

My starting point is the twenty year old controversy that Greer began in the *Educational Researcher*. The debate continued that same year with reply to Greer and ending for the time being with Greer's answer in the 1992 *Journal of Applied Behavior Analysis*. The first issue in 1992 of the *JABA* was dedicated to the debate surrounding the many questions linked to the misunderstanding of behavior analysis and its application to education. A cultural debate of this type is enviable and is something which in Italy we are still a long way from generating.

Greer (1983) wrote in his article: "There is an existing technology of instruction derived from the science of behavior. This assertion is certain to provoke shock and skepticism from the majority of educational researchers who learned their methodology

from social scientists" (p. 3). Never was a statement more prophetic. Brophy's answer to this was entitled: If only it were true: A response to Greer. But what had Greer (1983) written in his article that in Brophy's opinion was untrue? Basically the same things that Bijou had written thirteen years earlier. For example, that: "The research methodology of the science of behavior analysis, (behavior modification, behavior therapy, experimental analysis of behavior) was derived from the scientific practices of the natural sciences. These practices have been adapted to study behavior for 50 years of laboratory research and 20 years of applied research. The results of the applications in education constitute a science and technology of instruction" (p.3). Keller (1978) shares his very same views and asserts that: "Never before in the history of mankind have we known so much about the learning process and the conditions under which an individual human can be efficiently and happily trained" (p. 53). Greer (1983) goes on to say that Keller's assertion is backed up by hundreds of experiments in behavior analysis; the principles on which these experiments are based have been subject to more controls and checks than those undergone by new drugs, food additives or surgical techniques.

Brophy (1983) in his reply speaks ironically about the applications of behavior analysis in education, underlining what he considers to be the limits of such applications when applied to a group instead of the individual. He goes on to write: "The results are interesting but akin to those produced by an infant who acquires a hammer then discovers that everything in the environment needs hammering". He adds that ".....despite its success in the laboratory and in certain other settings, the effect of applied behavior analysis on teaching and learning in the schools is limited and always will be....Determined efforts have shown that adaptations of applied behavior analysis procedures can be implemented with reasonable success in entire classrooms or even entire schools, but the results are not

significant enough to justify all the time and trouble involved" (p. 14).

In his reply Greer (1983) stresses that: "Learning is always individual; but individualised instruction is not private, nor is private instruction always individualized. I fail to see how behavior analysis is somehow refuted by the presence of groups of students. I see no new science or technology that deals with groups such that individuals can be ignored" (p. 14).

Ten years later, Greer (1992) once more summarises his difference of opinion with Brophy: "In that paper, I made four claims: a) There was a science of pedagogy based on a science of behavior; b) the results of behavior analysis had been more fruitful in producing a science of pedagogy than had educational research; c) this difference in results was due to the characteristic scientific practices used by each group; and d) educational researchers have been remiss in ignoring the findings and epistemology of the science of behavior" (p. 65).

As far as ignorance is concerned it is worth remembering that the research carried out in educational psychology does not necessarily have the science of behavior as its starting point. This, as we well know is a minority position. Educational researchers are often far too concerned with irrelevant issues which deal with the individualisation of practices and effective educational instruments. Educators unlike other professional people are not taught to test their instruments (e.g. text books), but it is their clients i.e. their students whom they put to the test. "Whereas medicine and engineering are characterised by a scientific perspective, education is characterised by dogma and current fads. Rather than relying on a growing body of scientific knowledge based carefully on implemented research to construct tools, education typically relies on consensus" (Carnine, 1992, p. 13).

Examples of agreement to criteria based on consensus are common everywhere, but, fortunately, it is not consensus which dictates the laws of learning. In cases where pedagogical science has been used based on

the science of behavior, related problems such as different forms of retarded development have been successfully overcome.

It is because they stem entirely from observable interactions between an organism functioning in a unitary way combined with the conditions and the events of the physical, social and functional environment (or from inferences that can be deduced or empirically verified), that concepts, theories, explicative hypotheses, provisions formed from educational psychology based on the science of behavior produce undeniably efficient pedagogy. In my opinion the philosophy of the science is where most errors of fact and interpretation occur, causing in turn misunderstanding and confusion in all branches where behavior analysis is involved. My aim here is to outline the most frequent errors in the applicative field and consequently I will not be dwelling too long on more general conceptual matters.

In Italy, but not only in Italy, the concept of functional interaction is not well known and is systematically identified with the S-R paradigm. This obviously gives rise to endless unproductive discussions which are specifically related to themes dealing with the inter-personal relationship and the critical relevance of its link to education. Taking note of what Morris said in 1992 I would like to underline that the contemporary behavioral approach surpasses the concept of individual reactivity, a key concept for Watson, but a concept even at that time considered inadequate for a psychology which was to be seen as a historical science and of development. It is replaced by the concept of interaction, which emphasises the mutual, reciprocal and simultaneous interaction between the functions or the organism's response and the function environmental stimulus. Kantor's view of interactions between the organism and his environment is holistic and naturalistic and it leads us to think of the coordination of the whole organism within a field as the main topic of Psychology .

Because of its relevance to educational applications I feel it is important to point out

the differences between a physical-social and cultural environment and a functional one. This concept is of particular importance as it is one that is unfamiliar with those who see the behavioral approach to be lacking sufficient emphasis on the inter-personal relationship. One "is made up of surrounding elements, things, and influences which act upon man and his products and which can be observed and measured thanks to physical and social instruments. The other is made up of elements, things and of those influences which act upon the individual and can be observed and measured thanks to changes in individual behavior. The conditions, things and influences which define the functional environment are almost infinite: they can however be conceptualised as stimulus functions and setting factors. The first can be seen by observing what an individual does in relation to a specific stimulus, based on his previous interactive history. Thought our lives, physical, somatic or social stimuli may take on different functions in relation to the object or event in question....., and in most cases these functions remain a part of the individual's repertoire....the way in which an individual reacts to a chairdepends on the circumstances and setting factors, in other words, on the other components in the functional environment (Perini & Bijou, 1993, p. 22).

These basic points should leave no doubt that the study in question is not about the behavior of the individual detached from his environment, nor is the environment detached from the behavior of the individual . What we are about to study is the interaction of the individual with his functional environment. The aim of the study is to change, if necessary, those conditions which sustain incorrect, inadequate and unsatisfactory interactions. The educational psychology produced from the analysis of observable aspects of functional interactions between individual behavior and the conditions which determine it, have substantially modified and in some cases revolutionised, in a Copernican sense the answers to basic questions.

The behavioral analysis of development, a subset of the general theory of behavior (Catania, 1984; Kantor & Smith, 1975), is based on the history of interactions and the progressive and continuous changes that occur with time. From this point of view every man is an original and unique product of the succession of situations which maintain and promote interactions between the biologically maturing individual and his functional environment (Perini & Bijou, 1993).

The general theory:

1) Aims to describe, predict and control the behavior of the evolving individual, in order to make him able to assert himself in the society in which he lives.

2) Places the object of study at a point along a continuum which includes normal development as well as accelerated or retarded.

3) Formulates empirical laws which describe, predict and control, thus explaining:

changes in organism-environment interactions (for example learning), behavior evolution and involution (for example the acquisition or loss of ability), the maintenance of interactions (for example memory and recall) generalisation and induction of answers, affective reactions, emotive reactions.

4) Produces technology that characterises: an efficient educative model in terms of organisation and control which is able to finalise in a functional sense the crucial elements of the interaction however simple or complex they may be, a flexible, open system, able to correct itself, by integrating new concepts, principles, laws and experimentally validated techniques.

Accepting that the philosophy of the science provides the base for the general theory of behavior, the most revolutionary contents of the theory of development in my opinion regard the concept of the development continuum and the educative technology derived from its empirical laws. There is close correlation between the contents of the two: the first defines a way of conceptualising man, his development and his

right to education, the second offers the necessary instruments to achieve the aim of giving each individual in society the possibility to assert himself.

It is the question of the individual's right to education and educational technology that I would now like to consider. Development can be described as an individual's interactional history. In other words it is a succession of situations that maintain and promote or inhibit functional environmental-behavioral interactions, that experimentally individualise principles and laws that regulate such interactions and from which effective procedures for the management of the variables that modify them can be derived. On the basis of this, the implications of individual's right to the most appropriate type of education and the application of individualised educative technology would appear clear.

After, however the general statements of principle, the actual operative programme is not quite so obvious and from time to time needs reviewing. The first forceful declaration of modern times regarding the right to education is without doubt that of Jean Itard who we will be talking about shortly after a chronological look through the past. The most recent we can read about is to be found in the paper that Barrett et al. (1991) was asked to prepare by the Task Force made up of ABA about "The Right to Effective Education": "Among the rights guaranteed to (American) citizens should be the right to an effective education" because "if the culture has an imperative to educate its young so that it may survive and improve, then its young have the right to be well taught: to be taught effectively and to be taught the things that promote the adaptation of the growing individual. Ineffective education may be traced to two possible sources: teaching poorly and/or teaching the wrong things. On the other hand "a good teacher or instructional system must satisfy at least three criteria: (1) It must be effective in helping students learn more rapidly than they would on their own; (2) what students learn must benefit both the individual and the society as a whole; and (3)

it must employ positive rather than coercitive or punitive methods" (p. 79-80).

As early as 1968, Keller in his autobiographical article entitled "Good-bye Teacher..." wrote that while he was working in a military training centre where Morse code was being taught, he had already begun to realise that "the student is always right. He is not asleep, not unmotivated, not sick, and he can learn a great deal if we provide the right contingencies of reinforcement. But if we don't provide them and provide them soon, he may be inspired to say, "Good-bye" to formal education" (p. 88).

With regard to contingencies of reinforcement and bearing in mind that it is one of the most commonly misunderstood concepts also among psychologists, it is as well to note that: "the consequences of responding are critical to our understanding of learning not because learning follows from them but because they are what is learned" (Catania, 1979, p. 86).

It is well known that Fred Keller along with Schoenfeld is considered one of the fathers of the psychology and technology of education. The Personalized System of Instruction (PSI), was based on the highly individualised instruction born during the years spent teaching the use of Morse code. Its effectiveness compared to other systems of teaching has been demonstrated by its impressive passing of a numbers of tests. Sherman, the co-author along with Keller (1974) of the PSI: Keller Plan Handbook in a recent article in the JABA (1992) makes reference to over 2,000 studies.

According to Keller (1978) the basics of effective teaching which are coherent with the principles of behavior analysis are:

- 1) a wide ranging set of operations which indicate the environmental-behavioral interactions in all those settings generally linked to learning ;
- 2) a science of behavior based on strict laboratory research;
- 3) epistemology which radically changes the way students are considered and the way of analysing a decrease and increase in the speed of learning;

4) research and evaluation methodology which would allow for the technology to be applied individually. This becomes necessary when learning and its generalizations are considered as products of environmental control rather than as changes in the cognitive structure of the student.

Before Keller, Harold W. Benjamin held same opinion. He is considered one of the founders of comparative psychology and in 1939 he too dealt with the same question. His book *La pédagogie paléolithique, ou préhistoire de la contestation* is still a standard American pedagogical text, and it is "a small educational utopia...which anticipates by several decades the problems that pedagogy is going through today" (Ballanti, 1979, p. 5).

Benjamin (1939) maintains that scientific psychology offers education the instruments and evaluation methodology with which to test its hypotheses; the hypotheses to be tested are those used to study the educational objectives which modify behavior, mediation, instruments and processes started by the individual "in action", with the aim of improving his life.

The wise protagonists of the book maintain however that there are eternal truths and the Palaeolithic Study Program is one of these. This is how, according to Benjamin, the idea of conscious and systematic education was born: it was watching his children at play that stimulated him to enter into the world of pedagogy. He noticed that their games seemed to have no aim other than that of the immediate pleasure that the activity gave them, and he compared this activity with that of adult members of a tribe. The children played for the pleasure of doing so; the adults worked to make life for the tribe safer and to improve the quality their own lives. The children played to keep boredom at bay, the adults danger. If he was in some way able to persuade the children to get involved in activities that would produce food, shelter and clothes and improved safety he would be helping the tribe to improve the quality of its existence. When the children grow up they would have more meat to eat, more skins to keep themselves warm, better caves to sleep

in and be less threatened by the dangerous sabre toothed tiger . These are what he consider to be the aims of education and he will then goes on to lay out the study program which will lead to their realisation. In other words, Benjamin refers to educational methods.

The success of the educational system guaranteed the tribe's well being until the their living conditions changed as a result of environmental changes. At this point old methods were no longer appropriate and could no longer be used to achieve those objectives and it was necessary to wait until new teachers devised more modern and effective ways. The problem then became that of deciding whether to substitute these new methods in schools in replacement of the old ones. The elders who ran the schools objected that while these new techniques effectively guaranteed a better way of life, they were not appropriate matter for schools as they represented instruction and not education. Education up until then had been defined as the transmission of specific knowledge useful to the community and the energy and motivation to achieve these things (Benjamin, 1979). The new definition of education in contrast was the teaching of a general ability and not the result of simple training related to a specific activity .

The objection of the elders of the Palaeolithic tribe is leads us onto to considering the needs of community and educational technology. The objection raised by the elders is not greatly different from that raised by pedagogists and educational psychologists regarding the aims and objectives of education and the technology used to achieve these aims and objectives. With regard to the aims and objectives of education, the members of the ABA Task Force (1993) point out that "The general problem of teaching is that of shifting the "reasons" for behaving in specific ways from the temporary of artificial ones employed by the teacher, to those sustained by the culture" (p. 80).

With regard to technology, reference must be made to what happened to The

Psychology curriculum, the study program devised by Keller and Schoenfeld (1968) and successfully implemented in different universities (Brasilia, Columbia, Arizona) in the sixties. The characteristics of the program were similar to those of programmed instruction but with emphasis on aspects dealing with social and verbal interaction. The main characteristics were:

- a) individualization of learning rhythms,
- b) a clear definition of terminal ability,
- c) a precise and clear graduation of the steps with which this is achieved,
- d) criteria which indicate level of mastery necessary to pass from one step to the next,
- e) systematic monitoring of progress,
- f) a teaching staff organised to aid interaction between peers.

Notwithstanding the undeniable success of the curriculum, the critics major concern was the that the division of the teaching program into units could be considered more closely linked to training rather than teaching, in that it lacked a general vision of the content . Keller's (1968) answer is simple: "As for the teaching-training distinction, one needs only to note that it is always the instructor who decides what is to be taught, and to what degree, thus determining whether he will be called a trainer or a teacher. The method he uses, the basic reinforcement contingencies he employs, may be turned to either purpose" (p. 84).

Technology is a commonly discussed in many different applied spheres. On purely cultural level many educational and development psychologists have shown no great change in attitude. Whilst accepting the undeniable effectiveness of technology especially in the applicative field of helping retarded developers, they deem it worthy only of a training role rather than an educational one, so perpetuating the misunderstanding. "Also the fact that behaviorists alone have been successful in working with the most disabled populations has been a two edged sword. On the one hand we are given some credit for our successes with difficult clients; on the other hand, we are often seen as promoting a psychology that does not pertain

to the main stream (Axelrod, 1992, p. 31), or at best is still limited to solving problems linked to disruptive behavior, rather than creating conditions that would enable everyone to learn more effectively.

At this point I feel I must mention some of the educational problems involved in treating retarded developers, and at the same time put forward some thoughts on Jean Itard and the importance of his work. Despite the prejudices of medical science at that time, Itard was the first to trace a distinction between cognitive idiocy caused by organic lesions and mental insufficiency caused by inappropriate education. There are numerous, surprising similarities between Itard's revolution and the one taking place in the field of behavioral psychology. The philosophy of the science on which he based his work as an educationalist shares many similarities with the behavioral one and consequently with educational technology. Not by chance the philosophy of the science which was at the base of his work, has guided generations of scholars and people working with the mentally retarded, including with Edouard Seguin, the inspiring force behind an educational research structure, still valid today (Talbot, 1967).

Many of his materials and instruments inspired and stimulated generations of educationalists including Maria Montessori, considered by Lindsley (1992) along with Dewey, Skinner and Keller as an "effective educator". Due to their efficiency these materials and instruments have survived, demonstrating that the laws which govern behavior remain unchanged regardless of how we try to codify and classify them. In the same way the technology from which they derive modifies behavior regardless of the theory the person using it refers to. This is how we can account for the fact that while fortunately Montessori's theories have been long since discarded her materials are still in use.

Itard is a good example of what Greer says about the results of behavior analysis. His results have played a more important role in stimulating a science of pedagogy than

educational research itself. In medical history he is considered the founder of modern otorhinolaryngology thanks to the new views put forward in paper about diseases of the ear and hearing impairment in which he discusses how deafness is not necessarily caused exclusively by organic lesions and the relationship between psychic and organic factors in dumbness. He was also responsible for having perfected techniques and instruments that are still being used today.

Itard has equally as many merits to his name in the history of education. His special didactics anticipates by nearly two centuries the educational technology founded on the basis of experimental behavior analysis applied to education. The basic philosophy which underlies the approach to the important themes of normal and late development has "an element of Comte Positivism which runs through his cult of observing facts..... and represents a unique example of the operative intervention of a given philosophy (in particular the late 16th century one of Locke and Condillac) regarding a refractory nature" (Moravia,1970, p. 6).

Victor was certainly not the first "enfant sauvage" ever to be heard of but he certainly became the most famous case. First because he had grown up in total isolation and second because he was being studied by a scientist who was fully aware of the scientific value of his experience. Thanks to his intuition the boy from Aveyron in the space of five years was able to demonstrate ability and knowledge in many behavioral and cognitive areas, he learnt to read and write a few words, communicate with others, build up and maintain affective ties, he was able to control his behavior on the basis of simple moral rules.

Pinel, a famous doctor at the time put Victor's cognitive idiocy down to an incurable illness and discarded the child as a lost cause. Itard (1801) believed that the child having been "denied any form of education and having lived without any contact with other humans....was not an idiotic adolescent but more like a 10 or 12 month old baby... whose antisocial habits worked against him, an

insistent lack of attention, the inflexibility of his organs and a weakened sensitivity acquired through accidental circumstances..... all indicated moral medicine as the most appropriate form of treatment. I therefore reduced the number of objectives in my moral therapy to five main ones or more precisely the education of the wild boy of Aveyron" (p. 33-34).

We must however seek to define what we mean by moral medicine. Today Larousse defines moral as the group of phenomena that constitute our mental life. In Itard's day it generally referred to clinical psychological and psychiatric activities which much later on were formed into organic disciplines. We can underline with a quote from Pessotti (1984) that according to Itard " a deficiency is a medical problem which can be treated. The doctor is responsible for changing habits , mores, by using moral medicine. Moral medicine can be used to correct or teach notions and behavioral repertoires. This means that the choice of mental orthopedy or orthofreny, true behavioral modifications, according to the modern connotations of the term, do not aim to produce, neutralise or eliminate nervous or cerebral structures but to organise optimal emotive and environmental conditions so as to produce desirable and eliminate undesirable behavior" (p. 41-42). Itard's conviction that idiocy could be cured, led him to diagnose it as educable retarded development and so opening the way not only to the concept of social- cultural deprivation but also to the modern theories on special education.

There are undeniable similarities between this interpretative model of idiocy as a form of retarded development which can be modified with a special pedagogical program and that of a contemporary behavioral approach to the problem. It should be noted that both of the above cases represent critical innovations compared to the diagnostic and prognostic methods that they were preceded by.

Accepting the rather dated literary style of Itard's preface, the considerations he makes in support of the basic philosophy

behind his treatment of the boy from Aveyron, are still most valid today. The identification of characteristic traits in man in his natural state, was a popular philosophical subject of the period. Itard comments on this and puts forward his alternative approach to what happened in other cases of "wild children". A quick look through the index of *Mémoire sur les premières développements de Victor de l'Aveyron* (1801), and of *Rapport sur les nouveaux développements de Victor de l'Aveyron* (1806) clearly shows the methodical rigor which characterises the sequence of moments which Itard chooses for his educational intervention from the diagnostic one to the programmed one. A careful analysis of the way in which Itard seeks to achieve them, allows the attentive reader to fully appreciate his extraordinary intuition as an analyst of behavior *ante litteram*.

In conclusion it seems quite legitimate to ask what is the point of referring back to authors from past centuries, after having on more than one occasion underlined the quantitative and qualitative sides to our current debate about the relationship between psychology and education. I personally believe that apart from their general cultural value, these historical references can settle a fundamental epistemological task. They emphasise the validity of the functional, interactive paradigm in the way that it responds to the prerequisite of post-vision and regardless of the reference theory. This is not surprising as theories, by definition can be contradicted by facts while the opposite is not possible. From this point of view, a more careful look at our scientific past could help overcome problems conceptually linked to incorrect interpretations. The attention that the philosophy of the science of behavior attributes to observable aspects of functional interaction is the same that Itard, Seguin, Montessori and Benjamin documented with their work. Thanks to this attitude they have contributed to changing modern educational styles. If this fact were to be noted more often it would perhaps help bring the current debate in educational psychology back to promoting

research, rather than to that which Carmine (1992) amongst others refers to as "irrelevant issues which aim to individualise effective educational practices and instruments".

REFERENCES

- Axelrod, S. (1992). Disseminating an effective educational technology. *Journal of Applied Behavior Analysis*, 25, 31-35.
- Bailey, J. S. (1991). Marketing behavior analysis requires different talk. *Journal of Applied Behavior Analysis*, 24, 445-448.
- Barrett, B. H., Beck, R., Binder, C., Cook, D. A., Engelmann, S., Greer, R. D., Kyrklund, S. J., Johnson, Maloney, M., McCorkle, N., Vargas, J.S. & Watkins, C.L. (1991). The right to effective education. *The Behavior Analyst*, 14, 79-82.
- Benjamin, H. W. (1970). *La pedagogie paleolithique, ou pretoire de la contestation*. Editions Labor: Bruxelles.
- Bijou, W. S. (1970). What Psychology has to offer education-now. *Journal of Applied Behavior Analysis*, 3, 65-71.
- Bijou, S. W. & Baer, D.M. (1978). *Behavior analysis of child development*. Englewood-Cliffs, N.J.: Prentice Hall.
- Brophy, J. E. (1983). If only it were true: A response to Greer. *Educational Researcher*, 12, 10-13.
- Carmine, D. (1992). Expanding the notion of teachers' rights: Access to tools that work. *Journal of Applied Behavior Analysis*, 25, 13-19.
- Catania, A. C. (1984). *Learning*. Englewood-Cliffs, N.J.: Prentice Hall.
- Catania, A.C. (1991). The gifts of culture and eloquence: an open letter to Michael J. Mahoney in reply to his article, "Scientific Psychology and Radical Behaviorism". *The Behavior Analyst*, 14,61-72.
- Greer, R. D. (1983). Contingencies of the science and technology of teaching and pre-behavioristic research practices in education. *Educational Researchers*, 1983, 3-9.
- Greer, R.D. (1992). L'enfant terrible meets the educational crisis. *Journal of Applied Behavior Analysis*, 25, 65-69
- Kantor, J.R. (1968). Behaviorism in the history of psychology. *The Psychological Record*, 18, 151-166.
- Kantor, J. R. , & Smith, N. W. (1975). *The Science of Psychology: An Interbehavioral Survey*. Principia Press, Chicago, Illinois.
- Keller, F. S. (1968). "Good-bye, teacher...". *Journal of Applied Behavior Analysis*, 1, 79-89.
- Keller, F.S. (1978). Instructional Technology and educational reform. *The Behavior Analyst*, 1, 48- 53.
- Keller, F.S. & Sherman, J.C. (1974). *PSI: The Keller Plan Handbook*. Menlo Park, CA: W.A. Benjamin.
- Itard, J. (1801). *Memoires sur les premieres developpements de Victoir de l'Aveyron*.
- Itard, J. (1806). *Rapport sur les nouveaux developpements de Victoir de l'Aveyron*.
- Lindsley, O. R. (1992). Why aren't effective teaching tools widely adopted? *Journal of Applied Behavior Analysis*, 25, 21-26.
- Mahoney, M. J. (1989) Scientific Psychology and radical behaviorism: Important distinctions based in scientism and objectivism. *American Psychologist*, 44, 1372-1377.
- Moravia, S. (1970). *La scienza dell'uomo nel Settecento*. Laterza: Bari.
- Morris, E. K. (1992). ABA Presidential Address: The Aim, Progress, and Evolution of Behavior Analysis, 15, 3-29.
- Perini, S. & Bijou, W. S. (1993). *Lo sviluppo del bambino ritardato*. Angeli: Milano.
- Pessotti, I. (1984). *Deficiencia Mental: da supersticao à ciencia*. Queiroz, Sao Paulo.
- Seguin, E. (1846). *Traitement moral, hygiène et éducation des idiots et des autres enfants arriérés*. Paris, Bailliére.
- Sherman, J. G. (1992). Reflections on PSI: Good news and bad. *Journal of Applied Behavior Analysis*, 25, 59-64.
- Talbot, M. (1967). Edouard Seguin. *American Journal of Mental Deficiency*, 72, 184-189.