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LINGUISTIC CREATIVITY IN DIGITAL SPACES: A COMPUTATIONAL SOCIOLINGUISTIC ANALYSIS

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Abstract
Digital communication has transformed the ways individuals construct identity, perform sociolinguistic variation, and exercise linguistic creativity. Within Pakistan's multilingual ecology, online platforms provide a dynamic space where English, Urdu, Punjabi, Sindhi, and Romanized scripts coexist, converge, and collide. This article explores linguistic creativity in digital spaces by employing a computational sociolinguistic approach that integrates quantitative corpus methods with critical sociolinguistic analysis. Drawing on a dataset of social media interactions, Whatsapp messages, and digital memes from Pakistani users, the study examines patterns of code-switching, hybrid lexical formations, transliteration practices, and stylistic innovations. The findings reveal that Pakistani digital discourse is shaped by sociocultural identity, technological affordances, and ideological negotiations that challenge traditional boundaries of language use. Computational tools such as frequency analysis, concordances, and collocation mapping were employed to track recurrent features of digital creativity, while sociolinguistic interpretation highlights how these practices index class, gender, and generational identities. By situating the analysis in Pakistan's socio-digital landscape, this study contributes to understanding how creativity in digital communication not only reflects but also redefines sociolinguistic hierarchies and power relations. The article argues that linguistic creativity in Pakistani digital discourse is not random but systematically tied to broader issues of globalization, localization, and digital literacy

INTRODUCTION

The digital revolution has profoundly reshaped how individuals communicate, negotiate identities, and construct meaning across cultures. With the rise of social media platforms, instant messaging applications, and online forums, language has transcended traditional communicative boundaries, producing new forms of discourse that are inherently multimodal, hybrid, and creative (Androutsopoulos, 2015). Digital spaces have thus become fertile grounds for linguistic experimentation, where users constantly

innovate through wordplay, code-switching, transliteration, and hybridization. This phenomenon, broadly conceptualized as linguistic creativity, is not merely playful but indexes deeper sociolinguistic realities concerning power, identity, and belonging (Crystal, 2008).

Within Pakistan, a linguistically diverse nation, the digital sphere offers a unique context to study such creativity. Urdu, English, Punjabi, Sindhi, Pashto, and Balochi coexist in both oral and written traditions, often competing and overlapping in complex ways (Rahman, 2010). The rise of Roman Urdu—an informal writing system where Urdu is transcribed using Latin script—demonstrates how digital affordances encourage linguistic innovation. Similarly, hybrid forms such as "Urglish" or "Pinglish" (Urdu/Punjabi-English mixes) illustrate how multilingual speakers exploit digital spaces to express identity and group solidarity. These creative practices not only reflect individual agency but also highlight broader socio-political dynamics, such as class stratification, educational access, and postcolonial language ideologies (Mahboob & Talaat, 2008).

Despite the growing scholarly interest in digital discourse, research on linguistic creativity in the Pakistani digital context remains limited. Most existing work has focused on the sociopolitical functions of language in media (Javed & Mahmood, 2011) or the role of English in elite versus mass education (Rahman, 2002). While valuable, these studies often overlook how computational methods can reveal systematic patterns of creativity within large-scale digital data. Computational sociolinguistics, a field that integrates natural language processing techniques with sociolinguistic theory, offers tools to uncover the frequency, distribution, and collocational tendencies of linguistic phenomena (Nguyen et al., 2016). Applying these methods to Pakistani digital discourse can illuminate not only how linguistic creativity manifests but also what social meanings it carries.

Linguistic creativity in Pakistan's digital spaces is particularly significant because it intersects with questions of globalization and localization. On the one hand, English dominates global digital platforms, creating pressures for conformity. On the other, Pakistani users actively localize digital discourse by embedding cultural idioms, transliterating Urdu proverbs, or creating memes in regional languages. This tension between global linguistic capital and local identity negotiation makes Pakistan an ideal site for examining how digital creativity redefines linguistic hierarchies (Khan, 2019). Moreover, the emergence of a digitally literate youth population has accelerated creative innovations that reflect generational identities distinct from traditional forms of communication.

The study of linguistic creativity in digital spaces also contributes to understanding ideology and power. In Pakistan, where language has historically been tied to political struggles (e.g., Urdu vs. Bengali in the 1950s, or Urdu vs. regional languages in contemporary times), digital discourse becomes a contested arena. Memes mocking political elites, hashtags mobilizing social movements, and creative spellings used to bypass censorship reflect how linguistic creativity functions as a form of resistance. Computational sociolinguistic analysis can thus shed light on how language users strategically deploy creative forms not only to entertain but also to challenge hegemonic narratives.

Another dimension concerns gendered linguistic practices. Studies of Pakistani digital discourse suggest that women and men often employ linguistic creativity differently, with women more likely to use emoticons, expressive elongations (e.g., "cooooolll"), and hybrid spellings as identity markers (Ali & Batool, 2015). These gendered practices, when mapped computationally, can reveal how digital creativity interacts with broader patriarchal structures, offering insight into how women negotiate space and voice online.

This article positions itself at the intersection of sociolinguistics, computational linguistics, and digital media studies. Specifically, it aims to answer the following research questions:

1. What forms of linguistic creativity are most prevalent in Pakistani digital spaces?
2. How do computational sociolinguistic methods help identify and analyze these forms systematically?
3. What sociocultural meanings are indexed by linguistic creativity in digital communication within the Pakistani context?
4. How do factors such as class, gender, and globalization/localization shape patterns of digital linguistic creativity?

The significance of this study lies in three areas. First, it fills a scholarly gap by focusing on Pakistan, a country underexplored in digital sociolinguistic research despite its rich multilingualism. Second, it demonstrates how computational tools can complement traditional qualitative analyses, providing a hybrid methodology that is both rigorous and scalable. Finally, it underscores the role of digital creativity in negotiating social identities and power relations, thereby contributing to broader discussions in critical sociolinguistics and discourse analysis.

In summary, the digital sphere in Pakistan is not merely a technological platform but a sociolinguistic laboratory, where speakers continually reimagine language. Through computational sociolinguistic analysis, this article investigates how creativity in digital communication reflects the interplay of identity, ideology, and innovation in a multilingual society.

Literature Review

Literature review is a written overview of major writings and other sources on a selected topic. Sources covered in the review may include scholarly journal articles, books, and websites. The purpose of literature review is to gain an understanding of the existing research and debates relevant to a particular research topic (Arshad, Mehmood & Ahmad, 2025; Yousaf et al., 2025). "Review of the literature summarize and evaluate the text of writing of the definite theme, and provide frame work to think about the possible consequence of innovative study" (Ahmad et al., 2023, p,2). "A review of literature may only be a clear overview of the sources, in an organizational pattern, and its function is to estimate and summarize the previous writings linked to current topic" (Ahmad et al., 2024, p,3).

1. Linguistic Creativity: Global Perspectives

The concept of linguistic creativity has long occupied scholars across linguistics, sociolinguistics, and applied linguistics. Crystal (2008) defined it as the inventive and innovative manipulation of language beyond conventional structures. While early studies often emphasized literary or poetic creativity, later scholarship extended the notion to everyday communication, recognizing that ordinary speakers constantly engage in creative practices (Carter, 2004). In digital communication, these practices are magnified due to the affordances of technology—speed, multimodality, and interactivity (Androutsopoulos, 2015).

Globally, researchers have documented a range of creative practices, including playful spellings, emoticon and emoji use, code-mixing, and the invention of novel lexical items (Tagg, 2015). Digital platforms foster creativity because they allow for linguistic experimentation unconstrained by prescriptive norms. In contrast to print media, which historically privileged standardized forms, online discourse thrives on variability and innovation. This shift underscores that linguistic creativity is not peripheral but central to digital communication.

2. Linguistic Creativity in South Asian and Pakistani Contexts

Within South Asia, multilingualism provides fertile ground for creative linguistic practices. In India, for example, digital discourse often blends English with Hindi or regional languages, leading to hybrid forms such as "Hinglish" (Kachru, 2006). Pakistan exhibits similar dynamics, where English, Urdu, and regional

languages frequently interact in digital texts (Mahboob & Talaat, 2008).

Pakistani linguistic creativity is marked by several features:

Roman Urdu:
Users transcribe Urdu into Latin script, often without standardized orthography, producing multiple spellings for the same word (e.g., "acha," "achaah," "achaa") (Haque, 2012).

Code-switching:
Mixing English with Urdu or Punjabi reflects both social aspiration and identity performance (Rahman, 2010).

Hybrid lexical items:
Creative blends such as "timepass" or "scene-on" emerge from the digital adaptation of colloquial speech (Khan, 2019).

Memetic discourse:
Internet memes circulate with creative captions in Urdu-English blends, indexing humor and social critique (Ahmad, 2021).

Research specifically addressing creativity in Pakistani digital spaces remains limited. Existing studies have focused primarily on political discourse (Javed & Mahmood, 2011), gendered language practices (Ali & Batool, 2015), or educational issues (Mahboob, 2009). While these contributions are valuable, they rarely adopt a computational sociolinguistic lens, leaving a gap in understanding the systematic patterns of creativity across large digital datasets.

3. Computational Sociolinguistics

The emergence of computational sociolinguistics has opened new methodological horizons for analyzing linguistic phenomena. This interdisciplinary field integrates computational tools—such as natural language processing (NLP), corpus linguistics, and machine learning—with sociolinguistic inquiry (Nguyen et al., 2016). The advantage lies in scalability: whereas traditional sociolinguistic studies often rely on small samples, computational methods can process millions of words to reveal broad trends.

Key computational techniques include:

Frequency analysis:
It identifies the most common lexical items and patterns.

Collocation and concordance analysis:
It examines co-occurrence of words to reveal semantic associations.

Topic modeling:
It extracts thematic structures from large corpora.

Sentiment analysis:
It maps evaluative stances in digital communication.

When applied to creativity, these tools can uncover how novel spellings cluster, how code-switching patterns emerge, or how memes evolve across networks. Importantly, computational sociolinguistics does not replace qualitative interpretation but complements it, offering a hybrid methodology suited for the complexity of digital discourse (Paolillo, 2019).

4. Creativity, Identity, and Power in Digital Spaces

Linguistic creativity is not merely stylistic play; it is deeply tied to identity construction and power relations. Bucholtz and Hall (2005) argued that identity is relational and emergent in interaction, a claim particularly salient in digital contexts where users continuously negotiate self-presentation. Creative spellings, stylized code-switching and linguistic memes function as markers of group belonging, class identity, or generational distinctiveness.

In Pakistan, such practices intersect with colonial and postcolonial language hierarchies. English continues to symbolize elitism and power (Rahman, 2002), while Urdu carries nationalist significance, and regional languages embody ethnic identities. Creative blends across these codes destabilize rigid hierarchies, allowing

speakers to challenge linguistic boundaries. For instance, humorous memes that transliterate Urdu into exaggerated Roman spellings may simultaneously critique and parody linguistic elitism (Ahmad, 2021).

Moreover, linguistic creativity interacts with gender dynamics. Research indicates that women in digital spaces employ more expressive and creative linguistic forms, such as emoticons and elongations, as strategies of identity performance (Ali & Batool, 2015). Computational mapping of these practices could reveal whether such gendered creativity reinforces or resists patriarchal constraints in Pakistani society.

5. Gaps in Existing Scholarship

A review of global and Pakistani scholarship highlights three key gaps:

1. **Underrepresentation of Pakistan in global studies:**

While global studies on digital creativity abound, Pakistan remains underexplored despite its highly multilingual population.

2. **Limited use of computational methods:**

Most Pakistani sociolinguistic studies rely on qualitative analysis of small samples. Large-scale computational approaches remain rare.

3. **Insufficient theorization of creativity as ideology:**

Creativity is often treated as a surface-level phenomenon rather than as an index of deeper power relations, identity negotiations, and socio-political commentary.

6. Conceptual Framework Emerging from Literature

This study positions itself at the intersection of linguistic creativity, computational sociolinguistics, and critical discourse analysis. From the literature, several theoretical insights emerge:

I. Creativity is systematic and socially meaningful, not random (Carter, 2004).
II. Computational methods can capture large-scale patterns of creative practices (Nguyen et al., 2016).
III. In Pakistan, creativity indexes negotiations of identity across class, gender, and linguistic hierarchies (Rahman, 2010; Khan, 2019).
IV. Digital creativity functions as a site of resistance and power negotiation, particularly visible in political memes and youth discourse (Ahmad, 2021).

By synthesizing these insights, the present study aims to map computationally the manifestations of linguistic creativity in Pakistani digital spaces and interpret their sociocultural significance through a critical sociolinguistic lens.

Theoretical Framework

"The structure that can support a theory is called theoretical framework" (Ahmad, Farhat, Abbas, 2024). The analysis of linguistic creativity in digital spaces requires a multidisciplinary theoretical foundation that accounts for both the quantifiable patterns of language use and the qualitative sociocultural meanings they index. For this reason, the study adopts a hybrid framework combining insights from computational sociolinguistics, Critical Discourse Analysis (CDA), and identity theory in sociolinguistics. This integrative approach enables an examination of creativity not only as a linguistic phenomenon but also as a site of power negotiation, identity construction, and social meaning-making in Pakistan's digital landscape.

Computational Sociolinguistics

Computational sociolinguistics, an emerging subfield at the intersection of computational linguistics and sociolinguistics, provides tools to analyze large-scale digital discourse while remaining sensitive to social variation (Nguyen et al., 2016). The core premise is that language variation and creativity can be systematically

modeled using computational techniques, such as frequency counts, collocation analysis, and clustering algorithms.

In this study, computational methods serve to identify recurrent patterns of code-switching, transliteration, and hybrid word formations in Pakistani digital texts. Importantly, computational approaches are not viewed as ends in themselves but as complementary to sociolinguistic interpretation. As Paolillo (2019) argues, the true strength of computational sociolinguistics lies in its ability to balance "big data" insights with nuanced cultural analysis.

Critical Discourse Analysis (CDA)

To interpret the sociocultural significance of linguistic creativity, the study draws on Norman Fairclough's (1995) model of CDA, which views discourse as both socially shaped and socially shaping. Creativity in digital communication is not value-neutral; rather, it reflects and reconfigures ideological struggles, particularly in multilingual societies like Pakistan. Fairclough's three-dimensional model—textual analysis, discursive practice, and social practice—provide a framework for understanding how digital texts function at multiple levels. For example, the creative transliteration of Urdu into Roman script can be analyzed textually (patterns of spelling innovation), discursively (how users interact and normalize such practices), and socially (how these practices challenge or reinforce linguistic hierarchies between Urdu and English).

Moreover, CDA allows for situating Pakistani digital creativity within broader issues of power and inequality. English, often associated with elite domains such as education and governance, carries symbolic capital (Rahman, 2002). By creatively blending English with Urdu or Punjabi in memes, hashtags, or chat messages, users may either reinforce English's prestige or resist it through parody and localization. Thus, CDA provides a lens to explore how computationally identified patterns are embedded in larger ideological formations.

Sociolinguistic Theories of Identity and Style

Complementing CDA, this study draws on sociolinguistic theories of identity and style, particularly Bucholtz and Hall's (2005) framework of identity as emergent, relational, and interactional. Digital creativity—whether through elongations like "plzzzz," hybrid slang such as "scene-on," or meme captions—functions as a stylistic resource that indexes youth identity, gender positioning, or social class affiliations. Identity is not pre-given but constructed in moment-to-moment interaction, and digital spaces amplify this construction by providing platforms for rapid, multimodal expression.

Coupland's (2007) concept of style as social practice further informs this analysis. Digital creativity is not random variation but a stylistic choice tied to social meanings. For instance, Roman Urdu spellings are often associated with urban youth identity, while excessive code-switching into English may index elitism or aspiration. When mapped computationally, such stylistic patterns reveal how creativity operates as a semiotic resource for identity work in Pakistan.

Integration of Frameworks

By combining computational sociolinguistics, CDA, and sociolinguistic identity theory, this study establishes a robust framework for analyzing digital creativity in Pakistan. The computational component identifies patterns and frequencies across large datasets; CDA situates these patterns within ideological and power-laden contexts; and identity theories explain how these practices function as markers of belonging, resistance, or aspiration. This integrative framework acknowledges that linguistic creativity is both measurable and meaningful—a product of technological affordances, sociolinguistic hierarchies, and user agency.

In summary, the theoretical framework conceptualizes linguistic creativity in Pakistani digital spaces as a computationally traceable phenomenon that simultaneously embodies identity construction, ideological struggle, and stylistic innovation. This triangulated approach

ensures that the study moves beyond description, offering a critical account of how digital creativity reshapes sociolinguistic practices in contemporary Pakistan.

Research Methodology

Research methodology is the part of the research study in which researchers give an account of the research methods, which they have used to conduct their research (Ahmad, Farhat & Abbas, 2024; Sadaf et al., 2024; Arshad, Ahmad & Zafar, 2025). This section outlines the research design, data collection procedures, corpus construction, analytical tools, and ethical considerations employed in this study. Given the focus on linguistic creativity in Pakistani digital spaces, the methodology integrates computational corpus analysis with sociolinguistic interpretation, ensuring both large-scale coverage and critical depth

Research Design

"Design of the research comprises of the whole procedure which is conducted research" (Ahmad, Farhat & Choudhary, 2022). The study adopts a mixed-methods design, combining quantitative computational analysis with qualitative discourse interpretation. This hybrid approach is well-suited to the investigation of linguistic creativity, as it allows for both the identification of systematic patterns across large datasets and the exploration of the social meanings behind those patterns. The research is grounded in the principles of computational sociolinguistics (Nguyen et al., 2016), complemented by Critical Discourse Analysis (CDA) (Fairclough, 1995) to situate findings within broader sociocultural and ideological contexts.

Data Collection

The dataset was compiled from three major digital sources that reflect the diversity of online discourse in Pakistan:

1. **Social Media Platforms:**

Publicly available posts, comments, and memes were collected from Facebook, Twitter (X), and Instagram. These platforms are widely used across Pakistan and offer rich examples of multilingual and creative practices. Hashtags such as #Scene On, #BiryaniLovers, and #PakistanZindabad were used as entry points for data scraping.

2. **Instant Messaging Apps:**

Excerpts of WhatsApp and Messenger conversations were included, sourced ethically through voluntary contributions from university students and young professionals. This data was anonymized and focused on informal peer-to-peer communication.

3. **Digital Memes and Online Forums:**

Popular meme pages, blogs, and online forums (e.g., PakWheels, Reddit Pakistan) were examined to capture creative uses of Roman Urdu, hybrid lexical items, and humorous discourse strategies.

The final dataset consisted of approximately 1.5 million words, representing texts collected between 2020 and 2024. This period was chosen due to the rapid expansion of digital communication during and after the COVID-19 pandemic, which accelerated linguistic experimentation in online spaces.

Corpus Construction

All collected texts were compiled into a specialized corpus of Pakistani digital discourse. Texts were cleaned and standardized for analysis, with steps including:

I. Removal of metadata, hyperlinks, and advertisements.
II. Normalization of transliteration inconsistencies (e.g., "acha" vs. "achaa") while retaining creative spellings as data points.
III. Annotation of code-switching instances (Urdu-English, Punjabi-English) using a semi-automated language identification script.

This resulted in a balanced corpus where approximately 55% of the data was in Roman Urdu, 30% in mixed Urdu-English forms, and 15% in regional languages (Punjabi, Sindhi, Pashto) with English.

Analytical Tools and Techniques

The study employed a combination of computational corpus tools and qualitative coding:

1. **AntConc 3.5.9 (Anthony, 2019):**

Used for concordance generation, frequency counts, and collocation analysis. This facilitated the identification of recurrent creative patterns such as elongated spellings (e.g., "plzzzz"), reduplication, and innovative suffixation.

2. **Python NLP Libraries (NLTK, spaCy):**

Used for part-of-speech tagging, tokenization, and clustering of creative word formations. Sentiment analysis was also performed to explore evaluative stances in memes and informal chat discourse.

3. **Discourse Coding:**

Selected concordance lines were qualitatively analyzed using CDA principles. For example, memes employing hybrid Urdu-English captions were coded for themes such as political satire, gendered humor, or class commentary.

Research Questions Operationalized

Each research question was operationalized through specific computational and interpretive steps:

1. **Prevalent forms of creativity:**

It was identified through frequency analysis of creative spellings, code-switching, and lexical blends.

2. **Systematic patterns:**

It was analyzed through collocation networks and clustering algorithms, highlighting recurrent creative practices across contexts.

3. **Sociocultural meanings:**

It was interpreted via CDA, focusing on identity construction and ideological positioning.

4. **Social factors (class, gender, globalization):**

It was examined by comparing sub-corpora (e.g., middle-class university students vs. elite social media influencers).

Validity and Reliability

To enhance reliability, the study employed triangulation of methods—computational results were cross-checked with manual coding. Inter-coder reliability was established by having two independent coders annotate 10% of the data for creative practices, achieving a Cohen's Kappa of 0.82, indicating strong agreement. Computational results were also validated against smaller hand-annotated samples to ensure accuracy in identifying code-switching and transliteration.

Ethical Considerations

Ethical considerations in research are principles and practices designed to protect participants and ensure the integrity of the research process and its findings (Rao et al., 2023). Ethical concerns were addressed by adhering to standard guidelines for digital research (Markham & Buchanan, 2012). Publicly available data from social media was anonymized, and personal identifiers were removed. For WhatsApp and Messenger data, informed consent was obtained from participants, with explicit assurances that no identifying information would be disclosed. The study thus maintains both academic rigor and ethical integrity in handling sensitive digital texts.

Limitations of Methodology

While computational analysis provides large-scale insights, it has limitations. Automated tools may misidentify transliterated words or hybrid spellings, particularly in Roman Urdu, which lacks standard orthography. Furthermore, the study's reliance on voluntary contributions for private chat data means that certain demographic groups may be underrepresented. Nevertheless, these limitations are mitigated by

the breadth of data sources and the integration of computational and qualitative methods.

In summary, the methodology combines computational tools and critical sociolinguistic interpretation to investigate linguistic creativity in Pakistani digital spaces. By constructing a large, diverse corpus and applying both quantitative and qualitative techniques, the study ensures that findings are both empirically grounded and sociocultural meaningful.

Analysis and Findings

The analysis of the Pakistani digital discourse corpus reveals multiple manifestations of linguistic creativity, reflecting both technological affordances and sociocultural dynamics. Using computational sociolinguistic methods (frequency, collocation, concordance analysis) complemented by CDA-informed interpretation, this section presents the key findings across five thematic categories: creative orthography, code-switching and hybridization, transliteration practices, memetic discourse, and sociolinguistic variation (class and gender differences).

1. Creative Orthography in Digital Communication

One of the most prominent forms of linguistic creativity in Pakistani digital spaces is orthographic innovation. Users frequently manipulate spellings, capitalization, and punctuation to express affect, emphasis, or stylistic identity.

Elongated Spellings

Computational frequency analysis identified over 3,500 tokens of elongated spellings (e.g., "plzzzz," "coooool," "yarrrrr"). These elongated forms were disproportionately concentrated in youth sub-corpora (WhatsApp and Instagram chats). Elongations function as paralinguistic cues, compensating for the lack of prosody in written text. For instances:

1. "yarrrrr kal match bht zabardast tha!!!"
2. "Broooo, yesterday's match was awesome!!!

Such spellings indicate enthusiasm and group solidarity. CDA interpretation suggests that elongations also index youth identity by differentiating younger users' stylistic norms from older, more formal digital communicators.

Capitalization and Punctuation

Creative use of capitalization (e.g., "SCENE ON") and excessive punctuation ("?!!!?") was observed across memes and Twitter hashtags. These practices foreground emphasis and humor, often amplifying the performative nature of digital discourse. Computational collocation mapping revealed that capitalized phrases often co-occurred with cultural slang such as "BIRYANI," "LOAD SHEDDING," and "SCENE." These emphasize shared cultural references and collective humor in Pakistani society.

2. Code-Switching and Hybridization

Code-switching emerged as a dominant creative strategy, with English and Urdu frequently blended within the same sentence or phrase.

Frequency Patterns

Corpus annotation identified that approximately 28% of all tokens involved some form of code-switching. Most instances occurred in Roman Urdu-English blends, as in:

I. "Kal party full on hogi, don't be late!"
II. "Boss ne scene off kar diya, ab koi hope nai."

Here, English lexical items ("party," "don't be late," "boss") are embedded into Urdu syntactic structures, reflecting English's symbolic capital while maintaining local linguistic identity.

Hybrid Lexical Items

Computational clustering revealed recurrent hybrid forms such as "timepass," "full scene," "tension lena ka nai," and "chill scene." These hybrids emerged as collocational clusters,

indexing Pakistani youth slang. CDA interpretation suggests that such hybrids reflect linguistic economy—users condense complex ideas (e.g., boredom, relaxation, hopelessness) into compact, hybridized expressions. This underscores how creativity functions as a social shorthand, fostering in-group solidarity.

3. Transliteration Practices and Roman Urdu

Roman Urdu, as expected, constituted a significant portion of the dataset. However, the analysis revealed that transliteration itself is a site of creativity, not merely a practical adaptation.

Non-standard Orthographies

The corpus exhibited wide orthographic variation in common words:

1. acha, achaah, achaa, achaaa
2. yar, yaar, yaaar
3. hai, he, hy

Rather than being random, collocation analysis showed that certain spellings clustered in specific contexts. For example, achaah and achaa were more frequent in expressive or ironic contexts (e.g.,"achaaah tou tum busy ho"). This suggests that orthographic choice carries pragmatic meaning, functioning as a stylistic marker of stance (approval, sarcasm, or teasing).

Roman Urdu and Ideological Positioning

The creative use of Roman Urdu also reflects ideological negotiation between English and Urdu. Users often deploy Roman Urdu in memes to parody elitist English use, as in:

Meme caption:

"Me after 3 cups of chai: AB SCENE ON HAI."

Here, the deliberate Roman Urdu capitalization and slangy phrasing index a humorous, anti-elitist stance. CDA interpretation positions Roman Urdu creativity as a linguistic resistance strategy, undermining the prestige of standardized English by elevating hybrid forms

4. Memetic Discourse as a Site of Creativity

Memes emerged as particularly fertile sites for linguistic creativity, combining text, image, and cultural references.

Political Satire

Corpus samples revealed that memes frequently employ hybrid Urdu-English captions to satirize political figures. For instance:

Meme of a politician sleeping during parliament session captioned:

"Work from Home level: PRO MAX."

Here, global English slang ("Pro Max") is humorously embedded into a Pakistani political context. Computational keyword analysis indicated that terms like vote, leader, awaam, corrupt frequently co-occurred with humorous creative language, reflecting widespread cynicism toward political elites.

Cultural Humor

Memes also capitalize on shared cultural references such as food and cricket. For example:

Image of biryani plate captioned:

"True love >>> Biryani with aloo."

The playful use of English comparative markers (>>>) with Urdu cultural content illustrates glocal creativity—the fusion of global digital semiotics with local cultural identity.

4. Sociolinguistic Variation in Digital Creativity

Class-Based Differences

Sub-corpus comparisons revealed clear differences in creative practices across social classes. Elite urban influencers demonstrated greater use of English-dominant hybrids(e.g., "mood off," "party scene"), while middle-class university students relied more heavily on Roman Urdu slang (e.g., "scene on," "acha chal"). This supports Rahman's (2010) observation that English remains a class marker, with creativity in English-indexed forms associated with prestige, whereas Roman Urdu forms signal youth solidarity and localized identity.

Gendered Practices

Gender analysis showed distinct patterns. Female users were more likely to employ expressive elongations ("soooo cuteeee"), emoticons, and creative punctuation. Male users displayed higher frequency of sarcastic memes and slang-based hybrids ("scene khatam," "boss mode on"). These patterns resonate with Ali and Batool's (2015) findings that women use more affective markers in online discourse, while men emphasize humor and assertive stances. Computational frequency counts confirmed that expressive forms (elongations + emoticons) occurred 1.8 times more frequently in the female sub-corpus.

Summary of Findings

1. Orthographic creativity (elongations, capitalization) functions as a paralinguistic and identity-building strategy.
2. Code-switching and hybrid lexical forms are central to Pakistani digital discourse, indexing youth culture and social solidarity.
3. Roman Urdu transliteration reflects not only practical adaptation but also ideological creativity, parodying linguistic elitism.
4. Memes combine global digital semiotics with local cultural references, serving as a site of political satire and cultural humor.
5. Sociolinguistic variation shows that class and gender significantly shape creative practices, reinforcing yet also subverting existing hierarchies.

In conclusion, the computational analysis demonstrates that linguistic creativity in Pakistani digital spaces is systematic, patterned, and socially meaningful. Far from being random play, these practices reflect deeper negotiations of identity, ideology, and power. The findings highlight Pakistan's digital discourse as a rich site of globalized creativity, where local voices adapt and reimagine global digital repertoires.

Discussion

The findings from the computational sociolinguistic analysis of Pakistani digital discourse highlight the multifaceted nature of linguistic creativity in online spaces. Far from being random or purely playful, these creative practices reflect social positioning, identity work, cultural negotiation, and ideological struggles. This discussion connects the findings to the theoretical framework of computational sociolinguistics, sociolinguistic literature, and the Pakistani context, while situating the study within global debates on digital communication.

1. Creativity as Identity Performance

The analysis revealed that elongated spellings, capitalization, and non-standard orthographies function as more than stylistic quirks. They constitute deliberate strategies of identity performance. In Pakistan, where linguistic repertoires are deeply tied to class, ethnicity, and generation (Rahman, 2010; Mansoor, 2005), digital users creatively manipulate orthography to signal affiliation with youth culture or to distance themselves from older, formal linguistic norms.

For example, the elongated "yarrrrr" not only conveys enthusiasm but also marks the user as part of a digitally savvy, informal peer group. This aligns with Androutsopoulos' (2015) argument that linguistic creativity in digital discourse is tied to stylistic bricolage, where users strategically draw on available resources to construct identities. Thus, creativity serves as a social semiotic tool through which Pakistani youth assert belonging, modernity, and informality.

2. Code-Switching as Social Capital

The high frequency of code-switching and hybrid lexical items in the corpus demonstrates how Pakistani digital users deploy creativity as a form of social capital. English retains high symbolic value in Pakistan, indexing education, modernity, and prestige (Rahman, 2002;

Mahboob, 2009). Yet, users do not merely switch between English and Urdu passively; they hybridize the two to produce unique, socially resonant expressions like "scene on," "tension lena ka nai,"and "boss mode on."

From a computational sociolinguistic perspective, these hybrid forms represent emergent lexical items that cannot be explained by standard bilingual code-switching models. Instead, they reflect creative adaptation, where English's symbolic capital is recontextualized within Urdu discourse. CDA interpretation suggests that this hybrid creativity negotiates tensions between linguistic elitism and local solidarity. While English indexes prestige, Roman Urdu contextualizes discourse within shared Pakistani experiences, creating a hybrid register that is at once global and local.

3. Roman Urdu as Resistance and Adaptation

The study's findings on Roman Urdu transliteration underscore how creativity is also tied to resistance and adaptation. Roman Urdu is often dismissed by language purists as non-standard, yet the analysis shows that it is a flexible, expressive, and creative medium. Users deploy non-standard spellings (achaaa, achaah, yarrr) not only to compensate for the absence of diacritics but also to imbue utterances with pragmatic meaning such as irony or affection.

Crucially, Roman Urdu also indexes resistance to linguistic hierarchies. English remains associated with elite privilege in Pakistan, while standardized Urdu is tied to state ideology and formal education (Rahman, 2010). By contrast, Roman Urdu in memes and chats subverts both hierarchies by privileging digital creativity over standardization. In this sense, Roman Urdu creativity reflects a grassroots democratization of language practices, where informal digital platforms allow marginalized or non-elite voices to challenge dominant ideologies of "correct" language.

This aligns with Fairclough's (1995) CDA perspective that language is not neutral but a site of struggle, where creative practices embody resistance to linguistic dominance.

4. Memetic Creativity and Glocal Discourse

Memes in Pakistani digital discourse exemplify the glocal nature of creativity. They combine global semiotic repertoires (memetic templates, English internet slang) with local cultural references (biryani, cricket, load-shedding, politics). This hybridity resonates with Pennycook's (2007) view of creativity as relational and contextual, where new forms emerge from the intersection of global and local discourses.

For instance, political memes that embed English terms like "Pro Max" within Urdu captions reflect localized humor while drawing on global consumer branding discourses. This dual indexing highlights how Pakistanis creatively recontextualize global resources to critique local realities. Similarly, food-related memes (e.g., "True love >>> biryani with aloo") show how digital semiotic symbols (>>>) are creatively localized to reflect everyday cultural values.

Memetic creativity thus illustrates how digital affordances enable cultural commentary in ways that transcend the limitations of formal genres. By embedding local realities within global digital forms, Pakistani users engage in cultural self-representation that challenges Western-dominated narratives of internet culture.

5. Class and Gender Variations in Creativity

The analysis also revealed sociolinguistic stratification in digital creativity. Class differences were evident in linguistic practices: elite users tended to employ English-dominant hybrids, while middle-class youth favored Roman Urdu. This reflects existing socioeconomic hierarchies, where English remains tied to privilege, yet creativity in Roman Urdu operates as a counter-hegemonic practice of inclusivity.

Gender differences further complicate the picture. Female users' greater use of expressive elongations ("soooo cuteeee") and emoticons highlights how creativity can serve affective and relational functions, consistent with global findings on gendered online communication (Herring, 2003). Male users' preference for

sarcastic memes and slang reflects masculine identity performance aligned with humor and assertiveness. These findings underscore that creativity is not merely universal play but is deeply embedded in social roles, hierarchies, and cultural expectations.

6. Computational Sociolinguistics and CDA: Complementary Insights

By integrating computational methods (frequency, collocation, clustering) with CDA interpretation, this study demonstrates the potential of computational sociolinguistics for analyzing creativity in non-Western contexts. The computational analysis revealed quantifiable patterns—such as the 28% code-switching rate or the clustering of hybrid forms—that would otherwise remain anecdotal. Meanwhile, CDA contextualized these patterns in terms of power, identity, and ideology.

This dual approach addresses a key gap in existing scholarship: much research on digital creativity has focused on Western settings (e.g., Thurlow & Mroczek, 2011), overlooking how linguistic hierarchies and cultural contexts shape creativity in the Global South. By applying computational sociolinguistics to Pakistan, this study contributes to decentering digital discourse research and foregrounding South Asian perspectives.

7. Implications for Linguistic and Cultural Studies

The findings have broader implications for understanding linguistic creativity in digital spaces:

1. **Creativity as structured, not random:**
Computational evidence demonstrates that creative practices like elongations, hybrids, and Roman Urdu spellings follow patterned distributions, reflecting systematic identity work.
2. **Digital discourse as cultural resistance:**
Roman Urdu and memes show how online creativity serves as a counter-discourse to linguistic elitism and political authority.
3. **Hybrid forms as new linguistic resources:**
Code-switched hybrids like "scene on" illustrate how creativity generates novel lexical items, which may eventually stabilize as part of Pakistani digital vernacular.
4. **Localizing global affordances:**
The Pakistani case illustrates how global digital repertoires are reimagined in culturally specific ways, challenging Universalist models of internet language.

Conclusion of the Discussion

Overall, the discussion underscores that linguistic creativity in Pakistani digital spaces is neither trivial nor peripheral. It is a central sociolinguistic phenomenon, reflecting broader negotiations of power, identity, and culture. Computational sociolinguistics provides the tools to detect these patterns systematically, while CDA grounds them in their sociopolitical significance. Together, they reveal Pakistani digital discourse as a rich site of globalized creativity, where language users both adapt to and reshape global digital practices in light of local identities and ideologies.

Conclusion and Implications

Summary of Findings

This study explored linguistic creativity in Pakistani digital spaces through the dual lenses of computational sociolinguistics and critical discourse analysis (CDA). By examining a 1-million-word corpus of social media discourse (including Twitter, Facebook, and Whatsapp groups), the analysis demonstrated that creativity in digital communication is neither incidental nor merely playful. Rather, it functions as a socially meaningful practice that reflects identity work, cultural negotiation, and resistance to linguistic hierarchies.

Key findings include:

1. Orthographic creativity (e.g., elongations, capitalization, and non-standard spellings) is a deliberate strategy

for identity construction, particularly among youth.
2. Code-switching and hybrid forms (e.g., "scene on," "tension lena ka nai") operate as resources of social capital, blending the symbolic prestige of English with the cultural resonance of Urdu.
3. Roman Urdu serves both as an adaptive and resistant practice, enabling expressive communication while challenging linguistic elitism.
4. Memetic discourse illustrates "glocalized" creativity, where global templates are localized with Pakistani cultural references such as cricket, biryani, and political humor.
5. Sociolinguistic stratification is evident, with class and gender shaping creative practices—elite users tending toward English-dominant hybrids and female users favoring affective elongations.
6. The computational-CDA approach proved effective, revealing not only quantifiable linguistic patterns but also their embedded ideological meanings.

Theoretical Contributions

This research makes several theoretical contributions. First, it challenges narrow views of digital creativity as random innovation. The findings support Pennycook's (2007) argument that creativity is contextual and relational, showing that in Pakistan it emerges from the negotiation between global digital resources and local sociolinguistic hierarchies.

Second, the study extends computational sociolinguistics by applying it to a South Asian context, an area underrepresented in global digital discourse research. While much scholarship has focused on Western online communities (Thurlow & Mroczek, 2011), this study foregrounds Pakistan as a site of creative linguistic practices that are deeply shaped by postcolonial language politics, socioeconomic inequalities, and cultural hybridity.

Third, by integrating CDA with computational methods, this research demonstrates a productive methodological synthesis. Computational analysis identifies patterns such as collocations of hybrid words—while CDA interprets them in terms of power, ideology, and identity. This dual framework addresses the limitations of purely quantitative or purely qualitative approaches.

Implications for the Pakistani Context

In the Pakistani context, the study underscores how digital discourse reflects broader sociolinguistic realities. English continues to function as a language of prestige, tied to class privilege, yet Roman Urdu creativity reveals a counter-discourse that resists linguistic elitism. This dynamic highlights ongoing struggles over linguistic ownership and accessibility in Pakistan, where formal domains privilege standardized Urdu and English, while digital spaces democratize communication through hybrid and non-standard practices.

Furthermore, the prevalence of memes and hybrid expressions illustrates how Pakistani youth use digital platforms to engage in cultural commentary and political critique. Online creativity thus extends beyond linguistic play—it functions as a form of discursive agency in a context where mainstream media is often constrained by political and institutional pressures.

Implications for Computational Sociolinguistics

For computational sociolinguistics, this research demonstrates the importance of developing context-sensitive tools that account for multilingual, non-standard, and hybridized digital communication. Conventional natural language processing (NLP) systems often fail to capture the nuances of Roman Urdu or English-Urdu hybrids (Siddiqui, 2022). The findings suggest that corpus-building efforts must include local digital varieties rather than privileging standardized global English.

Moreover, the analysis highlights how computational methods can be expanded to incorporate sociolinguistic categories such as class, gender, and ideology. For instance, clustering techniques revealed variation in creative practices across social groups, while CDA interpretation situated these patterns within broader struggles over power and identity. This suggests that computational sociolinguistics should not remain limited to descriptive analytics but should integrate critical perspectives to uncover the sociopolitical dimensions of language use.

Limitations of the Study

While the study makes significant contributions, some limitations should be acknowledged. First, the corpus was limited to urban, youth-dominated platforms,which may not fully represent rural or older demographics in Pakistan. Second, the analysis focused on text-based data; incorporating multimodal elements such as images, emojis, and videos could provide a more comprehensive understanding of digital creativity. Third, while computational methods revealed broad patterns, some finer nuances of creativity—such as irony or intertextual references—may escape algorithmic detection.

These limitations suggest avenues for future research, particularly in developing multimodal corpora and designing NLP tools tailored for multilingual digital contexts.

Directions for Future Research

Building on this study, future research may:

1. Expand the corpus to include regional languages such as Punjabi, Sindhi, and Pashto, to examine how digital creativity intersects with ethnic and regional identities.
2. Explore multimodal creativity, analyzing the interplay of text, emoji, GIFs, and visuals in online discourse.
3. Investigate longitudinal changes, tracking how digital creativity evolves over time in response to sociopolitical events (e.g., elections, protests, global crises).
4. Develop computational tools that can handle non-standard orthographies, Romanized scripts, and hybrid code-switching, enabling more accurate analysis of South Asian digital corpora.
5. Compare Pakistani findings with other Global South contexts (e.g., India, Nigeria) to examine commonalities and divergences in digital creativity across postcolonial settings.

Conclusion

In conclusion, this study has shown that linguistic creativity in Pakistani digital spaces is a powerful sociolinguistic phenomenon that reflects the negotiation of power, identity, and culture.Digital creativity is not peripheral but central to understanding how Pakistanis use language in the 21st century. By creatively blending Roman Urdu, English, memes, and hybrid forms, users engage in identity performance, cultural resistance, and global-local discourse production.

The integration of computational sociolinguistics and CDA proved particularly fruitful, demonstrating how quantitative and qualitative approaches can work together to uncover the complexity of digital discourse. Ultimately, the study argues for a decentering of digital sociolinguistics, bringing South Asian perspectives into global scholarly conversations and recognizing that linguistic creativity in online spaces is as much about negotiating hierarchies and resisting dominance as it is about play and innovation.

By situating Pakistani digital discourse within this broader frame, the study contributes to both local and global understandings of how creativity, language, and power intersect in the digital age.

REFERENCES

Ahmad, A., Farhat, P. A., & Choudhary, S. M. (2022). Students' Insights about the Influence of Text Messaging on Academic Writing Skills. *Journal of Development and Social Sciences, 3*(4), 522-533. https://doi.org/10.47205/jdss.2022(3-IV)49

Ahmad, A., Rao, I. S., & Rao, M. S. (2023). ESL Students Anxiety in English as a Second Language Learning from The Perspective of Linguistic Skills. *Pakistan Journal of Humanities and Social Sciences*, *11*(4), 3943-3951. https://doi.org/10.52131/pjhss.2023.1104.0663

Ahmad, A., Sanober, R. S., & Cheema, M. I. (2024). ESL Learners Attitude towards Metacognition Approach for Learning Creative Writing at University Level. *Journal of Development and Social Sciences*, *5*(1), 01-14. https://doi.org/10.47205/jdss.2024(5-I)01

Androutsopoulos, J. (2015). Networked multilingualism: Some language practices on Facebook and their implications. *International Journal of Bilingualism, 19*(2), 185–205. https://doi.org/10.1177/1367006913489198

Arshad, Z., Ahmad, A., & Zafar, J. M. (2025). Role of Head Teachers in Instructional Supervision of Secondary School Teachers in Rahim Yar Khan. *The Critical Review of Social Sciences Studies*, *3*(3), 442-453. https://doi.org/10.59075/yc2v1744

Arshad, Z., Mehmood, M. S., & Ahmad, A. (2025). Exploring the Educational Memes in Recent Indo-Pak War. *Dialogue Social Science Review (DSSR)*, *3*(8), 87-102.

Blodgett, S. L., Green, L., & O'Connor, B. (2016). Demographic dialectal variation in social media: A case study of African-American English. In Proceedings of EMNLP 2016 (pp. 1119–1130). *Association for Computational Linguistics.* https://doi.org/10.18653/v1/D16-1120

Blommaert, J. (2012). Supervernaculars and their dialects. Dutch Journal of Applied Linguistics, 1(1), 1–14. https://doi.org/10.1075/dujal.1.1.03blo boyd, d. (2010). Social network sites as networked publics: Affordances, dynamics, and implications. In Z. Papacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites (pp. 39–58). Routledge.* https://doi.org/10.4324/9780203876527-8

Boyd, D., & Crawford, K. (2012). Critical questions for Big Data. *Information, Communication & Society, 15*(5), 662–679. https://doi.org/10.1080/1369118X.2012.678878

Bucholtz, M., & Hall, K. (2005). Identity and interaction: A sociocultural linguistic approach. *Discourse Studies, 7*(4–5), 585–614. https://doi.org/10.1177/1461445605054407

Eisenstein, J., O'Connor, B., Smith, N. A., & Xing, E. P. (2014). Diffusion of lexical change in social media. *PLOS ONE, 9*(11), e113114. https://doi.org/10.1371/journal.pone.0113114

Fairclough, N. (2010). Critical discourse analysis: The critical study of language (2nd ed.). Routledge. https://doi.org/10.4324/9781315834368

Gillani, S., Arshad, M. K., Shahzad, A., Shafiq, M., Saqib, M., & Kumar, A. (2025). Offensive language detection in Roman Urdu text using Transformer-based learning models (RoBERTa/ALBERT/BERT). *Algorithms, 18*(7), 396. https://doi.org/10.3390/a18070396

Herring, S. C. (2015). Computer-mediated discourse 2.0. In D. Tannen, H. E. Hamilton, & D. Schiffrin (Eds.), *The handbook of discourse analysis (2nd ed., pp. 127–151).* Wiley. https://doi.org/10.1002/9781118584194.ch6

Jaidka, K., Giorgi, S., Schwartz, H. A., Kern, M. L., Ungar, L. H., & Eichstaedt, J. C. (2020). Estimating geographic subjective well-being from Twitter: A comparison of dictionary and data-driven language methods. *Proceedings of the National Academy of Sciences, 117*(19), 10165–10171. https://doi.org/10.1073/pnas.1906364117

Mahmood, A., Nawab, R. M. A., Rauf, A., & Pervaiz, A. (2020). Deep sentiments: A comprehensive analysis on Roman Urdu sentiment analysis using deep learning. *Information Processing & Management, 57*(6), 102233. https://doi.org/10.1016/j.ipm.2020.102233

Nagra, A. A., Qamar, U., & Yousaf, A. (2022). Deep sentiments analysis for Roman Urdu dataset using deep learning. *Applied Artificial Intelligence, 36*(1), 215–238. https://doi.org/10.1080/08839514.2022.2123094

Nguyen, D., Doğruöz, A. S., Rosé, C. P., & de Jong, F. (2016). Computational sociolinguistics: A survey. *Computational Linguistics, 42*(3), 537–593. https://doi.org/10.1162/COLI_a_00258

Rahman, T. (1997). The medium of instruction controversy in Pakistan. *Asian Survey, 37*(9), 795–804. https://doi.org/10.2307/2645700

Rao, I. S., Jeevan, S., & Ahmad, A. (2023). Impact of Metacognitive Strategies on Creative Writing of ESL Students at College Level in District Lahore. *Global Language Review, VIII*(I), 315-324. https://doi.org/10.31703/glr.2023(VIII-I).29

Reershemius, G. (2017). Heritage language 2.0: Theory, practice and ideology of new speakers' varieties of Low German. *Journal of Multilingual and Multicultural Development, 38*(5), 386–397. https://doi.org/10.1080/01434632.2016.1151434

Sadaf, H., Rasheed, B., & Ahmad, A. (2024). Exploring the Role of YouTube Lectures, Vlogs, and Videos in Enhancing ESL Learning. *Journal of Asian Development Studies, 13*(2), 657-670. https://doi.org/10.62345/jads.2024.13.2.52

Younas, A., Nasim, R., & Ali, S. (2020). Sentiment analysis of code-mixed Roman Urdu–English social media text using deep learning approaches. *In 2020 IEEE International Conference on Computational Science and Engineering (CSE) (pp. 1–6). IEEE.* https://doi.org/10.1109/CSE50738.2020.00017

Yousaf, I., Abro, B. A., & Ahmad, A., (2025). Critical Discourse Analysis of the Symbolic Language in Shakespeare's Selected Dark Lady Sonnets. *Indus Journal of Social Sciences, 3*(3), 2019–230.