EDUCATIVE - REHABILITATION SCIENCE ON THE SCIENTIFIC CONTINUUM

VLADIMIR STANČIĆ

received: september '96.
accepted: february '97.

Scientific paper
UDK: 376.001

The author first determines the concept of epistemology with the aim of utilizing its method to analyze the position of educative-rehabilitation science on the scientific continuum. This analysis is carried out according to the criteria of scientificness, i.e.: (1) science as a process, (2) methodology, (3) verification or refutation, (4) coherence, (5) nomotheticity, (6) predictability, and (7) general acceptability. On the basis of these criteria, the author determines paradigmatically the position of three sciences on the scientific continuum, beginning with psychology and psychoanalysis, and then dedicating the majority of the article to the position of defectology on the continuum. In addition, he comes to the conclusion that, although the position of defectology (or educative-rehabilitation science) on the scientific continuum is not especially high-it does not correspond to the position taken by the exact sciences-at least it is not lower, but in some cases higher (according to some of the criteria), than some of the traditional sciences. The author considers this type of analysis to be necessary in order to improve the position of educative-rehabilitation science in terms of those criteria of scientificness according to which its position is inadequate.

INTRODUCTORY NOTES

In this article the term *defectology* is used parallel to the term *educative-rehabilitation* science, although the author was aware of the negative connotations of the former. At the present time there is a justified tendency among us to replace the term defectology with the term educative-rehabilitation science. However, as long as the new term is not generally and officially accepted among us, I will use the term defectology as well.

The term defectology was adopted in Croatia many years ago, being certainly inherited from Soviet defectology. Some authors wrote about this several years ago (for example, see Kovačević, Stančić, and Mejovšek, 1988; Stančić 1989, etc.).

I would like to stress some substantial features of our notion of defectology:

1. It is not primarily special education, for it is constituted as an interdisciplinary, and even transdisciplinary, scientific field which comprises many particular scientific disciplines in mutual permeation.

2. The transdisciplinary characteristic, by which defectology views the human being, including the human being with difficulties in social integration, as a whole (i.e., as a bio-psycho-social structure), became an important methodological principle. This way of conceptualizing the individual leads to the supposition that structural and multivariate research is a necessity for defectology (educative-rehabilitation science), and that the development of analytic methods using small samples is especially necessary.

3. In terms of the structural approach, it is understood that damage has neither attributive nor additive meaning for the

Vladimir Stančić, Ph.D., is a retired professor at the Faculty of Special Education and Rehabilitation, University of Zagreb
Correspondence to: Faculty of Special Education and Rehabilitation, University of Zagreb, Kušlanova 59a, 10000 Zagreb, Croatia

individual, but that it appears as one among many other elements of the structure. Consequently, its meaning for both the individual and the social environment is determined by its relations and interactions with other elements of the structure, which includes the features of the social environment as well, in a broad or narrow sense, in which the individual takes his or her part (the ecological approach).

4. For this reason it is common in Croatian defectology to use the term "persons with difficulties in social integration" instead of term such as "persons with developmental difficulties", "with defects", "with special needs", etc.

5. Up until now we thought of defectology as a transdisciplinary theoretical science, while rehabilitation was understood in its practical usage-i.e., in the transformational procedures of personal and social structures based upon defectological research. If we decide to abandon the term defectology (which we are most likely to do), there should remain a distinction between theoretical and practical (or applied) educative-rehabilitation science. From its practical aspect, rehabilitation ought to be understood as the process, system, and goal of enabling social integration (i.e., optimal social integration rather than maximal social integration: the latter is not desirable).

I would request that the reader take these remarks into account in order for the article to be more understandable and acceptable.

EPISTEMOLOGY

It might be useful for younger scientists dealing with defectology to become acquainted with some of its epistemological questions. One such question deliberates over the place which defectology (educative-rehabilitation science) takes on the scientific continuum. However, this question comprises two other questions which require answers as well. These are: what is epistemology, and what is the basis upon which one can speak about a scientific continuum?

Epistemology is the theory of science in general, or rather, of sciences, if particular sciences contain certain specific epistemological questions. Although the word epistemology is often used as a name for classical cognitive theory, today it is more and more utilized to designate cognitive questions related to science and scientific thinking. It poses questions about the origins of scientific knowledge, about its foundations, its possibilities, and its scope, as well as about the necessity of scientific discourse, the differences between formal sciences (mathematics and logic) and empirical sciences, and questions about scientific criteria, general and specific scientific methods, etc. Epistemology has pointed to various problems that arise within scientific thinking, such as the relationship between the empirical and theoretical approaches, the problem of isomorphism (a distinctive concordance between the way we think and the way in which the world functions), the problem of the origin of the form and laws of thinking which belong to the domain of the genetic epistemology, and also the problem of the linguistic and social-social-historical dependence of science, etc. Many philosophers who deal with epistemology, as well as scientists who, as a result of their dealing with epistemology, become philosophers (i.e., theorists of science) claim that firm knowledge which is totally warrant does not exist because sciences themselves are based upon grounds which are not totally warrant. These grounds are rather founded upon certain assumptions, some of which refer to induction, others to deduction. According to such opinions, science itself is eventually based upon certain beliefs that are nevertheless, no matter how warrant they seem, only beliefs. However, not giving credence to such beliefs draws an absurd conclusion: not only that the entire edifice of science would fall to pieces, but that one could believe that the praxis that is derived from science functions only accidentally, and can fail at any given moment. Moreover, one could believe that reality itself is in the end incom-

prehensible (various forms of Kantian philosophy).

It is of course impossible to provide answers for all these questions within the scope of this article. However, some of them bring us closer to the fundamental question of this paper-the position of defectology (educative-rehabilitation science) on the scientific continuum. Or perhaps one should take a different attitude and simply decide whether something is scientific or not. Among the questions raised by epistemology, I mentioned the problem of scientific criteria and also the problem of the relationship between compiling the facts-i.e., empirical work-and theory. By answering these two questions one is enabled to state what makes a certain science scientific, or in other words, what its position on the scientific continuum is.

SCIENTIFIC CONTINUUM

It is useful to demystify science as something which contains only reliable and warranted knowledge ("as shown by scientific research" is a frequent phrase which is sometimes used as a slogan in an advertisement). Just as the content of science includes knowledge, it includes non-knowledge as well, which is connected with the further acquisition of knowledge via various forms. Some forms of "knowledge" are in recent research considered to be false beliefs; some are inadequately established, although they pretend to be knowledge, while some non-knowledge might bear fruit for the subsequent development of science-for instance, certain hypotheses and theories and also already-formed scientific laws (Rayleigh-Jeans's law on the amount of radiation of glowing bodies came out to be incorrect, but the importance of that law was very significant because it indirectly helped the foundation of quantum physics). Some sciences have sounder methods for acquisition and verification of knowledge, and therefore differentiate more easily between knowledge and non-knowledge.

It is obvious from the above that we can talk about a scientific continuum, with certain sciences taking a higher position on this continuity than others. The position of a particular science on the scientific continuum depends upon the extent to which this particular science satisfies the scientific criteria.

SCIENTIFIC CRITERIA

The broadest scientific criterion derives from the definition of the science itself. There are various definitions of science, although it is possible to accept the following: science is a process of knowledge acquisition by means of specialized methods which are adjusted to the subject. These methods enable the collection of facts as well as their explanation and the verification of each single part of their content (corpus). The definition cited above is somewhat inconvenient, for every part of it calls for further explanation: what is knowledge, what is scientific knowledge, what are scientific methods, what are facts (what are, for example, mathematical facts?), what is explanation, and what does the verification of scientifically established research results mean? We will not, of course, deal with all of these questions here, assuming that they are known, at least to some degree, to the reader. I would like to point out that something is considered a science if it is appropriate to its definition. However, it is possible to elaborate the above definition and, thus come up with a certain number of scientific criteria, knowing that this number is not definite. It is also possible to formulate the definition of science in a different manner than was done above, and therefore recognize as science some activities that do not correspond to the proposed definition. Some claim that even philosophy is a science, so at one time it was popular to talk about "scientific philosophy" (for example, Marxist), but in the framework of logical primitivism as well (Schlick, Carnap, etc.). Nevertheless, it is obvious that philosophy does not entirely satisfy scientific criteria (I, of course, do not abandon the value of philosophy as a special spiritual

effort which, among other things, attaches importance to science, but it alone is not a science, unless we define science in a quite different manner, which reduces the problem at least partially to semantic analysis). These are, according to my opinion, particularly important scientific criteria:

1. Science is a process in both the methodological and substantial sense, which means that the majority (theoretically: all) of scientific insights, if viewed in a process, can be taken with suspicion, placed under re-examination, refutation, and reinterpretation.

2. Each science, with regard to its subject, should have an elaborated methodology which is also a process-i.e., it develops and changes alone. Some scientific problems which are now unsolvable are postponed until new research and methods of interpretation are developed.

3. In science it is always permissible, and sometimes even necessary, to verify the preceding research results, although there are different opinions within epistemology which consider refutation, not verification, to be a criterion for the identification of scientific cognition-for example, K. R. Popper, an English philosopher of Austrian background (Popper, 1963.).

4. Science should be and is in greater part more coherent than everyday experience, as well as some other reflective undertakings which do not belong to science. Coherence is, therefore, the next scientific criterion. It is possible for science that the results of a new research cause either disorder in its previous coherence, or a connection between its ideas causing the reinterpretation of the major part of the scientific corpus, as well as the research work which is to confirm these reinterpretations, to become necessary. Here we are talking about crises in sciences that lead to scientific revolutions, as described by the American physicist and theoretician of science, Th. S. Kuhn (1962). For instance, Michelson-Morley's famous experiment in 1881 showed that the speed of light is constant regardless of the direction in which it travels with reference to the Earth passing through the "ether". The result of this experiment was incongruous with the concepts of the physics of the time, especially the "ether" theory, but this incoherence, which was intolerable for physics, led eventually to Einstein's theory.

5. Nomotheticity is the next scientific criterion. Sciences strive for the comprehension of laws, but they differ with respect to the extent to which they are generalized. The levels of generalization differ according to their formalization and their approximation of the general validity. Degrees of the approximation of laws to the general validity vary. Sciences differ from each other with respect to their ability to achieve nomotheticity: in addition to the sciences that are able to formulate laws at a high level of mathematical formalization and with general validity, there are sciences in which the accomplished laws are more probable generalizations than laws in the strict sense of the term. There are also those which deny any possibility of the achievement of any laws. According to some opinions, this is so in the historical sciences, which are therefore called ideographical, for they explore and describe idiophenomena, unique historical events (Greek. idios 'own'; grapho 'I write'). The historical sciences could be considered scientific with respect to the methods they use, but according to their orientation and results, they are closer to aesthetic expression, as was pointed out by the Italian philosopher, Croce (1960).

6. The following scientific criterion is the prediction of an event, which is closely related with nomotheticity. The more nomotheticity is expressed in a particular science and the more it is mathematically formulated, the more prediction of future events or relations between concepts (for example, in mathematics) will be certain. For instance, we predict with absolute certainity

that the speed of light will be constant no matter what the circumstances in which the measurements are carried out are, that a particular compound of oxygen and hydrogen produces water, that by means of the energy of light and chlorophyll organic matter will be continuously produced in green plants out of carbon dioxide and water, etc. In particular sciences the possibility of prediction is far more uncertain. This is especially valid for sciences in which events are determined by numerous conditions that are difficult to separate-e.g., in the humanities and behavioral sciences such as sociology, psychology, educology, and of course, defectology. Prediction in such sciences is only statistical (statistical prediction exists in the natural sciences as well, and has solid grounds), which means that mass events can be predicted with much more certainty than individual ones. In sciences in which nomotheticity almost does not exist at all, the prediction of future events barely exists or is impossible, for instance in history, even when it is combined with sociology.

7. General acceptability is a scientific criterion that is indeed not derived from the preceding definition of science, but can be accepted in its principle form as its supplement. It is important to point out the principle acceptability of a particular science and its research results, and not to insist on everyday real acceptability of all findings and theories, because the majority of them will undergo various disputes and come under suspicion, which affects their improvement. General acceptability is far more obvious in the exact sciences-i.e., mathematics, physics, astronomy, chemistry, etc.-than in the humanities and behavioral sciences. Although sociology is generally accepted and acceptable as science, there are some sociological schools and subfields which are in general nonacceptable. Similarly, certain psychological orientations, such as "geisteswissenschaftliche" psychology and psychoanalysis, are sometimes considered nonscientific. The case of philosophy is even more impressive. Particular scientific circles do not view philosophy as science at all, and it is absolutely certain that it is not possible to talk about acceptability of philosophy as a whole, as it is when talking about mathematics, chemistry, physics, or biology. I can and I do accept physics as a whole, although my knowledge of physics is not significant, but I cannot accept philosophy as a whole. If I were to do so, I would need to accept as my life attitude and opinion both materialism and idealism, as well as agnosticism and empirism, as well as neoscolasticism and existentialism, which would cause the complete incoherence of such philosophy. Therefore, the difference between, for example, physics and philosophy with respect to general acceptance and acceptability is enormous.

It may be noticed that truthfulness was not classfied as a scientific criterion. There are various reasons for why this was so. Whenever something is considered an cognition or knowledge, one assumes that it is truthful, no matter how the truth is understood; with respect to the truthfulness criterion a special problem in the corpus of science is non-knowledge. We cannot talk about untrue knowledge. In addition, the truthfulness criterion is very broad and is used out of science as well. Also, truthfulness is such a complicated concept that it cannot be discussed sufficiently here.

A particular science does not take the same place on the continua of each of these criteria, and its place on the general scientific continuum is determined multidimensionally by its place on each of these single criteria. The less the methodology of a particular science is developed and exact (which depends upon the complexity of its subject), the more difficult it is to establish a suitable research instrumentarium, the less possible it is to verify (or refute) its results, the less it is coherent, generally accepted, and acceptable, and the lower it is situated on the scientific continuum. And the lower it is on this continuity, the more it includes "theories" (in the bad sense of the term) and various schools which differ with respect to their

fundamental elements. Within sociology, educology (pedagogy), psychology, linguistics, and psycholinguistics we can talk about different "schools", which also have their originators, while in physics, astronomy, chemistry and other exact sciences such schools are hardly to be found. The lower the scientific level of a certain science is, the more unverified hypotheses which are caused by either undeveloped methodology or complicated scientific subject or both, this science has. Usually, a subject's level of scientificness determines its methodology.

THE POSITION OF CERTAIN SCIENCES ON THE SCIENTIFIC CONTINUUM

In order to define the position of certain sciences on the scientific continuum we will grade different sciences according to preceding scientific criteria. By doing so we will avoid proclaiming particular research work highly scientific or the opposite; in many cases we will become more modest with respect to the scientific domain we are dealing with, which can only have positive repercussions for that field. When we establish that the position of a certain science on the scientific continuum is lower than it was expected, it might help its rehabilitation. This is what was happening with psychology, which invested a lot of efforts towards improving its methods of gathering and processing data, but is still far from adopting unique methods. Widespread belief in behaviorism was shaken in recent decades after the great amount of research by Chomsky and his followers in psycholinguistics (Chomsky, 1965, Slobin, 1974). Psychologists themselves do not agree upon the validity and applicability of the field's wide variety of analytic methods, and the fact is that these various methods often achieve very different results using the same data. However, it would be quite inconvenient if different methods of analysis in biochemistry produced radically different information on the structure of living matter. And this is exactly what we are dealing with in psychology: there are very different theories about the human personality, which should be the crown of all psychological researches and generalizations, but the differences among them are so severe that psychology does not satisfy the majority of the scientific criteria. Although psychology does not completely fulfill all the scientific criteria, it is still scientific, but in a different way than the exact sciences.

Sociology is a similar case, but the situation with psychoanalysis is even worse, although psychoanalysts, including Freud, have a very high opinion of its theory and clinical practice. For instance, Karen Horney (1965), despite her own innovations in psychoanalysis, claims that nothing famous was done in psychology and psychiatry after Freud's fundamental inventions; after they have been rejected, the value of the new insights was decreased. Yet Erich Fromm (1970), a follower of psychoanalysis and its sharp critic, says in his book, Crisis of Psychoanalysis, that "with his dynamic concept of the character, Freud raised psychology from the level of description to that of science" (p. 47). It is certain that psychoanalysis is not what some psychoanalysts consider it to be. It is a strange mixture of science and philosophy, and it often provides unproved, non-verified and non-verifiable, and even fantastic explanations of behavioral phenomena (for example, according to radical psychoanalysis women are castrated men). One might be able to prove (although there is no space for that here) that some fundamental hypotheses of psychoanalysis are contradictory (for instance, Fromm pointed out that Freud showed how most of what is conscious is not real and most of what is real is not part of our consciousness, from which it can be concluded that psychoanalysis is either unreal, or it appeared on the subconscious level. It might also be that it is not a conscious science, but is determined by subconscious impulses. In like manner, the entire field of psychoanalysis can be comprehended as a rationalization of certain

subconscious desires). Psychoanalysis does not really satisfy any of the cited scientific criteria. It is a process within which the critique of the achieved exists (for example, K. Horney emphasized the moral values of the human being rather than his sexual drive, because he thought that it was imposible to create a science which deals with the personality without respect for human values), but this critique is not always empirically verified. The methodology of psychoanalysis is mostly clinical, insufficiently elaborated and also insufficiently exact, based upon the generalizations of very few cases, often without adequate statistical analysis, and what is important to stress, already with Freud without a tendency towards verification. Psychoanalysis is not sufficiently coherent, for some of its fundamental starting points, although often disputed, exist in parallel with others. Freud himself, as well as some other psychoanalists, considers the Oedipus complex the fundamental psychoanalitical invention, so that only upon the appearance of the Oedipus complex does a child starts its true personal relationships, as was stated by Devereux (1992). Others, for instance Fromm, think that the importance of the Oedipus complex is derived from a lack of knowledge about the social and ethnological studies which show that this particular emotional relationship appears only in patriarchal societies. In addition, some even deny its universal existence, particularly its importance as a factor in producing neurosis (see K. Horney 1965). There are far more inconsistencies in psychoanalysis, but it would be impossible to discuss them here. If the methodology of scientific research in the domain of psychoanalysis is not sufficiently elaborated; if it has less tendencies towards empirical verification; if it is not sufficiently coherent; then its nomotheticity is also based upon insecure. As a result, it is certainly no accident that psychoanalysis is not generally accepted, and for at least two reasons; certain psychologists and epistemologists reject psychoanalysis in its entirety, saying that it is non-scientific, others, and I agree on this, think that it is a science which has produced valuable results and contributions to the understanding of the human being, beautiful texts about the explanation of his behavior, which is comparable with the most successful essay writings, thanks first of all to Freud and some of his followers and their clinical experience. This work, however, is found relatively low on the scientific continuum, especially with respect to certain of the scientific criteria; nevertheless, psychoanalysis is still a science.

EDUCATIVE - REHABILITATION SCIENCE ON THE SCIENTIFIC CONTINUUM

In order to prescribe the position of educative-rehabilitation science (defectology) on the scientific continuum, I tried first to show the position of psychology and psychoanalysis on the same continuum. To determine the position of defectology on the scientific continuum we need to take into account the cited scientific criteria. As a science, defectology is a process; about that there are no doubts. As a comparatively young science (it is known the world wide under different names, and it was suggested above that it should be reconstituted as educative-rehabilitation science), it is far from dogmatism, i.e. from persisting in overpowered ideas, and deals to a great extent with new research and the verification of the achieved; according to these criteria (science as process, verification) defectology equals, for instance, psychology and is in a better position than psychoanalysis. In terms of these criteria, it is positioned very well on the scientific continuum. As for the methodological criteria, defectology has, just as psychology, similar defects and the same difficulties in gathering and elaborating data. It is, however, ahead of psychoanalysis in this respect. It should be mentioned that as far as its measuring instruments are concerned, psychology is in a much better position than defectology, for it has a longer tradition and more experts both in the world

and in this country. One of the main problems in methodology is the insufficient objectivity of data (on different variables) which are based upon the observations and evaluations of others or the subjects of the investigations alone. However, there are more and more situations in which the objective activities of the examinees are estimated-for example, activities of the weak-sighted in the programmed practicing of sight; successfulness in mastering independent motion in drilling the mobility of the blind; testing perceptive-motor functions in children with mental retardation; successfulness of the application of various forms of auditive training in persons with impaired hearing; evaluation of the successfulness of certain methods of speech disorders treatment, etc. There is also discussion of the fact that in transformational processes with persons with difficulties in social integration, computers will be used to plan, program, and control these processes, as it was pointed out long ago by Kovačević, Stančić, and Mejovšek in their book *Osnove teorije defektologije* (The Basics of Defectological Theory) (1988). As far as the treatment of data is concerned, educative-rehabilitation science (defectology) today has at its disposal a number of different methods, algorithms, and programs adjusted to various sorts of collected research data, which are in fact equal to the methods used in psychology and some other sciences (Momirović et al., 1987; Nikolić, 1991a, 1991b). This means, though, that defectology also shares common problems with, for instance, psychology. With respect to methodology the position of defectology has improved in recent years, although it is far from being satisfactory. This is at first determined by the complexity of the problem it deals with. If there are problems in methodology, it is certain that difficulties in terms of the verification of research results might appear, although they derive in great part from the insufficient coherence of defectology (educative-rehabilitation science).

With regard to the coherence criterion alone, the position of defectology is considerably unfavorable. Being incoherent causes problems for certain sciences: if incoherence reaches too high a level, it can cause a chaotic situation which might put the existence, feasibility, and justification of a that science into question. Defectology is not in a position that would threaten its fundaments, but it is obvious that from theoretical standpoints, attention should be paid to some epistemological questions of defectology which will promote it on the coherence continuum. The problem of coherence appears with regard to certain probelms of defectology (or: educative-rehabilitation science) as well as to its particular fields (impaired sight, hearing, mental retardation, etc.). Considering some general problems of defectology, certain questions are still unsolved: what is defectology, is it an autonomous scientific field, or does it belong to educational or medical sciences, etc. Defectologists alone consider defectology (educative-rehabilitation science) to be independent, but at the present time there are still many insufficiently informed persons, especially in education or medicine, who tend to classify defectology incorrectly, sometimes for completely banal reasons. For example, conforming with the fact that the aspiration for defectology to change its name to educative-rehabilitation science is getting stronger, some medical experts think that it should become a part of medicine, because *rehabilitation* has an entirely medical meaning. However, they are decades behind the contemporary understanding of the concept. Some problems of defectology(which are not yet solved on a general level, so that there are parallel ideas on the same subject) contribute to the incoherence of defectology. These include the question of the inter- or transdisciplinary characteristic of defectology, the definition of individuals with impairment, disorders, and difficulties with social integration, the problem of the structural explanation of impairment with respect the the whole personality, etc. They are not theoretical questions without importance for research work, but on the contrary, they are very

important for the organization of research projects and the interpretation of their results, a fact which could be proved easily if we had enough space for such procedures. The organization of research projects and particularly the interpretation of their results differ with regard to whether we consider a certain impairment attributive (which means that it belongs to the essence of a personality), additive (if it was added among many other properties), or structural (which means that it is a part of the integral personality structure; its meaning depends, however, upon its relations and interactions with other elements of the structure).

Disconnected and incoherent ideas within particular fields that deal with impairments or disorders have an explicitly negative influence upon research and the verification of its results. If, for instance, in a field which deals with mental retardation or delayed cognitive development, the definitions and determinations of the basic features of this condition are not in concordance (for example, it is permitted that the definition of mental retardation includes besides the intelectual status the level of social competence as well), this will influence the sampling in research work. If accord in definitions does not exist at the international or at the local level, then this might have serious consequences for the verification of certain types of research. Simultaneous existence of contradictory theories on the origin, characteristics, and rehabilitation of certain difficulties in social integration, without critical endeavors toward their verification and development into larger units, causes incoherence in particular fields of defectology. This incoherence threatens now and then to be turned into chaos or to produce a number of disconnected partial research endeavors which would not improve the position of defectology on the scientific continuum or affect all its problems. Recently, some broad research endeavors within the framework of several large scientific projects of the Faculty for Defectology were carried out with a significant number of partial treatments of the received data, but without interpretations which could bring to the coherent elaboration of a certain problem, and without any synthesis.

From the incoherence of defectology (educative-rehabilitation science) derives another complication for this scientific field, and that is the fact that it is rich in individual opinions which are not sufficiently supported by scientific research and scientific arguments. In spite of that, they are based upon a psychological secret assumption that one greater or smaller additive to the existing chaos will not significantly change the common state of affairs. Such chaos used to govern disputes on the educational and extensive social integration of individuals with developmental difficulties. These arguments were usually motivated by emotional and other personal, even political reasons (both here and abroad); today, when things on the conceptual level are more or less settled, a new phrase is being introduced: *progressive inclusion* (Reynolds, 1989). This is, however, an attempt (not the first, and presumably not even the last) to solve some problem on a linguistic level (remember the endless series of attempts to find less pejorative, and more acceptable, terms for various types of impairment, against which there were some serious objections, though we need not agree upon this) by M. Oliver, the professor of disability studies at Thames Polytechnic School in London, an invalid himself. Truly, one should avoid introducing new terms, when they are not a necessity, if they do not contain something substantially new. New terms only cause confusion and mistakes, or they support the illusion that we have grasped something new and more valuable than that what we have already known and had, which should be scientifically and practically and organizationally improved. Due to the problems in methodology, and especially on the behalf of the insufficient coherence of defectology, it follows that defectology cannot satisfy to a desirable extent even the nomotheticity criterion, although this is not an exception in comparison with the

situation in other sciences. It is not really important that there were people here (N. Šoljan, 1980) and abroad (e.g., G. W. Allport, 1961) who tried to deny the possibility and justification of nomotheticity in behavioral sciences (psychology, educational science, and indirectly defectology), for these opinions were prevailed over long time ago. However, educative-rehabilitation science or defectology can satisfy nomotheticity criteria not via formal laws expressed by mathematical formula, but rather by means of generalizations which are based upon statistics with a certain degree of acceptability. In spite of that, there are difficulties even with this aspect of formalization of nomotheticity, due to the fact that for many reasons, of mostly methodological character, but also because of insufficient coherence of defectology and the nature of its subject, the received research results of the same problem are often contradictory. For instance, while a great amount of research indicates that individuals with mental retardation differ from others not only quantitatively, i.e. with respect to the intelligence, but also accordingly to certain qualitative differences in its structure, there are some, indeed rare, research endeavors that do not support these ideas. It is necessary to verify such results incessantly, and to be circumspect when making any kind of generalizations; it is also necessary to subject the results of both sides to critical analysis. In the domain of the evaluation of different rehabilitation methods and programs, a large number of contradictory issues are to be found as well. For example, the sensory integration method, planned and promoted by A. J. Ayres, was originally conceived as a rehabilitation method for children with cerebral palsy, but it was extended later to include children with mental retardation and those with learning disabilities. Today it is mainly used as a rehabilitation method for children with learning disabilities, and in theoretical assumptions of this method the importance of vestibular, proprioceptive, and tactile stimulations for the development and behavior are especially emphasized, for, as pointed out by the author, in children with learning disabilities a sensory-integrative dysfunction exists (Ayres, 1979). In addition to this, according to Ayres, these children also have, in a high percent of cases, the post-rotatory hyporeactive nystagmus as an objective sign of vestibular dysfunctions. These are the fundamental assumptions on the basis of which Ayres's method of sensory integration is founded. But more recent research (see their review in Hoen and Baumeister, 1994) places in doubt not only the cited, but also some other, theoretical hypotheses of the sensory integration method as well as its success in rehabilitation treatment. The fact that the critical verification of a certain method and its theoretical assumptions does not always produce results which are in accordance with the expectations of an author, is not an isolated phenomenon related only with defectology, yet it exists in other sciences as well (defectology, maybe, deals with such questions more often then some other sciences, for instance, educology). But since it happens relatively frequently, it shows that defectology has difficulties in accomplishing desirable nomotheticity, which is, to be pointed out again, the result of insufficiently elaborated methodology, extreme complexity of its subject and unstable conditions under which its researches are carried out. One could itemize a series of examples about the problems with nomotheticity in different fields of educative-rehabilitation science or defectology, such as sight and hearing impairment, speech disabilities, etc., but I hope that which was already said will be enough. It is obvious that where knowledge of the rules of behavior and the rules of programmed or non-programmed influences on behavior achieves relatively modest results, the prediction is less certain, regardless of all regression analyses and of regression equation, although there are significant differences with respect to the particular fields of defectology, particular forms of behavior and rehabilitation procedures. Prediction depends upon the establishment of

generalization that is not always the same. Therefore, it will be safer to predict the behavior and success of some slightly mentally retarded child that attends regular school, in strictly defined conditions, or the success of a speech pathology treatment when working with an individual child, while it will be much more difficult and less successful to predict the success of gestalt therapy when working with a child who is both mentally retarded and has some behavioral disturbances. The anticipation in bihavioral sciences, including defectology, is especially complex, for there are many, often unexpected and sometimes entirely new, conditions in real life which should be taken into account, but which could not have been taken into account in advance.

As far as criterion of the general acceptability of educative-rehabilitation science or defectology as a science is concerned, there are no greater problems, because certain sporadic attempts of classifying defectology into some other scientific domains should be taken as administrative meddling in the problem rather than as scientifically founded objection. However, it is possible to deny the acceptability of the term defectology, which seems a little out of fashion: it might be better to name it educative-rehabilitation science with the assumption that we know what rehabilitation is, and that we do not place it on the same level with medical rehabilitation. Defectology (regardless of which name it appears under) is accepted here and abroad as a science with a special subject and goals of research, and-in its usage-an exceptionally important social activity considering the fact that approximately 10 percent of the population has problems which can be treated theoretically and practically in educative-rehabilitation science.

CONCLUSION

I have tried to determine the position of educative-rehabilitation science or defectology on the scientific continuum, relying on certain criteria. It is obvious that the number of criteria is not definite. Trying to examine defectology with respect to these criteria, we could have noticed that its position as a science is not the same with relation to all the criteria: sometimes it is higher, sometimes lower. All things considered, the position of defectology on the scientific continuum is not remarkably good; it can not be compared with mathematics, physics, astronomy (although, the latter has its weaknesses, especially considering the cosmogony), or chemistry, biology, etc. However, it is not less favorable than the position of many other sciences which are already marked by a traditional dedication to science, such as sociology, psychology, and other sciences. I will dare to say, though, that it is more favorable than the position of psychoanalysis, and especially pedagogy, which has, at least in this country, only recently become a real empirical science. I consider it important to analyze the position of educative-rehabilitation science or defectology on the scientific continuum for two reasons: (1) in order to point out its shortcomings, which should be eliminated by serious scientific critical efforts; and (2) in order to show that the position of defectology is not worse than, but rather the same as, the position of many, as said before, traditionally dedicated sciences, or even better. If I were Spinoza, I would say: Quod erat demonstrandum!

REFERENCES

1. Allport, G. W. (1961): Pattern and growth in personality, Holt, New York.
2. Ayres, A. J. (1979): Sensory integration and the child, Western Psychological Services, Los Angeles.
3. Chomsky, N. (1965): Aspects of the theory of syntax, Cambridge, Mass., MIT.
4. Chomsky, N. (1972): Language and mind, Harcourt Brace Jovanovich, New York.
5. Croce, B. (1960): Estetika - kao nauka o izrazu i opća lingvistika, Naprijed, Zagreb.
6. Devereux, G. (1992): Ogledi iz opće etnopsihijatrije, Naprijed, Zagreb.
7. Fromm, E. (1970): The crisis of psychoanalysis, Fawcet Publications, Inc., Greenwich, Conn.
8. Hoehn, Th. P., Baumeister, A. A. (1994): A critique of the application of sensory integration therapy to children with learning disabilities, Journal of Learning Disabilities, 27, 6, 338-350.
9. Horney, K. (1965): Novi putevi psihoanalize, Kosmos, Beograd.
10. Kovačević, V., Stančić, V., Mejovšek, M. (1988): Osnove teorije defektologije, Fakultet za defektologiju, Zagreb.
11. Kuhn, Th. S. (1962): The structure of scientific revolution, Chicago.
12. Momirović, K. et al. (1987): Metode, algoritmi i programi za analizu kvantitativnih i kvalitativnih promjena, Institut za kineziologiju, FFK, Zagreb.
13. Nikolić, B. (1991a): Modeli za analizu promjena nastalih uključivanjem kompjutera u transformatorske procese kod osoba s teškoćama socijalne integracije, Defektologija, 1, 28, 77- 87.
14. Nikolić, B. (1991b): Neki modeli za rješavanje problema planiranja i kontrole transformacijskih procesa u primjeni kompjutera kod osoba s teškoćama socijalne integracije, Defektologija, 1, 28, 131-139.
15. Oliver, M. (1992): Intellectual Masturbation: A rejoinder to soder and both, European Journal of Special Needs Education, 1, 7, 20 -27.
16. Popper, K. R. (1963): Conjectures and refutations, The Growth of Scientific Knowledge, London.
17. Reynolds, M. (1989): An historical perspective: The delivery of special education to mildly disabled and at-risk students, Remedial and Special Education, 10, 6, 7-10.
18. Slobin, D. I. (1974): Psycholinguistics, Scott, London, Foresman and Comp.
19. Stančić, V. (1989): Neke novije tendencije u defektološkoj teoriji i praksi, Socijalna politika, 44, 6-7, 7-27.
20. Šoljan, N. (1980): Preobrazba odgoja moguća je samo kao praksa njegova podruštvljavanja, Studentski list, Zagreb, br. 761.