THE EFFECT OF POSITIVIST AND POST-POSITIVIST PARADIGMS ON THE CHANGE OF VALIDITY CONCEPTUALIZATION

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ACADEMIC STUDIES
IN
EDUCATIONAL SCIENCES

Editor
Prof. Dr. Hulya GUR

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PREFACE

This book provides a detailed and up-to-date overview of works in education, science and mathematics education. This book is informative for especially educators, researchers, academics, postgraduate students, preservive teachers, teachers and school leaders own development. It gives suggestions to educators, researchers, academics, postgraduate students, preservive teachers, teachers, school leaders and policy makers and so on...

The book presents educational articles on various aspects, all of them centred on the area of Area of Education and Pandemia. The book consists of eleven chapters and 173+-page work. Thus, first paper – “Opinions of the High School Students Regarding the Flipped Classroom Practice...”. The next work is “The Content Analysis of Studies on Individual Differences in Education In Turkey From 2000 to 2020”. After that, the paper entitled “Effectiveness of Remote Training with Covid-19 Pandemic Source”, Another study “Investigation Of Awareness of Parents in the Pandemic Process and the Perspectives Related to Science and Education In This Process”, and other namely: “Multiple Intelligence Theory and Effective Learning in Visual Arts Education”, “The Relationship Between the Views of The Preservice Mathematics Teachers on Proof and Their Multiple Intelligence...”, “The Significance of Science Centers in Science Education...”, “The Effect of Positivist And Post-Positivist Paradigms on The Change of Validity Conceptualization”, “A Psychological Perspective on Organizational Loneliness...” and “Studies on Cognitive Load Theory in Turkey: A Literature Survey”.

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Prof. Dr. Hulya GUR
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CHAPTER VIII

THE EFFECT OF POSITIVIST AND POST-POSITIVIST PARADIGMS ON THE CHANGE OF VALIDITY CONCEPTUALIZATION

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In this section, we will try to look from different perspectives on validity by taking into account the studies and conceptual debates on validity from past to present in the light of positivist and post-positivistic paradigms. We will try to shape our predictions for the future on the universal knowledge that the history of science has presented to us. In other words, this section, in which we try to reach the roots rather than get lost in the branches of the tree, is the logbook of a journey on the philosophical foundations of measurement.

THE VALIDITY OF WHAT?

The term validity is an adjective. Therefore, it cannot be used alone. In this respect, we started this section with the question of "the validity of what?". In scientific literature, the validity of inferences, interpretations, or conclusions is mentioned. They are claims made by researchers based on their observations. Even if it is scientific, all claims can be questioned and discussed. The validity of inferences drawn from data; validity of interpretations based on test scores; validity of the conclusions drawn from the research results can be questioned (Taylor, 2013). Besides, expressions such as validity of predictions, validity of sources, validity of measures, or validity of measurement instruments (assessment tools) are encountered in the literature or daily life. We discussed validity as a concept related to these last two, namely, measurements and measurement instruments. In fact, although the concept of validity appears in many different ways, all of these are interrelated. In short, validity is one of the most important areas of discussion for scientific research in all scientific fields such as education, psychology, sociology, biology, etc.
The American Educational Research Association, American Psychological Association, and National Council on Measurement in Education share their views on validity as follows, “Validity refers to the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests. Validity is, therefore, the most fundamental consideration in developing tests and evaluating tests. The process of validation involves accumulating relevant evidence to provide a sound scientific basis for the proposed score interpretations. It is the interpretations of test scores for proposed uses that are evaluated, not the test itself. When test scores are interpreted in more than one way, each intended interpretation must be validated. Statements about validity should refer to particular interpretations for specified uses. It is incorrect to use the unqualified phrase ‘the validity of the test.’” (American Educational Research Association [AERA], American Psychological Association [APA], and National Council on Measurement in Education [NCME], 2014, p. 11).

Cronbach (2009), on the other hand, mentions very earliest discussions about test validity as follows, some early writers said that a test is valid if it measures what it purports to measure. Other early writers said that a test is valid if it serves the purpose for which it is used. From these definitions, it appears that there is a big difference between the old and the new conceptualization of validity.

According to Angoff (2009), this active interest in a new conception of validity pointed to a more widespread philosophical shift, from the purely pragmatic and empirical orientation that characterized psychometry in the first half of the 1900s to a new and growing interest in psychometrics and psychological theory.

The question is, are these discussions over? The answer is, no. Our students, who read the latest opinions of organizations in the USA, are confused. They ask, can't we talk about the validity of the tests? In our opinion, expressions like a valid test or a test has construct validity are absolutely false. Because no test or measurement can be completely valid and the validation process is not an ending process. But there is no harm in using an expression like this: “An achievement test with evidence that it makes valid measurements for math ability.” or “The test with strong validity arguments.” We think that validity can be considered not only related to test-based interpretations but also in relation to the tests themselves.

A BRIEF OVERVIEW OF THE HISTORY OF SCIENCE

According to Stacey (1969), the aim of each scientific discipline is to identify and explain the subjects within its field. Science determines phenomena only through observation and experiment. Disclosure of the
detected facts is a logical process. Science uses ways of describing and explaining facts in order to reach its goal. The most basic characteristic of science is that it is experimental, and another important feature is not only how information can be reached with the methods it has established, but also allows other scientists to repeat them. The issue that has been debated by researchers for many years is whether scientific knowledge should be obtained by quantitative or qualitative methods. It is possible to come across opinions that qualitative research methods have no place in science on the ground that they destroy objectivity. Some intellectual theories reject qualitative studies altogether. For example, the quantitative research method represents the research method of the positivist paradigm; Quantitative studies are carried out on the positivist foundations (Bryman, 1984).

Social sciences have also changed form with the influence of many movements since its emergence. In particular, different philosophical views have caused various fluctuations and trends in scientific fields. These changes affected psychology, sociology and educational sciences, sometimes directly and sometimes indirectly. Therefore, it would be appropriate to examine the differences of opinion in the field of psychometrics within the historical development process of social sciences and in the context of the effects of the trends emerging during this process. Moreover, it is need to examine which currents the psychometrics discipline are influenced by, examining not only the differences of opinion, but also the issues that have been agreed upon.

The source of information is an important problem in philosophy. Some philosophers (realists, empiricist, etc.) argue that the source of knowledge is an experiment. The human mind is innately empty (tabula rasa). In this case, all information is aposteriori. On the other hand, some philosophers (rationalists, Plato, Hegel, etc.) defend that the source of knowledge is the mind and they admit that the human mind is not empty from birth. According to these philosophers, all the correct information exists in the human mind and one can reach them using his mind. Therefore, knowledge is a priori because correct information is always and everywhere the same. Information obtained through experiments based on observation data, since the observed facts are constantly changing, such information is not correct and universal. Furthermore, some philosophers claim that the source of true knowledge is both intelligence and experiment. Kant is the most important of these thinkers. According to him, concepts without intuitions are empty, intuitions without concepts are blind. Apart from all these, some thinkers say that the source of true information is intuition such as Gazali and Berkson (Sönmez, 2010).
The strengthening of the science of sociology has had such a great impact that causes radical changes in all other scientific branches. Because according to the positivist point of view of Auguste Comte and his friends, the founder of sociology, science is the basis of all kinds of knowledge, statistical analysis should be used in social theory and causal explanations should be sought for social phenomena. According to positivists, knowledge is acquired only through experience and empirical progress (Swingewood, 1984).

Another aim of positivism is the understanding of absolute knowledge. If the facts are accepted as a result of experiments, this acceptance must be universal and of infinite duration. In other words, a physics experiment should give the same result in England and Africa. An experiment should give the same result in 1830 and 1984. If this happens, the facts become facts. Positivists are also aware of the difficulties of reaching such precise information. For this, numerous research should be done and the best result should be reached. The positivist view, which finds strong support in the scientific world, has led to intellectual and methodical changes in many scientific disciplines.

Positivism approach is not the only theory that guides social sciences. Post-positivist theories have been put forward as a critique of positivism after the positivist approach has been introduced. According to Thomas Kuhn (cited in Sönmez, 2010), one of the leading names of those who criticize positivism, there are no universal and generally valid criteria to control scientific findings. Scientific criteria are determined by scientists in every period by consensus because it is not an objective activity. There is no such thing as verification, falsification, or refutation in science. Science's goal is to understand. Understanding in science is the interpretation of situations and events. There are many interpretations of situations and events because the main factor driving science is the psychological and sociological characteristics of scientists. Perception is essential in scientific research. There can be no objective perception because the scientist examines the facts with the information he has obtained up to that time. In this context, as positivists say, there is no complete objectivity. Moreover, there is no single method in science, and the method is not everything. Therefore, it is not necessary to carry out experiments in the laboratory under strict control, said Thomas Kuhn. These philosophical debates on science also affect psychology. A technique used to measure any psychological structure can be defined as a suitable technique when evaluated in terms of some approaches that have emerged in the history of psychology until today. However, when evaluated in terms of some approaches, it can be defined as an inappropriate technique for measuring the relevant structure.
The history of psychology begins with structuralism and continues with functionalism. The basic principles of behaviorism, which was born in 1913 as a radical change movement against both schools, are simple, direct, and specific. Watson, the founder of behaviorism, called this understanding objective psychology. It deals only with observable behavioral activities that can be objectively described in terms of action and response, through objective observations. Watson strongly rejected the concept of consciousness on the grounds that it harmed objectivity. According to Watson, consciousness can never be seen, touched, smelled, tasted, or moved. This is an unprovable assumption, at least as much as the concept of the soul. Then the revolt of cognitive psychology with Gestalt psychologists against behaviorism begins. There are clear differences between Gestalt psychologists and behaviorists. Gestalt psychologists have argued that it is pointless to create psychology deprived of consciousness, as behaviorists do. It starts to talk about the concepts of consciousness and subconscious. Since psychoanalytic theorists deal with intangible structures such as the unconscious, they have taken a rather different approach from the objective psychology of behaviorism. Along with recent trends such as humanistic psychology, cognitive neuroscience, evolutionary psychology, the science of psychology has a great variety in theory. As a result, psychology today is more fragmented than at any other stage in its history. Each movement embraces its own theoretical and methodological orientation by developing and advancing itself with its own language and school of thought while approaching human nature with different techniques. (Schultz & Schultz, 2015).

During research, a social scientist has to measure as a necessity of doing scientific research, no matter what theory is under the influence. Psychometry comes into play as a scientific discipline at this stage. Whether a psychologist is a gestalt, behaviorist, or neurocognitive does not affect his measurement purpose. Regardless of the technique used, the researcher has to measure with high validity and reliability in all conditions. It is clear that the decision reached as a result of evaluations based on valid and reliable information will be an appropriate decision (Cronbach, 1988, 1990). Although almost all scientists agree on this issue, discussions about how to make valid and reliable measurements have gained a philosophical dimension today. The effect of differentiating paradigms on the proposed definitions and methods plays an important role in the evolution of the concept of validity as it is felt in the whole measurement and evaluation discipline.
THE CHANGE OF VALIDITY DEFINITION UNDER THE INFLUENCE OF DIFFERENT PARADIGMS

For scientists, during the years when the positivist approach was effective on social sciences, special observations, rules, and empirical generalizations, theoretical expressions and definitions, mathematical and statistical analyzes on data collected systematically and objectively, predictability studies based on these analyzes, as a basic research understanding stood out.

It can be argued that experimentation has an important place in measurement studies under the influence of the positivist approach. Theorists made the following definition for validity in the 1930s: Validity is the correlation between test results and the results of another test determined as its criterion (Newton, 2012). Guilford defined validity similarly, in a very general sense, a test is valid for anything with which it correlates (Guilford, 1946). When the mentioned definitions are examined carefully, the traces of the experimentalism that come to the fore in the definition made will be noticed. Lissitz and Samuelsen (2007) argue that in the late 1940s and early 1950s, authors began to look for evidence as to what they might identify as inadequate in the definition of validity, moving from empirical approaches to approaches that are more theoretical in nature. After this period, researchers influenced by post-positivist approaches have embarked on a great struggle against rigid experimental approaches in the field of psychometrics. Researchers adopting post-positivist approaches in this struggle have claimed the differentiating paradigm as the correct way to access information and accused experimentalists of being backward. The positivists, who described these attempts as an attack on their scientific discipline, accused the post-positivists of making systematic disinformation propaganda to get away from science.

When the current state of this ongoing conflict in the scientific world is examined, it is seen that the domain of post-positivist approach has spread over to important institutions and organizations. This effect caused the definition of validity to take its current form. The definition of validity made by measurement and evaluation societies in the USA can be considered in this context. Based on their definition, it is stated that the phrase “validity of tests” cannot be used, but the phrase “validity of inferences made from test scores” can be used. In this sense, it would not be wrong to say that the definition of validity is shaped by a post-positivist perspective. Because of this approach, "validity" has been transformed into a concept that changes according to different usage situations or purposes of the test. It has been removed from the functional definition.
COULD THE MEASUREMENT INSTRUMENTS HAVE FIXED PROPERTIES?

The idea that qualities such as validity and reliability, which was previously described as the quality of the measurement instrument, will change in line with the scores obtained in different ways from different groups is now a dominant opinion. However, there are also researchers such as Lissitz and Samuelsen (2007) who oppose this view. Content validity is the focus of these discussions.

Suppose that we developed a test aimed at measuring mathematics achievement of Grade 6 students in Turkey. We know that the achievements expected to be reached by grade 6 students across the country are certain in the curriculum. Therefore, when developing such a test, the behavior pattern to be sampled is also determined. When the content of the test is established in line with the table of specifications and expert opinions, this is no longer a feature that will change in different regions of the country. Therefore, can the statement "content validity of the test" be considered as a false statement? If we cannot use such an expression, by what feature can we distinguish a test that has been meticulously studied in terms of content in the development process and a test developed cursorily in terms of its content.

APA experts avoid characterizing even a validation related to the content of the test as the test's feature. So, what are we going to say about standard tests whose psychometric properties are determined by applying to large standardization samples covering all subgroups concerning the feature it aims to measure? Could the values obtained from a sample that truly represents the target group is characterized as a feature of the test rather than a feature of the particular group? If not, what will the test manual be used as a reference for all practitioners? Are we going to create different handbooks for each practitioner?

Considering all these discussions, we see that the effect of post-positivist approaches on the concept of validity makes the objectivity of all measurement instruments debatable, including standardized tests.

We do not agree with the view that it is not possible to obtain validation arguments of the test itself since the test will be used for different purposes. The test developers determine the purposes of the tests and obtain validation arguments according to this line. If another researcher wants to use the test for another purpose, he/she has to obtain new validation arguments as to whether the test will be used for that purpose. The validation process is not an ending process. However, validation arguments are not independent of the test. Because there are no unlimited usage purposes for a test. In brief, a test can have many validation arguments. If these arguments are strong, the following
statement is correct in our opinion: “The test with strong validity arguments.”

CONCLUSION

It is a fact that the efforts of Auguste Comte and his friends to make social sciences as objective and absolute scientific disciplines as natural sciences contributed greatly to the formation of new scientific disciplines such as sociology and psychology. Later, opinions claiming that positivism is out of date have become widespread.

The conflict that started between these two opinions is not yet over. The positive side of this conflict is that the philosophical roots of social sciences are discussed. This issue wasn't discussed sufficiently in the emergence process of social sciences. Roots are important and will shape the future of social sciences. The negative side of the conflict is that the paradigm against positivism has become overly dominant, and therefore we tend to move away from the principles of objectivity and generalizability of science. We think that the exacerbation of these philosophical debates will lead us to a better point. We have come a long way in producing more objective, stable and generalizable results in the field of psychometrics. We're moving forward on statistical-based and more robust approaches such as item response theory. In the future, it can be predicted that mathematical models with more solid logical foundations and more easily applicable in practice will dominate the measurement processes. Also, in the near future, these models will enable us to obtain strong validity and reliability evidence for tests.

Kuhn (1991) suggests that paradigm is the key term in the development of science and according to him, the term paradigm is intertwined with science. Scientists with a common paradigm use this paradigm to refine theories, to achieve more accurate and precise measurements over time, and finally to strive to expand the boundaries of normal science. Since social sciences are newer than other sciences, it cannot be said that any paradigm is unquestionably accepted in many subfields.

The important thing here is not to fall into the delusion that any one approach is totally superior to other approaches. All approaches have strengths and weaknesses relative to each other. In addition, scientists with different perspectives contribute to the development of the scientific fields in different ways. When the common history of all sciences is examined, it can be thought that as a result of this turbulent process, a widely accepted paradigm will be reached in the field of psychometrics as in other scientific disciplines. However, the immutability of the last paradigm will always remain a matter of debate.
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