5-1-2002

The Role of Paradigms in the Social Sciences

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Honors Senior Project
Proposal

Form 1 - Submitted at beginning of project proposal as soon as student and advisor set on project.

Proposed Title: The Role of Paradigms in the Social Sciences

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Received in Honors Office: 5/1/02
(date)

Approved by Honors Council: 5/1/02
(date)

Signature of Honors Program Director: [signature]

Honors Senior Project
Abstract

Form 2 – Complete and return with Form 1.

After conferring with your project mentor, briefly describe your overall project as follows: 1) discuss the problem(s)/issues(s) you plan to pursue/investigate and state your objective(s); 2) set forth the question(s) you will attempt to answer and/or hypotheses you plan to test; 3) tentatively explain your plan to answer the questions and/or test the hypotheses by describing your methods. This abstract should be brief, but complete so that anyone who reads it will know what you plan to do. The abstract should fit on this page and be returned with a completed Form 1.

The problem I intend to investigate in this paper is one aspect of the process of knowledge-gathering in the social sciences. Through an investigation of the nature of the objects-of-study I hope to demonstrate the varying levels of skepticism that result from studying the physical sciences, the historical social sciences, and the contemporary social sciences. The way in which I will pursue this is through a critical look at the nature of the objects-of-study of the three disciplines and evaluating the validity of the nature and way that we characterizes these objects.

Honors Senior Project
Approval

Form 3 – Submit with completed thesis. All signatures must be obtained.

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Department: PHILOSOPHY

Degree: Bachelor of Arts

Full title of project: The Role of Paradigms in the Social Sciences

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Approved by:

Project Advisor	Date 5/1/02
Department Chair	Date 5/1/02
Honors Program Director for Honors Council	Date 5/1/02

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Abstract

The problem I intend to investigate in this paper is one aspect of the process of knowledge-gathering in the social sciences. Through an investigation of the nature of objects-of-study I hope to demonstrate the varying levels of skepticism that result form studying the physical sciences, the historical social sciences and the contemporary social science. The way in which I will pursue this is through a critical look at the nature of the objects-of-study of thee three disciplines and evaluating the nature and way that we characterize these objects.

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The Role of Paradigms in the Social Sciences

Natural Science, before the work of Kuhn, was widely seen as an objective activity that captured truth and that was much more organized and understandable than the complex machinations of other aspects of society such as politics, gender role, or other things studied by what are now called the social sciences. Kuhn develops a very compelling argument that society and the conceptual frameworks that issue from the conventions of society have influenced science. While it has become customary to apply the standards of science to every aspect of knowledge seeking, the nature of the phenomena studied may affect the degree to which the scientific process may be applied. An investigation of the nature of the phenomena studied gives the researcher insight as to which questions they are really asking when they attempt to study a social process. What may be conceived as being an abstract, methodical method for identifying unifying features of society may actually be so incredibly variable in ways that other disciplines with the label of 'science' are not, that being able to have methods for finding facts about the society as a thing-in-itself may be an impossibility.

Kuhn outlines a historically-grounded investigation of the method of scientific inquiry in The Structure of Scientific Revolutions that challenges some of the conventional assumptions about science. Kuhn does this through the concept of *paradigm* which he characterizes as an "achievement (that) [is] sufficiently unprecedented to attract an enduring group of adherents away from competing modes of

scientific activity. Simultaneously, it [is] sufficiently open-ended to leave all sorts of problems for the redefined group of practitioners to resolve" (Kuhn 10). In other words, a paradigm is a set of assumptions and methods for viewing the world that are accepted by the scientific community and provides a framework for new questions and the means for answering them.

So pervasive is the role of paradigms in our lives that individuals who operate under differing paradigms actually inhabit different worlds. "Looking at a contour map, the student sees lines on paper, the cartographer a picture of terrain. Looking at a bubble-chamber photograph, the student sees confused and broken lines, the physicist a record of familiar sub nuclear events" (Kuhn 11). Only after repeated exercises to understand and interpret the data does "... the student becomes an inhabitant of the scientist's world, seeing what the scientist sees and responding as the scientist does" (Kuhn 11). As the student learns the methods and rules for the new world, "... the world of his research will seem, here and there, incommensurable with the one he had inhabited before" (Kuhn 112). Kuhn argues here that an individual's world actually changes with the adoption of a new or different paradigm. Interestingly enough, Kuhn pulls evidence for this claim from the work of psychologists. The experiment that Kuhn sites deals with a subject that wears goggles that appear to invert the world. Initially, while viewing the world as upside down, the subject experiences extreme disorientation. "But after the subject has begun to learn to deal with his new world, his entire visual field flips over, usually after an intervening period in which vision is simply confused. Thereafter, objects are again seen as they had been before the goggles were put on" (Kuhn 112).

Kuhn goes further to define normal science as a puzzle-solving activity. After a paradigm has been adopted are "all sorts of problems for the redefined group of practitioners to resolve" (Kuhn 10). The paradigm gives the researchers the framework within which to pursue the solutions to these problems. Occasionally, old problems are discarded as nonsensical due to the incommensurability of paradigms. Just as old problems may become obsolete, new problems and issues emerge. The scientist therefore has the problems and the tools necessary to find a solution, such is the activity of normal science. Normal science does not engage fundamental issues or problems, but problems that fit the paradigm. In a sense, it becomes a process of puzzle-solving in which there is an answer and one has the tools to discover it, the puzzle must simply be put together (Kuhn 37).

It is only out of the activity of normal science that anomaly can emerge. Anomalies are problems of normal science that are regarded as insoluble in the boundaries of the paradigm in use. The tools that the paradigm allows for are insufficient for the problem being investigated and one particular phenomenon cannot be accounted for. The paradigm, in its use for answering questions within its realm of inquiry, must find an avenue that will allow for the phenomena to be addressed. Occasionally minor modifications to the paradigm are made such as adding constants or redefining aspects of the paradigm. Very rarely, an anomaly develops that the paradigm is thought to be unable to answer. This anomaly may be insignificant in which case it is ignored. This anomaly may be significant, yet the paradigm performs so well that the problem is subverted and suppressed. If the anomaly is seen as a substantial problem by enough of

the right people and cannot be accounted for by changing the current paradigm, a crisis results.

An example of this system of anomalies and crisis is the recent revolution of quantum mechanics. A particular problem emerged as to the nature of sub-atomic particles such as electrons and photons. A number of experiments were run that seemed to indicate that these particles acted sometimes as wave and at other times as particles. There exists areas in which a particle can be found. In the realm of chemistry, electrons can be found within certain areas around a nucleus in an atom. These areas in which they can be found are called orbitals, namely because they are areas in which the electron orbits the nucleus. The electrons move in orbit around the nucleus and this movement and the kinetic energy that makes it possible prevents the negative charged electrons from being pulled into the nucleus.

In 1924, do Broglie, a French physicist proposed the idea that electrons have wave-like properties in addition to their particle-like properties (Bruice 5). This proposition challenged the paradigm in place which prevented a particle from being at once a tangible particle and an intangible wave. The version of quantum mechanics most useful to chemists was proposed by Erwin Schrodinger. Schrodinger proposed that each electron has a wave function. If one solves the function, then one can find the volume of space around the nucleus that the electron may be found in. Yet, there are areas in between portions of this orbital in which the electron cannot be found. These areas in which the electron can not be found are called 'nodes'. A particle would, however, need to transverse this space in order to occupy other areas of the orbital. This means that the particle, the electron, must pass through a space in which it is impossible for it to be

found. This means that the particle must occupy a space in which it can never be, an obvious problem. Conceiving the electron as a particle makes this opportunity impossible, and so an anomaly emerged as a result of this experimentation. This discrepancy creates a situation in which the electron possesses the qualities of a wave until measured, and then the wave function collapses into a locality. As a result of this, one cannot determine both the location and trajectory of a particle. It is not the case that we merely do not have the necessary tools to discover this aspect of the particle, it literally is impossible. This level of indeterminacy greatly concerned Albert Einstein to the point at which he defiantly stated, "God does not dice".

This revolution is an excellent example of the concept of anomaly that Kuhn wishes to develop. Kuhn is careful to indicate that anomalies are only disparities between what a scientist expects and what a scientist discovers as a result of experimentation. "Discovery commences with the awareness of anomaly, i.e., with the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science" (Kuhn 52). The researcher's expectations are driven by his paradigm and his world view. The expectations can be seen in the aspect of making hypotheses. This particular statement that Kuhn makes is surprising, for he attributes the source of the anomaly as 'nature' violating the paradigm forced upon it. Using the puzzle metaphor, one way to understand an anomaly is that it appears as a result of one not having enough pieces to solve the puzzle. Another possibility of anomaly, staying with the puzzle metapho,r is that you have pieces that do not combine to form the puzzle's solution. The first possibility would result in additional pieces, or tools, provided by an adapted paradigm. The second possibility displays a condition in which a crisis will

occur. The entire framework of the puzzle pieces must be changed in order to accommodate the inability to solve the puzzle.

The example also shows the possibility for crisis and the resolution of crisis. Einstein was a prominent figure in the science of physics at the time and he strongly resisted the revolution of quantum mechanics. Einstein attempted to suppress the anomaly and accommodate his own theory of relativity to incorporate this anomaly. However, other prominent scientists viewed this anomaly as a serious problem that relativity could not incorporate. With enough prominent scientists opposed to relativity, the paradigm of relativity was in crisis and the paradigm of quantum mechanics developed to cope with the new found anomalies.

The attribution of nature to anomaly presents the picture of some objective reality that we are dealing with. Things-in-themselves, to use the Kantian term, have properties that are independent of our understanding. The objects as we understand them have been given properties that may or may not be properties that they posses outside of our understanding of them. Furthermore, as we attempt to understand the objects and find their 'true' nature, we find that they posses qualities that will resist our conceptualizations. As we attempt to impose our concepts onto the object, its natural properties which it possesses outside of our experience, prevent us from accurately assigning our conflicting conceptual properties. However, due to the uncertainty of the exact nature of these properties, we can not ever know their true identity with certainty. Since there is no access to these objects outside of the realm of human experience, we can never be sure as to whether the properties we believe them to have are the actual objective properties of the things-in-themselves.

We can, however, know if and when our conceptual properties are misplaced. The nature of anomaly may not be able to tell us with certainty when we are right, but it can easily tell us when we are wrong. If the possibilities of a combination of properties were not endless and all of our conceptual properties would, in every false instance, conflict with the properties of the object whenever they were not possessed by the thing-in-itself, we could discover the object's properties with certainty. Unfortunately, due to the nature of objective reality, to assert such a thing would be to beg the question. In order to ascertain that the thing-in-itself's objective properties would, in all cases of falsity, conflict with the conceptual properties we impose on it, we would need to know this as a property *of the properties* of the thing-in-itself. The properties being out of reach by being just as objective as the thing-in-itself prevents this knowledge because of an infinite regress. In order to know anything about the objective properties of a thing-in-itself, we would have to have an equally objective understanding of those properties.

This all gives insight to the nature of the thing-in-itself under study in the physical sciences. The thing-in-itself has properties that are assigned to it in our own conceptual framework that enables us to understand it. These conceptual properties may or may not match the objective properties of the thing-in-itself and there will always be a level of skepticism about the properties we expect an thing-in-itself to possess. We may, in fact, develop a paradigm that allows for the attribution of properties that are sufficient to satisfy all potential anomalies, such is the goal of the physical sciences. We will, however, never be certain that the properties are merely the necessary properties of the thing-in-itself and may be left with extra properties that we attribute to the thing-in-itself that are not be objective properties of the thing-in-itself. Regardless, the objective

properties of the thing-in-itself make themselves known when we attempt to impose conflicting conceptual properties to the objects. These anomalies keep us accurate and allows us to present our theories as convincing representations of objective reality.

Now that there is some understanding of the nature of the objects under study with the physical sciences, it is time to compare and contrast the nature of these objects of study to the objects of study in the social sciences. Social science is defined as a branch of science that deals with the institutions and functioning of human society and with the interpersonal relationships of individual members of a society. A society is an enduring and cooperating social group whose members have developed organized patterns of relationships through interaction with one another. These definitions garnered from the Webster's dictionary dictate a definition that allows the inclusion of the following fields in addition to others: psychology, sociology, and anthropology. Some examples of the processes of specific instances of social science may provide insight to the objects of study and the way that these objects are studied.

In the study of ancient Roman society, history has long taken a patriarchal focus of the historical evidence. The activities of the completely male army and the male emperors dominated the study of ancient Rome for decades. Certain authors gave passing interest to the women of ancient Rome, but since these women were unable to hold political office or join the army, they were largely regarded as inconsequential in the operations of the empire. An interest in the role of women in the ancient Roman republic and empire originated with the advent of the women's liberation movement. In 1962, Richard Balsdon was revolutionary in his book, Roman Women. For the first time, women in ancient Roman society were studied independently of men as possible.

Balsdon even affectionately labeled one chapter "Emancipation of Women" which reflects suspiciously on the developments of our own society.

As a result of the paradigm shift of the roles that women could play in our society, there was a shadow of our own society appearing on the society of the ancient Romans. Balsdon was the first to publish a book entirely devoted to the women of ancient Rome. Others followed suit and currently biographical data of the imperial women of ancient Rome are appearing. Further evidence of our own society throwing shadows on the way in which we look at ancient Rome appear with the investigation of the nature of Livia, the wife of Augustus. The investigation of this woman's influence on her emperor husband begins concurrently with the growing role of the first lady in our own presidential institution. The investigation begins in earnest at the same time that Nancy Reagan and Barbara Bush begin their public interest in manipulating policy through their husband. In the ancient art historical world, which is closely linked to the anthropological world, people began to look at how much influence Livia had over Augustus.

In fact, in the investigation there were many political references that blatantly demonstrate how our own society affects our scientific paradigms of history and dictates the questions that we are asked in our investigations of ancient Rome. Susan E. Wood, a very prominent and respected scholar in the area of the Roman Imperial period states in her introduction, "During the past two decades, however, concurrent with the growth of interest in women's history and gender studies, this picture has changed, and more and more scholars, not all of them women and not all of them ideologically feminist, have devoted historical, art-historical, and archaeological studies to the women of Roman antiquity" (Wood 3). Here the role of the assumptions of our own current social

interactions affect the way in which we look at the anthropological evidence of the ancient Romans.

As a result of the changes we experience in our own society, we begin to question our ancient sources, developing ways to discredit them. For instance, Susan Wood attempts to discredit Tacitus' work The Twelve Caesars. She states, "Many ancient historians, most notably Tacitus, frequently represent the actions of women behind the political scenes as embodying capricious and unscrupulous abuses of those powers. Whether Tacitus was misogynistic in a pathological sense or not, he was fully willing to exploit the prejudices against women to arouse the indignation of his readers" (Wood 10). This primary source evidence is questioned only as a result of our own society and the way that our own society has framed the questions that we can ask. We begin to see that women played the part in ancient Roman society that they play in our current society. According to Kuhn's notion of the world view, the society of ancient Rome changes with our own society's paradigm influencing developments.

When looking at the society of ancient Rome, so much interpretation is involved that one can see clearly and distinctly the shadow of our present society on the image of the past society. The paradigm of gender roles that we perceive now are applied to the conception of gender roles of the past. Historians dealing with only minute evidence must postulate most of the conditions that are not directly reported on. Even when there are direct reports, however, there is a level of skepticism as to whether they are accurate or not. If the reports conflict with our own current situation then the aspects of the evidence that had remained unquestioned for a long period of time become anomalies as a result of a paradigm shift. According to Kuhn, there are varying ways in which an

conceptualize and understand them. What we do know for certain about these objects is that the properties that we have attributed to them that are in conflict with the actual properties of the thing-in-itself are incorrect. In a sense, we can only be sure we are wrong about the properties and never sure that we are right.

Moving to the anthropological, art-historical, historical picture of ancient Rome, we know that there was some reality that existed. We have connections directly to that time and place through our primary source evidence. Unfortunately, we do not have a complete picture of the time and place. We have sculptures and artifacts, manuscripts and histories, and most of all, we have skepticism. We know that the sculptures are from the time period, but the motives behind them are unknown. We have artifacts that can be attributed to the time and place, yet we only know scarce information about their function. We have histories of ancient scholars, yet they were recorded after the fact and not contemporary to the occurrences. The sculptures and the artifacts serve their obvious role in society whether they are coinage used for currency or sculptures to commemorate deities or prominent figures. The histories of the ancients may have a political flavor to them, seeking to please those in power rather than telling the facts of the matter. Flattery may have taken precedence over recording truth.

Following this description of what we can know about things-in-themselves from the physical sciences and ancient Rome, it appears that methods of study and the amount of skepticism concerning ancient Rome is very similar in nature to the objects of study for the physical sciences. We do not have any knowledge of Rome with certainty. We only know about the access we have to Rome, primarily the evidence that is listed above. Rome remains in the same realm as things-in-themselves. The artifacts that we have of

Rome are like our perceptions of things-in-themselves. The interpretations of these artifacts are like the properties we assign things-in-themselves. While we can be certain about some aspects of the artifacts just as we can be relatively certain about our experience of reality, we can only postulate what these artifacts meant to the ancient Romans. We can assign properties to ancient Rome, just as we do to things-in-themselves, yet we certainly cannot know the properties that ancient Rome possessed with complete certainty.

It appears, however, that we do have direct knowledge of the society we live in. Upon further investigation, perhaps we do not. Our own personal experience of the society in which we live is insufficient to understand the larger society that we live in. In order to say something about society, we must be able to say something about the society that we experience and also the society that we do not experience. While Kuhn has shown us that a certain level of paradigm influence is unavoidable as a result of the intrusive and inescapable role that paradigms play in out knowledge-gathering, a singular perspective of an issue is certainly not useful for truth finding. The solution to this dilemma in the social sciences is to conduct research using anything from random polling sampling to large, longitudinal studies. This introduces a level of distance and that same skepticism that plagues all of our other knowledge-seeking. When such an undertaking is managed, one has to ask whether the random sampling actually reflect the population as a whole.

The assumption that is inherent in the studies of the physical world of things-in-themselves is that all objects under observation have some of the same properties, and in some respects, are indistinguishable from each other. For instance, electrons, regardless

of what atomic nucleus they are orbiting, are identical in all respects in relation to themselves. The difference between two electrons comes from their relation to the particles around them such as distance from the nucleus, distance from each other, and their bond relationship between to atoms. These relationships that affect the electron's behavior are not attributed to the electron itself, because the individual electron can be interchanged with any other electron and this replacement is assumed to behave the same way. The particular electron in this series of relationships is arbitrary, it is only the relationships which distinguish the electron from other electrons.

.Ancient Rome is a different object-of-study yet has some of the same characteristics as the object-of-study of the physical sciences. Rome, as we conceive of it is a construction of the constituent parts of the historical records and artifacts that have been discovered. Yet, in questioning these artifacts, we question the validity of all of the artifacts. Only certain artifacts are representations of ancient Rome. Additionally, what may be representative for one area of a very vast and diverse empire may not reflect any other area in the empire. This is similar to the conditions of the electron. Those characteristics evident in artifacts that represent the entire empire would be characteristics similar to the characteristics that electron's possess independent of the relationships that affect their behavior. The condition of the unique or limited characteristic is similar to the characteristics that electron's possess as a result of their relationships. The characteristics can vary from being representative of the thing-in-itself as a whole, to being characteristics that are dependent on the context of the measurement of the thing-in-itself.

This relationship cannot be easily seen in the realm of the social sciences. The study of society or of the individuals in that society possess such varying characteristics from both the relation-independent and relation-dependent aspects of characteristics that generalizations are difficult to find. These generalizations may not, due to the vast possibility of variance between individuals, even exist. As each individual struggles with their own individual experiences and the influence of paradigms and other social institutions on their conceptions, the individual becomes greatly differentiated from even the most similar individual. The generalizations made between individuals may only be accurate at a very superficial level with a very precise definition of the superficial characteristic. Ultimately, it may be the case, that the variance between any two individuals is so great that generalizations are impossible. Additionally, these individuals that are measured and studied change over time. There is no guarantee that the measurement of the individual will persist even over a short period of time. In the case of historical social science and the physical sciences, there are at least some characteristics that will definitely persist over time. These conceptions of the individual and it's characteristics creates an epistemic condition that is not found in the physical sciences or the historical social sciences.

Methodologically speaking, the investigation of any given individual, even if randomly selected, cannot give an accurate representation of the entire society. Following the scientific model, the assumption that each individual is a representation of the society on the whole, or even that a large portion of the population can represent the population as a whole, relies on an assumption that we know to be false. We once thought that our science, like the objects physical science studies, was independent of the

researcher conducting the science. We then mapped this scientific process as a whole on to the social realm, keeping the same assumptions that we had previously. Social scientists have been attempting to assume that the world which they are studying is just as measurable as the physical world outside our experience. Difficulties emerge due to the nature of the objects-of-study. The differentiation of the individual is so complex and varying, generalizations are difficult or impossible to assert.

All of these epistemological problems are a result of the particular metaphysical picture that Kuhn presents. The question that must then be asked is whether or not Kuhn is right in his metaphysical stance. The line between science and social science is determined by the relation of social science to the physical sciences. The social sciences are not given precedence for being scientific over the physical sciences probably because they are considered new sciences. The question of whether the social sciences are actual sciences depends heavily on the definition of science that we are currently seeking in the wake of Kuhn's work. Perhaps, when we finally decide on what science is, the definition that results may indicate that the social sciences are more scientific than the physical sciences. The nation that we live in, and the world at large is continually attempting to cope with the issues that Kuhn has raised. Perhaps it would be better to not attempt to follow a scientific tradition, after all we may not decide that being a science is such a good thing after all.

Bibliography and Acknowledgement

I would like to thank Dr. Andrew Cling for his assistance, patience, and critical evaluation in regards to this project.

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