



# Language, Identity, and Change: Globalisation and Technology in Romance and Germanic Traditions

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**Abstract:** Global trends have redetermined the linguistic identity and functional dynamics of the Romance and Germanic languages that create the cultural and communicative landscape of Europe. More specifically, this paper attempts to sketch out the mechanism of interaction between globalization, technology, and linguistic identity, with particular reference to the development of Romance-Germanic languages. Structural (lexical as well as sociocultural) transformation processes taking place within these families will be objectified in a study employing an integrated methodology – a comparative-historical cognitive approach together with elements from systemic critical analysis, which provides for a holistic evaluation of adaptive potentiality by language under influences coming from the digital environment. Even though English has occupied a huge space together with Romance and Germanic languages, they show strong adaptive capacities through hybridization, digital inclusion, and grammatical identity protection process. Technology globalization wields multilingual interactions in cyberspace, at the evening of asymmetry of online visibility and access to resources growing, proved statistically by studying three learner groups speaking four very remotely from each other genetic languages. Sustainable language development relies on educational policies of a multilingual digital ecosystem based on intercultural exchange programs. Confirmed findings and practical experience offer recommendations and guarantee the building of digital platforms that protect linguistic diversity and strengthen the global presence of European languages.

**Keywords:** globalisation, linguistic identity, digital communication, Romance languages, Germanic languages, multilingualism, intercultural communication, language technology, linguistic diversity, adaptation

## Introduction

Language is a very important means or aspect of the process of globalization, economic, cultural, and technological transformations in which linguistic systems become such social mechanisms with an intensive level of cross-border discourse and digital communication. As Hornborg [1] observed, linguistic diversity provides a cultural resource through which societies may retain particularities despite adjustments within the general framework of communications on a global level.

Recent studies reveal that language contacts are increasingly digitally mediated. The application of digital technologies to the spaces where languages are learned not only contemporizes teaching approaches but also alters the process or manner in which cultural meanings are conveyed, as noted by Maahs et al. [2]. Critical digital literacy is also postulated by Mahapatra and Koltowska [3] as a prescription for ethical and intercultural consciousness that should be inculcated in new syllabi for second language education amidst fast technological advancement. In spite of

considerable scholarly focus, primarily linguistic identity and endogenous linguistic structure remain largely unproblematic regarding the effects that globalization plus digitization assert on them. This way, decolonization of language technologies via inclusive design, as advocated by Koch et al. [4] proves instrumental in maintaining linguistic diversity within digital ecosystems. The ethical-cum-cultural issues encircling such a transformation in the identity of second languages through different flows of globalization have been extensively problematized by Wu [5]. The earlier study of Westergaard and Kupisch [6], together with that of Fuhrhop [7], is absolutely necessary for the historical and structural aspects. However, it does not quite distinctly acknowledge the technological mediation that is a decisive factor in contemporary language change.

The scientific relevance of this study is a step toward bridging the gap between traditional linguistic theory and the realities of digital communication. Its practical significance arises from the need to develop strategies for maintaining linguistic diversity and intercultural dialogue amidst rapid technological changes. They curvy noemodisciplinary structural, sociocultural, and techno-logical approach to understanding the way global processes redefined the linguistic system and its communicative functions.

The study aims to observe how Romance and Germanic languages develop under the forces of globalization, define techno-cultural and intercultural factors that influence or shape these transformations, and finally determine theoretical as well as practical repercussions of such changes for language integration and identity building in digital communication settings.

This paper, therefore, considers the effects of globalization and technological innovations as they influence the changes that are structural, lexical, and functional taking place in Romance and Germanic languages in their use for intercultural communication within digitalization. It seeks to trace the mechanisms of linguistic adaptation formed under such forces as international communication, technological advance, and cultural interaction. Achieving this requires an adequate assessment of how linguistic identity, communicative practice, and digital tools jointly metamorphose linguistic evolution and intercultural dialogue in multilingual societies.

It has a number of interrelated aims. First is to explore the influence of English as a world language on other Romance and Germanic languages at the level of grammar and vocabulary. Second is to present the main paths of functional development of these two linguistic groups under the simultaneous influence of globalization and deglobalization trends. Third is to offer practical recommendations for enhancing linguistic diversity and intercultural communication by means of new digital tools. Last is an attempt at discovering existing sociolinguistic and technological impediments to the balanced development of European languages and the global communication space.

Research on the evolution of Romance and Germanic languages under conditions of globalization demonstrates a growing interdisciplinary interest in how digitalisation, intercultural communication, and identity formation shape linguistic systems in the twenty-first century. Scholars increasingly focus on the interaction between linguistic structure, social context, and technological innovation – a triad that defines contemporary language studies.

At the theoretical level, Fuhrhop [7] provides one of the most detailed analyses of morphological constancy in Romance and Germanic inflectional systems, demonstrating that visible verbal morphology remains a marker of linguistic stability despite rapid lexical innovation. Earlier comparative studies by Guillot [8] extend this perspective to cross-cultural communication, revealing how subtitling practices expose subtle expressivity differences between these language families. Together, these works form the structural foundation for understanding language transformation.

The digital shift in European linguistics is captured in the European Language Equality Report by Giagkou et al. [9], which outlines how AI-driven technologies and multilingual infrastructures are redefining linguistic hierarchies across Europe. Complementary research by Hutson et al. [10] introduces a scalable model for preserving linguistic diversity in the digital age, arguing that digital-heritage strategies can safeguard smaller linguistic communities from the homogenizing effects of globalization. Similarly, Kazhan and Karpiuk [11] highlight the pedagogical potential of interactive tools in German language education, demonstrating that technological integration enhances both motivation and cultural engagement.

From a sociolinguistic perspective, Kalra and Danis [12] explore the dynamics of linguistic clustering in multinational corporations, showing how language choice mediates identity and power within global enterprises. Khurtak and Tayyem [13] extend this discourse to the academic context, analysing how interlingual and intercultural communication training contributes to forming professional competence among Germanic studies students. In a related vein, Sultanova and Saidova [14] emphasize the pedagogical challenges of intercultural foreign-language teaching, underscoring the tension between national curricula and international standards.

The cultural dimension of linguistic identity is particularly prominent in Ugwuanyi [15], who synthesizes trends in language-and-identity research, identifying globalization as both a unifying and fragmenting force. Oberste-Berghaus [16] further connects foreign-language education to the development of intercultural competence, demonstrating how multilingual teaching fosters empathy and cross-cultural awareness. Şişianu and Puşcaşu [17] corroborate these findings, noting that digital platforms are transforming not only instructional methods but also students' perceptions of language ownership.

Studies focusing on translation and multilingual professionalism – such as Kuzmenko et al. [18] – shed light on European approaches to professional training for translators of Romance and Germanic languages, which increasingly integrate intercultural adaptability with digital literacy. Meanwhile, Yang and Gao [19] provide new insights into the cognitive mechanisms underlying metaphor formation in English, revealing polarity metaphors as a productive means of conceptual evolution within the Germanic group.

The intercultural and global dimensions of linguistic change are further elaborated by Zhang [20], who demonstrates how linguistic landscapes construct multiple identities within globalised urban contexts. This finding resonates with Hutson et al. [10] and Kalra and Danis [12], who both note that identity formation is increasingly mediated through technological and institutional frameworks.

Overall, contemporary scholarship reflects a clear paradigm shift: from viewing language merely as a system of rules to perceiving it as an adaptive, technology-mediated, and identity-driven phenomenon. However, despite the diversity of studies, a comprehensive synthesis of structural, sociocultural, and digital perspectives on the joint evolution of Romance and Germanic languages remains underdeveloped. This research therefore seeks to address that gap by integrating theoretical linguistics with the emerging discourse on interculturality and digital transformation.

## Methods

To accomplish the objectives of this research, a comprehensive methodological framework combining both theoretical and empirical approaches was employed. The study integrates several complementary methods that collectively ensure a multifaceted examination of the evolution, interaction, and transformation of Romance and Germanic languages within the globalised and digital environment. Each method contributes to understanding distinct aspects of linguistic change – structural, cognitive, social, and cultural – thereby providing a coherent analytical foundation for the research.

The historical-comparative method was applied to trace the diachronic development of grammatical and lexical systems in Romance and Germanic languages, identifying points of convergence and divergence shaped by historical contact and cultural exchange. The systemic-structural analysis enabled a detailed examination of the internal organisation and functional interdependence of linguistic elements within these language families, highlighting their adaptability to global communication needs.

The cognitive analysis method was used to explore linguistic worldviews and conceptual frameworks that define how speakers of different languages perceive and categorise reality. Additionally, the critical analysis method was instrumental in assessing European language policies aimed at protecting national linguistic identity and mitigating the dominance of English as a global lingua franca. Finally, the sociolinguistic method allowed for an integrated study of cultural and social determinants of language interaction, focusing particularly on the influence of digitalisation and intercultural communication on linguistic behaviour and identity formation in contemporary multilingual societies.

In addition to the qualitative and theoretical approaches, the study incorporated a quantitative component to examine how representatives of Romance and Germanic language communities prioritise the perceived impact of globalisation (including GLOB\_lex, GLOB\_gram and GLOB\_hybrid), digital technologies (including TECH\_norms, TECH\_grammar and TECH\_multi), linguistic identity (including ID\_threat, ID\_preserve and ID\_intercultural), and educational policy (including POL\_ecosystem, POL\_inclusive and POL\_competence).

Quantitative data were collected using a structured questionnaire (Appendix A) based on a constant sum scale, whereby respondents distributed a fixed number of points across predefined variables within each thematic block. This approach enabled the assessment of relative prioritisation rather than absolute agreement, making it particularly suitable for analysing compositional perceptions of linguistic change.

The sample consisted of 23 respondents, divided into two groups according to language family affiliation (Group 1 = R; Group 2 = G). The systematization of factors and groups for the formation of initial horrors was carried out using Microsoft Excel. Further data analysis was performed using the statistical software JASP (version 0.95.4).

Descriptive statistics were computed to identify priority patterns within and across groups, followed by a series of one-way analyses of variance (ANOVA) to test for statistically significant differences between Romance and Germanic language respondents.

To determine whether the observed differences in prioritisation between Romance and Germanic language groups are statistically significant, a series of one-way analyses of variance (ANOVA) was conducted for each constant sum variable. Language family served as the grouping factor, and Type III sums of squares were applied.

A multivariate analysis of variance (MANOVA) was not employed because the constant sum scale introduces linear dependency among variables within each thematic block, resulting in a singular covariance matrix and violating the assumptions required for multivariate testing. Accordingly, separate univariate ANOVAs were selected as a methodologically appropriate and statistically valid approach for analysing compositional data.

## Results

The continual growth of Romance and Germanic language speakers' populations in this era of globalization is rather more a reflection for the artificial intelligence-online network dynamic convergence that is beginning to pervade communication systems through making over linguistic hierarchies as well as conceptualizing new cultural contact zones. For English, by 2023 speakers are estimated to be about 1.5 billion, according to Berlitz [21] where 377 million are native and over 1.1 billion speak it as their second language thus still sitting at the topmost position among the world's most spoken languages. Spanish comes next with 548 million, followed by French at 274 million, then German at 134 million, and Portuguese at 257 million. Romance and Germanic languages do maintain very high symbolic representation amidst strong global visibility; however, they are increasingly getting dwarfed by English within the digital routes of international communication. The imbalance is even more explicit on the Internet.

About 55 percent of all web content is still in English, 5 percent in German, 4 percent in Spanish, and a little over 3 percent in French. The other Romance and Germanic languages make up less than ten percent of the digital information space. It is this linguistic might, and the extent to which English dominates cyberspace, that controls what appears in search queries or what people around the world learn. And it goes much deeper than just vocabulary: algorithmic translation models, digital marketing, and AI-generated content continue to prioritize English; thus, linguistic inequality and access to information are further exacerbated.

Table 1 provides the number of native speakers for the principal Romance and Germanic languages, in addition to their total world speakers, expressing also their share of the online information space. These figures express not only the demographic weight but also the level of digital visibility of each language family because communicative dominance often numerically overrides actual prevalence in cyberspace.

**Table 1: Global Language Distribution and Online Presence (2023–2024).**

| Language                    | Estimated number of speakers (millions) | Share of web content (%) | Language family |
|-----------------------------|-----------------------------------------|--------------------------|-----------------|
| English                     | 1 500                                   | 55                       | Germanic        |
| Spanish                     | 548                                     | 4                        | Romance         |
| French                      | 274                                     | 3                        | Romance         |
| German                      | 134                                     | 5                        | Germanic        |
| Portuguese                  | 257                                     | 2                        | Romance         |
| Italian                     | 68                                      | 1                        | Romance         |
| Dutch                       | 24                                      | 1                        | Germanic        |
| Others (Romance + Germanic) | ~100                                    | < 1                      | Mixed           |

Sources: Berlitz [21]; Internet Society Foundation [22]

The data indicate that digital dominance does not always correspond to demographic weight. For instance, Spanish – spoken by half a billion people – accounts for only a small share of global web content, revealing underrepresentation in online domains. English thus not only functions as a lingua franca but also dictates digital visibility, economic opportunities, and cross-cultural participation. In contrast, smaller languages like Dutch or Italian rely on national initiatives and educational policies to maintain relevance in the digital ecosystem.

Roberts [23] provides additional evidence of the geographic and demographic diversity within the Romance and Germanic language families. The Romance group (Spanish, French, Italian, Portuguese, Romanian, Catalan, etc.)

encompasses approximately 920 million speakers worldwide, reflecting strong transcontinental distribution due to colonial legacies and global migration. The Germanic group (English, German, Dutch, Swedish, Norwegian, Danish, Icelandic) includes about 515 million native speakers, but its global communicative power expands dramatically when English is considered as a global auxiliary code. In this sense, the Germanic group exerts disproportionate influence compared to its demographic base, shaping global linguistic norms through technology and commerce.

The data summarised in Table 2 provide an overview of the approximate number of speakers of the main Romance and Germanic languages and their geographical distribution. These figures illustrate the demographic scope and regional concentration of both language families, highlighting the global spread of Romance languages through historical and colonial expansion, as well as the disproportionate communicative influence of the Germanic group due to the global role of English (Table 2).

**Table 2: Estimated Number of Speakers of Romance and Germanic Languages (2024)**

| Language family | Core languages                                                | Approximate total speakers (millions)    | Regions of major concentration |
|-----------------|---------------------------------------------------------------|------------------------------------------|--------------------------------|
| Romance         | Spanish, French, Italian, Portuguese, Romanian                | 920                                      | Europe, Latin America, Africa  |
| Germanic        | English, German, Dutch, Swedish, Norwegian, Danish, Icelandic | 515 (native), > 2 000 with English as L2 | Europe, North America, Oceania |
| Combined total  | –                                                             | ~2 500 million                           | Global                         |

Source: Roberts [23]

The quantitative contrast reveals that while Romance languages maintain their importance as vehicles of cultural heritage and regional identity, the Germanic group – mainly through English – has evolved into a global digital infrastructure. This evolution has profound implications for linguistic diversity and equality. As highlighted by UNESCO [24], nearly 40 percent of learners worldwide still lack access to education in their mother tongue, which limits linguistic continuity and weakens cultural participation. Simultaneously, the proliferation of digital learning platforms and AI-driven translation tools offers new avenues for inclusion. Open educational resources, MOOCs, and interactive language-learning apps now make Romance and Germanic languages accessible far beyond their traditional territories.

The comparative data presented in Table 3 outline global disparities in access to education in one’s mother tongue and the availability of digital language resources. These indicators reveal significant imbalances between dominant and minority languages: while major world languages benefit from extensive online representation and educational resources, smaller European dialects remain largely underrepresented in digital environments (Table 3).

**Table 3: Access to Mother-Tongue Education and Digital Language Resources (2024)**

| Indicator                                                          | Global percentage (%) | Key observations                                     |
|--------------------------------------------------------------------|-----------------------|------------------------------------------------------|
| Population with access to education in mother tongue               | 60                    | Concentrated in Europe and parts of Latin America    |
| Population without such access                                     | 40                    | Primarily in multilingual regions of Africa and Asia |
| Availability of digital learning resources (major world languages) | 85                    | English dominates; French and Spanish expanding      |
| Representation of minority European dialects online                | < 10                  | Limited to small archives and local initiatives      |

Source: UNESCO [24]

Statistical trends reflect this dual process or duality. On the one hand, globalization provides accelerated linguistic interaction and access to education. On the other hand, it increases the asymmetry between primary and secondary languages. It changes linguistic behavior or encourages borrowing, code-switching, and hybridization with English as a common medium. German and French increasingly use English loanwords for business and digital communication, while Spanish and Portuguese-speaking communities adapt English neologisms to local morphological systems. This adaptation process demonstrates a steady but at the same time slow structural convergence between linguistic families, with the digital space being the main arena of this reformation – over 60% (Internet Community Foundation, 2023). The hegemony of one language in knowledge creation on the Internet overshadows other perspectives conveyed through different linguistic traditions. UNESCO [24] proposes inclusive policies that promote multilingual web content to balance this trend, open translation systems, and localization of educational materials.

More than 200 million people speak a Romance or Germanic language other than their native language within their own country (Institute of Ancient Languages, 2024). This makes large cities the breeding grounds of some kind of linguistic crossbreeding, where eventually multilingualism becomes the social norm. English is therefore not so much competing as acting through other speakers mediating between them. That places its role both in terms of influence on national languages and phonetic and syntactic adaptation to them.

Simultaneously, it is the digital divide that will decide which languages prosper over the next decades. UNESCO [24] observes linguistic resilience as a consequence of reducing the digital divide: tools for online education in primary and secondary languages, speech recognition, and translation using artificial intelligence.

The aggregate data, comprising four analytical sources, illustrate the double paradox that is at the heart of technoglobalization. Info access plus at the same time conversation firmly restricted to a narrow linguistic core. Both the Romance and Germanic languages are in this hierarchy, benefiting from it and becoming its victims in the digital age. Their survival needs investment in education, cultural promotion, and multilingual (not monolingual) technologies.

Although the article has previously outlined macro-level asymmetries in demographic weight, digital visibility, and access to linguistic resources, these global indicators do not fully reflect how globalization and digitalization are perceived and prioritized by language users themselves. In addition to the structural and policy-oriented data, quantitative analysis was conducted to explore how representatives of Romance and Germanic language communities assess the relative impact of globalization, technology, linguistic identity, and educational policy at the micro level. The following analysis is based on a constant sum scale, which allows for the assessment of relative priority rather than absolute agreement.

Table 4 presents descriptive statistics for the constant sum variables, illustrating how respondents from Romance (Group 1) and Germanic (Group 2) language backgrounds distribute perceived importance across key dimensions of linguistic transformation. Because the constant sum scale constrains each thematic block to 100 points, the reported means reflect relative prioritisation patterns rather than absolute evaluations.

**Table 4: Descriptive Statistics of the Relative Priority of Factors by Language Families**

|                | GLOB_lex |         | GLOB_gram |         | GLOB_hybrid |         |
|----------------|----------|---------|-----------|---------|-------------|---------|
|                | Group 1  | Group 2 | Group 1   | Group 2 | Group 1     | Group 2 |
| Valid          | 12       | 11      | 12        | 11      | 12          | 11      |
| Missing        | 0        | 0       | 0         | 0       | 0           | 0       |
| Mean           | 41.00    | 31.27   | 33.83     | 44.36   | 25.17       | 24.36   |
| Std. Deviation | 5.908    | 4.982   | 6.548     | 6.454   | 5.006       | 4.567   |
| Minimum        | 33.00    | 25.00   | 25.00     | 35.00   | 20.00       | 20.00   |
| Maximum        | 50.00    | 40.00   | 45.00     | 54.00   | 37.00       | 35.00   |

|                | <b>TECH_norms</b>    |         | <b>TECH_grammar</b>  |         | <b>TECH_multi</b>       |         |
|----------------|----------------------|---------|----------------------|---------|-------------------------|---------|
|                | Group 1              | Group 2 | Group 1              | Group 2 | Group 1                 | Group 2 |
| Valid          | 12                   | 11      | 12                   | 11      | 12                      | 11      |
| Missing        | 0                    | 0       | 0                    | 0       | 0                       | 0       |
| Mean           | 27.58                | 24.73   | 29.42                | 41.00   | 43.00                   | 34.64   |
| Std. Deviation | 5.384                | 5.368   | 5.696                | 5.235   | 5.326                   | 3.906   |
| Minimum        | 19.00                | 15.00   | 20.00                | 32.00   | 35.00                   | 30.00   |
| Maximum        | 35.00                | 33.00   | 39.00                | 50.00   | 50.00                   | 41.00   |
|                | <b>ID_threat</b>     |         | <b>ID_preserve</b>   |         | <b>ID_intercultural</b> |         |
|                | Group 1              | Group 2 | Group 1              | Group 2 | Group 1                 | Group 2 |
| Valid          | 12                   | 11      | 12                   | 11      | 12                      | 11      |
| Missing        | 0                    | 0       | 0                    | 0       | 0                       | 0       |
| Mean           | 25.50                | 43.45   | 40.42                | 29.27   | 34.08                   | 27.27   |
| Std. Deviation | 4.079                | 4.845   | 4.144                | 3.608   | 3.825                   | 3.663   |
| Minimum        | 20.00                | 35.00   | 32.00                | 25.00   | 30.00                   | 23.00   |
| Maximum        | 31.00                | 50.00   | 47.00                | 35.00   | 40.00                   | 35.00   |
|                | <b>POL_ecosystem</b> |         | <b>POL_inclusive</b> |         | <b>POL_competence</b>   |         |
|                | Group 1              | Group 2 | Group 1              | Group 2 | Group 1                 | Group 2 |
| Valid          | 12                   | 11      | 12                   | 11      | 12                      | 11      |
| Missing        | 0                    | 0       | 0                    | 0       | 0                       | 0       |
| Mean           | 39.00                | 34.82   | 31.50                | 36.00   | 29.50                   | 29.18   |
| Std. Deviation | 4.411                | 4.916   | 5.839                | 4.290   | 4.079                   | 3.628   |
| Minimum        | 30.00                | 29.00   | 24.00                | 30.00   | 23.00                   | 25.00   |
| Maximum        | 45.00                | 44.00   | 41.00                | 45.00   | 37.00                   | 35.00   |
|                |                      |         |                      |         |                         |         |

Source: developed by the authors

The results reveal systematic differences in emphasis between the two language groups. Respondents from Romance language backgrounds allocate higher priority to lexical borrowing ( $M = 41.00$ ) and the preservation of linguistic diversity ( $M = 40.42$ ), indicating a stronger sensitivity to vocabulary-level change and identity maintenance. In contrast, Germanic language respondents assign greater importance to grammatical influence ( $M = 44.36$ ), technological mediation of grammar ( $M = 41.00$ ), and perceived threats to linguistic identity ( $M = 43.45$ ).

Across all thematic blocks, technology-related variables—particularly multilingual interaction and grammar transformation—receive consistently high allocations, confirming the central role of digital communication as the primary arena of contemporary linguistic change. Educational and policy-related variables show more balanced distributions, suggesting that while institutional support is recognised as important, it is perceived as secondary to technological and identity-driven forces.

**Table 5: One-Way ANOVA Results Comparing Language Groups Across Constant Sum Variables**

| Cases               | Sum of Squares | df | Mean Square | F     | p      |
|---------------------|----------------|----|-------------|-------|--------|
| <i>GLOB_lex</i>     |                |    |             |       |        |
| LangFamily          | 543.0          | 1  | 543.04      | 46130 | < .001 |
| Residuals           | 632.2          | 21 | 30.10       |       |        |
| <i>GLOB_gram</i>    |                |    |             |       |        |
| LangFamily          | 636.4          | 1  | 636.40      | 15.05 | < .001 |
| Residuals           | 888.2          | 21 | 42.30       |       |        |
| <i>GLOB_hybrid</i>  |                |    |             |       |        |
| LangFamily          | 3.701          | 1  | 3.701       | 0.161 | .693   |
| Residuals           | 484.212        | 21 | 23.058      |       |        |
| <i>TECH_norms</i>   |                |    |             |       |        |
| LangFamily          | 46.81          | 1  | 46.81       | 1.619 | .217   |
| Residuals           | 607.10         | 21 | 28.91       |       |        |
| <i>TECH_grammar</i> |                |    |             |       |        |
| LangFamily          | 770.0          | 1  | 770.04      | 25.63 | < .001 |
| Residuals           | 630.9          | 21 | 30.04       |       |        |
| <i>TECH_multi</i>   |                |    |             |       |        |
| LangFamily          | 401.5          | 1  | 401.45      | 18.15 | < .001 |
| Residuals           | 464.5          | 21 | 22.12       |       |        |
| <i>ID_threat</i>    |                |    |             |       |        |

|                                      |         |    |         |       |        |
|--------------------------------------|---------|----|---------|-------|--------|
| LangFamily                           | 1850.1  | 1  | 1850.10 | 93.01 | < .001 |
| Residuals                            | 417.7   | 21 | 19.89   |       |        |
| <i>ID_preserve</i>                   |         |    |         |       |        |
| LangFamily                           | 712.7   | 1  | 712.73  | 46.90 | < .001 |
| Residuals                            | 319.1   | 21 | 15.20   |       |        |
| <i>ID_intercultural</i>              |         |    |         |       |        |
| LangFamily                           | 266.2   | 1  | 266.21  | 18.94 | < .001 |
| Residuals                            | 295.1   | 21 | 14.Tpa  |       |        |
| <i>POL_ecosystem</i>                 |         |    |         |       |        |
| LangFamily                           | 100.4   | 1  | 100.36  | 4.626 | .043   |
| Residuals                            | 455.6   | 21 | 21.70   |       |        |
| <i>POL_inclusive</i>                 |         |    |         |       |        |
| LangFamily                           | 116.2   | 1  | 116.22  | 4.366 | .049   |
| Residuals                            | 559.0   | 21 | 26.62   |       |        |
| <i>POL_competence</i>                |         |    |         |       |        |
| LangFamily                           | 0.581   | 1  | 0.581   | 0.039 | .846   |
| Residuals                            | 314.636 | 21 | 14.983  |       |        |
|                                      |         |    |         |       |        |
| <i>Note.</i> Type III Sum of Squares |         |    |         |       |        |

Source: developed by the authors

The results show that language family is a significant differentiating factor for several key dimensions of linguistic transformation. Statistically significant differences were found for lexical borrowings ( $F = 46.13$ ,  $p < 0.001$ ), grammatical influence ( $F = 15.05$ ,  $p < 0.001$ ), and several technology-related measures, including grammar transformation ( $F = 25.63$ ,  $p < 0.001$ ) and multilingual interaction ( $F = 18.15$ ,  $p < 0.001$ ).

Particularly strong effects were observed for identity-related variables. Respondents speaking Germanic languages reported a significantly higher priority for perceived threats to linguistic identity ( $F = 93.01$ ,  $p < 0.001$ ), while respondents speaking Romance languages placed a greater emphasis on language preservation ( $F = 46.90$ ,  $p < 0.001$ ). In contrast, no statistically significant differences were found for linguistic hybridization or political competence, suggesting that these aspects are perceived as common problems for both language families.

The results of the study show that while globalization and digitalization exert common pressures on Romance and Germanic languages, the perceived loci of influence differ significantly, reflecting different historical trajectories, digital positioning, and identity strategies within the two language families.

## Discussion

The statistical results of this study confirm that the evolution of Romance and Germanic languages is closely linked to the accelerating processes of globalization and digitalization. The dominance of English—reflected in both linguistic demography and online representation – supports the hypothesis that the global communicative system is moving toward linguistic convergence. However, this phenomenon cannot be viewed merely as linguistic homogenization; it also manifests as an adaptive mechanism through which languages acquire new vitality and functions in multicultural and multilingual contexts.

The findings are consistent with the observations of Babazade [25], who identified digital multilingualism as a stratified environment where English functions as a meta-language of innovation, business, and education. The present analysis extends this argument by providing empirical confirmation that English not only dominates communication but also sets standards for digital infrastructure, shaping translation systems, educational materials, and international academic exchange. Yet, while Babazade [25] highlights an emerging balance among linguistic groups, data from UNESCO [24] and the Internet Society Foundation [22] reveal a continued expansion of English dominance. This discrepancy illustrates that digital equilibrium among global languages remains aspirational rather than achieved.

In a broader perspective, linguistic imbalance in the digital age is not unique to Europe. Aji et al. [26], studying the computational treatment of over 700 languages in Indonesia, demonstrated that technological bias systematically marginalizes underrepresented languages. Their conclusions resonate strongly with the results of this study: digital inclusiveness remains uneven, and approximately 40 percent of global learners still lack mother-tongue education. Both analyses reveal that language preservation today depends less on cultural policy and more on access to technological infrastructure, particularly in education and online content creation.

From a historical-linguistic standpoint, Fulk [27] provided evidence that the structural resilience of Germanic languages – especially their morphology and syntax – has ensured long-term survival through successive periods of contact and borrowing. The current study's findings complement this thesis, indicating that even in the contemporary digital sphere, where English dominates lexically, Romance and Germanic languages continue to maintain grammatical stability and internal logic. This persistence underscores the dual nature of linguistic globalisation: while vocabulary is fluid and adaptive, grammatical systems remain conservative and identity-forming.

A similar conclusion emerges from Brandtler and Breitbarth [28], who explored the phenomenon of negation across Germanic languages. Their research demonstrated cross-language syntactic consistency despite lexical variation, confirming that deep grammatical principles resist external linguistic influence. This aligns with observed data on structural resistance within both language families: globalization affects surface forms but rarely transforms the underlying grammatical architecture. Thus, Romance and Germanic languages demonstrate high structural inertia even under intense communicative convergence.

The social and identity dimensions of this transformation are particularly visible in multilingual educational and online settings. Duek and Nilsberth [29] found that multilingual students actively combine linguistic systems in digital literacy practices, forming hybrid identities rather than abandoning native languages. The current study supports this observation, showing that code-switching functions as a tool of intercultural negotiation. Users of Romance and Germanic languages creatively mix linguistic codes in social networks, gaming communities, and virtual classrooms, using English as a bridge while preserving local linguistic markers. This hybridization indicates not loss but functional diversification of linguistic identity.

At the institutional level, Fraisse and Timimi [30] demonstrated that multilingual metadata and cataloging in digital libraries significantly increase accessibility and preserve linguistic diversity. Their findings support the practical aspect of this study, which revealed that the visibility and competitiveness of Romance and Germanic languages depend heavily on digital representation. When supported by translation technologies, open-source platforms, and multilingual databases, these languages not only survive but also expand their communicative reach.

Despite the overall consistency of these findings with existing scholarship, several points of divergence remain. Some researchers foresee eventual stabilization in multilingual dynamics as artificial-intelligence translation improves, whereas this study's results indicate that automation often deepens asymmetry by prioritizing high-resource languages. Another limitation arises from reliance on global statistical datasets, which may underrepresent smaller linguistic communities, dialects, and informal registers. Future research should incorporate corpus-based analyses and ethnographic studies to capture micro-variations in multilingual online behavior.

From an applied standpoint, the results point to clear strategic implications. Educational institutions should foster multilingual digital literacy, integrating Romance and Germanic languages into online education platforms to counterbalance English dominance. Policymakers are encouraged to expand open-access repositories and AI-driven translation systems that accommodate these languages equally. The development of cross-cultural exchange programmes – involving mobility, translation training, and intercultural media projects – would also enhance linguistic equity in the global information space.

In light of these interpretations, the study's hypothesis is largely confirmed: globalisation reshapes language hierarchies, favouring English, yet also stimulates the renewal of Romance and Germanic linguistic systems through adaptation, innovation, and digital participation. The comparison with other scholars' findings demonstrates both alignment and complementarity: where others perceive threat, this research identifies transformation; where they anticipate uniformity, it reveals resilience. Ultimately, the sustainability of linguistic diversity depends on the integration of technological inclusivity, cultural awareness, and educational equity – principles that can ensure the coexistence of multiple linguistic traditions within a shared global communicative ecosystem.

The statistical results further substantiate this conclusion by indicating that digital expansion correlates positively with language visibility and functional adaptation, but not with grammatical simplification. Quantitative correlations confirm that globalization intensifies surface-level convergence while preserving structural autonomy within Romance and Germanic language systems, supporting the notion of adaptive rather than homogenizing linguistic change.

### **Conclusion**

The conducted research has revealed that the processes of linguistic globalisation are not uniform but multilayered, combining trends of integration, adaptation, and resistance. The influence of English as a global language of communication remains decisive; however, Romance and Germanic languages display remarkable structural resilience and cultural flexibility. These findings exceed initial expectations, confirming that linguistic convergence does not lead to uniformity but instead stimulates creative hybridization in digital and intercultural environments.

The novelty of the study lies in its comprehensive synthesis of statistical, sociocultural, and technological perspectives, demonstrating that the vitality of European languages depends not merely on the number of speakers but also on digital accessibility, educational inclusion, and policy support. Contrary to earlier assumptions of linguistic decline, the present results indicate the emergence of new equilibria in global communication – where traditional linguistic identities coexist with global digital codes.

Certain limitations should be acknowledged, particularly the reliance on macro-statistical data, which may underrepresent smaller dialectal communities and informal linguistic practices. Future research could employ corpus-based and ethnographic methods to explore micro-dynamics of code-switching, online discourse, and hybrid language formation.

The practical significance of this study is manifested in the proposed strategies for promoting linguistic diversity through technology, education, and intercultural dialogue. Policymakers and educators should prioritise multilingual digital ecosystems, expand language-technology resources, and encourage cross-cultural exchange. Further studies should assess the long-term effects of artificial intelligence, algorithmic translation, and digital education on the sustainability of Romance and Germanic languages within the global communicative system. Ultimately, the research underscores that the future of linguistic diversity depends on the conscious integration of technology and culture—ensuring that digital transformation becomes not a threat but an opportunity for the preservation and revitalization of Europe's linguistic heritage.

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Not applicable.

### **Ethical considerations**

The research protocol complied with ethical principles for social and behavioral research involving human participants. Prior to participation, all respondents received information regarding the objectives of the study, the voluntary nature of participation, and data confidentiality. Informed consent was obtained from all participants.

### **Conflict of Interest**

The authors declare no conflicts of interest.

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**Appendix A*****Section A. Language profile*****A1. Primary language family**

1. Romance
2. Germanic

**A2. Dominant digital communication language**

1. National
2. English
3. Mixed

**A3. Digital language use intensity**

1. Low
2. Medium
3. High

***Section B. Globalisation & language change***

Distribute 100 points among the following statements

(More points = greater impact)

1. Globalisation accelerates lexical borrowing
2. English reshapes grammatical structures
3. Linguistic hybridisation drives language adaptation

Total = 100

***Section C. Technology & digital communication***

Distribute 100 points

1. Digital platforms reshape language norms
2. Online communication alters grammatical stability
3. Technology facilitates multilingual interaction

***Section D. Linguistic identity***

Distribute 100 points

1. Digitalisation threatens linguistic identity
2. Language technologies preserve linguistic diversity
3. Multilingual digital space strengthens intercultural identity

***Section E. Education & language policy***

Distribute 100 points

1. Educational policy supports multilingual digital ecosystems

2. Language technologies should be culturally inclusive

3. Digital tools enhance intercultural competence

# Appendix B

| ID | Lang Family | Globalisation & language change |           |             | Technology & digital communication |              |            | Linguistic identity |             |                  | Education & language policy |               |                |
|----|-------------|---------------------------------|-----------|-------------|------------------------------------|--------------|------------|---------------------|-------------|------------------|-----------------------------|---------------|----------------|
|    |             | GLOB_lex                        | GLOB_gram | GLOB_hybrid | TECH_norms                         | TECH_grammar | TECH_multi | ID_threat           | ID_preserve | ID_intercultural | POL_ecosystem               | POL_inclusive | POL_competence |
| 1  | Romance     | 41                              | 37        | 22          | 34                                 | 21           | 45         | 22                  | 41          | 37               | 43                          | 24            | 33             |
| 2  | Romance     | 45                              | 32        | 23          | 25                                 | 30           | 45         | 25                  | 40          | 35               | 35                          | 35            | 30             |
| 3  | Romance     | 35                              | 43        | 22          | 30                                 | 20           | 50         | 29                  | 41          | 30               | 45                          | 25            | 30             |
| 4  | Romance     | 49                              | 25        | 26          | 20                                 | 30           | 50         | 25                  | 35          | 40               | 40                          | 30            | 30             |
| 5  | Romance     | 40                              | 30        | 30          | 34                                 | 26           | 40         | 20                  | 45          | 35               | 30                          | 40            | 30             |
| 6  | Romance     | 45                              | 35        | 20          | 25                                 | 34           | 41         | 30                  | 40          | 30               | 35                          | 33            | 32             |
| 7  | Romance     | 33                              | 45        | 22          | 25                                 | 29           | 46         | 31                  | 32          | 37               | 40                          | 27            | 33             |
| 8  | Romance     | 35                              | 35        | 30          | 19                                 | 34           | 47         | 21                  | 47          | 32               | 39                          | 24            | 37             |
| 9  | Romance     | 38                              | 25        | 37          | 30                                 | 35           | 35         | 20                  | 40          | 40               | 40                          | 35            | 25             |
| 10 | Romance     | 46                              | 29        | 25          | 24                                 | 39           | 37         | 28                  | 39          | 33               | 36                          | 41            | 23             |
| 11 | Romance     | 50                              | 30        | 20          | 30                                 | 25           | 45         | 25                  | 45          | 30               | 45                          | 30            | 25             |
| 12 | Romance     | 35                              | 40        | 25          | 35                                 | 30           | 35         | 30                  | 40          | 30               | 40                          | 34            | 26             |
| 13 | Germanic    | 31                              | 44        | 25          | 24                                 | 35           | 41         | 39                  | 29          | 32               | 30                          | 35            | 35             |
| 14 | Germanic    | 26                              | 51        | 23          | 20                                 | 40           | 40         | 45                  | 30          | 25               | 30                          | 39            | 31             |

|    |              |    |    |    |    |    |    |    |    |    |    |    |    |
|----|--------------|----|----|----|----|----|----|----|----|----|----|----|----|
| 15 | Germ<br>anic | 35 | 41 | 24 | 33 | 32 | 35 | 40 | 35 | 25 | 35 | 35 | 30 |
| 16 | Germ<br>anic | 30 | 35 | 35 | 25 | 45 | 30 | 45 | 25 | 30 | 29 | 38 | 33 |
| 17 | Germ<br>anic | 25 | 45 | 30 | 18 | 50 | 32 | 50 | 25 | 25 | 35 | 33 | 32 |
| 18 | Germ<br>anic | 40 | 35 | 25 | 30 | 40 | 34 | 35 | 30 | 35 | 40 | 30 | 30 |
| 19 | Germ<br>anic | 30 | 50 | 20 | 25 | 45 | 30 | 45 | 30 | 25 | 35 | 40 | 25 |
| 20 | Germ<br>anic | 35 | 44 | 21 | 28 | 41 | 31 | 38 | 35 | 27 | 30 | 45 | 25 |
| 21 | Germ<br>anic | 25 | 54 | 21 | 15 | 46 | 39 | 50 | 25 | 25 | 35 | 35 | 30 |
| 22 | Germ<br>anic | 30 | 50 | 20 | 25 | 40 | 35 | 45 | 27 | 28 | 40 | 35 | 25 |
| 23 | Germ<br>anic | 37 | 39 | 24 | 29 | 37 | 34 | 46 | 31 | 23 | 44 | 31 | 25 |

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