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## Scientific Research Paradigms in Social Sciences\*

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### Abstract

In this study, scientific research paradigms that lead social sciences research were inquired. Definitions, sorts and classifications (positivist, constructivist, critical) of paradigms were discussed. As the theories and epistemologies in the historical background of all three paradigms were given shortly, ontological, epistemological and methodological characteristics were discussed based on Guba's work. Actually, this study is based on Guba's perspective which is parallel to Khun in the sense of incommensurability and revolutionary side of paradigms and which claimed social sciences in a revolutionary situation that led paradigm wars.

**Keywords:** *paradigm, research, positivism, constructivism, critical paradigm*

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## **Paradigm**

The use of paradigm as shared set of beliefs and practices that lead and guide a field in doing scientific studies (Morgan, 2007) was begun by Khun (1970/2006) for physics. While Khun (1970/2006), with the concept of paradigm claimed that the scientific development was revolutionary rather than linear form; according to Grant, (2006) Khun showed that scientific agenda was determined not only by the theoretical problems, experimental results or faculty squabbles but also by the funding pressures and peer groups. This paradigm concept of Khun was used in social sciences to define the increasing interest to qualitative research: In 1970's, while the increasing interest to qualitative research was seen as addition of some new techniques to existing ones some of the researchers like Egon Guba and Yvonna Lincoln described it as a revolutionary state as paradigm revolutions in physics (Donmoyer, 2008). In sociology, researchers generally classified theories or research strategies as paradigms: Ritzer, made a classification of social compounds, social facts and social behavior as three paradigms; for macrosociology, Bottomore (1975) identified four paradigms (structural-functionalist, evolutionist, phenomenologist, and structuralist). (Cohen, 2000).

According to Lincoln and Guba, in social sciences, qualitative methods being used by researchers can not be interpreted just as a methodological diversity; at least some of these researchers have completely different beliefs about knowledge (ontological and epistemological): knowledge is constructed not discovered (Donmoyer, 2008). The best known approach to create alternative to positivism is the model of Egon Guba and Yvonna Lincoln which differentiate the paradigms based on their components (ontology, epistemology, methodology) come from philosophy of knowledge (Morgan, 2007).

Lincoln and Guba added the critical paradigm (Guba, 1990) as the third paradigm to the list of the perspectives that they considered to be efficient in the fields of social sciences in the course of time (Guba, 1994).

Guba (1990) expresses that these paradigms, which may also be mentioned as “scientific research paradigms”, can be qualified according to the answers to the ontological, epistemological and methodological questions their followers provide. “Ontology”: It is the theory of what exists (Kalof and et al. 2008); they are the basic opinions about the nature of what is known or reality (Guba, 1990); it is the presentation of worldview or reality peculiar to a certain theory or paradigm (Jennings, 2005). “Epistemology”: It examines the problematic of what is the relationship between the one who knows and what is known, and what can be deemed as knowledge (Guba, 1990); the science of knowledge; the relationship between researcher and what is known; this relationship assumes an objective or subjective posture (Billings and Jennings, 2000); it is about what can be known (Kalof and et al. 2008) “Methodology”: It is about how researcher carries out study on revealing information (Guba, 1990); it draws a comprehensive frame in order to determine the method to know reality and to achieve the knowledge on reality, research question, process steps to be applied and the methods to be used.

Paradigms are restrictive in respect of their philosophy and general perspectives; they tell what is important, legal or reasonable to their followers or appliers: This is a normative quality indicating for the appliers on what they should do without considering epistemological thinking or what they have needed for a long time (Patton, 2002). Since the paradigms are not of a common theoretical language, they cannot be compared (Khun, 1970/2006); as a result of this, the question of ‘which paradigm is the best?’ does not have an answer.

**Paradigm Classifications**

The three paradigms (positivist-constructivist-critical) which differs in ontological, epistemological, and methodological aspects, in the classification of this study is also commonly included in the paradigm classification of the most researchers (Table 1).

**Table 1. Three Basic Paradigms within the context of their Basic Components**

	<b>Positivist Paradigm</b>	<b>Constructivist Paradigm</b>	<b>Critical Paradigm</b>
<b>Ontology</b>	Naive realism	Relativism: local and specific constructed and co-constructed realities	Historical realism: virtual reality shaped by social, political, cultural, economic, ethnic, and gender values; crystallized over time
<b>Epistemology</b>	Dualist/objectivist; findings true	Transactional/subjectivist; created findings	Transactional/subjectivist; value-mediated findings
<b>Methodology</b>	Experimental/manipulative; verification of hypotheses; chiefly quantitative methods	Hermeneutical/dialectical	Dialogic/dialectical

(Adapted from Guba and Lincoln, 2005)

In Guba’s (1990) classification, postpositivist paradigm has been discussed as a separate paradigm and a quartet classification (positivist, postpositivist, constructivist, and critical) has been made by differentiating in the aspects of ontology, epistemology, methodology. The classifications of the two paradigms (positivist-postpositivist)

whose basic assumptions are not different in respect of the aims are emphasized the change in positivism instead of the existence of two completely different paradigms. discussed separately

Burrell and Morgan (1979) have made a quartet classification (radical humanist – radical structuralist, interpretative – functionalist) according to the change-regulation and subjectivity-objectivity dualities in order to analyze the social theory. They have matched the aspects of the nature of science (subjective-objective) and the nature of society (change - regulation) on a matrix (Table 2). In this way, every cell corresponds to a certain paradigm.

**Table 2. Paradigms in accordance with the Nature of Science and Society**

	<b>Radical change</b> (Sociology of radical change)	<b>Regulation</b> (Sociology of Regulation )
<b>Subjective</b>	Radical Humanist	Interpretative
<b>Objective</b>	Radical Structuralist	Functionalist

(It is quoted from Sociological Paradigms and Organization Analysis by Burrell and Morgan, 1979)

Lather (2006) has made a quartet classification (Positivist, Interpretative, Critical, and Postmodern) by emphasizing the aims such as prediction, understanding, emancipation, deconstruction and added postmodern paradigm/ paradigms to the basic three classifications in this context (Table 3). She points out that a transition has been made to postmodernist, poststructuralist, posthumanist theory/discourse after a break has occurred from the modernist, constructivist, humanist theory/discourse. According to this classification positivist, constructivist and critical paradigms are modernist paradigms.

**Table 3. Lather’s Quartet Classification**

Modernist			B	Postmodernist	
Predict	Understand	Emancipate		Deconstruct	Next?
Positivist	Interpretative	Critical	B E A K	Poststructural	Neo-positivism
Mixed methods	Natural	Neo-Marxist		Postmodern	Postteori
	Constructivist	Feminist		Post-humanist	Post-theory
	Phenomenological	Praxis-oriented		Post-critical	Neo-pragmatism
	etc.	etc.		etc.	Post-post etc.

(Adapted from Paradigm Classification by Patti Lather, 2006)

Neuman (2009), on one hand, indicates that positivist, interpretive and critical social sciences are three important approaches, on the other hand that feminist and postmodern researches are less-known, achieved visibility after 1980’s, and they are alternatives which criticize positivism based on interpretative and critical social sciences.

Guba and Lincoln (2005) have added a fifth category called as participatory to Guba’s quartet structure. Here participatory paradigm stresses on that it is an outstanding deficiency for the positivist scientists to have been broken off from the world and it purports that researcher should also participate in research and so results should be established together.

Analyzing the development of educational science in Germany, Wulf (2010) indicates that these three different paradigms (humanist pedagogy, empirical educational science, and critical theory) play an important role on the development of educational science.

Mackenzie and Knipe (2006) have made a different quartet classification including positivist/postpositivist, interpretative/constructivist, transformative and pragmatic. Pragmatic paradigm ensures utilization of the paradigm providing the best answer to the research question by means of its situational feature.

Johnson and Christensen (2004), who remark that there are three great research paradigms in education, have adopted a qualitative, quantitative, mixed classification which is rather described as research design or approach and brings data forms (qualitative/quantitative data) into mind.

Garrison and Shale (1994) designate positivist social science, interpretative social science and critical social science as the leading role while they state that the feminist, postmodern and action research are the sub-characters. Neuman (2009) also expresses that feminism and postmodernism are weak and cannot be included in the paradigms yet. Guba and Lincoln (2005) state that these are just perspectives rather than paradigms.

Table 4 demonstrates the relationship between the three paradigms structures adopted in this study and the paradigm classifications the researchers have made.

**Table 4. Paradigm Classifications by Several Writers Including Each of The Three Paradigms (positivist, constructivist, critical)**

Paradigms Researchers	Positivist- Postpositivist	Constructivist	Critical	Postmodern	Other
<b>Guba</b>	Positivist- postpositivist	Constructivist	Critical		
<b>Burrell and Morgan (1979)</b>	Functionalist	Interpretative	Radical structuralist (Mature Marx)  Radical humanist (Young Marx)		
<b>Lather (2006)</b>	Positivist	Interpretive	Critical	Postmodern paradigms (the first three are modernist paradigms)	
<b>Neuman (2009)</b>	Positivist social science	Interpretive social science	Critical social science	Postmodern (new)	Feminist (new)
<b>Guba and Lincoln (2005)</b>	Positivist- Postpositivist	Constructivist	Critical		Participatory
<b>Wulf (2010)</b>	Empirical educational science	Humanist pedagogics	Critical educational science		
<b>Mackenzie and Knipe (2006)</b>	Positivist- Postpositivist	Interpretive / constructivist	Transformative		Pragmatic
<b>Johnson, B. and Christensen, L. (2004)</b>	Quantitative	Qualitative			Mixed (against the principle of incommensurability)
<b>Garrison and Shale (1994)</b>	Positivist social science	Interpretive social science	Critical social science	Postmodern (perspective)	Feminist action research (perspective)

### **Historical Background of Positivist -Postpositivist Paradigm**

Positivist paradigm dates back to Augusto Comte (1778–1857) [even to Aristotle (Mackenzie and Knipe, 2006)] who is also accepted as the founder of sociology (Scott, 2006; Güçlü and et all, 2002; Lather, 2006; Mackenzie and Knipe, 2006). Social physics or positivist physics is completely the application of the scientific method of natural sciences to social science (Nollmann and Straser, 2007).

Sociological idea is increased to a more positivist epistemological stage by Durkheim, the founder of empirical sociology based on the scientific rationalism understanding developed by himself (Pierce, 2005; Esgin, 2005). According to Durkheim, the same effect always comes from the same cause in parallel with the monist perspective (Nielsen, 1999). Logical empiricism accepts that only the knowledge which can be verifiable empirically is meaningful; science is a cumulative process based on induction; the method of physics is the method of all sciences including social sciences; and the discovery of natural and general laws is main aim of any science (Cipolla and Giarelli, 2000).

Critical realist Popper (1935/2005) changed the verification concept by means of falsification and suggested hypothetic – deductive method: If one hypothesis fails in a test than it may be defined as not true.

### **Positivist Paradigm**

Positivist methodologies result from the reality that social sciences have the same aim with the natural sciences, therefore, from the naturalist interpretation of social sciences (Schwandt, 1990). According to positivism, science must find out the “true” nature of reality regulated by constant natural laws and how it works “in a right way”; finally it must target to make prediction and control on natural phenomenon as well (Guba, 1990).

Realist ontology indicates that reality regulated by constant natural laws and mechanisms is accessible; the information about these assets, laws and mechanisms can be summarized as the generalizations independent from time and context (Guba, 1990). The monist reality may be searched by an objective epistemology, so this can be ensured if the researcher does not have interaction with what is searched. In this way it is possible for the results not to be affected by the value.

According to positivists, since there is just one reality, this reality can be expressed by the variables and measured reliably and validly (Onwuegbuzie, 2000). For this reason positivists believe that scientific research is independent from the value. Positivist methodology is an empirical/manipulative methodology in which the questions and/or hypotheses are expressed in the form of propositions beforehand and are subject to empirical tests (falsification) under the conditions controlled very carefully (Guba, 1990).

In positivist paradigm, the aim is to predict (Lather, 2006). After natural laws are come into light in the form of cause-effect, these laws are used as a tool for prediction.

A significant feature of positivist methodology is its insistence about the separation between normative and empirical theory which means a claim of value freedom (Schwandt, 1990). Positivist methodology seeks “what is”; it is not a methodology on “what is ought to be”. For this reason positivist methodology deals with social facts; social and political targets, aims, ethics and values that are the contents of normative theory are not within the area of concern (Schwandt, 1990). So positivist aim of social sciences is to achieve/verify the theory of value freedom.

Postpositivism, which is a transformed form of positivism as a result of the impact of the criticals, carries on its general aim to predict and control; but its ontological aspect is of a critical realist understanding rather than pure realist understanding (Guba, 1990). Despite the existence of a real world, according to postpositivism, human being’s imperfect perception and understanding skill cannot perceive this reality entirely. For this reason (due to the insufficiencies of human being) researcher should have a critical standing against the results he/she obtains (Guba, 1990).

### **Historical Background of Constructivist Paradigm**

Although constructivist paradigm has been based on the book titled “Social Construction of Reality” by Berger and Thomas Luckmann (Lather, 2006), it is possible to see several theories or epistemologies such as interpretation, phenomenology, ethnography, hermeneutic in its historical background all of which are almost outside or against the positivism (Schwandt, 1990; Niglas, 2001; Grant and Giddings, 2002; Mackenzie and Knipe, 2006; Costantino, 2008; Özlem, 2010)

Dilthey is the first to provide interpretation as an alternative to the methods of physical sciences at the service of humanities (Göka, Topçuoğlu, Aktay, 1999). Spiritual sciences were completely different from the physical sciences. Therefore they could not share the same method (Göka, Topçuoğlu, Aktay, 1999). All the interpretations, evaluations and principles about life are relative to the subjects living in a certain place and time (Güçlü and et all, 2002; Özlem, 2010).

According to Windelband and Rickert, the true separation between physical and spiritual sciences should be based on aims and interests (making generalization and individualization) instead of subjects and methods (there are sharp differences between the two sciences) (Özlem, 2010). In other words, idiographic is for understanding the specific and defining the individual event while nomothetic is for investigation of lawmaking, regularities and general laws (Anchor, 2006). Physical sciences are interested in real events which do not have any relationship with the values and mean anything alone. But social sciences entirely deal with the meaning and therefore it should always be very close to the system of values (Esgin, 2005).

The sociology, which includes not only empirical and interpretative but also positivist areas (Whimster, 2005), of Weber, the founder of German Sociology, combines the two antithesis (understanding/explanation and idiographic/nomothetic). Weber has a sociology idea as follows: Both making generalizations, nomothetic and interpretative, idiographic: argument on complementing interpretative understanding together with casual explanation (Cipolla and Giarelli, 2000).



Edmund Husserl's theory called phenomenology, which is aimed at explaining the basic process of giving the meaning to the world of life, is an attempt (Brewer, 2003; Drummond, 2006) to make philosophy scientific in an aspect as a research method (Srubar, 2005). Knowledge about object is obtained just by subject; objective is only tested by subject. This is only possible with phenomenology as well (Hançerlioğlu, 1993).

Society has really an objective factuality and is constructed by means of action indicating the subjective meaning indeed (Berger and Luckmann, 1966/2008). We create cultural products by the help of social interaction and when the creation is completed, these products have externality according to us. Due to this externality, people lose the recognition that they are actually the creator of the products created and while these products exist independently from the individual, individuals feel an objective reality towards them. Then individual realizes the properties that are independent from him and have objective reality (in fact its own products) (Berger and Luckmann, 1966/2008).

### **Constructivist Paradigm**

Constructivist paradigm is called as "interpretivist paradigm" in some paradigm classifications. There is not a different definition made in respect of ontology, epistemology and methodology; it is indicated that the two approaches (Schwandt, 1994) share the aim of understanding the life experience of the complex world from the perspective of the individuals who have that experience. When we focus on positivist paradigm by means of constructivist paradigm, the argument, which preferring the methods of physical sciences in order to explain social reality or human behavior is too wrong, may be the first main argument.

Research is influenced by the values of researcher. Constructivists stress that all of the multiple interpretations related to the different researchers are valid since there is multiple reality. For constructivists, the reality is the product of human mind which is developed socially, as their developers change, the reality also changes; there is a dependence between the one who knows and the one what is known. For this reason, researcher should come very close to what is examined as much as possible (Onwuegbuzie, 2000).

In constructivist paradigm, the aim is to understand the phenomenon (Lather, 2006). The reality constructed by the individuals in their mind is described in the way they are understood.

If a number of interpretations can always be made in any research ontologically and there is not any structured process with a view to determining which construction is on true or not, there is not any other alternative rather than having a relativist position; the reality is multiple and exists in human mind (Guba, 1990). Patton (2002) expresses that human being has the capacity to interpret and construct reality; the perception world of human being is not true like the way how we see/know sun but it is developed and shaped with cultural and linguistic structures.

If realities exist only in the mind of the participant, it seems that the only way to reach them is subjective interaction (Guba, 1990). Researchers and participants join in reconstruction process in the study together and therefore to be far away and objective for researchers is neither desired nor possible (Hatch, 2002).

The thing to be transformed is mind, not the real world (Guba, 1990). Researchers seek to reconstruct the constructs which the participants use to give meaning to their world; make interviews with the participants in long periods and observe them in their natural environments (Hatch, 2002). Constructivists endeavor to investigate, describe and interpret the intersubjective meanings area constituted in cultures, languages, symbols, etc. (Schwandt, 1990). Since it has been described that it is possible to make individual construct by the help of hermeneutic and dialectic methods, “constructivism does not intend to predict and control or transform the real world; however, it aims at reconstructing that world only in the place where it exist, in other words, in the minds of the ones who create it” (Guba, 1990).

### **Historical Background of Critical Paradigm**

Critical paradigm is based on Frankfurt School called as “critical theory” [Lather, (2006) indicates that it is also based on the social movement in 1960 and 70s] (Lather, 2006). Kellner (2005) emphasizes that the term of critical theory has a number of meanings in different cultural contexts, is used several fields of humanities including history, literature and cultural studies broadly, defines the studies of Frankfurt School; he also points out that newly developed discourses, which may be associated with the movements such as constructivism, post-constructivism and postmodernism rising in France, may be included in critical theory and finally there are specific critical theories developed after 1970’s by the women, homosexuals and groups subject to discrimination against color and race.

The School was influenced by the historical developments around in its early years. The main environmental developments on the foundation of the School may be listed as follows: the defeat of left wing and rising of fascism in Europe, Nazism, communism transformed to Stalinism in Russia, and new economical (mass consumption) and political trends emerged in the capitalist system (Bohman, 2001). Several studies of the School’s philosophers differentiate\*\* periodically and individually rather than a single critical theory.

The members of the institute<sup>††</sup> which was dissolved during the years of II. World War carried on their studies in USA (How, 2003). According to Adorno and Horkheimer, science and technology have developed terrible weapons leading to destruction and death; culture has become the commodity of industry culture (mass production industry); and a ‘democracy’ which the people elect despot and demagogue rulers, individuals give themselves over to be the instruments of war and the labor (Kellner, 2005). Adorno and Horkheimer have preferred the term of culture industry in

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\*\* Bottomore (1997) groups this difference into periods (four period): 1. Marxist period; 2. The period of the differentiating ideas about critical theory; 3. The period of the main ideas of the critical theory; 4. The period of critical theory separated from Marxism.

†† While Leo Lowenthal, Marcuse, Neumann were working for the government of USA due to its opposition to fascism, Adorno and Horkheimer studied on their common work titled “Dialectics of Enlightenment” in California (How, 2003).

addition to folk culture or mass culture and discussed a cultural transformation<sup>‡‡</sup> in their first publication on this subject titled “The Culture Industry: Enlightenment as Mass Deception” (How, 2003).

Marcuse has made critics about contemporary capitalism and Soviet Communism within the context of rising the new forms of social pressure in its most well-known book titled *One-Dimensional Man* (1964) (Wikipedia-One Dimensional Man, 2007). Marcuse has made a conclusion that the dominant understanding of science in social sciences makes people objects, therefore such a scientific approach should be given up. Habermas (2004) comments on this result as follows: “As a result, Marcuse imagines not only the formation of another theory, but also fundamentally a different science methodology”. Marcuse’s arguments - not all of them- are acceptable for Habermas as well. The current understanding of science aims at exploiting and controlling nature. The adoption of this understanding to social sciences makes human being controllable this time. However that it is not the unique form the science can take and a new understanding of science is necessary for freedom is not shared by Habermas.

On one hand Habermas accepts the negative effects of positivist understanding of science, on the other hand he indicates that a new understanding of science is not necessary for human being to be emancipated, purposive rational action is inevitable within nature, however it is essential that this understanding of science be kept in the limits of its field (in an constant form); practical and emancipated interest as well as technical interest should be included in humanities, politics or the other fields of society.

### **Critical Paradigma**

According to Guba (1990), all the perspectives under critical paradigm reject the claim of value free made by positivists (even postpositivists generally continue this). Critical science is based on the critics of dominant ideology today (Schwandt, 1990).

Since paradigms are the constructs made by human being, they naturally reflect the values of their developers and these developers begin research by some option points<sup>§§</sup> (Guba, 1990). According to critical paradigm, since the two paradigms do not consider the political and ideological contexts, its explanation is insufficient on social behavior (Cohen, Manion and Morrison, 2007).

For critical theorists, the world is made of the structures which have a real effect on the lives of the individuals and have placed in the course of history (Hatch, 2002). These structures are perceived in as real and social action originated from the reality perceived causes that individuals develop different behavior based on their social classes, genders, races etc. (Hatch, 2002). In critical paradigm, the aim is to emancipate human being (Lather, 2006).

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<sup>‡‡</sup> “Passing from telephone to the radio separated the roles. The first one was giving the right of subject for the subscriber and was liberal. The second one was democratic: It made all the participants audience and forced to broadcast completely the same programs” (Adorno ve Horkheimer 1972: 121–2; How, 2003)

<sup>§§</sup> The problem to be selected for the study, the paradigm to be used, the tools and analytic methods to be applied, the recommendations to be made, comments, results, etc.

The duty of research is to make people (who are under pressure, in stuck) rise to the true conscious level; if they recognize just for once how they have been under pressure, they can act so as to transform the world (Guba, 1990). Guba (1990) stresses on an interesting similarity between positivist paradigm and critical paradigm at this point:

It should not be missed that there is close parallelism between transforming the world and controlling or predicting it.

Researcher acting within the limits of subjectivist epistemology is of naturally a normative position (Grant and Giddings, 2002).

In respect of methodology, critical theorists use the research methods to lead transformative action and political and social equality, which are more interactive, based on dialog and reciprocity (Lather, 2004). The methodological approaches especially in the forms of action research and critique of ideology are related to critical paradigm (Cohen, Manion and Morrison, 2007).

### **Conclusion**

The question of ‘which paradigm is the best?’ is not a meaningful question since there is not any answer of it. For this reason, it is all in vain to compare the paradigms according to a criterion. Every paradigm has a coherency and consistency in itself. These ideas require normally that multiple paradigm approach is recognized. Multiple paradigm understanding, on the other hand, will mean increasing paradigms day by day.

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