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“ Science is best defined as a careful, disciplined, logical search for knowledge about any and all aspects of the universe, obtained by examination of the best available evidence and always subject to correction and improvement upon [the] discovery of better evidence. ” - James Randi (1987) Earl R. Babbie advocated that a discipline became a science when it collectively placed increased emphasis on systematic questioning of an event or situation or occurrence instead of in its description.

This may be achieved through discreet observation of a social or natural phenomenon or phenomena; formulation of ideas and theories; and usage of methodologies. Babbie proposed eight (8) criteria a discipline should follow in order to become a science. The criteria which I will expound on in this essay are: parsimony, openness to modification, inter-subjectivity, generality, empirical verification, determinism, specificity and logicity. The relationship between physical or natural sciences and social sciences is correlated since they share the same rules / laws, regulations and guidelines.

In research, the investigator or researcher seeks maximum deducing power of as little variables as possible without adding complexity or complication to the experiment or research. This process is known as ensuring parsimony. For example, some people suspect that crop circles are due in some way to extraterrestrial influence, whether directly or otherwise. Others suggest that the patterns are the work of dedicated artists or hoaxers and very much an earthly occurrence.

On the face of it, then, especially given that the latter group has been able to demonstrate the construction of a crop circle, there is no need to imagine

aliens to account for why farmer's fields are routinely invaded in this fashion. If we wish to hold to economy of thought, we should pick the simpler explanation. Researchers are said to be stingy in obtaining the best results from their research or investigations because they are trying to obtain the best results possible with as little effort to do so.

This criterion is important since the researcher has a tendency to be over-careful in acquiring the results desired. In the late 15th century and the early 16th century, Amerigo Vespucci (America's etymon), an Italian map-maker, believed that the world was a flat circular orb. Navigators and map-makers alike believed that in order to travel from their location – the Eastern Hemisphere, to the Western Hemisphere one should sail east. However, Christopher Columbus' 1492 accidental voyage disproved this belief since he travelled due west into the Western Hemisphere.

Upon his return to Spain, map-makers and navigators alike realized the importance of this discovery. It not only meant that sailors could travel due west into the Western Hemisphere and beyond into the Eastern Hemisphere, but that the earth was round or spherical. As a result of this discovery, geography – the science of the physical nature of the Earth, experienced modification. Modification or change is not always readily accepted in any theory since it implies that other ostensibly sound theories could change. However, no social or scientific theory may endure indefinitely.

Another important criterion proposed by Babbie is inter-subjectivity. When a researcher is about to conduct a study or investigation, they scrutinize the results obtained by other researchers in the experiment and in the same

field or subject matter. Based on the results accomplished by another, they formulate the foundation or basic guideline of their research. In other words, they undergo an investigation with the expectation to replicate the same or similar results based on the subject matter of the research as a starting point according to the details provided.

An example of inter-subjectivity is a performer, whether a professional on a stage or someone telling stories in a bar, finds new life injected into their act by the reaction of the audience—and of course the audience responds to the freshness of the performance. A joke being retold for the thousandth time can seem funny even to the teller, with a “ good” audience. This probably means that the performer/audience relationship is good. It may even be that sometimes no particular reaction is required, the performer gaining the boost just by putting himself in the shoes of someone to whom the routine is new.

All research should have the ability to be generalized so that other investigators of similar design can access and follow with little hindrance. An example of generalizability in everyday life involves driving. Operating an automobile in traffic requires that drivers make assumptions about the likely outcome of certain actions. When approaching an intersection where one driver is preparing to turn left, the driver going straight through the intersection assumes that the left-turning driver will yield the right of way before turning.

The driver passing through the intersection applies this assumption cautiously, recognizing the possibility that the other driver might turn

prematurely. Most American drivers also generalize that everyone will drive on the right hand side of the road. Yet if we try to generalize this assumption to other settings, such as England, we will be making a potentially disastrous mistake. Thus, it is obvious that generalizations are necessary for forming coherent interpretations in many different situations, but researchers should not expect their generalizations to operate the same way in every circumstance.

With enough evidence they can make predictions about human behavior, yet simultaneously recognize that these assumptions are based on statistical probability. Empirical Verification is defined as the testing of a scientific proposition or theory for maximum application in the real world. Consider the following illustration. Many studies concerning mental health among ethnic minorities have used the concept of acculturation as a model of explanation, in particular J. W. Berry's model of acculturative stress. But Berry's theory has only been empirically verified a few times.

The aims of another study was to examine whether Berry's hypothesis about the connection between acculturation and mental health can be empirically verified for Greenlanders living in Denmark and to analyse whether acculturation plays a significant role for mental health among Greenlanders living in Denmark. Acculturation was assessed from answers to questions about how the respondents value the fact that children maintain their traditional cultural identity as Greenlanders and how well the respondents speak Greenlandic and Danish.

There was no connection between Berry's definition of acculturation and mental health among Greenlanders in Denmark. On the other hand, other findings showed a significant relation between mental health and gender, age, marital position, occupation and long-term illness. Therefore, acculturation plays a lesser role for mental health among Greenlanders in Denmark than socio-demographic and socio-economic factors, hence we cannot empirically verify Berry's hypothesis.

From this illustration, it may be said that the researchers utilized a pragmatic environment in which they could disprove J. W. Berry's model of acculturative stress. As with natural scientists, social scientists suggest that an event occurs for a particular reason or for a variety of reasons. Things do not "just happen"; every situation or occurrence has an antecedent determinant. In natural science, the early scientist Sir Isaac Newton formulated three laws of thermodynamics. I will use his third law as the basis for my point on determinism.

His law postulates that every action has an opposite and equal reaction. If you push on anything, it pushes back on you. That's why if you lean against the wall, you don't just fall through it. The wall pushes back on you as hard as you push on it, and you and the wall stay in place. If you throw something, you put more force behind it than just leaning on it, so it pushes back with more force. This is hard to observe, because usually, if you throw something away from you, the friction between you and the floor makes resistance to keep you in place.

The power and utility of the principle of specificity is clearly observable in the general methodology of science which encourages social scientists and natural scientists to achieve actuality and precision. These attributes are essential in an observed event since the observer must be cognizant of the peculiarities of things under specific conditions. This principle of specificity is intimately related to the principle of relativity in that the components of scientific systems are dependent upon each other.

In consequence, observers must take into account the unique characteristics of the various components of any system and the interrelationship of the components in their complexity with other factors in specific fields. It is extremely crucial in social science that exhaustive consideration is given to the choice of method to be used in measuring gathered data since the researcher, experimenter or investigator usually discusses this critical area of the entire survey briefly.

Social scientists seek to understand the rationale for individual social behavior whereas physical or natural scientists seek to gather statistics to interpret and analyze events in a particular environment. Both groups of scientists follow the same ethical procedures and logical constraints. The social sciences are aimed at the coherent understanding of social behavior. In other words, the natural scientists and the social scientists equally utilize deductive and inductive logics in acquiring a theory. Deductive reasoning works from the general to the specific.

The deductive reasoning works as follows: thinks of a theory about a topic and then narrows it down to a specific hypothesis (hypothesis that we test or

can test). Expounds further if we desire to collect observations for hypothesis (to accept or reject hypothesis and to confirm or refute the original theory).

In a conclusion, when we use deduction we reason from general principles to specific cases, as in applying a mathematical theorem to a particular problem or in citing a law of physics to predict the outcome of an experiment.

Inductive reasoning is the opposite; it works from observation (s) works toward generalizations and theories. Inductive reason starts from specific observations (or measurements); a search for patterns or no patterns; regularities or irregularities; formulation of a feasible hypothesis; and the development of general theories or conclusion (s). In a conclusion, when we use induction we observe a number of specific instances and from them infer a general principle or law.

In conclusion, a discipline became a science by fortifying its domains with theoretical models according to those of a natural science thus leading to inflexibility and dogmatic as they proceeded to deal with reality on the basis of certain assumptions and theories. Being the axioms or starting points for an entire discipline these cannot be challenged without undermining its activity and usage. This may be best accomplished through the proposed criteria of Earl Babbie: parsimony, openness to modification, intersubjectivity, generality, empirical verification, determinism, specificity and logicity.