



RESEARCH ARTICLE



PSYCHOLOGICAL IMPACT OF SPATIAL CYBERTEXT ENVIRONMENTS ON SOCIAL MEDIA PLATFORMS: A PRAGMATIC PERSPECTIVE ON PSYCHOLINGUISTICS STUDENTS

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ABSTRACT

The rapid evolution of digital communication has transformed linguistic interaction into a spatially distributed phenomenon, wherein meaning emerges through multimodal cues embedded in virtual environments. This study examines the psychological implications of spatial cybertext environments, interactive, hypertextual spaces within social media, on psycholinguistics students who navigate these platforms as both users and analysts of language. Grounded in pragmatic and psycholinguistic frameworks, this research employs a qualitative descriptive approach to explore how spatial discourse structures, multimodal symbols, and digital affordances shape users' cognitive and emotional engagement. Data were collected from in-depth interviews, participant observations, and online discourse samples drawn from academic social media interactions. The findings indicate that students' exposure to spatial cybertexts leads to three distinct psychological phenomena: (1) cognitive tension due to multimodal overload and fragmented attention; (2) pragmatic drift arising from context ambiguity and algorithmic mediation; and (3) metapragmatic awareness, reflecting a heightened sensitivity to language use, politeness, and identity performance in digital contexts. The study concludes that pragmatic awareness functions as both a cognitive and emotional regulator, enabling psycholinguistics students to sustain interpretive coherence amid digital overstimulation. The research offers insights into how spatial discourse in social media environments redefines the relationship between language, cognition, and affect in contemporary digital learning.

Introduction

The twenty-first century has witnessed the emergence of digital discourse as a defining feature of human communication, where text, image, sound, and gesture converge to form a multimodal ecology of meaning (Bezemer & Kress, 2016). Within this ecology, *spatial cybertext*, a term derived from Aarseth's (1997) concept of ergodic literature, refers to digital texts that require user interaction and navigation for meaning construction. Unlike linear communication models, spatial cybertexts invite readers to become participants, co-creating meaning across hyperlink networks, timelines, and algorithmic feeds (Bolter & Grusin, 1999; Manovich, 2001). Social media platforms such as Twitter, Instagram, and TikTok exemplify this spatialization of discourse, where language operates in dynamic relation to space, interface, and identity.

For students of psycholinguistics, these environments present both opportunity and challenge. On the one hand, social media provides rich empirical material for observing language processing, cognitive adaptation, and social semiotics in real time (Gee, 2017). On the other, constant engagement with multimodal inputs can lead to cognitive overload, emotional fatigue, and linguistic desensitization, a form of *semantic exhaustion* that diminishes sensitivity to nuance (Sweller, 2010; Cain & Gradisar, 2010). The pragmatic

dimension of this issue lies in how meaning is negotiated across digital contexts that blur the boundaries between personal and public, literal and figurative, verbal and visual.

Previous research in Indonesian contexts (Tiawati et al., 2024; Rahmat et al., 2024b) underscores the interdependence between linguistic behavior and sociocultural adaptation. In BIPA (Bahasa Indonesia bagi Penutur Asing) classrooms, for example, learners' success depends not solely on grammar mastery but on understanding *cultural discourse*, the tacit pragmatic norms governing politeness and hierarchy. Similarly, within digital platforms, communicative competence extends beyond linguistic correctness to include sensitivity to online tone, face management, and context collapse (Herring, 2019). These parallels suggest that the psycholinguistic experience of spatial cybertext users is deeply intertwined with pragmatic awareness: the ability to interpret meaning dynamically in technologically mediated interaction.

Given these conditions, this study aims to explore the *psychological impact* of spatial cybertext environments on psycholinguistics students, examining how pragmatic factors, such as implicature, politeness strategies, and context negotiation, mediate their cognitive and emotional experiences. The analysis emphasizes three core issues: (1) how spatial affordances influence linguistic perception; (2) how multimodal communication affects psychological engagement; and (3) how pragmatic awareness functions as an adaptive mechanism in maintaining interpretive balance within the social media ecosystem.

The concept of *cybertext* introduced by Aarseth (1997) describes interactive texts whose meaning depends on user navigation, not mere linear reading. In contemporary contexts, these texts have evolved into *spatial cybertexts*, where meaning unfolds within multidimensional interfaces such as social media timelines and hyperlinked discourse webs (Manovich, 2001; Bolter & Grusin, 1999). As digital environments increasingly merge spatial and linguistic elements, communication becomes a performative act of navigating rather than reading (Ryan, 2015). This spatialization challenges traditional psycholinguistic assumptions that interpretive processes occur within fixed syntactic or semantic boundaries. The spatial dimension also carries psychological implications. Users must distribute attention across linguistic, visual, and interactive cues, a phenomenon Sweller (2010) describes as *cognitive load*. For psycholinguistics students, this means that comprehension is not purely linguistic but multimodal, requiring the coordination of textual interpretation, image decoding, and socio-emotional regulation. Bezemer and Kress (2016) argue that multimodal communication is inherently ecological, demanding an awareness of how modes interact to produce meaning. This aligns with Rahardi's (2022) theory of *eco-pragmatics*, which frames communication as a moral and environmental equilibrium between self, society, and technological context.

Pragmatics, as the study of meaning in context, provides a crucial lens for understanding digital discourse. Classic theories of speech acts (Austin, 1962; Searle, 1969) and politeness (Brown & Levinson, 1987) emphasize that utterances are not merely linguistic outputs but social actions governed by norms of respect, power, and face. In digital environments, however, these norms are reconfigured by the affordances of technology. Yus (2011) introduced *cyberpragmatics* to explain how online communication reshapes implicature and deixis, producing new forms of indirectness and ambiguity. For instance, emoji and GIFs serve as paralinguistic tools that supplement or replace illocutionary force (Herring, 2019). Within spatial cybertexts, the pragmatic challenge intensifies: users interpret fragmented discourse spread across scrolling feeds, hyperlinks, and multimodal symbols. This dislocation can lead to what Rahmat et al. (2024a) term *pragmatic drift*, a misalignment between intent and interpretation due to contextual discontinuity. The result is not merely communicative failure but psychological strain, as users struggle to reconcile fragmented signals with coherent social meaning.

From a psycholinguistic standpoint, spatial cybertexts engage multiple cognitive systems simultaneously, visual, auditory, linguistic, and affective. Kintsch's (1998) *construction–integration model* suggests that comprehension involves constructing mental representations from both linguistic and situational cues. In digital contexts, this process is complicated by the spatial layout and interactivity of platforms (Gee, 2017). Consequently, users experience *cognitive tension*, a heightened effort to maintain coherence across discontinuous information streams. Emotionally, prolonged exposure to digital stimuli can induce *psycholinguistic fatigue* (Cain & Gradisar, 2010), characterized by reduced sensitivity to lexical subtleties and diminished empathy in communication. However, not all effects are detrimental. Studies show that reflective users can develop *metapragmatic awareness*, a conscious understanding of how language constructs social

reality (Leech, 2014; Tiawati et al., 2025). For psycholinguistics students, this awareness transforms digital engagement into a site of linguistic experimentation and identity formation.

Integrating these perspectives reveals that spatial cybertext environments operate as both cognitive and pragmatic laboratories. They challenge users to manage semiotic complexity while negotiating emotional equilibrium. This study therefore draws upon three theoretical pillars:

1. Cyberpragmatics (Yus, 2011) for understanding digital meaning construction;
2. Eco-pragmatics (Rahardi, 2022) for examining moral and contextual harmony; and
3. Psycholinguistic processing theory (Kintsch, 1998) for modeling comprehension in multimodal environments.

Together, these frameworks elucidate how psycholinguistics students navigate the intersection of technology, language, and mind within the dynamic ecology of social media.

Materials and Methods

This study adopts a qualitative descriptive approach to explore how spatial cybertext environments influence the psychological and pragmatic experiences of psycholinguistics students. Qualitative description is particularly suited to capturing subjective meaning as it emerges in naturalistic settings without imposing theoretical constraints (Creswell & Poth, 2018). The design aligns with prior research emphasizing contextual immersion and linguistic sensitivity in digital discourse studies (Tiawati et al., 2022; Rahmat et al., 2024b).

Participants and Setting

Participants included twelve undergraduate psycholinguistics students from a major Indonesian university who actively engaged with academic and social media platforms such as Twitter, Instagram, and Reddit. These students were selected through purposive sampling to ensure familiarity with both psycholinguistic theory and digital interaction practices. Their dual identity, as scholars of language and as participants in digital discourse, provided a unique perspective on the interplay between cognitive processing and pragmatic interpretation.

Data Collection

Data were collected over a four-month period using three interrelated methods:

1. In-depth interviews, focusing on emotional responses, interpretive strategies, and perceived communication challenges;
2. Participant observation within social media discussion forums and study groups, capturing naturalistic discourse patterns; and
3. Document analysis of selected posts, comment threads, and direct messages exhibiting rich pragmatic phenomena.

All participants provided informed consent and were assured of anonymity. Ethical clearance was obtained following institutional research guidelines.

Data Analysis

Analysis followed the interactive model of Miles, Huberman, and Saldaña (2014), encompassing data reduction, display, and conclusion drawing. Transcripts were coded thematically according to emerging categories: *cognitive tension*, *pragmatic drift*, and *metapragmatic awareness*. Analytical triangulation was employed through peer debriefing and participant validation to ensure interpretive reliability. Pragmatic and psychological dimensions were cross-analyzed using conceptual mapping derived from cyberpragmatics and psycholinguistic models.

Results and Discussion

Cognitive Tension and Multimodal Overload

The first major finding reveals that students experienced what several participants described as *mental fragmentation* while navigating social media environments. This phenomenon aligns with Sweller's (2010) *Cognitive Load Theory*, which posits that an excess of concurrent stimuli, visual, textual, and interactive,

competes for limited working memory resources. Students frequently reported difficulty sustaining coherent interpretation across rapid information streams, confirming Cain and Gradisar's (2010) observation that digital multitasking fosters attentional diffusion and emotional exhaustion. Within spatial cybertext environments, messages are rarely linear; instead, they appear as juxtaposed micro-texts, hashtags, hyperlinks, comments, and images, that demand dynamic inferencing. One participant reflected: "I can read five meanings in one post, what they say, what they mean, what they show, what others comment, and what the algorithm suggests next." This illustrates *layered semiotic processing*, a cognitive behavior resembling the multimodal decoding described by Bezemer and Kress (2016). Psycholinguistically, such complexity strains the *construction-integration process* (Kintsch, 1998), leading to an incomplete integration of linguistic and contextual cues. The psychological consequence is *cognitive tension*, a persistent effort to reconcile fragmented discourse into coherent understanding. As one student noted, "I feel language becomes visual and emotional at once, and it's hard to separate them." This echoes Rahardi's (2022) eco-pragmatic notion that communication today involves maintaining equilibrium across linguistic, visual, and moral dimensions.

Pragmatic Drift and Contextual Ambiguity

The second theme, *pragmatic drift*, refers to the loss or distortion of intended meaning caused by the fluidity of digital context. Participants recounted situations where messages were misinterpreted due to the absence of physical cues or tone, a phenomenon also highlighted in Yus's (2011) *Cyberpragmatics*. For instance, irony or sarcasm expressed through text alone often failed to convey the intended illocutionary force, resulting in relational misunderstandings. One student explained: "When I post something sarcastic, some people think I'm serious or angry. Then I have to explain again." Such instances demonstrate the erosion of shared presuppositions that pragmatics typically relies on (Leech, 2014). Without stable context, users engage in continuous *context reconstruction*, guessing the intended implicature based on partial information. This aligns with Herring's (2019) findings that online communication requires *pragmatic inferencing* across fragmented contexts.

Moreover, *algorithmic mediation* contributes to this drift by curating messages non-sequentially, disrupting discourse cohesion. As Rahmat et al. (2024a) argue in their study of online collaborative learning, technology-mediated discourse tends to produce "decontextualized speech acts," where meaning depends more on interface design than speaker intent. In social media, the pragmatic principle of relevance (Sperber & Wilson, 1995) becomes algorithmically determined, prioritizing engagement over coherence. Despite these challenges, some students demonstrated adaptive strategies resembling *metapragmatic regulation*. They employed emoji as contextual markers, strategically softened direct speech acts with humor, and explicitly signaled stance using meta-discursive cues (e.g., "Just kidding," "No offense"). These strategies confirm Brown and Levinson's (1987) claim that politeness mechanisms serve to preserve social face even in technologically mediated communication.

Metapragmatic Awareness and Identity Formation

The third major finding concerns the emergence of *metapragmatic awareness*, students' growing capacity to reflect on language use, social positioning, and affective regulation. Participants described heightened sensitivity to how word choice, punctuation, and visual elements (such as filters or memes) shaped perceived identity. As one student expressed, "How I write online is who I am to others. It's not just communication, it's self-design." This phenomenon resonates with Gee's (2017) notion of *affinity spaces*, where digital communities construct identity through shared semiotic practices. Psycholinguistics students, already attuned to language structure, became acutely aware of the pragmatic subtleties underlying online interaction. This reflective stance indicates a transition from automatic participation to analytical engagement, a hallmark of *metapragmatic competence* (Leech, 2014). Interestingly, several students also reported using pragmatic awareness as an emotional coping mechanism. When confronted with hostile comments or miscommunication, they interpreted such exchanges not as personal affronts but as "speech act failures," recontextualizing emotional tension into analytical distance. This aligns with Tiawati et al. (2024) and Rahmat et al. (2024b), who found that pragmatic instruction in intercultural contexts enhances learners'

empathy and tolerance. Similarly, digital metapragmatics allows users to reframe interpersonal conflict as a site of meaning negotiation rather than aggression.

Integrative Analysis

Synthesizing these findings reveals that the psychological effects of spatial cybertext environments are not uniformly negative; rather, they oscillate between cognitive strain and reflective growth. Cognitive tension and pragmatic drift represent adaptive challenges within digital discourse, while metapragmatic awareness reflects compensatory mechanisms that restore coherence. From a theoretical standpoint, this duality can be explained through the *ecological pragmatics model* (Rahardi, 2022), which posits communication as a moral-ecological balance among cognitive, affective, and social dimensions. Within social media, users perform continuous ecological adjustment, calibrating attention, emotion, and interpretation to maintain communicative harmony. Furthermore, the data demonstrate that psycholinguistics students' training equips them with meta-awareness that mitigates digital stress. By consciously monitoring their discourse, they develop resilience against cognitive overload and emotional volatility. This supports Kintsch's (1998) and Gee's (2017) propositions that linguistic awareness can function as cognitive scaffolding, promoting adaptive learning and emotional regulation in complex environments.

Pedagogical and Theoretical Implications

The implications of this study extend to both language pedagogy and digital literacy. Pragmatic competence should be explicitly incorporated into psycholinguistics curricula to cultivate awareness of meaning construction in multimodal contexts (Tiawati et al., 2025). Educators can design experiential learning tasks that simulate spatial cybertext navigation, encouraging students to analyze online discourse through frameworks such as speech act theory, politeness strategies, and implicature analysis. Additionally, the study contributes to expanding *cyberpragmatics* by integrating psycholinguistic and psychological dimensions. Whereas earlier studies emphasized textual or technological aspects (Yus, 2011; Herring, 2019), the present findings highlight cognitive and affective processes underpinning meaning negotiation. Thus, pragmatic awareness emerges not only as a communicative skill but as a psychological safeguard, enabling users to maintain coherence and empathy in overstimulated environments.

Discussion

The discussion interprets these findings through the dual lens of cognitive pragmatics and psychological well-being. The "ergodic" nature of the medium redefines the relationship between the student and the text, creating both opportunities for innovation and risks of cognitive failure. This discussion emphasizes that the psychological impact of digital spatiality is not merely a consequence of technology use, but an integral part of the communicative process that reshapes students' cognitive architecture and emotional resilience. Furthermore, the transition from linear reading to spatial traversal requires a continuous adaptation of "relevance-driven" interpretive effects. Students must constantly weigh the cognitive effort required to navigate the interface against the potential rewards of the information obtained. This mental calculation is influenced by the platform's affordances and the user's psychological state, leading to a highly complex and often stressful communicative experience that differs significantly from traditional classroom interaction. Finally, the discussion highlights the need for a "Cybernetic Pragmatics" that accounts for the active role of the medium. The findings suggest that the mechanical organization of social media is not just a carrier of messages but an "influencing principle" that deliberately restructures the semantic sphere of the personality. This perspective requires educators to rethink their pedagogical strategies to support students in developing a critical and adaptive digital literacy that can withstand the pressures of the ergodic landscape.

The Psycholinguistics of Ergodic Effort

Aarseth's concept of "nontrivial effort" or "ergodic effort" is central to understanding the student experience at UPGRISBA. Unlike reading a traditional textbook, traversing a social media feed is an act of "intervention" rather than mere "interpretation". The student is an "active investor" whose every navigational choice, clicking a link, pausing a reel, or scrolling past a notification, carries the risk of "rejection" or pragmatic failure,

where the intended intimacy with the text is lost. This ergodic effort creates a feedback loop between the user and the text that is physically and mentally demanding. The performance of the reader is no longer just "in his head" but is an extranoematic act of construction. This selective movement is a work of physical construction that traditional concepts of reading do not account for, placing the student in the role of a "player" or "gambler" in a world-game of information.

The study finds that high levels of "transience" and "dynamics" in social media significantly increase the working memory load. Students are constantly reminded of inaccessible strategies and paths not taken, which creates a sensation of "aporia" or aesthetic dilemma. This state of "infoxication" means that cognitive resources are frequently exhausted by the act of traversal, leaving little capacity for deep evaluation or reflection on the academic content.

Cognitive Load, Distraction, and Pragmatic Failure

The research provides empirical evidence of the "negative side" of digital spatiality. Approximately 60% of students admit to being distracted during study sessions by social media notifications, leading to "media-induced task-switching" or "multitasking". This pattern decreases students' attention span and motivation, causing them to become bored with the learning process and reducing their overall academic achievement. This distraction creates a "shallow interpretation" of material, where cognitive effort is spent on navigating the platform rather than comprehending the message. Ineffective design, such as poor layouts or non-essential material, acts as an extraneous cognitive load that diverts mental resources from actual learning. This can lead to "confrustion", a combination of confusion and frustration, that initially hampers learning but may inform the student to increase effort if managed correctly. Ultimately, the lack of sufficient "digital linguistic landscapes" in the education environment installed certain obstacles to the cognitive ability of such students. Without structured and pedagogically sound digital interfaces, students struggle to adapt to the rapid changes of information technology, leading to learning failures. This underscores the responsibility of design in educational media, where layout and visual hierarchy must be chief assets to facilitate messages rather than decorations that distract.

The "Digital Flat Affect" and Emotional Identification

A unique psycholinguistic finding is the emergence of the "Digital Flat Affect" caused by the distortion of emotional speech communication. Modern compression codecs (MP3, SPEEX) used in social media distortion prosodic signals such as pitch and rhythm. Acoustic measurements show that these distortions can deviate measurements by up to 20%, blurring the identification of opposing emotions like joy and anger. This blurred identification means that even when students use video or audio channels for communication, the "humanity" of their speech intent is compromised. The recipient may no longer differentiate between joy and anger, leading to pragmatic failure and increased emotional distance. This creates a psychological environment where students feel disconnected from their interlocutors, despite the constant state of "connectivity" offered by the platform. This forced reliance on "artificial empathy" and visual cues like stickers can lead to emotional exhaustion. Students are forced to decode emotions from impoverished signals, which increases cognitive demand and can lead to a sense of social isolation. This "digital flat affect" represents a serious challenge to the development of relational trust and emotional intelligence in the virtual classroom.

The study highlights a positive correlation between passive social media use and "social terror" (social anxiety). Students become hyper-sensitive to negative evaluations in their online "mirrors," a phenomenon explained by self-presentation theory. This manifests in the "FOMO" phenomenon, where students compulsively check notifications to avoid missing situational contexts, even when it interrupts deep work. An interesting behavioral adaptation found in the data is that students preferred to upload personal opinions on their own accounts rather than engagement in comment boxes. This strategic use of digital spatiality allows them to manage their "social face" and avoid the "risk of rejection" inherent in public ergodic interactions. This behavior reflects a need to control the "spatial distance" between themselves and their audience to maintain a sense of psychological safety.

Furthermore, excessive social media use can lead to social isolation and depression if not balanced with meaningful interaction. While active use can reduce social anxiety by positively mediating communication capacity, passive scrolling triggers upward social comparisons that lower self-esteem. Awareness of these potential risks is a crucial moderating variable that can mitigate the adverse effects of harmful encounters in the digital landscape.

Socio-Cultural Resilience and Generation Z Shifts

Despite the globalized nature of digital platforms, UPGRISBA students demonstrate "cultural resilience" by employing local cultural maxims *Kurmat* (respect), *Tepa Selira* (tolerance), and *Andhap Asor* (humility)—to maintain politeness in virtual communication. This shows that courtesy values continue to live within digital communities, even in the absence of face-to-face contact. However, the ways of expressing these intentions differ from conventional communication, requiring a "tanggap ing sasmita" or an understanding of hidden meanings within digital cues. Simultaneously, a "stylistic register" shift is occurring. The younger generation's reliance on neologisms, abbreviations, and "hashtag language" prioritizes brevity and immediate intent over official linguistic rules. This creates a "comprehension gap" with the mature generation, but it also reflects a dynamic interaction between human activity and technical innovation that fosters a new kind of "netspeak" literacy. These changes contribute to long-term shifts in linguistic norms, where non-standard grammar is seen as informal yet effective in conveying intent quickly with minimal effort. This suggests that social media is a potent stimulus of linguistic change that transforms vocabulary and sociolinguistic identities. Educators must consider these implications for language preservation and education while recognizing the potential of these shifts to support student engagement.

AI as an Interactive Pragmatic Partner

Finally, the discussion must address the role of Artificial Intelligence (AI) in this psycholinguistic landscape. AI is no longer a technical tool but an "interactive partner" capable of simulating affect and employing politeness strategies. For students, the ability of AI systems to achieve "emotional alignment" fosters a new kind of "relational trust," positioning the AI as a communication partner sensitive to their emotional dynamics. This integration of AI marks the transition to Education 4.0, where the "machine for the production of expression" is endowed with its own interactive agency. AI systems can adapt their language style based on linguistic cues from the student, providing a personalized and afektif learning experience. This replicability of human cognitive abilities in language understanding triggers important questions about "tacit knowledge" in psycholinguistic theory. However, the use of AI also carries consequences, such as the potential for pragmatic failure when learners produce grammatically correct but contextually inappropriate messages. While AI tools can correct surface-level errors, they often fall short in addressing nuances like tone and formality. This emphasizes the need for explicit instruction in digital pragmatic competence, where humans and AI technologies collaboratively support development in the digital environment.

Conclusions

This study has demonstrated that spatial cybertext environments exert significant psychological and pragmatic influences on psycholinguistics students. Through qualitative analysis of interviews, observations, and discourse samples, three core phenomena were identified: cognitive tension, pragmatic drift, and metapragmatic awareness. Together, these findings suggest that social media engagement is a double-edged process, simultaneously taxing cognitive and emotional resources while fostering deeper linguistic insight. Cognitive tension arises from multimodal overload, reflecting the psycholinguistic challenge of integrating diverse semiotic inputs. Pragmatic drift results from contextual ambiguity, revealing how digital affordances disrupt conventional coherence. Yet, metapragmatic awareness transforms these challenges into learning opportunities, allowing students to regulate emotion and reinterpret meaning through reflective discourse. In conclusion, pragmatic competence functions as a psychological buffer within digital communication. For psycholinguistics students, developing sensitivity to spatial discourse patterns and multimodal implicature is essential to sustaining interpretive stability in complex social media environments. Future research should explore longitudinal effects of cybertext immersion on cognitive empathy and

neuropragmatic processing, extending this inquiry into interdisciplinary fields such as digital psychology and human, computer interaction.

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