

Strengths and Weaknesses of Laboratory versus Field Method and the Interview versus Questionnaire

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Overview

The strength and weakness of different research designs do not exist in vacuum as if there are absolute merits and demerits in any design.

They are interwound with available methods and inferential process of a given period. The discussion of strength and weakness is also affected by different epistemology of scientists. It is assumed that such differences of epistemology and inferential process center around atomism, holism, causal inference and related mathematical logics.

Following a brief background of different epistemology, the traditional assessment of two research designs are reevaluated in light of changing epistemology of the contemporary organizational theories.

It is also assumed that such changing epistemology comes from the General Systems Theory and multivariate inferential statistics. Strength and weakness of data collection strategies are also discussed briefly as a part of field survey method.

1. INTRODUCTION

Abraham Kaplan (1964)¹ succinctly termed that the methods and epistemology

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or philosophy of science are inseparable in the behavioral science. The understanding of the strength and weakness of different research designs and strategies is better done by proper understanding of the types of theories and epistemology held by scientists in the given disciplines.

The understanding of epistemological issues is critical especially when we appreciate the often quoted analogy made by Kaplan of a child with a hammer pounding everything without much thought or clear cut objectives.

The discussion of epistemological issues is justified in the discussion of organizational theory and research methods by the thesis of Thomas S. Kuhn(1970)² of paradigm maturity and scientific progress. He observed that scientific community shares theories, methods, problems and values. He also asserted that social science in general is in the state of low paradigm. Such thesis can be interpreted that there is not much agreement on epistemological and methodological issues. Therefore, it can be safely submitted that the study of organization requires a clear understanding of the different epistemological issues in view of low paradigm state in the field. In addition, awareness of epistemological issues is critical as contemporary organizational students are interdisciplinarians inheriting different heritage of traditional disciplines.³

A cursory observation of available literature on research methods in behavioral science tends to point that field methods have traditionally been employed and elaborated by sociologists based on their Aristotelian holistic epistemology while experiments have been developed extensively by the psychologists who share more or less Newtonian atomistic epistemology. It is also generally submitted that field method is rich in realism and generality, yet weak in rigor of precision and causality. It has also been submitted that laboratory experiment is weak in realism and generality, but strong in precision and rigor of causal inference.

Next, a clarification of the term epistemology is in order. Kuhn's proposal of paradigm includes constellation of theories, values, problems and methodology.⁴ These are often called perspective in the modest form. But the term values

and perspectives have residual meaning, such as ethical, normative and a priori contents. In fact, Kuhn's earlier proposition was criticized on this very issue.⁵ For values and beliefs are beyond reason and not subject to easy falsification, modification on ground of new emergence of methodology and empirical findings. However, the values and belief shared by the scientific community is modifiable in view of new methods and empirical evidences running in parallel to the similar notions in the ethics. Therefore, the use of term epistemology is justifiable in place of shared belief and values in the scientific community at a given region at a given period of time.

Philosophically, the logical system and philosophy shared by the scientific community are called positivism. Kaplan (1968) equated the term epistemology with the term philosophy of science.⁶ On the other hand, D. W. Hamlyn (1967)⁷ suggested that epistemology is a theory of knowledge. He further contended that the epistemological statement is observable, explainable, falsifiable and separated or runs in parallel to the ethical statement. In other words, belief and mode of thinking in philosophy, ethics and science are identical. Yet those of scientific community is separated or restricted by the empirical contents.

In this paper, the term epistemology is used as the scientists' definition of social reality, reasons associated with the levels of analysis, their mapping of research problems and the choice of research strategies largely restricted by the available theories and research technology.

Next, a brief discussion of both similarities and differences between two different epistemological background, holism and atomism will be given.

Abraham Kaplan (1968)⁸ observed that there are two positivism: the 19th Century Positivism and the 20th Century Positivism. The both are the outgrowth of the 19th Century Philosophy of Enlightenment, which emphasized the positivistic sciences based on tested and systematized experience in place of undisciplined speculation.

The forerunner of the 19th Century Positivism is Auguste Comte. He viewed human history as progressing through three stages: religious period, metaphy-

sical period and the scientific period. He argued that the role of scientists were to articulate and systematize the principles underlying the later stage. Such philosophy was shared by Herbert Spencer and Thomas Huxley. The 20th Century Positivism is also called Logical Positivism, Logical Empiricism and Scientific Empiricism.

It emphasises the unification of science, empirical activity instead of wisdom and propositions. It views logics and mathematics as providing the syntax of language of science. Unlike Comte, the 20th Century positivists do not view the laws of logic, principles of reasoning as the truth of being. They rather viewed them as a consequence of scientific rules arising from controlled observation. It emphasizes factual knowledge accepted on the basis of direct experience.

Such search for factual knowledge employs both analytic and synthetic modes. Its main characteristics consist of induction and probability. Its activity consists of operationalism aiming at the unity of terms eventually believed to be conducive towards the unification of sciences.

Kaplan also observed that the 20th Century Positivism had an impact on the 20th Century Analytic Philosophy, and on the empirical side, upon psychology, sociology and later on the behavioral science. Such influence on the empirical sciences was seen more on the methodological side than on the substance.

It now becomes clearer that in the positivistic tradition of factual knowledge, empiricism, validity, objectivity (generalizability, repeatability and intersubjectivity) are jointly shared by all scientists including both atomists and holists.

On top of such shared philosophy, there are also two tradition within social sciences in their epistemology namely atomism and holism. Atomism is also called individualism and holism is also called collectivism.

Atomism related to laboratory experiment is a type of doctrine based on the belief that the subject matter of a given discipline is divisible into a set of units which are not further divisible and thus becomes the ultimate constituents. It further assumes that large group characteristics are not real but ultimately be traced in the isolated parts. And E. A. Gellmer(1964) observed that the problem

of atomism lies in the difficulty of locating identifiable atoms.¹⁰ Contemporary physicist, I. Prigogine(1978), a Belgium Nobel laureate in hard sciences emphatically stated that Einstein's search in ultimate constituent part, Quantum theory is a failure. And he also stressed that when a part or atom is singled out from a whole, it loses an explanatory power.¹¹

Statistically expressed, atomists believe in a set of univariate unidirectional correlations(causality) simply added to reconstruct a social reality of a whole. But by such assumption, they have to ignore overlapping zones among independent variables (multicollinearity) by doubly and multiply counting the contribution of correlations.

Such atomism has been greatly influenced by early scientists including Descartes, Galileo and Newton. (Bertalanffy, 1972)¹² According to Kaplan (1964),¹³ such tradition of focusing only one variable at a time has been maintained largely due to the lack of proper mathematical tool in the 19th Century to deal with complexity.

Psychologists traditionally have held atomistic epistemology and developed rigorous methods and theories in search of atoms, one theory/one variable at a time regarding the behavior of an average man. The psychologists' paradigm has been always stimulus and response according to Vinacke.(1977)¹⁴

In contrast, afore-mentioned I. Prigogine(1978) asserted that there is a growing awareness in all sciences that the ultimate part of analysis does not exist in reality. There is a general trend to take a whole as well as complexity as a unit of analysis. This new trend can be termed a revival of Aristotelean holism. But it differs in methodology as Aristotelean philosophy has been termed a metaphysical holism while contemporary revived version can be properly named as an empirical holism. This new trend is made possible largely due to the availability of high speed computer and development of multivariate inferential statistics.

According to W. H. Dray, (1967)¹⁵ holism is also called collectivism, organism or historicism in taking longer time span, large and complex whole as a unit

of analysis.

The forerunner of holism is Aristotle who stated that "the whole is more than the sum of its parts." Such view has been neglected by rigorous 19th Century type scientists in the tradition of Newtonian physics and inorganic chemistry. Because they did not have adequate methodology including analytic empirical and mathematical logical system and methods.

And holistic view has been traditionally maintained by sociological theoreticians, economic historians and political scientists and organizational theorists at linguistic, metaphysical levels in the form of propositions, such as invisible hand, social events, circumstances etc. They employed linguistic logics, intuition and insights based on, many times, scanty and uncontrolled empirical evidences to describe the abstract social aggregate reality.

However, with the emergence of a new logical system namely multivariate inferential statistics, the scientists, today, are in position to recapture the metaphysical holism in the form of rigorous empirical holism with new form of rigor, control and precision.

The traditional scientific form of logical system centers around causality, univariate unidirectional correlation. It assumes that nothing but an event affects other event, where one is independent, autonomous, while the other is passive and dependent. I. Priogini noted that such Newtonian logic is no longer tenable. In Newton's law of motion, once an equation is computed from present, the past and the future course of trajectory could be predicted. But in the contemporary physics of complexity, or in the physics of phenomenology, largely drawing from the Second Law of Thermodynamics, the bullet in the trajectory cannot be taken as given, passive or constant. But it should be taken as another autonomous variable on its own. Besides, the environment must be considered. In traditional approach the three components were studied separately. But in the contemporary notion, they should be observed simultaneously. It means that there is a multiple network of mutual causality, or interaction effect. And this changing trend tends to point that the logic of causality has to be

modified to cope with the contemporary epistemology i.e, available methods and research problems.

I. Priogini also proposed that through the General Systems Theory, the unification of physics, chemistry and biology has been made possible, and the unification of natural science and social science and even humanity is possible in the same rubric. If so, social phenomena are even more complex, less tangible, therefore, the need to modify the Newtonian atomistic causal inferential process is pressing.

It does not mean that the causality is completely wrong. It rather mean that occasion under which causality is maintained is drastically limited, and such occasion cannot be blamed to be a lack of rigor and precision.

Hubert M. Blalock Jr. who made conscientious effort to bridge the gap (1968, 1969)¹⁶ noted (1961)¹⁷ that "there appears to be an inherent gap between the languages of theory and research." One thinks in terms of theoretical language such as causality, which exists only in imaginary world as things in reality are never alike nor repeat in exactly same manner. And causal model can never be proved in any empirical study. So, scientists present new postulated properties or variables in such a manner so that causal model cannot be negated, mostly in the form of temporal antecedence and isolation. He also quoted from Herbert Rimom that causal model can be conceptualized in terms of simplified models. In other words, causal models are at best possible adaptation between our inference process and the reality rather than the reality relationships themselves.

But signals of change of inferential process from absolute and deterministic causality of univariate unidirectional models to relativistic mutual causal and multiple causal models are also found in the social sciences in the past.

1. Carl Gustav Jung(1875—1961) long ago proposed the principle of synchronicity where two events covary without causality.

2. Economists have long used the notion of interaction or multiplication effect in their models of income effect and other multipliers in mutual causal models.

3. Covariance models have been used by statistically oriented social scientists

as a relaxed or relativistic causal models or interaction models. In the famous dictum of Auguste Comte, "the individual is a cause and consequence of situation at the same time," it can be stated that individual as a correlate or a variable has both independent and dependent dimensions simultaneously with different proportion.

4. Many sociologists and social psychologists have come to accept social interactionistic paradigm in their theory building.

5. In the cross lag analysis of repeated measurement, the causality is inferred relativistically, while the statistics show each variable has both independent and dependent aspect simultaneously with different magnitude.

To sum up, contemporary organizational scientists have inherited both atomistic and holistic epistemology. Organizational researchers are interdisciplinarian therefore they need to be aware of different epistemological background of behavioral theories, in their choice of research questions and research strategies.

There is a changing awareness that traditional understanding of attributing lack of rigor in the holistic field study is changing due to the increasing use of multivariate inferential statistics and high speed computer, in the behavioral research, with new rigor and precision. Theoretically such change is endorsed by the General Systems Theory.

2. LABORATORY EXPERIMENT IN THE ORGANIZATIONAL RESEARCH

Fromkin and Streufert stated that (1976)¹⁸ the earlier observation made by Weick (1965)¹⁹ was still valid in saying that the laboratory experiment was underrepresented in the organizational study. As a result, they felt, the organizational theorists were not able to take advantage of social psychological research in the study of organization.

They maintained that the laboratory experiment has been erroneously attacked on the following grounds; 1) employment of artifacts and artificiality, 2) not able to predict behavior in the real life situation.

Fromkin et. al., believes that such attack arises from the confusion between the setting and components in the laboratory experiments, and such attack should not be used as an excuse in defence of alternatives.

As long as one maintain a rigorous causal model of an average individuals, their contentions are fully justified. For laboratory experiment is to identify cause and effect (stimulus and response) controlling, blocking and ruling out all alternatives while manipulate only a few variables at a time.

Their definition of laboratory experiments extends their contentions:

1. Events occur at the discretion of the experimenters. The underlying assumption is that experimenters do not wait for natural variance but create and manipulate key variables so that researchers do not have to adopt research goals to the setting nor seek out settings appropriate for the research goals.

2. Experimenters use controls to identify sources of variation, so as to rule out any plausible alternative explanations and minimize confounding effect.

3. Laboratory experiment refers to the situation where precise measurement of variables are possible. This view enlarges conventional meaning of laboratory experiments as known to be related to a special place. This also extends the concept of laboratory experiment to what was conventionally known as quasi experiment.

For example, Cook and French's study (1948)²⁰ of change and resistance was conducted in organizational setting but clearly meets the conditions set by Fromkin and Streufert. Marse and Reime's (1956)²¹ study of organizational change, Siegel and Siegel's study of attitude change and reference group-conducted in the university setting,²² Fiedler's study of leadership with Belgium Navy Training (1966)²³ were conducted in the field while researchers had control over research designs. And these can be called laboratory studies.

This broader view of the laboratory experiment is significant as it opens a new avenue for the increased employment of the research technology of multivariate analysis dealing with organizational study with some modification such as multiple variables for a sustained period of time.

To put it simply, precision, rigor, manipulation or artificial variance, control or isolation are the main issues stressed in the traditional laboratory experiments. And these factors are supposed to directly link ("interpretable") the study procedures and the findings in the atomistic scientists' positivistic theories of causality. Yet the principles and procedures can be modified to adopt to the new emerging holistic behavioral research.

Next, a discussion of the key issue in the traditional atomistic positivism of causality will be discussed.

Selltiz, Jahoda, Deutsch and Cook (1959)²⁴ defined the causality as necessary and sufficient condition. Necessary condition means, when X is a necessary condition for Y, X must occur for Y to occur. In sufficient condition, where X is a sufficient condition for Y, whenever X occurs, Y will always occur. And necessary and sufficient condition is stated, when X is a sufficient and necessary condition for Y, Y never occurs unless nothing but X occurs. This is an absolutistic and deterministic univariate unidirectional relationship where X is independent and Y is always dependent, in the language of logical positivism, the most precise verbal human language.

There are also other conditions. When X can lead to Y's change, but may not lead to Y's change, then X becomes necessary but not sufficient condition for Y. When X leads to Y's change, while Y's change can be led by other factors, X becomes sufficient but not necessary condition for Y.

On the other hand, when a number of factors would lead to a change in Y, one of the factors become contributory condition for Y, as it increases the likelihood of Y to occur but not certain. This is in many cases congruent to the conditions arise in the multivariate analysis or in the research of complexity, such as organizational study.

When a cluster of variables provides a condition for X to affect the change of Y, the cluster of variables is jointly termed as contingent condition for X—Y relationship. This too was traditionally labelled to be weak form of causal model, but it is congruent to the organizational study such as boundary condition

concept employed in the thermodynamics. Although the scientists could not isolate such conditions precisely in the past, the contemporary scientists are able to pinpoint and discriminate such multiple relationship among variables.

Also, when each of contributory conditions alone or in subclusters lead to Y to occur, each of these singular or subcluster is called alternative condition. This is also congruent to the contemporary notion of multivariate statistics.

It is clear, for anybody who has some understanding of organizational theories, that the causality as necessary and sufficient condition does not exist in the real world but only approximated relativistically by such tactics as blocking, randomization and manipulation of a single variable to adapt the reality to the human cognizing process with relative precision. It is essentially the best fit of causal determinism and the research design emphasizing clean, isolated and simplified situation in the laboratory to rule out alternative conditions.

But, still the key issues remain. Would such clean and simplified condition and relationship between variables do justice to the social/organizational reality of complexity? Could causality oriented laboratory experiment still hold to be rich in internal validity when there is a change of epistemology of new empirical holism to deal with complexity as a unit of analysis with renewed rigor?

In the contemporary multivariate analysis, we have a technology to partial out, peel off contributory conditions, contingent conditions and their interaction from the key correlates using such technique as stepwise regression and partial correlation. And holistic epistemology requires preservation of such partialled out conditions so that the found result preserves the accurate depiction of complex relational network. Such boundary conditions and contributory conditions cannot be ruled out as weakening the causal relationship but they become important key research problems and variables on their own account.

But it must be added that even in the contemporary statistical analysis, the researchers claim to have ruled out all elements of confounding effect unobserved. It cannot account for alternative conditions when observed samples do not have the different combination of variables. Therefore, theoretically postulated

yet not found variable in the observed population can be artificially manipulated in the laboratory setting along with key multiple variables in an empirical holistic manner. And such tradition as setting up control group can be adapted in the field setting too. But randomization is a problem in the field setting as the organizational design include selection as a key variable.

Let us now further elaborate the issues of causality as has been handled in the traditional laboratory experiment. Traditionally, inference of causality was maintained in the following three conditions in the behavioral science.

1. Temporal antecedent. It is a temporal ordering of covariation of two events. This inference process has been widely employed. It requires at least one replication study of the temporal reversal of the sequence as in the cross lag study. In fact, many conditions are indifferrent to the time ordering of events but a slight difference. Such transformation from relativistic reality to an absolutistic causality should be handled with care.

2. Concomitant variation of two events. It occurs either from theoretical prediction or from relative higher contribution among clusters of correlates towards other sets of correlates. In this case, the assumption of directionality of covariance is taken as a convenience of inference and logical structure of the theory. Traditional atomistic scientists shunt such condition as weak in internal validity. But the covariation and relative magnitude of contributory condition too must be taken as rigorous as in the case of traditional causality.

3. Ruling out symmetrical or alternative causal explanation, as in the Homans' study of norm acceptance and status in group. This aspect is highly elaborated in the rigorous control of alternative conditions and confounding effects. Laboratory experiment is very strong in this aspect, and such feature can be readily accepted in contemporary organizational study. (Seltiz et al, 1958; Seltiz et al, 1976; Cook and Campbell, 1976)²⁵

From observation of the three conditions under which causal models have been inferred, it becomes clearer that there has been a gap or some discrepancy between the atomistic inferential process and the holistic nature of the social

reality. Next, a discussion will be shifted to the specific features and operational principles to cope up with the problems between the empirical reality and the issues surrounding causal models.

In the classical work done by Campbell and Stanley(1966),²⁶ the authors discussed various forms of experimental and quasi experimental designs based on two principles: internal validity and external validity.

Internal validity is the "basic minimum without which any experiment is uninterpretable." The word "interpretable" can be assumed to link the theoretical inferential process and the empirical reality, in the framework of logical positivism.

The threat to the internal validity consists of: 1) history, 2) maturity, 3) testing, 4) instrumentation, 5) regression, 6) selection, 7) mortality, 8) interaction of selection and maturation.

Based on these eight criteria of internal validity, Campbell and Stanley reviewed six experimental designs to decide that only three true experimental designs of random assignment could get full scores in the internal validity.

Their true experimental designs are: Design Four, Pretest- Posttest Control Group; Design Five, Solomon Four Group Design; and Design Six, Posttest Only Control Group. All these designs have features of random assignment, control group in contrast to their Pre-experimental Designs. (see table 1)

It leaves one wonder why these factors are regarded as threat (extra-research variables) to the internal validity. One simple and plausible answer is that when the atomistic epistemology consists of one variable at a time strategy for a short period of treatment and measurement. And it led them to the conclusion. Also most of these factors of the "threat to the internal validity" will not be the threat or extra research variables but become key research variables in the holistic epistemology of multivariate analysis and longitudinal research designs.

For example, history in the case of time series or experimental designs is an unobserved exteraneous event occuring simultaneously side by side the research variables. In the GST oriented organizational study, it becomes a very important

Table 1. Sources of Invalidity for Designs 1 Through 6

	Sources of Invalidity									
	Internal							External		
	History	Maturation	Testing	Instrumentation	Regression	Selection	Mortality	Interaction of Selection and Maturation, etc.	Interaction of Testing and X	Interaction of Selection and X
<i>Pre-Experimental Designs:</i>										
1. One-Shot Case Study	-	-				-	-			-
X O										
2. One-Group Pretest Posttest Design	-	-	-	-	?	+	+	-	-	-
O X O										?
3. Static-Group Comparison	+	?	+	+	+	-	-	-		-
X O										
.....										
O										
<i>True Experimental Designs:</i>										
4. Pretest-Posttest Control Group Design	+	+	+	+	+	+	+	+	-	?
R O X O										?
R O O										
5. Solomon Four-Group Design	+	+	+	+	+	+	+	+	+	?
R O X O										?
R O O										
R X O										
R O										
6. Posttest-Only Control Group Design	+	+	+	+	+	+	+	+	+	?
R X O										?
R O										

Note: In the tables, a minus indicates a definite weakness, a plus indicates that the factor is controlled, a question mark indicates a possible source of concern, and a black indicates that the factor is not relevant.

It is with extreme reluctance that these summary tables are presented because they are apt to be "too helpful", and to be depended upon in place of the more complex and qualified presentation in the text. No+or- indicator should be respected unless the reader comprehends why it is placed there. In particular, it is against the spirit of this presentation to create uncomprehended fears of, or confidence in, specific designs.

variable of the organizational environment. If not, it can be identified and easily partialled out through statistical tools. Setting up a control group or observation in a different situation such as comparative organizational study too are also strategies to overcome this problem.

Maturation in many organizational setting is a legitimate variable such as length of service, age, tenure and seniority.

Testing and instrument decay are both problems. But it can be overcome partly by disguising the true hypothesis or by designing multiple measurement scheme per variable. And this can be prevented and corrected in advance through reliability testing. On the other hand, many forms of monitoring employee performance take place in the manner of testing. The hypothesis guess may not be much of a problem as in the laboratory experiment with sophomore students who are obsessed with testing. Of course the subjects should not be led to believe that the measurement jeopardizes their organizational life.

Regression can be considered to be a development of some group process such as group norm to control for deviants or in the form of inter unit competition. In that case, it can be singled out, measured and partialled out. The classical cases of such norm was the soldiering effect leading to Taylor's Time and Motion study and Hawthorne's finding of informal group formulation in the formal units.

Regarding the problem of selection, it is one of the main process of absorption of human energy or recruitment. In fact no organization is organized under the assumption of an averaged or randomized man. The recruitment or intended clustering of individuals with particular ability and characteristics. It is a key variable in the organizational study. Therefore the idea of an average man in the traditional atomistic study will be disruptive in the organizational structure and process. It does not mean that the theories developed under atomistic tradition are useless in the organizational study. They provide a base or starting point for the organizational theory building on powerful and general principles. Yet organizational setting is varied and particularistic. The testing of the general

theories in the particular setting will lead to maturity in both perspectives.

Therefore, random assignment, the key feature of laboratory experiment is not only impossible but also undesirable because contemporary organizations are designed under the assumption of functional differentiation and specialization, which require a matching between organizational demand and the qualification of individuals, abilities and characteristics. Besides, randomization will disrupt important organizational structure and process of long established complex network of interpersonal relationships.

Based on the above discussion of the issues of internal validity, the general contention of the advocates of laboratory experiments and quasi-experiments should be appreciated in a relativistic sense. In other words, such contention should be raised in the context of what epistemology, atomistic or holistic? Are they proposing classical method of analysis or contemporary statistical tool?

On the issues of external validity or generality, Campbell and Stanley raised the following features: 1) interaction of testing and treatment, 2) interaction of selection and treatment, 3) reactive arrangement, 4) multiple treatment interference.

Interaction is not a problem in the contemporary statistical analysis as it can be accurately depicted and singled out in contemporary statistics. Treatment in the contemporary organizational study is not artificial but naturally occurring variance. Even if there are some treatment variables along with other natural variables, the natural mix would enhance disguise and singled out later accurately. Selection, promotion, transfer are key features of organization. Multiple treatment too can be no problem as each treatment can be singled out accurately employing statistical techniques. Also there are many techniques to overcome reactive arrangement either through cover letter, and in the manner the experiment is conducted etc.

In fact, Campbell and Stanley properly conceded that, "in the language of analysis of variance, history, maturation, testing etc, have been described as main effect." This is an indication of their awareness of the discussion of

strength and weakness of different designs are based on different epistemology. Such flow of logic can be applied to what they term as field experiments (Cook and Campbell, 1976; Karl E. Weick, 1965) and quasi-experimental designs (Table 2 and 3 from Campbell and Stanley, 1966). For they can be termed special kind of laboratory experiment, atomistically oriented in the framework of Fromkin and Streufert's definition. Therefore, quasi-experimental designs are simple effort by the atomistical scientists to enhance external validity of laboratory experiments in the field. Campbell and Stanley assigned full internal validity scores to three true experimental designs and only full internal validity scores to one quasi experimental design out of thirteen different field experimental designs.

To sum up, laboratory experiment has been developed by rigorous atomistic scientists. Its key features are random assignment, control group, artificial treatment at the discretion of researchers, and control for external variables. These features would enable the scientists to directly relate the causal univariate theory to the empirical observation. But these features can be relativistically appreciated when we are dealing with holisitc empiricism.

Some of the features, contemporary scientists of organization still can learn or adopt from the atomistic laboratory experiment are the following.

1. Control group to control for unobserved exterenous variables.
2. Systematic thinking or reduction.

The systematic thinking process, the rigorous logical reduction process long elaborated in the atomistic tradition can be recaptured in the contemporary empirical holists in simultaneous multiple variable reduction process, as well as their interrelationships. This aspect is called the construct validity. Causality is also a relational concept. And when its directional determinism is duely considered, the rigor of reduction will be directly applied in the contemporary organizational study.

Some weaknesses of the laboratory experiment has been also discussed by Fromkin and Steufert, and Weick.⁽²⁹⁾

TABLE 2 Sources of Invalidity for Quasi-Experimental Designs 7 Through 12

	Sources of Invalidity									
	Internal							External		
	History	Maturation	Testing	Instrumentation	Regression	Selection	Mortality	Interaction of Selection and Maturation, etc.	Interaction of Testing and X	Interaction of Selection and X
<i>Quasi-Experimental Designs:</i>										
7. Time Series O O O O X O O O O	—	+	+	?	+	+	+	+	—	?
8. Equivalent Time Samples Design X ₁ O X ₀ O X ₁ O X ₀ O, etc.	+	+	+	+	+	+	+	+	—	?
9. Equivalent Materials Samples Design M _a X ₁ O M _b X ₀ O M _c X ₁ O M _c X ₀ O, etc.	+	+	+	+	+	+	+	+	—	?
10. Nonequivalent Control Group Design O X O O O	+	+	+	+	?	+	+	—	—	?
11. Counterbalanced Designs X ₁ O X ₂ O X ₃ O X ₄ O X ₂ O X ₄ O X ₁ O X ₃ O X ₃ O X ₁ O X ₄ O X ₂ O X ₄ O X ₃ O X ₂ O X ₁ O	+	+	+	+	+	+	+	?	?	?
12. Separate-Sample Pretest-Posttest Design R O (X) R X O	—	—	+	?	+	+	—	—	+	+
12a. R O (X) R X O R O (X) R X O	+	—	+	?	+	+	—	+	+	+
12b. R O ₁ (X) R O ₂ (X) R X O ₃	—	+	+	?	+	+	—	?	+	+
12c. R O ₁ X O ₂ R X O ₂	—	—	+	?	+	+	+	—	+	+

Table 3 Sources of Invalidity for Quasi-Experimental Designs 13 Through 16

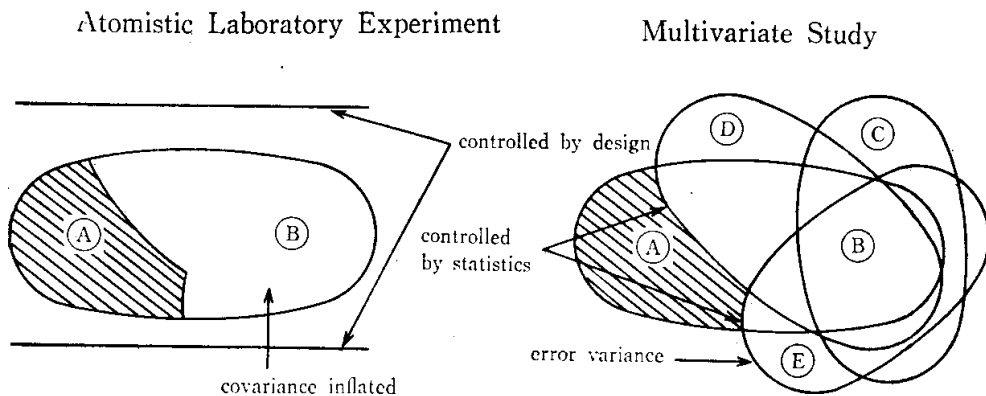
		Sources of Invalidity											
		Internal								External			
		History	Maturation	Testing	Instrumentation	Regression	Selection	Mortality	Interaction of Selection and Maturation, etc.	Interaction of Testing and X	Interaction of Selection and X	Reactive Arrangements	Multiple-X Interference
<i>Quasi-Experimental Designs Continued:</i>													
13.	Separate-Sample Pretest-Posttest Control Group Design	+	+	+	+	+	+	+	—	+	+	+	
	R O (X)												
	R X O												
												
	R O												
	R O												
13a.	R O (X)	+	+	+	+	+	+	+	+	+	+	+	
	R X O												
												
R ¹	R O (X)												
	R X O												
												
	R O (X)												
	R X O												
												
	R O												
	R O												
												
R ¹	R O												
	R O												
	R O												
14.	Multiple Time-Series	+	+	+	+	+	+	+	+	—	—	—	
	O O O X O O O												
												
	O O O O O O												
15.	Institutional Cycle Design												
	Class A X O ₁												
												
	Class B ₁ RO ₂ X O ₃												
	Class B ₂ R X O ₄												
												
	Class C O ₅ X												
												
	• Gen. Pop. Con. Cl. B O ₆												
	• Gen. Pop. Con. Cl. C O ₇												
	O ₂ < O ₁ }	+	—	+	+	?	—	?		+	?	+	
	O ₅ < O ₄ }												
	O ₂ < O ₂ }	—	—	—	?	?	+	+		—	?	+	
	O ₂ < O ₃ }	—	—	+	?	?	+	?		+	?	?	
	O ₆ = O ₇ }												
	O _{2y} = O _{2a} }	+							—				
16.	Regression Discontinuity	+	+	+	?	+	+	?	+	+	—	+	+

• General Population Controls for Class B, etc.

Campbell et al., *ibid*, p. 56

1. Some variables are hard to be replicated in the laboratory such as norm and differentiation of positions and responsibilities as stabilizers in the group process.
2. Difficulty of manipulation, familiarity of fellow subjects as resources and personalities leading to predictability.
3. Feedback as a base of comparison.
4. Existence of deviants, strangers and task.
5. Intensity of variation, due to ethical reasons.

Finally the following diagram contrast the problem of causality.



3. FIELD STUDY AND DATA COLLECTION STRATEGIES

Even if the laboratory experiment and its extension in the field in the name of quasi experiment are rooted on the atomistic epistemology, field study in essence is rooted on holistic epistemology. Therefore, its implication is more than location of the study. It also has contributed to the behavioral science and organizational study with rich theories and data gathering strategies. To illustrate the point, some definitions of the field study will be examined.

A.N. Oppenheim (1966)⁽³⁰⁾ termed that "survey is a form of planned collection of data for the purpose of description or prediction as a guide to action or for the purpose of analyzing the relationships between certain variables... usually conducted on a fairly large scale, as contrasted with laboratory experiment."

As in the atomistic science of laboratory study, field researchers too placed

theories to guide research in the natural setting. However, while atomistic theories were predetermined in deductive logic of hypothesis testing, the holistic scientists were also conscious of "description" of unintended relationships and new variables to be reflected in the theory generation. In other words, the field scientists were employing both inductive and deductive logic in the scientific enterprise of field study.

One additional and important feature of the field survey is the notion of large number of variables. This is congruent to the insistence of the holists on the realism and generalizability of the field study. But traditionally, such Aristotelean metaphysical or linguistic holism did not have proper rigorous logical/mathematical inferential tool such as contemporary multivariate statistics. To further illustrate the point, Earl R. Barbie's (1973)⁽³¹⁾ propositions of the characteristics of field survey will be examined.

1) Field survey is being logical and guided by all the logical constraints to facilitate the careful implementation of logical understanding.

He too emphasized the theory first principle for survey research. But he did not specify what logical system to be employed in the field setting.

2) Survey research is deterministic to explain the reasons for the sources of observed events, characteristics and correlations.

He seems to propose causality models but he did not elaborate on the problems the causality face inherently in the multivariate or multidimensional phenomena. However, his proposal of characteristics, a structural property is interesting as some radical atomists such as Skinner sets the tone of nihilism on structural construct emphasizing only relations and process.

3) Survey research is general to account for the behavioral propositions about human behavior, through large scale sampling and through public-ness of methodology.

This position seems to arise from the implicit assumption of national census type of research where average man notion is prevalent. This is subject to modification in the organizational study where complexity of structure and process

as well as individuals are observed in interaction.

4) Survey research is parsimonious in a sense that the researchers can carefully examine relative relevance of relationship among a few variables from a large number of variables.

This proposition clears up the erroneous assumption of lack of rigor (reduction) before research design. This position is to be taken as 'let empirical reality and data feedback in the reduction process towards model building' rather than a priori reduction as in the atomistic tradition.

5) Survey research is specific in the conceptualization of measurement and construct.

This is taken to clarify the notion that field researchers would rely on the construct entirely on the reality.

It is assumed that such emphasis on rigor of precision, reduction, control and empiricism are shared jointly by laboratory scientists and field scientists. Yet field scientists were more concerned in multivariate, multidimensional approach towards realism and precision at the cost of relaxation of causal models. Such tradition of field study will be able to drastically enhance its rigor, control and precision by increasing employment of contemporary inferential statistics. Such advantage will compensate the inherent problem of field without manipulation of variables.

In addition, there are more advantages of the field study according to Thomas J. Bocuhard Jr. (1976)³²

1) The range and intensity of variables in the field setting cannot be generated in the laboratory because of ethical and other restrictions.

2) Phenomena in the field often shows a fair range of variation than could be simulated in the laboratory research including group size, span of control and degree of concentration, complexity and time span of discretion.

3) Duration of such treatment in the laboratory is temporal while duration and operation of such treatment in the field is based on natural span of life so that experiments may simply fail to provide conditions which cross the response

system threshold.

To put it simply, the traditional field scientists were aware of holistic nature of the social reality but they did not have adequate empirical methods to deal with complexity with accuracy. Therefore they have developed many methods especially data collection strategies to cope with the dissonance between research methods and the nature of the empirical reality. For Richard Scott (1966)³³ quoted from Zelditch(1962) to state that, "a field study is not a single method gathering a single kind of information." He added three different objectives of field study: a) descriptive, b) exploratory, and c) hypothesis testing. They contrasts with the laboratory study where only hypothesis testing is conducted; the contrast of deductive versus deductive and inductive.

Exploratory study is inductive in logic so that it is also called hypothesis generating strategy where empirical observation can be feedback to theory.

Descriptive strategy in the field may lie in between the deductive hypothesis testing and inductive explopatory study. It can also be said that such strategy has been employed in linguistic logic because of lack of proper rigorous research tool, to cope with complexity as a unit of analysis..

Despite such lack of rigor, precision and objectivity, it is remarkable to note what Scott is saying, "most of organizational theories come from the field study."

Closely related to such methodology of field study is also the difference in the definition of situation, the epistemology of organizational study. Scott (1966) proposed that organizational study preclude single categories of persons. It differs from atomistic scientists like psychologists and demographic economists and sociologists. Such difference comes from the definition of organization, which consists of individuals linked by a common set of relationship, both by design, by natural formation, and by organizational person-environment interaction. Members in the organization share common set of values and norms which at times respondents are unaware of. There are high degree of differentiation, and roles are highly elaborated. There are explicit goals, reflecting many formal features of organizational characteristics, to serve the function of control for

some aspects of situation. And these aspects do not operate in separation but interwind in multiple and dynamic interaction.

One of the classical example of discrepancy between the atomistic epistemology and the holistic reality is found in the communication theory as studied in the laboratory and in the field. In the observation made earlier by Carl I. Hovland (1959), the attitude change through communication in the typical laboratory experiment showed remarkable change while the field survey study to the same phenomenon tended to negate the findings of laboratory.

Bouchard (1976) also noted that the laboratory study is strong in the representativeness of subject while weak in the representativeness of treatment. As discussed earlier, it is doubtful if organization is set up with the notion of an average man. For example, professionally trained medical doctors and nurses cannot be expected to respond to the same stimulus as an average man does.

Bouchard admitted that the weakness of field study are 1) ambiguity of causality, 2) weakness of one sample study where $N=1$, and high cost. He also admitted that the correlational study is weak in ruling out alternative explanation. But he is justified in stating that the carefully documented case study employing standardized instrument can be accumulated and compared to other studies. He defended the problem of cost. He proposed that cost will go up in all significant scientific exploration.

It must be added that field scientists should not attempt to fit the empirical reality to the human cognition process of causality as in the traditional causality obsessed rigorous scientists. Human mind and verbal language are flexible to adapt to the new situation, and an attempt must be made to translate statistical language into verbal language as in the case of Blalock.

Other issue raised by Bouchard is an unsuccessful attempt to overcome self-selection problem, where high IQ managers from small organizations were matched against high IQ managers in the larger organization. And as a result, the high IQ managers lost the representativeness of small organization population of managers. There are ways in the statistics to handle the problem without

injecting artificial assignment of subjects into cells (Meehl, 1970)³⁵. IQ can be taken as one of multiple variables, and later can be partialled out.

It can be said briefly that field study has been correct in definition of the empirical reality but did not have an adequate logical mathematical methods other than half commitment to causality, which had firmer footings in the laboratory study. With new emergence of theory and logics, (GST and Multivariate statistics in evolution) a new epistemology of empirical holism, the traditional laboratory study and the traditional field study can play the mutually complementary and mutual enriching roles.

Data Gathering Strategies Developed in the Field Survey and Data Collection Strategies

Thomas J. Bouchard Jr. (1976)³⁶ reported five major methods of field study. They are questionnaire method, participant observation method, interview method, systematic observation method and unobtrusive measure method. These methods have been developed mainly in the field study with different objectives as exploratory study, descriptive study and hypothesis testing study.

Interviewing is widely used as a systematic data gathering technique in organizational research. Both interview method and questionnaire method have the advantage over observation method as they "capitalize on language, the human being's most powerful form of communication."³⁷

Bouchard presented a two by two contingency table to classify four different types of possible interview methods based on factors of questions and responses either specified or unspecified.

Response	Questions	
	Specified	Unspecified
specified	I	III
unspecified	II	IV

Type I is structured and closed type generally used in contemporary multiva-

riate organizational study because the statistics cannot handle huge number of missing data generated from open ended questions and response sets, which would generate endless dimensions too late to be examined across all subjects.

This type can take many form per item such as multiple choice, true-false, yes or no, agree or disagree, dislike or like and identification format. The problems with multiple choice and identification formats are that the researcher would have hard time justifying that the response variations are unidimensional. The problem of dichotomous format is that statistics cannot discriminate variations. So Likert type response is generally regarded as sensitive in variation and it ensures unidimensionality of response. Such condition is adequate in the contemporary organizational analysis.

The rationale for Likert type of questionnaire is that attitude (response) is a disposition toward overt action and it is a verbal substitute for overt action. And the underlying dimensions (factors) can be differentiated with a scale sensitive and unidimensional.

The type II, III and IV are variations between different mix of open ended and structured data gathering strategies. These formats can be used in the organizational study as a preliminary phase of instrument development and tapping of theoretically unsuspected dimensions of organization. But they have to be converted into Type I as scientists move from exploratory phase to hypothesis testing phase in the context of contemporary rigorous empirical holistic study of organization.

Such structuring and open-ended response and questions are employed in both questionnaire methods and interview method.

There are different interview methods with specific features and goals.

Tandem interview is conducted by two interviewers. Its advantages are; 1) efficiency due to coverage of good deal of ground. 2) increase in rapport because respondents have the interviewers' complete attention. Interviewers can conduct the interview at a normal pace, respondents are free to talk and the interview is not slowed down by note taking. 3) Increase in range and depth of data as

they can pick up new ideas and probe them for detailed clarification. Increase in accuracy of analysis because of easier cross validation between the interviewers. Its weakness is cost involved in employing two interviewers per subject so that the number of samples are restricted for a research.

Focused interview is employed when the topic is narrow. Non directive method is also used. It can enhance range, specificity, depth and personal context. Its problem can be a lack of objectivity as in the psychiatric analysis.

Group interview is greater in depth and scope as respondents can remind and stimulate each other for recall of the past events. Its shortcomings are, difficulty of scheduling, problem of right mix of people, the problem of one failure endangering the entire research project and problem of taping private or personal information. Potential danger is also development of group norm to mislead the response sets.

Stress interview is a special type of interview used in cases like criminal interrogation in the police department. This has an ethical problem but it is reportedly reveal respondent's characteristics, traits and temperament. Its potential danger is that the subject under coercion may be forced to lie due to interviewer's bias.

Automated interview is mainly used in medical diagnosis when they have highly developed diagnostic tree. In the behavioral science with low paradigm state, it might have a limited use, but interviewer may have a multiple check list instead of systematically dichotomized theories as in a tree diagram, until we have more elaborated and systematic theories.

The strength of interview methods according to Selltiz⁽³⁸⁾ lies in the flexibility in eliciting information and the possibility to observe the subject in the total situation. It can also overcome difficulty and complexity of questions. It was observed by Selltiz that subjects tend to cooperate more under the interview situation than in mailed questionnaire situation. Therefore the response rate is higher in interview than in mailed questionnaire situation. It can overcome confusion. The method is not limited to special type of people as interviewers can

help subject overcome problems of illiteracy. It can prevent misinterpretation of the items by making sure that the subjects understand everything right. It also has a high completion rate.

Its weakness is relatively higher costs as compared to the mailed or impersonal questionnaire methods and suspicion on the confidentiality. There are also problems of validity and reliability as the settings are not uniform.

On the other hand the advantages of questionnaire method are; low cost, uniformity in response sets due to standardized questions, greater confidence in the respondents' anonymity and less pressure to the respondents for immediate response.

The weaknesses of questionnaire methods are; the possibility of questions interpreted by respondents differently, low return and low completion rate, weakness to handle emotion ladden issues, weakness in exploratory and descriptive type of research and the problems of poor understanding of the questions by the respondents.

4. SUMMARY AND CONCLUSION

Strength and weakness of laboratory research and field research are discussed together with different epistemological tradition. Reports of weakness and strength in the data gathering methods namely interview and questionnaire formats were also briefly discussed. The data gathering strategies are mainly developed in the field study while causal models are central focus of the scientific community. However it is also pointed out that causal model, the basic human inference process is not adequate or congruent to the reality, which is holistic, and multivariate in nature. It has also been discussed that there is a changing trend of paradigm from univariate unidirectional causal model to multiple causal and multiple mutual causal and multiple mutual causal interactive network coming largely from the General Systems Theory and multivariate inferential statistics under experimentation and in evolution.

The rigor of atomism comes from dissection of the whole into simplistic part. It is often called and condemned as reductionism. The new empirical holism as opposed to the traditional metaphysical holism can be termed as a cluster of atomistic process including multiple and simultaneous reduction for simultaneous observation in dynamic interaction.

In the organizational study, the relativistical atomistic questions can be asked by providing boundary conditions or 'eco-behavioral entities' for special clusters of individuals including variables of power, technology and environment. Holistic questions can be asked in empirical multiple reductionistic manner of multiple theory-multiple hypothesis testing, rather than traditional linguistic descriptive and metaphysical manner.

Within such change of paradigm of theory, causal model and methods, the traditional laboratory, field, and interview and questionnaire methods can be employed in mix or, in contrast, towards convergent validity and mutually complementary manner. But this must be done only with the acceptance of the emerging holistic empiricism rather than traditional atomistic manner.

There are studies where an open ended exploratory and descriptive methods were used for instrument sharpening purpose. And these information are used in structured questionnaire designs. To take the advantages both from interview methods and questionnaire methods, group interviews were conducted to cut the cost at the same time improve communication and completion rate.

It is also proposed that an exploratory-descriptive-hypothesis testing study of the field can be recaptured in the laboratory setting for alternative conditions. But the process in both cases must be based on contemporary empirical holism employing multiple variables/theories and contemporary multivariate inferential statistics.

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背景과 要約

行動科學研究에서의 認識論 및 方法論的인 問題

——實驗研究法과 現場研究法을 中心으로——

許 哲 夫

金光雄教授는 (1979) 國內政治學 및 行政學界의 主要 行動科學研究를 調査하여 研究의 運營化(Operationalization)過程의 未進化 狀態를 指摘하였다. (그는 Operation의 國文翻譯을 操作化라 하였으나 實驗研究法에는 이에 該當하는 Manipulation이란 用語가 있으며 Operation에 作戰, 作業, 實行, 手術, 運營의 意味가 있기 때문에 研究의 運營化라고 쓴다.) 研究方法에서의 運營化過程이 未進化 狀態에 있다는 말은 아주 深刻한 말로서 우리 學界의 嚴格하고 精密한 社會科學研究, 研究文化水準을 相當히 높여 놓아야 한다는 말이기도 하다. 이 研究方法論에 對한 소홀함과 隨伴하는 研究運營化의 소홀함이 지난 10~20年間的 歐美社

會科學 및 組織研究의 主要業績이 우리 學界에 올바르게 알려지지 못한 理由인지도 모른다.

앞으로 우리 大學도 大學院 中心의 教育을 한다 하거니와 여기의 核心은 研究方法論에 있다고 믿는 바이다. 認識論과 科學哲學의 運營化・具現化가 研究方法論이며 美國學界에서 이 分野는 組織行爲 및 行政學分野에서 지난 15~6年間 엄청난 發展을 하였고 心理學, 社會學, 教育心理學, 生物學, 生化學 等에서는 그보다 훨씬 더 오래前부터 研究方法論이 發展하였지만 그 分野도 우리 學界에서는 學部教育 中心이라 큰 發展이 안 보이는 것은 筆者가 寡聞한 탓인지 모르겠다.

社會科學方法論 및 近來에 들어와서 美國學界에서 急速한 發展을 보인 行動科學方法論이 統計學, 認識論 및 科學哲學과 密接한 表裏의 關係에 있는 것이 事實이지만 近來 우리 學界一角에서 나타난 것처럼 科學과 哲學의 또는 人文學과의 境界가 없는 것도 아니고, 또 그들의 主張처럼 上位의 哲學이 下命하는 (Dictate) 演繹의 關係에 있는 것도 아니다. 그렇다고 一部 極端의인 行動科學者들의 主張처럼 科學界內에서의 獨立的이고 他學問에 對하여 排他的인 것도 아니다. 社會科學의 發展과 研究方法論은 相互密接한 關係에 있으며 여기서는 問題는 “아는 것”을 “어떻게 아느냐”라는 認識論의인 問題로서 이것이 바로 哲學의인 問題이므로 哲學者에게 맡겨야 한다고 생각하고 또 哲學者들이 나서서 解決해야 한다고 생각하는 것이 우리 學界의 지난 70年代의 주된 흐름이었고 또 대부분 學者들이나 識者들이 無關心 乃至 盲目的으로 追從하였던 것 같다. 이와 對照되는 歐美的 實證主義 哲學者들은 自然科學者나 社會科學者 및 行動科學者들에게서 계속 배우고 살펴 보며 다시 哲學의인 次元에서 整理해 보는 겸허하고 歸納的인 接近을 하였던 것 같다. 우리 學界에서 行動科學者들이 어이없이 認識論的인 論爭에서 慘敗를 당한 것은 科學哲學, 統計學, 認識論 및 研究方法論의 武裝이 잘 되어 있지 못한 데서 온 것 같다. 이유는 무엇이든 社會科學 方法論과 哲學과의 關係는 相互獨自論을 가지며 自律性을 가지면서 또 相互作用 및 相互依存하는 바이의 中間地帶가 科學哲學인 것 같다.

이와 같이 “안다고 생각하는 것”에 대한 “어떻게 안다고 할 수 있느냐”라고 끊임없는 質問에 대한 끊임없는 對應에서 研究方法論의 많은 發展을 가져 왔으며 이와 같은 知性的이고 지속적인 探求는 오래전부터 있어 온 文明 發達의 軌跡이기도 하다.

言語로서 人間이 動物과 다른 엄청난 發展과 進化 및 文明을 構築할 수 있었음에도 不拘하고 言語의 不完全性 不正確性을 깨닫게 되자 古代 東西에서 論理學의 發達로 막아 보려 했고 西洋에서의 中世와 東洋에서의 유교전성기에 政治權力과 社會의 계층화 및 권위의 論

理로서 無分別의이고 奔忙한 思惟의 飛翔을 억지로 制御하려고 하였다. 이와 같은 思惟의 無原則性은 새로운 發展의 可能性과 同時에 社會의 또는 集團의 自殺行爲에 이르는 精神疾患의 大量化에 이르는 두가지 相反된 結果에 도달한 바 또 그 限界를 굽기가 아주 어렵다는 데서 人類史의 社會制度化的 苦悶이 있다고도 볼 수 있겠다.

이와 같은 人間의 知的 에너지 또는 能力의 寄與機能을 極大化하고 破壞機能을 極少化하는 것이 實事求是의 實證主義이며 知的 活動에서 感情, 偏見, 價值觀에서 벗어나 森羅萬象의 事實을 더하지도 말고 빼지도 말며 있는 그대로 인식하자는 最小限度的 約束에서 自然科學과 社會科學의 發展이 急速히 왔던 것이다.

그러나 여기에 問題가 없는 것이 아니므로 補完하기 爲한 美國 新左派의 支柱가 되었던 實存主義 및 現象學派 哲學의 一部가 偏頗의으로 導入되어 우리나라에서는 軟弱한 實證主義者和 行動科學者들을 罵倒 窒息하기에 이르도록 한 것 같다. 이들 간의 相互補完의 發展과 共存이 아쉬울 뿐이다. 人間이 “아는 것”을 “어떻게 아느냐”라는 끊임없는 質問이 古代부터 論理學의 發達에서 나타났고 實事求是에서 나타났다. 또 數學 및 統計學의 論理의 開發 援用과 研究方法論의 發展에서 나타났으며 近來에는 實證哲學과 現象哲學의 批評도 受容할 수 있는 可能性도 內包한다. 그러나 用語의 統一, 分科學問의 相互調整의 研究라는 行動科學과 高度로 發展하는 過程에 있는 多變數推理 統計學이라는 精密한 高速 論理體系와 高性能 「컴퓨터」의 活用 等도 人間의 思惟에서 오는 誤謬을 克服하려는 人類의 끊임없는 努力의 過程의 한 모습이라고 말할 수 밖에 없을 것 같다.

우리 學界가 지난 10餘年間 社會科學과 人文學 間에 境界가 없듯이 흐른 것 같다. 主觀性인 價值(當爲—Sollen)와 客觀性인 經驗性的(實存—Sein) 完全한 分離가 어려운 것도 事實이다. 그러나 그 強調의 差異, 配分의 差異만은 지키지 않을 수 없으며 그 經驗性이나 客觀性이라는 價值, 前提 또는 目標 및 보편 타당성을 흔들어 버리면 우리는 最小限의 合意點도 잃게 되며 科學이라는 用語를 버리고 學問이라고 하는 것이 더 솔직한 行動이 아닐까하고 생각한다. 그리고 美國의 極端的인 行動科學者들이 非難하는 “편안한 안락의자에 앉은 億測과 幻想”에 (Intuition, hunches and fantasies of easy relaxed armchairing) 대꾸조차도 할 수 없지 않을까 하고 생각한다.

여하튼 우리 學界가 大學院 中心의 教育을 實施한다는 것은 우리가 좀 더 嚴格하고 正確한 (自律의으로 統制된) 思惟(概念化와 推理에서 科學의 四大 機能인 說明, 理解, 豫測 및 統制)를 한다는 것으로 생각된다. 이것은 또한 우리 大學의 相對的 獨立性과 研究方法 水準의 向上이 그 眞面目이라고 생각되며 이 向方에 적은 寄與를 해보려는 데 이 粗雜한 小稿

의 目的이 있다.

大體로 美國의 行動科學의 三大支柱인 心理學, 社會學 및 人類學에서 獨自的으로 發達된 認識論과 研究方法論으로는 實驗研究法・現場研究法 및 事例研究法 등이 있다.

이들 間에 認識論의 論爭이 그 強弱點으로 나타나는 바 本小論에서는 이와 같은 論爭을 科學哲學과 最近 發達을 한 多變數 推理統計學의 認識論에 비추어 再照明하여 새로운 體系下에 整理하여 본 것이다. 人類學의 事例研究法의 假說探索發生的(Hypothesis generating) 特性은 嚴格性과 客觀性이 弱한 것이 흠이고 假說檢證의(Hypothesis Testing)인 實驗法과 現場法의 機能이 달라 後者들만 論하였다.

相反되는 研究方法論(resarch design)의 強點과 弱點에 絕對性이 있듯이 어떤 眞空狀態에 實存하고 있는 것은 아니다. 이와 같은 特定方法論의 強弱點은 特定時代의 推理過程과 可用한 研究方法論과 뒤엉켜 있을 뿐이다. 이와 같은 研究方法論의 強弱點은 또한 科學者들이 다른 認識論에 影響을 입고 있는 것을 反映한다. 이와 같은 認識論과 推理過程은 原子主義(atomism), 總體主義(Holism) 및 因果推理論理(Causal Inference)와 連關된 數學的 論理體系의 發達過程에 달려 있다고 보아진다.

다른 認識論의 背景을 學論한 뒤에 傳統的 二大 研究方法論의 評價를 近來 組織理論研究 등에서 나타난 變遷하는 認識論에 비추어 再評價하고 있다.

이와 같은 變遷하는 認識論은 一般시스템理論과 多變數推理統計學의 發展에서 오는 것으로 思料된다. 資料蒐集戰略의 몇가지 技法의 強弱點도 또한 現場研究法의 一部로서 간략히 다루어지고 있다.