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A Neutrosophic Approach to Social Phenomena

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Abstract

Sociology has long sought to understand human societies and the social behaviors within them. It explores the organization, structure, dynamics, and transformations of society over time. However, traditional sociological methods face significant challenges in addressing the complexity and indeterminacy inherent in social data—data that is often ambiguous, incomplete, and contradictory. The Neutrosociology offers a novel approach to studying and modeling social phenomena by employing mathematical and philosophical tools that can accommodate uncertainty.

Keywords: Neutrosophic Sociology, Neutrosophic Social Systems, Mathematical Models, Social Phenomena, Social Change, Sociological Forecasting, Neutrosophic Probability, Indeterminacy, Social Norms, Sociological Triads, Family Structures, Political Movements, Social Complexity, Truth, Falsehood, Indeterminacy, Gender Constructs, Social Data, Cultural Shifts, Social Science Models, Dynamic Social Systems, Neutrosophy, Sociological Theory.

1 | Introduction

As a scholar, my interest in the mathematical representation of socio-political events has driven me to explore whether mathematical models, equations, or operators can effectively describe the complexities of social phenomena. This inquiry raised several key questions:

- Can social phenomena be represented mathematically?
- How can we account for the unmodeled aspects of society?
- Is it possible to predict the future trajectories of human societies—what might they look like in one hundred or one thousand years?
- How might future social structures evolve or disintegrate? Will they remain divided by class, or will new forms of organization emerge?
- How will family structures evolve? Will traditional models be replaced by alternatives such as single-parent families, polygamy, polyandry, or even the dissolution of the family unit?
- How can we scientifically forecast social change using methods like Markov chains, and what degree of accuracy can we expect?

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To address these questions, I proposed the neutrosophic framework [4], which is capable of embracing the complexities and uncertainties in social life. By applying neutrosophic logic, set theory, and probability, [5] one can develop more accurate models of social phenomena, incorporating the degrees of truth, indeterminacy, and falsehood that characterize social data [1, 2, 7].

2 | The Concept of Neutrosophic Sociology (NeutroSociology)

Neutrosophic sociology [6] is grounded in neutrosophy, a philosophical framework that investigates the degrees of truth (T), indeterminacy (I), and falsehood (F) in various domains.

These concepts are crucial in neutrosophic sociology because they allow a more nuanced representation of the contradictory and often uncertain nature of social data.

Traditional sociological data is rarely complete or entirely clear. Instead, it is often ambiguous, contradictory, and incomplete. Neutrosophic sociology provides a method for addressing these imperfections, enabling sociologists to model social facts in terms of their degree of truth, degree of indeterminacy, and degree of falsehood.

This framework allows us to reflect the complexity of social reality with greater accuracy than classical sociological approaches.

For instance, consider the concept of "democracy" as it applies to a country. In conventional sociology, a country is either democratic or it is not. However, a more nuanced analysis reveals that certain laws or policies might not align with democratic principles, or different groups may have conflicting interpretations of what democracy entails.

Using neutrosophic analysis, we can express a country's democracy as a (T, I, F)-concept, where T represents the degree of truth (e.g., 80% democratic), I represents the degree of indeterminacy (e.g., 10% uncertain), and F represents the degree of falsehood (e.g., 10% nondemocratic).

3 | Neutrosophic Triads and their Applications

In neutrosophic sociology, triads are employed to model the relationships between a concept (T), its indeterminate counterpart (I), and its opposite or anti-concept (F). These triads provide a framework for understanding the dynamic interplay of concepts within social phenomena.

For example, in a sociological context, the concept of "man" is complemented by the anti-concept "woman," with "transgender" serving as the indeterminate counterpart.

This triad—[Man, Transgender, Woman]—demonstrates how gender is socially constructed, encompassing varying degrees of truth, indeterminacy, and opposition. Similar triads can be applied to other sociological constructs, such as social class, political affiliation, or family structures. [6]

Furthermore, neutrosophic sociology allows for the decomposition of these triads into subcomponents. For example, when examining power dynamics between two soccer teams, we can define multiple degrees of victory, such as the likelihood of one team winning by one goal versus two or more goals, or the probability of a draw. Each of these components can be described with its own T, I, F values, leading to a more precise, multidimensional model of the social event.

4 | Neutrosophic Social Systems

Neutrosophic sociology views social systems as dynamic, open, and continuously evolving. In contrast to traditional sociological models, which often focus on static representations of society, neutrosophic sociology acknowledges that social systems fluctuate between states of order and disorder. These fluctuations are influenced by various hidden and observable parameters, such as cultural shifts, economic pressures, and political movements.

Social systems are never perfectly stable; they constantly oscillate between periods of apparent stability and moments of instability. For example, the rise and fall of political ideologies, the changing roles of families, or the fluctuating nature of social movements can all be modeled as transitions between ordered and disordered states.

Neutrosophic sociology enables us to capture these transitions by considering the degrees of order, disorder, and indeterminacy within each system [6].

5 | Sociological Forecasting and Social Change

One of the most compelling applications of neutrosophic sociology is its potential for sociological forecasting. Using neutrosophic probability, [4, 5] we can predict the likelihood of future social events, such as revolutions, wars, or changes in family structures. Neutrosophic statistics offer the potential to identify patterns of social change, helping policymakers, social scientists, and futurists make more informed decisions about how societies may evolve.

For example, the future of family structures remains a critical issue for sociologists. Will the traditional family model endure, or will alternative forms of family life, such as polyamory, single-parent families, or other structures, become more prevalent? Neutrosophic probability allows us to model the likelihood of these outcomes, each with its own degree of truth, indeterminacy, and falsehood.

6 | Neutrosophic Social Norms and Rules

Social norms and rules in any society are shaped by varying degrees of truth, falsehood, and indeterminacy. What one group considers morally acceptable, another may view as morally wrong, while yet another may remain uncertain about the issue. Neutrosophic sociology takes this complexity into account by representing social norms as (T, I, F)-rules, which reflect the partial truth and indeterminacy inherent in societal values.

For instance, certain cultural practices, such as polygamy or capital punishment, may be viewed as morally acceptable in some societies but as unethical in others. Neutrosophic sociology recognizes that these norms are not absolute but are subject to change and reinterpretation based on cultural, historical, and individual perspectives.

7 | The Many Truths and Falsehoods in Social Life

A core principle of neutrosophic sociology is the recognition that multiple truths and falsehoods exist in social life. Different individuals and groups perceive social facts in different ways, often influenced by personal, cultural, or ideological biases. As such, social facts are rarely absolute; they are frequently interpreted through the lens of individual and collective experience [3].

Neutrosophic sociology encourages us to embrace this diversity of perspectives, acknowledging that no single interpretation of a social fact is universally "right" for all people.

This approach fosters a deeper understanding of the complexity of social interactions and the multiple interpretations that arise in diverse social contexts.

8 | Conclusion

Neutrosophic sociology offers a powerful tool for understanding the complexities and contradictions of social life. By integrating the principles of Neutrosophy—degrees of truth, indeterminacy, and falsehood—into sociological analysis, we can more accurately represent the fluid and dynamic nature of society. As we continue to confront the uncertainties and complexities of social phenomena, neutrosophic sociology holds the promise of becoming an invaluable resource for both theoretical inquiry and practical decision-making.

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Data Availability

The datasets generated during and/or analyzed during the current study are not publicly available due to the privacy-preserving nature of the data but are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that there is no conflict of interest in the research.

Ethical Approval

This article does not contain any studies with human participants or animals performed by any of the authors.

References

[1] Álvarez Tapia, Milena Elizabeth et al. (2021). "Neutrosociology for Analyzing Public Procurement in Ecuador around the Health Emergency." *Neutrosophic Sets and Systems* {Special Issue:Impact of neutrosophic scientific publication in Latin American context}, Vol. 44, 333 – 341.

[2] Arias, Nemis García et al. (2020). "Neutrosociology for the Analysis of the Pros and Cons of the LIFE Series in UNIANDES, Ecuador." *Neutrosophic Sets and Systems* {Special Issue: Social Neutrosophy in Latin America}, Vol. 34, 177-182.

[3] Bunge, Mario (1998). Social Science under Debate: A Philosophical Perspective. University of Toronto Press, 1998.

[4] Smarandache, F. (2007). A Unifying Field in Logics: Neutrosophic Logic. Neutrosophy, Neutrosophic Set, Neutrosophic Probability and Statistics, 6th edition. Ann Arbor: InfoLearnQuest. Retrieved from the The University of New Mexico Digital Repository, https://digitalrepository.unm.edu/math_fsp/163/

[5] Smarandache, Florentin (2005). Introduction to Neutrosophic Measure, Neutrosophic Integral, and Neutrosophic Probability. Craiova, Romania: Sitech. https://digitalrepository.unm.edu/math_fsp/34

[6] Smarandache, Florentin. (2019). Introduction to Neutrosophic Sociology (Neutrosociology). Brussels: Pons.

[7] Vásquez-Ramírez, Michael R. et al. (2024). Neutrosophic Social Structures and Neutrosophic 2-tuples Technique for Studying Labor Insertion and Gender Inequality. International Journal of Neutrosophic Science (IJNS), Vol. 24, No. 2, 229-236.