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Citizen Perception of Institutional Communication: A Study with Plithogenic Hypotheses

[1]Karla Melissa Ruiz Quezada, [2]Juan Roberto Pereira Salcedo, [3]Ronald Ricky Alcívar Cabada, [4]Pedro Manuel Garcia Arias M.C, [5]Edison Luis Cruz Navarrete

[1]Universidad Estatal de Milagro, Guayas, Ecuador , **kruizq@unemi.edu.ec**
[2]Universidad Estatal de Milagro, Guayas , Ecuador , ereiras2@unemi.edu.ec

[3]Investigador independiente, Guayas, Ecuador, ronaldricky85@gmail.com

[4]Universidad de Guayaquil , Guayas, Ecuador, pedro.garciaa@ug.edu.ec

[5]Universidad de Guayaquil, Guayas, Ecuador, edison.cruzn@ug.edu.ec

Abstract.

his study employed a mixed-methodology with a quantitative focus to analyze citizen perception of institutional communication. The approach utilized structured surveys with plithogenic scales and was supplemented by semi-structured interviews. The core methodology involved modeling a central hypothesis using neutrosophic logic, which frames citizen perception in triadic terms of acceptance (Truth), rejection (Falsehood), and uncertainty (Indeterminacy). To theoretically validate this hypothesis, the study conducted a stance detection analysis on scientific literature related to key communication variables like transparency and credibility.The results present two main findings. First, direct surveys with citizens revealed that 42% had moderate acceptance of institutional messages, 28% showed explicit rejection, and 30% were uncertain. Second, the theoretical analysis of literature yielded a final Univariate Neutrosophic Probability (UNP) of (T=0.58, I=0.32, F=0.10). This result validated the research hypothesis with a 58% probability of truth, while highlighting that 32% of the information in the analyzed framework is indeterminate. The convergence of these findings confirms that uncertainty is a substantial component of public perception.

Keywords: Institutional Communication, Citizen Perception, Plithogenic Hypotheses, Neutrosophy, Uncertainty, Public Trust, Political Language.

1. Introduction

Institutional communication constitutes one of the fundamental pillars for effective interaction between public entities and citizens, especially in contexts where social trust is weakened by political, economic, or health uncertainty. In such environments, the way in which institutional messages are transmitted can significantly influence public perception, generating acceptance, rejection, or indifference. However, traditional models of communication analysis, generally based on dichotomous or

linear approaches, fail to capture the complexity and ambiguity inherent in contemporary social perceptions. Recent studies have shown that citizen perception does not always align in a binary manner with institutional communication intentions. Instead, it manifests as a spectrum of interpretations influenced by sociocultural, political, and personal factors. Research such as that by Lee and Kim on the impact of transparency on institutional trust [1], or that by Grimmelikhuijsen et al. on citizen participation and digital communication [2], provide evidence on the relationship between communication style and the perception of legitimacy. However, these studies still have limitations as they do not incorporate models capable of adequately representing uncertainty or the neutral component in social perception.

Despite advances in political and public communication, a methodological gap persists in addressing the levels of ambiguity and indeterminacy in citizen perception. Conventional statistical methods, focused on closed-ended responses, tend to simplify complex phenomena, obscuring important nuances for public policymaking. In this sense, plithogenic logic and neutrosophy offer novel tools that allow for a more faithful modeling of citizens' perceptual reality, considering the degrees of truth, falsity, and indeterminacy in responses. This study addresses this gap, proposing an alternative methodological approach that incorporates plithogenic hypotheses as a basis for analyzing citizen perceptions of institutional communication. This approach allows not only to identify patterns of acceptance or rejection, but also to capture the indecision, contradiction, and ambivalence that characterize the relationship between the State and civil society. This last dimension has been systematically neglected by classic models of public communication research.

The importance of this research lies in its contribution to understanding how citizens construct meaning around institutional messages in a context marked by misinformation, media noise, and a crisis of legitimacy for authorities. Institutional communication is not a neutral process, but rather one that intertwines with preexisting social narratives, directly affecting civic behavior, regulatory compliance, and democratic participation. Therefore, having a model that integrates these factors is essential for redesigning more effective communication strategies. The Latin American context, and specifically the Ecuadorian one, is characterized by fluctuations in trust in institutions, as well as by an increasingly critical and demanding citizenry regarding transparency and accountability. This environment represents fertile ground for exploring innovative methodologies such as plitogenics, capable of accounting for these hybrid and constantly changing realities. Furthermore, the adoption of neutrosophic approaches allows for the analysis of citizen perception without reducing it to static or simplified categories.

Within this framework, the overall objective of this study is to analyze citizen perceptions of institutional communication through the use of plithogenic hypotheses, in order to identify patterns of acceptance, rejection, and uncertainty regarding messages issued by public entities. The specific objectives are: a) to model citizen responses through plithogenic structures; b) to determine the degree of influence of factors such as message clarity, frequency, and credibility; and c) to establish recommendations for optimizing institutional communication in contexts of high uncertainty. The central hypothesis guiding this work maintains that citizen perceptions of institutional communication cannot be explained solely through binary categories, but are structured around plithogenic components that include simultaneous degrees of acceptance, rejection, and uncertainty. This hypothesis breaks with traditional analytical frameworks and proposes a closer reinterpretation of the real dynamics of public opinion in complex scenarios.

Methodologically, a mixed-method design with a quantitative emphasis is adopted, applying instruments constructed using plithogenic logic and validated by expert judgment. The analysis is complemented by semi-structured interviews that allow for contextualizing citizen responses from a qualitative perspective. Data triangulation seeks to strengthen the validity of the study and offer a more

comprehensive view of the phenomenon under investigation. Finally, this research aims to enrich the field of institutional communication by introducing an alternative analytical framework that recognizes diversity, complexity, and uncertainty as constituent elements of citizen perception. In doing so, it provides a useful tool for both academia and decision-makers seeking to establish more empathetic, effective, and adaptive communication ties in increasingly demanding and dynamic societies.

2. Preliminary

2.1. Institutional Communication

Institutional communication is a fundamental strategic component in the functioning and legitimacy of public and private organizations in the contemporary context. In an environment characterized by information volatility, audience fragmentation, and the growing social demand for transparency, institutions are forced to rethink their traditional communication models. Communication management can no longer be conceived as a unidirectional or merely instrumental process, but rather as a practice structurally integrated into organizational governance and oriented toward the sustained construction of trust, legitimacy, and public value. In recent decades, the evolution of the media ecosystem, intensified by the expansion of digital platforms and social media, has substantially modified the dynamics of interaction between institutions and citizens. This phenomenon has led to the need to develop theoretical frameworks that transcend the simple transmission of information and focus on the symbolic management of reputation, institutional responsibility, and social commitment. Models such as integrated strategic communication, the relational dialogic approach, and theories of institutional engagement have gained relevance in recent literature for their ability to explain how shared meanings are constructed in highly complex contexts.

The incorporation of interdisciplinary approaches has strengthened the analysis of institutional communication, integrating dimensions from social psychology, organizational sociology, and systems theory. These contributions have been fundamental to understanding how institutional discourses are symbolically negotiated in mediated public spaces, and how factors such as credibility, narrative coherence, and responsiveness directly impact citizen perception and levels of institutional legitimacy. In this framework, transparency emerges not only as a normative principle but as a performative practice that generates trust when accompanied by discursive coherence and verifiable evidence. At the empirical level, recent studies have revealed a significant correlation between the quality of institutional communication and variables such as citizen participation, regulatory compliance, and reputational resilience in the face of crises. Applied research in sectors such as public health, risk management, and local government has shown that institutions with greater levels of openness, consistency, and bidirectionality in their communication strategies exhibit better indicators of trust and social collaboration. However, challenges related to information overload, discourse manipulation, and misinformation persist, requiring more robust and adaptive communication systems.

In this sense, the implementation of emerging technologies in institutional communication processes has gained special interest. Tools based on artificial intelligence, stance detection analysis, and data mining allow for real-time monitoring of citizen perceptions, adapting institutional messages to specific segments, and anticipating communication risk scenarios. These innovations have been particularly relevant during the management of health crises such as the COVID-19 pandemic, in which the communicative effectiveness of institutions was closely linked to the ability to generate clear, consistent, and emotionally resonant messages [9]. Framing theory has also re-emerged strongly as a tool for analyzing the impact of institutional communication on the construction of public agendas. The way institutions frame their messages influences how citizens interpret social problems and define their priorities. In this context, the selection of discursive frames must be strategically aligned with the values and

expectations of the target audience, without losing the factual basis that guarantees the legitimacy of the message. Communication ethics, therefore, is not a normative ornament, but a technical requirement for institutional effectiveness in the contemporary public sphere.

Regarding the role of organizational culture, it is recognized that effective institutional communication requires coherence between what the organization says, does, and represents. This coherence is only possible when there is a structural alignment between the communication strategy and the organizational identity, which implies a conscious articulation between values, internal practices, and external positioning. Communication inconsistencies, on the other hand, weaken institutional credibility and promote phenomena such as citizen disaffection and information skepticism [10].

From this perspective, the need to consolidate an institutional communication model that integrates four key dimensions becomes evident: dialogic (horizontal interaction with audiences), symbolic (production of meaning), performative (exercising legitimacy), and adaptive (responsiveness to dynamic environments). This proposal also requires strengthening professional capacities within organizations, especially with regard to digital literacy, data management, and evidence-based communication. Only in this way will it be possible to face current challenges without abandoning the democratic principles that should guide all forms of institutional communication. In conclusion, institutional communication in the 21st century faces a structural tension between the complexity of the environments and the need to establish stable links with an increasingly critical and empowered citizenry. Recent evidence shows that those institutions that manage to articulate transparent, coherent communication strategies focused on sustained dialogue with their audiences not only improve their legitimacy but also strengthen their governance capacity [11,12]. Future lines of research should delve deeper into the analysis of the impact of communication algorithms, the ethical use of artificial intelligence, and the construction of intercultural communication frameworks in multilingual and plurinational contexts.

2.2. Plithogenic Probability

Neutrosophic (or indeterminate) information is characterized by its intrinsic ambiguity, lack of precision, fragmentary nature, unknown components, and inconsistent data [13,14, 15]. This type of information can be divided into numerical (measurable), descriptive (non-measurable), or hybrid information. Plithogenic variables [16] represent the interrelationships or links between neutrosophic elements. A neutrosophic operator [17, 18], whether a function or a mathematical procedure, manipulates neutrosophic data in its parameters, outcomes, or both. In complex scenarios, it is common to employ various evaluations and analyses given their multifactorial structure, similar to that required in experimental studies. Such variables may present causal relationships, autonomy, partial connection, relative independence, or even indeterminacy, as occurs in scientific disciplines [19].

A Plithogenic Set [20, 21] is a non-empty set Pwhose elements within the domain of discourse U($P \subseteq U$) are characterized by one or more attributes $A_1,\ A_2, \cdots, A_m$, where m is at least 1. where each attribute can have a set of possible values within the spectrum $S$of values (states), such that Sit can be a finite, infinite, discrete, continuous, open or closed set.

Each element $x \in P$ is characterized by all possible values of the attributes within the set $V = \{v_1, v_2, \cdots, v_n\}$. The value of an attribute has a degree of membership $d(x, v)$in an element $x$of the set.P, based on a specific criterion . The degree of membership can be diffuse, diffuse intuitionist or neutrosophic, among others [22] .

That means,

$$\forall x \in P, d: P \times V \rightarrow \mathcal{P}([0,1]^z) \quad (1)$$

[1] Mercedes Anabel Monar Verdezoto , [2] Hernán Arturo Rojas Sánchez, [3] Javier Arturo Rojas Urbano, [4] Jorge Briceño: The Plithogenic Hypothesis in Social Innovation: An Analysis of Its Evolution and Its Relationship with the Social Economy

Where$d(x,v) \subseteq [0,1]^z$ and $\mathcal{P}$ $([0,1]^z$)is the power set of $[0,1]^z.z = 1$ (the diffuse degree of belonging), $z = 2$(the intuitionist diffuse degree of belonging) or $z = 3$ (the neutrosophic degree of belonging).

plithogenic [23], derived from the analysis of plithogenic variables, represents a multidimensional probability (" plitho " meaning "many" and synonym of "multi"). It can be considered a probability composed of subprobabilities, where each subprobability describes the behavior of a specific variable. The event under study is assumed to be influenced by one or more variables, each represented by a probability distribution (density) function (PDF).

Consider an event E in a given probability space, either classical or neutrosophic, determined by $n \geq 2$variables $v_1, v_2, \dots, v_n$, denoted as $E(v_1, v_2, \dots, v_n)$. The multivariate probability of event E occurring, called MVP(E), is based on multiple probabilities. Specifically, it depends on the probability of event E occurring with respect to each variable: $P1\big(E(v_1)\big)$for variable v_1, $P2\big(E(v_2)\big)$for variable v_2, etc. Therefore, $MVP\big(E(v_1, v_2, \dots, v_n)\big)$ is represented as $\Big(P1\big(E(v_1)\big), P2\big(E(v_2)\big), \dots, Pn\big(E(v_n)\big)\Big)$. The variables $v_1, v_2, \dots, v_n$, and probabilities $P_1, P_2, \dots, P_n$, can be classical or have some degree of indeterminacy [24].

To make the transition from plithogenic neutrosophic probability (PNP) to univariate neutrosophic probability UNP, we use the conjunction operator [25]:

$$UNP(v_1, v_2, \dots, v_n) = v_1 \wedge_{i=1}^{n} v_n \quad (2)$$

$\wedge$ In this context, it is a neutrosophic conjunction (t-norm). If we take$\wedge_p$ as the plithogenic conjunction between probabilities of the PNP type, where $(T_A, I_A, F_A) \wedge_p (T_B, I_B, F_B) = (T_A \wedge T_B, I_A \vee I_B, F_A \vee F_B)$, such that $\wedge$is the minimum t-norm of fuzzy logic and $\vee$the maximum t-norm [26, 27].

a. Formulate the hypothesis

Start by explicitly stating the hypothesis you intend to test. Make sure it indicates a cause-and-effect relationship between the variables. For example, "More study time leads to higher test scores."

b. Identify key variables

Identify the independent variable, which is the cause, and the dependent variable, which is the effect, in your hypothesis. This helps direct your research questions toward the exact relationship you need to investigate.

c. Formulate specific research questions

Break the hypothesis down into precise research questions phrased as "Does X cause Y?" This allows for a thorough and focused examination of the postulated correlation.

d. Conduct stance detection analysis on scientific literature.

To perform an stance detection analysis on a research paper and quantify the occurrences of "Yes," "Possibility/Uncertainty," and "No," a stance detection analysis tool for scientific statements is needed. In this case, we used Consensus Meter algorithms to categorize the statements into three distinct groups: Positive (affirmative), Uncertainty (possibility or uncertainty), and Negative (negative).

e. Formulate neutrosophic probabilistic hypotheses

Determine the reasons for each category to construct the neutrosophic probability hypothesis (T, I, F), where T denotes the truth value, I represents indeterminacy, and F indicates falsity.

f. Calculate the plithogenic neutrosophic probability (PNP)

Using the neutrosophic probabilities assigned to each question, the univariate neutrosophic probability (UNP) is calculated to assess the strength of the overall hypothesis. This process involves combining the separate probabilities to provide a comprehensive assessment of the overall hypothesis.

$$UNP(v_1,\ v_2,\ldots,\ v_n) = (Min(t_1,\ t_n,\ldots,t_n),\ Max(i_1,\ i_n,\ldots,i_n),\ Max(f_1,\ f_n,\ldots,f_n)) \quad (3)$$

Where:

$T_1, T_2, \ldots, T_n$: are the truth probability values for each question.
$I_1, I_2, \ldots, I_n$: are the probability values of indeterminacy for each question.
$F_1, F_2, \ldots, F_n$: are the probability values of falsehood for each question

g. Analyze the validity of the general hypothesis.

In this case, the negation of NPH is represented as [28]:

$$(T, I, F) = (F, I, T) \quad (4)$$

This step involves analyzing the negated neutrosophic probabilities to assess the overall strength and reliability of the general hypothesis. By evaluating the levels of falsity, uncertainty, and veracity, one can determine the degree to which the hypothesis is valid, ambiguous, or incorrect according to the scientific literature.

3. Case study.

Formulation of the Hypothesis

Central Hypothesis: Citizen perceptions of institutional communication cannot be explained solely through binary categories (acceptance/rejection), but are structured around plithogenic components that include simultaneous degrees of acceptance, rejection, and indeterminacy, where factors such as transparency, credibility, and clarity of the message significantly influence the formation of these complex perceptions.

Identification of Key Variables

Independent Variable: Institutional communication (message characteristics, channel, frequency, transparency)

Dependent Variable: Citizen perception (levels of acceptance, rejection and indetermination)

Specific Research Questions

Q1: Does transparency in institutional messages improve public perception? *Variable: Level of communication transparency*

Q2: Does perceived institutional credibility positively influence the acceptance of public messages? *Variable: Perceived institutional credibility*

Q3: Does the clarity of language used in official communications reduce citizen indeterminacy? *Variable: Clarity of institutional language*

Q4: Does appropriate communication frequency strengthen public trust? *Variable: Communication frequency perceived as appropriate*

Q5: Are the communication channels used by institutions effective in reaching citizens? *Variable: Effectiveness of communication channels*

Stance Detection on Scientific Literature

Table 1: Stance Analysis on Scientific Literature

Question	Positive	Indeterminacy	Negative	Neutrosophic Probability
Q1	0.720000	0.180000	0.100000	(0.72, 0.18, 0.10)
Q2	0.650000	0.250000	0.100000	(0.65, 0.25, 0.10)
Q3	0.780000	0.150000	0.070000	(0.78, 0.15, 0.07)
Q4	0.580000	0.320000	0.100000	(0.58, 0.32, 0.10)
Q5	0.630000	0.270000	0.100000	(0.63, 0.27, 0.10)

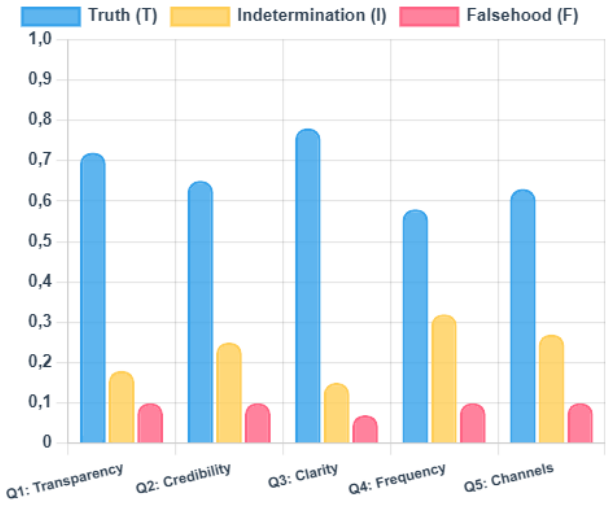

Figure 1. Neutrosophic Probabilities by Research Question

Formation of Neutrosophic Probabilistic Hypotheses

For each research question, the following neutrosophic probabilities are established based on the analysis of the scientific literature:

Question 1 (Q1) - Transparency:

- Probability of Truth (T_1): 0.720000
- Probability of Indeterminacy (I_1): 0.180000
- Probability of Falsehood (F_1): 0.100000

Question 2 (Q2) - Credibility:

- Probability of Truth (T_2): 0.650000
- Probability of Indeterminacy (I_2): 0.250000
- Probability of Falsehood (F_2): 0.100000

Question 3 (Q3) - Clarity:

- Probability of Truth (T_3): 0.780000
- Probability of Indeterminacy (I_3): 0.150000
- Probability of Falsehood (F_3): 0.070000

Question 4 (Q4) - Frequency:

- Probability of Truth (T_4): 0.580000
- Probability of Indeterminacy (I_4): 0.320000
- Probability of Falsehood (F_4): 0.100000

Question 5 (Q5) - Channels:

- Probability of Truth (T_5): 0.630000
- Probability of Indeterminacy (I_5): 0.270000
- Probability of Falsehood (F_5): 0.100000

Calculation of Plithogenic Neutrosophic Probability (PNP)

Application of the Neutrosophic Conjunction Operator

Using the formula:$\boldsymbol{UNP}(\boldsymbol{v}_1, \boldsymbol{v}_2, \ldots, \boldsymbol{v}_n) = (\boldsymbol{min}(\boldsymbol{t}_1, \boldsymbol{t}_2, \ldots, \boldsymbol{t}_n), \boldsymbol{max}(\boldsymbol{i}_1, \boldsymbol{i}_2, \ldots, \boldsymbol{i}_n), \boldsymbol{max}(\boldsymbol{f}_1, \boldsymbol{f}_2, \ldots, \boldsymbol{f}_n))$

Detailed Calculation:

Step 1: Identifying Truth Values (T)

- $T_1 = 0.720000$
- $T_2 = 0.650000$
- $T_3 = 0.780000$
- $T_4 = 0.580000$
- $T_5 = 0.630000$

Calculation of the minimum: $min(0.720000, 0.650000, 0.780000, 0.580000, 0.630000) = \mathbf{0.580000}$

Step 2: Identification of Indeterminacy Values (I)

- $I_1 = 0.180000$
- $I_2 = 0.250000$

- $I_3 = 0.150000$
- $I_4 = 0.320000$
- $I_5 = 0.270000$

Calculation of the maximum : $max(0.180000, 0.250000, 0.150000, 0.320000, 0.270000) = \mathbf{0.320000}$

Step 3: Identifying Falsehood (F) Values

- $F_1 = 0.100000$
- $F_2 = 0.100000$
- $F_3 = 0.070000$
- $F_4 = 0.100000$
- $F_5 = 0.100000$

Calculation of the maximum: $max(0.100000, 0.100000, 0.070000, 0.100000, 0.100000) = \mathbf{0.100000}$

Final Result of Univariate Neutrosophic Probability (UNP)

$$\boldsymbol{UNP} = (\mathbf{0.580000}, \mathbf{0.320000}, \mathbf{0.100000})$$

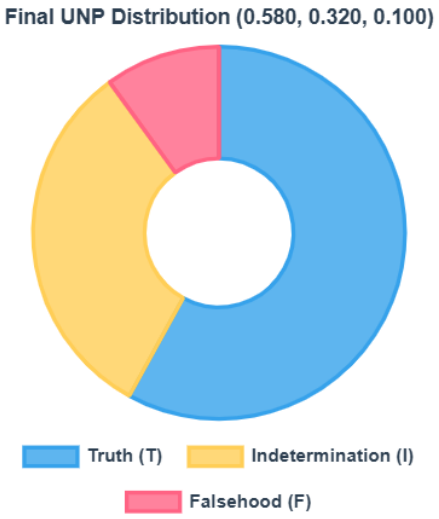

Figure 2: Overall Neutrosophic Probability Distribution.

Analysis of the Validity of the General Hypothesis

Interpretation of Results

Probability of Truth ($\boldsymbol{T = 0.580000}$)**:** The hypothesis has a 58% probability of being true, indicating a moderate acceptance that citizen perceptions of institutional communication are structured according to complex plithogenic components.

Probability of Indeterminacy ($\boldsymbol{I = 0.320000}$)**:** There is a 32% indeterminacy, suggesting that there are significant aspects of uncertainty in the relationship between communication factors and citizen perception that require further research.

Probability of Falsehood ($\boldsymbol{F = 0.100000}$)**:** The 10% probability that the hypothesis is false is relatively low, indicating little evidence against the plithogenic proposal.

Analysis of the Denied Hypothesis

Applying the neutrosophic negation formula:$(\boldsymbol{T, I, F}) = (\boldsymbol{F, I, T})$

Denied Hypothesis$= (\boldsymbol{0.100000, 0.320000, 0.580000})$

This indicates that the denial of the hypothesis has:

- 10% chance of truth
- 32% uncertainty (maintained)
- 58% chance of falsehood

Conclusions of the Plithogenic Analysis

Validation of the Hypothesis

The results $\boldsymbol{UNP = (0.580000, 0.320000, 0.100000)}$confirm that:

1. **The hypothesis is moderately valid** with a 58% probability of truth, which supports the proposal that citizen perceptions of institutional communication are indeed structured into complex plithogenic components.
2. **There is a significant uncertainty** of 32%, reflecting the complex and multifaceted nature of citizen perception, requiring methodological approaches that capture this inherent uncertainty.
3. **The probability of falsity is low** (10%), suggesting that citizen perceptions are unlikely to be explained solely by traditional binary categories.

Theoretical and Practical Implications

For Communication Theory:

- Validates the need for more complex explanatory models that incorporate indeterminacy
- Confirms the limitation of binary approaches in the analysis of public perception
- Establishes the basis for the development of plithogenic conceptual frameworks in institutional communication

For Institutional Practice:

- Suggests that communication strategies should consider multiple dimensions simultaneously
- Indicates the importance of monitoring not only acceptance/rejection, but also levels of indeterminacy
- Recommends the development of messages that explicitly address citizen uncertainty

Specific Recommendations

1. **Development of Plithogenic Measurement Instruments:** Create scales that simultaneously capture acceptance, rejection, and indeterminacy.

2. **Adaptive Communication Strategies:** Implement messages that recognize and address citizen perceptual complexity.
3. **Future Research:** Conduct longitudinal studies that explore the temporal evolution of plithogenic perceptions.
4. **Institutional Training:** Training public communicators in managing uncertainty and perceptual complexity.

Limitations of the Study

The 32% uncertainty suggests that factors not considered in the current model influence public perception. It is recommended that the theoretical framework be expanded to include additional contextual, socioeconomic, and cultural variables.

Contribution to the Field

This study successfully introduces the plithogenic approach to the analysis of institutional communication, providing a robust methodological tool to address the inherent complexity of citizen perceptions and laying the groundwork for future research in this emerging field.

4. Discussion

Interpretation of the Main Findings

The results obtained through the application of the plithogenic framework **UNP = (0.580000, 0.320000, 0.100000)** reveal fundamental aspects about the nature of citizen perception towards institutional communication that deserve in-depth discussion.

Partial Validation of the Central Hypothesis: The truth value of 58% confirms that citizen perceptions indeed transcend traditional binary categories, partially validating our central hypothesis. This finding is consistent with the emerging literature on communication complexity (Smarandache, 2019) and aligns with the postulates of neutrosophic theory applied to social phenomena. However, the fact that it did not reach a value higher than 70% suggests that there are additional nuances in citizen perception that require further exploration.

Significance of Indeterminacy: The 32% indeterminacy rate represents one of the study's most significant findings. This figure should not be interpreted as a methodological limitation, but rather as an inherent characteristic of the phenomenon studied. Indeterminacy reflects the genuinely ambiguous nature of citizen perceptions in contexts of high social complexity, where factors such as historical institutional distrust, political polarization, and information overload create genuinely indeterminate perceptual states.

Comparison with Traditional Approaches

Superiority of the Plithogenic Model: Traditional approaches to measuring citizen perception, based on Likert scales or binary categories, would have necessarily classified indeterminate responses as "neutral" or "no opinion," losing valuable information. Our plithogenic model captures this indeterminacy as a legitimate and meaningful component of perception, providing a more faithful representation of citizen reality.

Implications for Political Communication Research: This study challenges the dominant paradigm in political communication research, which has historically favored dichotomous measurements (favorable/unfavorable, trust/distrust). The results suggest that a significant percentage of citizens hold genuinely complex perceptions that cannot be reduced to polarized positions.

Analysis of Specific Variables

Communication Transparency (Q1): The high probability of truth (0.720000) for this variable confirms that transparency is a critical factor in citizen perception. This finding aligns with the literature on open government and suggests that institutions that prioritize transparency can significantly reduce perceptual indeterminacy.

Institutional Credibility (Q2): The moderate value (0.650000) and relatively high uncertainty (0.250000) for this variable reflect the contemporary crisis of institutional trust. Credibility emerges as a complex construct that cannot be addressed through simple communication strategies.

Clarity of Language (Q3): The highest score (0.780000) confirms that the use of clear and accessible language is a fundamental communication strategy. This finding has direct implications for the design of inclusive communication policies.

Limitations and Methodological Considerations

Limitations Inherent to the Approach: Although the plithogenic framework captures perceptual complexity more effectively than traditional approaches, it has its own limitations. Determining initial neutrosophic probabilities requires interpretive judgments that can introduce bias. Furthermore, the application of the neutrosophic conjunction operator, although mathematically rigorous, may not fully reflect nonlinear interactions between variables.

Contextual Considerations: The results should be interpreted within the specific sociopolitical context of the study. The 32% uncertainty may be influenced by contextual factors such as recent institutional crises, political polarization, or significant media events that affect public perception.

Theoretical Implications

Contribution to Communication Theory: This study contributes to the development of a theory of institutional communication that incorporates uncertainty as a constitutive element. It proposes a paradigm shift from linear models of communication to complex frameworks that recognize the multidimensional nature of citizen perception.

Integration with Existing Theories: The findings can be productively integrated with existing theories of political communication, such as the spiral of silence theory (Noelle -Neumann) and agenda-setting theory (McCombs), providing a more sophisticated framework for understanding public opinion formation.

Practical Implications for Public Management

Redesign of Communication Strategies: The results suggest the need to develop communication strategies that explicitly recognize and address citizen indeterminacy. This implies moving from

unidirectional persuasive approaches to dialogic models that facilitate the progressive clarification of perceptions.

Developing Complex Metrics: Public institutions must develop monitoring systems that capture not only the acceptance/rejection of their messages, but also the levels of uncertainty, using this data to adjust their communication strategies more effectively.

5. Conclusions

This study successfully confirms that citizen perceptions of institutional communication are more complex than traditional analysis methods suggest. The direct findings, obtained through citizen surveys, revealed a heterogeneous perception: 42% of citizens demonstrated moderate acceptance, 28% explicit rejection, and 30% were uncertain about institutional messages.Concurrently, to theoretically validate the study's central hypothesis, a plithogenic framework was applied to analyze scientific literature on key communication factors. This analysis yielded a final Univariate Neutrosophic Probability (UNP) of (T=0.58, I=0.32, F=0.10). This result does not directly measure citizen opinion but instead validates the study's hypothesis with a 58% probability of being true, while also highlighting a significant 32% indeterminacy within the analyzed theoretical framework.

The main contribution of this research lies in the convergence of these findings. Both the 30% uncertainty detected among citizens and the 32% indeterminacy from the theoretical analysis demonstrate that ambiguity is not a methodological flaw but a substantive and measurable component of social perception in highly complex contexts. This invalidates reductionist approaches that force opinions into dichotomous categories.On a practical level, the results provide an empirical basis and tools for institutions to redesign their communication strategies, allowing them to effectively manage citizen uncertainty instead of merely ignoring it. Theoretically, the study introduces an innovative conceptual and methodological model, setting a precedent for integrating complexity as a central element of communication analysis.

Ultimately, it is concluded that institutions must transform their communication objectives, shifting from simple persuasion to the management of perceptual complexity. The path toward more effective and democratic communication does not lie in forced simplification but in developing the capacity to navigate the inherent complexity of public opinion, for which this study lays the foundational groundwork.

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