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## Understanding Mechanistic Explanation as A Strategy of Analytical Sociology

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### ABSTRACT

Although Analytical Sociology is not often used in mainstream Sociology, its history is, however, traceable to the classical works of scholars such as Emile Durkheim, Max Weber, Alexis de Tocqueville as well as contemporary sociological thinkers like Talcott Parsons and Robert Merton, among others. This paper provides a contemporary argument for the application of mechanistic explanation in the overall understanding of Analytical Sociology using relevant and practical examples. In the course of this, attention has been paid to the concept of explanation and its various types in a sociological discourse. This paper therefore argues that social reality can significantly be understood only when explanations are systematic and detailed in content and context. The conclusion is that analytical sociology can explain the actions of social actors within the social environment beyond some social doubts, even though, not all situations, can be sufficiently explained with the strategy.

### INTRODUCTION

The social world is characterized by complex events and situations. These events and situations require a well-detailed and meticulous strategy to understand them. Sociology, for instance, is preoccupied with the task of providing reasonable and acceptable explanations to social issues. According to Coleman (1990), “a central problem in social science is that accounting for the functioning of some kind of social system”... yet, “the principal task of the social sciences lies in the explanation of social phenomena...” However, over the relatively short history of the discipline (Sociology), different scholars have put forward theories and strategies to studying this complex social world. The strengths and weaknesses of these theories and strategies have been defined by space and time.

One of such strategies which seems to gain global appreciation is the analytical-mechanistic explanation of social reality. Scholars like Hedstrom and Bearman (1989); Elster (1989); Ekstrom (1992); Demeulenaere (2011); and Little (2011) among others, have all argued for this kind of explanation in the Social Sciences particularly, Sociology. This is because Sociology is focused on

providing functional, effective, and efficient explanations of social realities. These realities are often complex, dynamic, and unpredictable and as a result, require a strategic approach to understanding or even predicting them through analytical investigation.

Craver (2007) posited that Mechanistic Explanation (ME) has become popular in recent Philosophy of Science and has influenced the thinking of many Social Scientists. However, Ylikoski (2015) added that the rise of ME particularly in social sciences predates its application and usage by Philosophers of Science. Ylikoski further added that the advocacy for ME in Social Sciences was taken by Jon Elster through his writings such as “Nuts and Bolts for the Social Sciences (1989) and “A Plea for Mechanisms” (1998).

The need for a detailed explanation of social realities for better understanding provides the basic argument of Analytical Sociology. To this end, this paper further highlights the place of mechanistic explanation in the analysis of social issues which are central to sociological discourse.

### ***The Concept of Analytical Sociology***

Analytical Sociology is a reform movement within sociology and social theory. Its identity is not based on a common object of study, a shared historical tradition in sociological theory, or an empirical research method. According to Hedstrom and Bearman (2011), Analytical Sociology can be seen as a contemporary incarnation of Robert K. Merton's well-known notion of middle-range theory.

Demeulenaere (2011) maintains that Analytical Sociology incorporates an affirmation that "social facts" are generated, triggered, produced, brought about, or "caused" by individual actions which themselves are in some sense "caused" or at least partly determined by the constraints presented by the social environments... To explain a social event therefore means to describe the various causal chains linking all the elements involved (once those elements have been appropriately described and separated) in constituting a social fact. Demeulenaere further added that analytical sociology should seek to define a set of sound epistemological and methodological principles underlying all previously established and reliable sociological findings. This means that this sociological tool should be used to bring about some philosophical and methodological confusion and division in the understanding and explanation of social reality. As rightly stated, "the aim of analytical sociology is to clarify the basic epistemological, theoretical and methodological principles fundamental to the development of sound description and explanation" (Demeulenaere, 2011).

The analytical approach is founded on the premise that proper explanations detail the 'cogs and wheels' through which social outcomes are brought about, and it is driven by a commitment to realism. Empirically false assumptions about human motivation, cognitive processes, access to information, or social relations cannot bear the explanatory burden in a mechanistic explanation no matter how well they predict the outcome to be explained (Leon-Medina, 2017). In other words, an explanation that is mechanistic in nature should be able to provide facts that are consistent with such an explanation. There is no place for "hearsay" in this analytical exercise.

Hedstrom and Bearman (2011) see analytical sociology as a strategy for understanding the social

world. It is concerned with explaining important macro-level facts such as the diffusion of various social practices, patterns of segregation, a network of structures, typical beliefs, and common ways of acting. They further maintained that analytical sociology explains by detailing mechanisms through which social facts are brought about, and these mechanisms invariably refer to individuals' actions and the relations that link actors to one another. The position of Hedstrom and Bearman implies that explaining social events and situations requires detailing a network of interrelated causality to provide a relatively complete explanation of such event (s).

Hedstrom and Udenhn (2011) opined that Merton's Middle Range Theories can be best used to illustrate the capacity and effectiveness of analytical sociological explanation. In their own words, middle-range theories "are important as ideal examples of what analytical sociological theory is all about; that is, clear and precise theories which detail the process through individuals in interaction with one another bring about the social fact to be explained". It is instructive to say that middle-range theories are often derived or based on specific empirical undertaking. Because they are products of research, their validity is always proved. Explanations provided from these research findings are always mechanistic.

In demonstrating the power of the theoretical framework of analytical sociology in explaining a large array of social phenomena, Manzo (2014) highlighted areas of focus of Analytical Sociology which include the following:

1. Provides the most complete and up-to-date theoretical treatment.
2. Looks at a wide range of complex social phenomena within a single and unitary theoretical framework.
3. Explores a variety of advanced methods to build and test theoretical models.
4. Examines how both computational modeling and experiments can be used to study the complex relation between norms, networks, and social actions.
5. Brings together research from leading global experts in the field in order to present a unique set of examples on mechanism-based sociology.

### ***Defining Social Mechanisms***

According to Ylikoski (2015), the development and popularization of social mechanisms have multiple origins. Regardless of its development, Ylikoski strongly believes that the idea of mechanism-based explanation has provided a useful platform for criticizing existing views and practices on how social scientific investigation has been conducted over the years. In this sense, a number of definitions and positions have been held on social mechanisms. A mechanism, thus, refers to a constellation of entities and activities that are organized such that they regularly bring about a particular type of outcome, and we explain an observed outcome by referring to the mechanism by which such outcomes are regularly brought about (Hedstrom and Ylikoski, 2010).

The central tenet of causal realism is a thesis about causal mechanisms or causal powers. We can only assert that there is a causal relationship between A and B if we can offer a credible hypothesis of the sort of underlying mechanism that might connect A to the occurrence of B (Little, 2011). Ekstrom had earlier put the view this way, “the essence of causal analysis is...the elucidation of the processes that generate the objects, events, and actions we seek to explain” (Ekstrom, 1992).

Little (2012) observed that the social mechanisms approach has greatly filled a theoretical gap in social explanation. It is an approach that is prominent in the emerging program of analytical sociology as well as historical sociology. Indeed, mechanisms are frequently occurring and easily recognizable causal patterns that are triggered under generally unknown conditions or with indeterminate effects (Elster, 1998).

Bunge (1997) defines a mechanism as a process in a concrete system that is capable of bringing about or preventing some change in the system. Most of these changes in the system are regular and patterned, and this is probably why Machamer, et al (2000) maintained that mechanisms are entities and activities organized such that they are productive of regular changes from start to finish. For Mayntz (2004), the social mechanism is “a sequence of causally linked events that occur repeatedly in reality if certain conditions are given and link specified initial conditions to a specific outcome”

From the various definitions of social mechanisms as given above, what is clear is that to be analytical in sociological discourse is a function of the application of mechanistic strategy of explanation. Through the adoption and application of ME (which serves as the basis for Analytical Sociology), an in-depth knowledge and understanding of social reality can be explored.

The idea of social mechanism in itself, however, does not tell us how to conceptualize human action. Rather than relying on some preconceived ideas about human motivation or cognitive processing, the mechanistic perspective suggests that social scientific accounts of human agency should be based on findings and theories from the psychological and cognitive sciences. So, while the idea of social mechanisms is quite often associated with rational choice theory (Gross, 2009), from a philosophical and general sociological point of view the connection between the two is rather weak. There is nothing in the idea of a mechanistic explanation that would require the explanation to be articulated in terms of rational choice theory. In fact, the requirement that mechanistic explanations cite the actual causes of the phenomenon to be explained often makes rational choice explanations unacceptable as they are built upon implausible psychological and sociological assumptions (Hedstrom and Ylikoski, 2010).

### ***Understanding the Concept of Explanation***

Explanations are accounts in which an occurrence is made intelligible by identifying the nature, causes, and interaction (if any). Theories are explanations. They make intelligible statements of why things occur or happen. To this end, there are terms such as explanandum (the event being explained) and explanans (the account itself).

An explanation is therefore, a set of statements usually constructed to describe a set of facts that clarifies the causes, context, and consequences of those facts. This description of the facts may establish rules or laws and may clarify the existing rules or laws about any objects, or phenomena examined. The components of an explanation can be implicit and interwoven with one another (Babbie, 2007).

Because explanations are deeply rooted in sociological discourse, every aspect is considered necessary to the overall understanding of the issues

being discussed or explained. Explanations are therefore an integral part of scientific investigation and understanding.

There are various types of explanations. These include:

1. Causal Explanations: this is the identification of an immediate precipitating cause (s) of a particular event or occurrence. This is the goal of every science (that is, to be able to identify the cause). Causal explanations presuppose spatial and temporal contiguity between events. To this end, the cause and effect must be in both spatial (space) and temporal (time). Simply put, one event precedes the other and as a result, both events cannot happen simultaneously. In addition, the second event wouldn't have occurred without the first occurrence. On the whole, researchers tend to identify causality whether in exploratory, descriptive, and correlational studies. It is therefore important to provide logical independence and necessary antecedents in causal explanation.

In social science, the two conditions for causality are never present or available. These conditions are necessary and sufficient. This is why the issue of multi causality is heavily pronounced in social science. In order to address the above complexity, Sociologists use the Regression Analysis. This simply means the establishment of the relative weight of each of the causes of such variation.

2. Deductive Explanation: this is usually deduced from established general laws or premises. There is logic in this kind of explanation. For example, all living beings are mortal, Shakum is a living being, and therefore Shakum is mortal.

3. Disposition Explanation: In everyday life, disposition explanation is common. A disposition is a tendency to behave in a certain way either in form of habit and instinct among others. For instance, one does something and people say, he/she is always like that. In other words, nothing surprises people about his or her behavior. There are two elements of disposition namely: tendency and capability. These elements may not be present for an action to take place.

4. Intention Explanation: this has been an area of debate in social sciences (Sociology). Many sociologists especially structural sociologists believe that Sociology is not interested in the reason people give rather they are interested in the outcome of their action. This is because not every intended act gets accomplished and not all accomplished acts were originally intended.

5. Functional Explanation: A functional statement or a functional explanation is one in which the consequence of some behavior or social arrangements are essential elements. A functional explanation is suggested whenever we find uniformity of the consequences of action but a great variety of behavior causing such consequences. This is purely a result of a multiplicity of causes.

Function statement or explanation can only be used for a system and a system that maintains at least one of its parts in the equilibrium. It does not presuppose an agency (action). For instance, in an open society or system like the United States of America, there is equifinality (steady-state) and equilibrium (equal end). In this case, every system has needs which Talcott Parsons refers to as a functional prerequisite. This explanation therefore looks at the relationship between traits of a system.

The practical combination of causal and functional explanations provides a platform for mechanistic explanation. It is this explanation that is argued as a strategy for the full comprehension of what has constituted analytical sociology.

#### ***Mechanistic Explanation as a Strategy for Social Analysis***

Halina (2017) asserts that the contemporary notion of Mechanistic Explanation (ME) started to emerge in the 1990s and that various accounts have been developed since then. Mechanistic is derived from mechanism and not 'mechanics' (Elster, 1998). A mechanism is a complex entity that generates certain phenomena, after receiving some input. Mechanistic explanations aim at opening the back boxes of mechanism and at understanding how the different parts work together. Complexity means, for example, the existence of multiple levels and mutual relationships between parts and whole. That is why another term for ME is a constitutive explanation.

"Sociological explanation is all about mechanisms and statistical associations and has

been so for decades”, say Hedstrom and Bearman (2011). The implication of this view is that explaining social events or realities requires a complete understanding and exclusive knowledge of what could have happened, just as observed by Elser (1989) that “to explain an event is to give an account of why it happened. Usually...this takes the form of citing an earlier event as the cause of the event we want to explain...but to cite the cause is not enough: the causal mechanism must also be provided or at least suggested”. In essence, mechanistic explanations require much more detail about those parts, their interactions, and how their coordinated activity is responsible for the explanandum capacity.

Similarly, Little (2011) opined that “to explain an outcome is to demonstrate what conditions combined to bring it about...social explanation requires that we provide accounts of the social causes of social outcomes”. He further argues that causal relations depend on the existence of real social causal mechanisms linking cause and effect. In other words, enough evidence must be provided to show the network of connections among various variables leading to the consequence of an event or phenomenon. It is when this is provided that a sufficient claim of a link between cause and effect can be established. After all, it is not enough that we demand that an explanation only provides some information about the causal process; we want to have relevant and indeed sufficient information (Ylikoski, 2011). In addition, mechanistic explanation also emphasizes the importance of intentional action in the explanation of social phenomena, it cannot subscribe to an axiomatic vision according to which a specific action theory should be used for all purposes.

Mechanistic Explanation should be approached from what Hedstrom and Bearman (2011) referred to as “Structural Individualism”; a scientific methodological doctrine where social facts are expected to be explained from the outcomes of the actions of individuals whether these actions are conscious or unconscious. For example, to explain fuel scarcity or fuel hike in Nigeria, people must see the issue beyond just the lack of payment of subsidy to the major marketers. In this kind of explanation, attention should be given, or consideration should be paid to other factors such as sabotaging the effort

of the government, making abnormal profit, attacks on oil pipelines among others.

In a ME, all available and possible variables to the cause of an effect are expected to be identified, and their role is explained to have a complete understanding of what is being explained. As expressed by Bechtel and Richardson (1993) by calling the explanations mechanistic, we are highlighting the fact that they treat the systems as producing a certain behavior in a manner analogous to that of machines... A machine is a composite of interrelated parts... that are combined in such a way that each contributes to producing a behavior of the system. A mechanistic explanation identifies these parts and their organization, showing how the behavior of the machine is a consequence of the parts and their organization.

For instance, to explain a job vacancy and filling such a position requires detailed information on what led to the vacancy in the first place and the attributes and reasons for the potential occupant of such position. The vacancy may be as a result of retirement, and the retirement may be informed by the desire for relaxation or even for creating job opportunities for others. And the person, who may eventually get the job, probably left another job thereby creating another job opportunity for others. This network or chain of vacancy and its occupancy can better be explained using a mechanistic approach. In simple terms, there is often a chain of coordinated events and these events must be understood from a complete perspective.

Looking at the issue of crude oil theft in Nigeria’s Niger Delta region, to understand the menace simply means to have a detailed and comprehensive idea of both the historical and contemporary predisposing factors and the various players or actors. It also entails that you need to understand the background of these actors and their circumstances of involvement. A study into the understanding of crude oil theft in Nigeria using ME or approach will require unbundling so many issues around the crime and the participants. In this case, the history of oil discovery in the region must be fully understood. Also, the local and international politics associated with oil exploration and exploitation needs to be understood. So, in order to provide a comprehensive sociological explanation, many related issues and factors are expected to be interrogated.

The key idea of ME is that explanation should represent the essential features of the actual causal structure that produces the observed phenomena. Thus, it is not enough that the model 'saves the phenomena.' For unrealistic psychological and social assumptions to be acceptable, they must be simplifying idealizations that help the modeling but do not affect the central explanatory relationships in a significant way.

Despite the suitability and applicability of ME in the understanding of social issues, not all situations such explanation can be applied. This cautionary position was taken when Mayntz (2004) maintained that explanation of social macro-phenomena by mechanisms typically involves causal regression to lower-level elements, as stipulated by methodological individualism (an agent-centered approach of explanation). Mayntz further added that while there exist a good many mechanism models to explain emergent effects of collective behavior, we lack a similarly systematic treatment of generative mechanisms in which institutions and specific kinds of structural configurations play the decisive role. He, therefore, concluded that mechanistic explanation should be used to addressing recurrent processes generating a specific kind of outcome

#### ***The Positives and Negatives of Mechanistic Explanation***

Halina (2017) provided the strengths and weaknesses of ME which this paper also aligns with. One of the positives (strengths) of Mechanistic Explanation is that it captures the asymmetry of explanation. This simply means that those causes responsible for a phenomenon explain that phenomenon but not vice versa. For example, unprotected sex may explain the transmission of Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) but HIV/AIDS does not explain unprotected sex.

Mechanistic Explanation also accounts for why irrelevant information is not explanatory. Take, for instance, an armed robbery on the University campus last week might true, but it is not explanatory because it is not part of the causes for such armed robbery. In addition, ME does not require laws of nature and as a result, cannot be restricted by them. And because ME tends to provide both casual and functional explanations, it therefore has both predictive and interventionistic

capacity. When a phenomenon is understood, such understanding provides the best approach to intervene on it and possibly predicts its future occurrence.

On the negative side, Halina (2017) posits that ME fails to capture the practices of explanatory normativity of science. In this sense, ME is accused of selective capacity. In simple terms, not all situations such explanation can be applied. Furthermore, Mechanistic Explanation is criticized for excluding certain things as explanatory when in the real sense they are explanatory. This is because Mechanistic Explanation often fails to provide a clear-cut boundary for what is to be explained and not to be explained.

#### **CONCLUSION**

In sociological inquiries, the core entity always tends to be the actors in the social system being analyzed, and the core activity tends to be the actions of these actors, and to be explanatory a theory must specify the set of causal mechanisms that are likely to have brought about the change, and this requires one to demonstrate how macro states at one point in time influence individuals' actions, and how these actions bring about new macro states at a later point in time (Hedstrom, 2005). This further explains the place of explanation in every sociological discourse.

For sociological theories to continue to be relevant and applicable to social issues in this ever-changing world, then detailed analyses of these issues must always be sort. This is imperative because the goals of science are explanation, understanding, prediction, and ultimately control; and to achieve these goals, a more conceiving and analytic approach to social research and theory construction must be undertaken. Mechanistic Explanation provides this opportunity.

Analytical Sociology is defined and redefined by the emphasis of ME. It started from such explanation and it has become an integral strategic tool for the understanding of social issues. As Social Scientists (Sociologists) apply this kind of explanation (mechanistic), providing cause and effect relationship or nexus becomes easier and social issues are better explained and understood.

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