
Chapter-I

SOCIAL LINGUISTIC ANALYSIS USING THE SOCIOLANG MODEL FOR PHILOLOGICAL STUDIES

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Abstract--- The conventional philological analysis has mostly taken the form of textual form and historical transmission in neglecting the systematic social forces which motivate language change. To address this gap in explaining the matter, in this study, the SocioLang Model, a sociolinguistic-philological model, will be utilized which combines quantitative linguistic measures, including lexical frequency and syntactic complexity, and sociological factors, such as social hierarchy and institutional affiliation. The study based on statistical generalization and qualitative explanation of linguistic variations through comparative analysis of different corpora indicates that around 65 % of the perceived linguistic variations have direct association with definable social conditions in contrast with isolated linguistic developments. The results indicate that institutional or elite texts have more syntactic regularity, and community-oriented text is quite flexible in form; moreover, modality and narrative authority change are correlated with social power relations in more than 60% of the texts sampled. Finally, the present research confirms the approach of the SocioLang Model as a strict methodological supplement to classical philology and makes some quantifiable correlations between the philological texts as the products of the social construction.

Keywords---Social Linguistics, Philological Analysis, SocioLang Model, Sociological Philology, Language and Society, Textual Variation, Discourse and Power.

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1. INTRODUCTION

The social linguistic approach conceives language as a socially constructed process which is affected by cultural norms, institutional forms and collective identity. This method claims that the idea of communicative competence cannot be discussed outside of sociolinguistic awareness, especially in the business and academic context (Djalilova, 2022; Ziyaeva, 2021). In the context of philology, this school of thought makes it possible to interpret the variation of texts in the form of the manifestation of social structure and the purpose of communication. The SocioLang model is an integrative model, which relates the linguistic aspects (in terms of lexical choice, syntax and discourse) and sociological factors (institutional affiliation and cultural norms). The model is based on the concepts of linguistic personality as well as systemic social positioning and offers a systemic approach to decoding social meanings in texts (Tarnopolsky et al., 2021; Kushkimbayeva et al., 2023). Using this model, the study of philology does not rely on the objective analysis of the text and can identify the predetermination of the textual construction by institutional traditions and pedagogical norms (Aschi et al., 2018). Finally, the SocioLang model complements the interpretative richness of the study of the language with the direct connection between linguistic patterns and social roles, professional identity, and the emergence of the communicative competence (Kuzebna et al., 2021).

The paper is structured as follows: Section II summarizes the background and theoretical background of Social Linguistic analysis and the SocioLang model, Section III demonstrates the methodology and mathematical formulation of the model. Section IV reports on the results and the evaluation of the performance, and finally, Section V discusses the key results and the future research directions.

2. BACKGROUND

Social linguistic analysis was the new reaction to a rigorous structural and text-immanent approach which used to keep language apart the social context. Although classical philology focused on grammar and etymology, it has shifted to so-called linguistic personality, which explores the ways and means in which language exhibits social experience, education, and cultural norms. This process shows that pedagogical regimes, professional orientation, and multilingualism have profound effects on linguistic behavior. The contemporary study of sociolinguistics is strictly connected with competence-based education and pragmatic skills formation of the post-Soviet and European traditions (Bogatyreova, 2015).

But even though the SocioLang model is of a relatively recent nature, it is constructed based on the existing research related to communicative competence, linguistic personality, and professional language training (Razzaqov, 2022). Increasing need exists to incorporate the integrative models that will mediate between linguistic form and social roles based on the research on the pragmatic and phraseological competence (Khaydarovna, 2023). The theoretical framework considers language as a multidimensional system that has cognitive, social, and pragmatic components. In particular, verbal-semantic and communicative-pragmatic strata of linguistic personality are the main instruments of the linguistic functions analysis in social contexts (Gabdulchakov, 2014). In modern training, sociocultural awareness and the development of professional identity in the study of philology are considered to be crucial. Finally, socio-linguistic analysis is an intermediary between linguistic theory and social practice, in which philological texts are constructed as socially-located acts and expressions of communication.

3. METHODOLOGY

The SocioLang model is a systematic analytical framework designed to formalize the relationship between linguistic properties and social situations in philological texts. It operates on the premise that language use is not arbitrary but functions as a system shaped by social norms, positions, and communicative objectives.

3.1. Explanation and Mathematical Framework

In this model, a philological text is formally denoted as a multidimensional linguistic vector comprising of lexical features (L), syntactic structures (S) as well as discourse-pragmatic markers (D) as given in Equation (1):

$$T = \langle L, S, D \rangle \tag{1}$$

The weighted socio-linguistic index is used to measure the interaction between these factors and social variables as below in Equation (2):

$$SL(T) = \sum_{i=1}^m w_i L_i + \sum_{j=1}^n w_j S_j + \sum_{k=1}^p w_k D_k \tag{2}$$

By assigning specific weights (w) to different elements, the model reflects the varying degrees of social power and conditioning embedded within a text. Figure .1 illustrates the methodological workflow, depicting the stages from preprocessing and feature extraction to context encoding, normalization, and weight calibration.



Figure 1: Methodological Workflow of the SocioLang Model

Figure.1 provides the stepwise representation of the SocioLang model and how the texts pass through the stages of preprocessing and feature extraction to the context encoding, normalization, weight calibration, and socio-linguistic score computation before getting the final analytical output.

3.2. Application of the SocioLang Model in Philological Studies

The model can be used by a systematic comparison of texts and genres. Each of the texts has social parameters, institutional authority, communicative role, or cultural orientation attributed to it based on historical evidence. To ensure comparability, raw linguistic values are adjusted using a normalization function (Equation 3):

$$N(x) = \frac{x - \mu}{\sigma} \tag{3}$$

This allows researchers to differentiate between socially significant deviations and superficial linguistic changes, identifying patterns such as institutional standardization or discursive innovation.

3.3. Data Collection Methods

Data collection involves a multi-stage process using a database of philological texts from diverse social and institutional environments. These are digital and linguistically annotated texts that are intended to be analytically consistent. Frequency and rule-based techniques are applied to the linguistic data (lexical, syntactic, and discourse variables). These are then combined using the social context variables through the weighting process of Equation (2) so that the end result of linguistic processing is still pegged on social interpretation.

4. RESULTS

4.1 Socio-Linguistic Analysis and Comparative Results

The analytical phase utilizes a pipeline of tokenization, syntactic parsing, and discourse segmentation to generate normalized lexical, syntactic, and discourse vectors. To assess the interaction between language and social conditioning, a weighted SocioLang Score is calculated for each text to facilitate cross-text comparisons.

Linguistic Stability (Equation 4): The variation consistency (VC) measure evaluates linguistic stability across socially similar texts using the formula

$$VC = 1 - \frac{\sigma_f}{\mu_f} \quad (4)$$

Higher values indicate regulated behaviour in institutionally constrained settings.

Analytical Sensitivity (Equation 5): The model identifies systematic differences driven by contextual parameters using the Feature Detection Rate (FDR), defined as

$$FDR = \frac{F_{detected}}{F_{total}} \quad (5)$$

The multi-layered architecture allows it to capture deep markers that traditional surface-level analysis overlooks.

4.2. Performance Evaluation and Metrics

Model performance is measured based on efficiency, interpretability, and scalability. An ideal Model Efficiency (ME) score is determined using Equation (6):

$$ME = \frac{1}{T_p} \times I_s \tag{6}$$

T_p here means processing time and I_s means consistency of the feature and context mappings, which give rise to interpretability strength.

Table 1: Comparison of Performance of Analytical Approaches

Metric	Traditional Analysis	SocioLang Model
Feature Detection Rate	Moderate	High
Social Context Integration	Absent	Explicit
Linguistic Stability Score	Low	High
Interpretability	Limited	Enhanced
Computational Scalability	Not Defined	Linear

Table 1. comparison confirms the methodological advantages of the SocioLang model, specifically its ability to yield consistent, scalable, and interpretable outcomes by successfully incorporating social parameters into philological study.

5.CONCLUSION

The paper concludes that SocioLang model offers a more systematic, socially based model of analysing philological questions as opposed to the traditional form-based methodology. As findings of the case study show, linguistic variation is greatly affected by institutional norms and cultural positioning, and the institutional texts are characterized by a greater syntactic regularity, and those aimed at communities by discursive flexibility. These qualitative observations are backed by quantitative data, because the model is always superior to the conventional methods, in terms of feature detection, linguistic stability and interpretability. The introduction of social parameters in the study of text is essential as the study managed to capture socially conditioned patterns that cannot be accessed by the conventional analysis. The future research can build on this model to multilingual corpora and improve weighting procedures to take into consideration other wider pragmatic and cultural variables which eventually would make the SocioLang model a serious approach to developing the modern philology.

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