
RESEARCH ARTICLE

The role of emojis in emotional language communication: emotional valence and cognitive-affective processing in digital discourse

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ABSTRACT

This paper examines the role of emojis in contemporary emotional language communication, placing them within digital discourse as meaningful semiotic resources that shape both emotional expression and interpretation. Building on current research in emoji studies, the paper synthesizes existing findings on their semantic and affective functions in computer-mediated communication. It further introduces the theoretical construct of emotional valence, outlining its relevance for understanding how affect is encoded, perceived and interpreted in linguistic contexts. Finally, the paper engages with frameworks of emotional language comprehension, highlighting how multimodal emotional cues, particularly emojis interact with textual information to influence cognitive and affective processing during language understanding. By integrating perspectives from pragmatics, psycholinguistics and digital communication studies, the paper argues that emojis function not merely as paralinguistic elaboration but as integral components of emotional meaning construction in online interaction.

KEYWORDS

Emojis, emotional valence, digital communication, language comprehension, cognitive-affective processing

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1. Introduction

Emoji are widely used visual symbols in digital communication that extend, supplement or replace textual emotional meaning, thereby functioning as key semiotic resources in contemporary online discourse (Erle, Schmid, Goslar, & Martin, 2022). As nonverbal communicative devices, emojis convey affective states through graphic forms ranging from facial expressions to contextual icons (Derks, Fischer, & Bos, 2008). When combined with verbal language, emojis enrich emotional tone, enhance interpersonal intimacy and shape meaning construction in computer-mediated interaction. The Emotion as Social Information (EASI) model further suggests that emojis operate analogously to facial expressions, eliciting emotional contagion and inferential processing that influence behavioral intentions (Erle, et al., 2022), which can be observed by means of the time course of semantic processing for emoji-fied text (Barach et al., 2021).

Recent research interest in emojis has grown substantially, as evidenced by a systematic search (2000–2024) across CNKI and Google Scholar, yielding over 20,000 publications. Early studies primarily focused on usage patterns and basic communicative functions (Walther & D'Addario, 2001; Derks, Bos, & Von Grumbkow, 2008). Since 2016, emoji studies have become highly interdisciplinary, encompassing linguistics, psychology, sociology, and computational modeling, reflecting their central role in digital communication. Within this booming field, scholars have emphasized the context-dependent and polysemous nature of emojis. For example, Li and Jiang (2017) demonstrated the pragmatic variability of the *laugh-cry* emoji, while Yuan (2021) highlighted its strategic use in expressing irony and implicit meaning in social media discourse. Similarly, computational studies show that emojis significantly enhance sentiment analysis performance by providing additional emotional cues that improve textual interpretation (Zhao & Jin, 2020).

A growing body of literature also examines emojis in cross-cultural communication, showing both universal and culture-specific interpretive patterns. For instance, Lin et al. (2020) demonstrate systematic differences in emoji design conventions between Eastern and Western contexts, while Xu (2019) identifies divergent usage frequencies and communicative norms between Chinese and Japanese users. Furthermore, Shen (2017) shows that identical emojis (e.g., *laugh-cry*) may generate distinct pragmatic meanings across languages, and Zhu (2021) and Li (2018) further confirm that cultural background shapes emotional interpretation and sentiment responses. These findings underscore emojis as culturally embedded yet globally circulating semiotic tools. In addition to intercultural variation, emojis play important role in social interaction and identity construction in digital environments. Studies show that emoji usage enhances interpersonal intimacy and relational closeness in platforms such as WeChat in China (Liu, 2017), while also serving strategic functions in impression management and identity performance (Jin et al., 2022). Qian et al. (2022) show that emoji-text integration improves emotional interaction quality in social media discourse. From a technological perspective, emoji interpretation is also platform-dependent. Miller et al. (2016) demonstrate that visual rendering differences across operating systems lead to divergent emotional interpretations of identical emojis. Liu et al. (2019) confirm that platform interface design and communication contexts significantly influence emoji usage patterns and semantic functions. Qian et al. (2022) similarly hold that platform variation affects the emotional effectiveness of emoji-text integration, highlighting the importance of technological mediation in digital communication.

Recent psycholinguistic and cognitive studies further reveal the mental processing mechanisms underlying emoji comprehension. Eye-tracking research shows that emoji placement and emotional valence significantly affect reading behavior and cognitive load (Robus et al., 2020). Neurocognitive evidence indicates that emojis with different emotional valences engage distinct processing mechanisms (Kutsuzawa et al., 2022), while emotional inconsistency between emojis and text increases cognitive load and affects comprehension. ERP and fMRI studies further suggest that emojis activate neural systems associated with emotional recognition and semantic integration (Li, 2022). Within sentence processing research, there are four key strands: (i) emojis modulate sentence emotional valence and interpretation (Derks et al., 2008); (ii) they influence semantic processing, facilitating comprehension under emotional congruence but increasing cognitive load under incongruence (Walther & D'Addario, 2001); (iii) emoji ambiguity and emotional valence jointly affect interpretation bias (Fang & Huang, 2023); and (iv) emojis function as analogues of facial expressions, triggering emotional contagion and inferential social cognition (Erle et al., 2022). EEG-based studies further confirm distinct neurocognitive responses when emoji-text semantic conflict occurs (Fossati et al., 2003).

It can be seen from the above-mentioned description that emoji research has developed into a highly interdisciplinary field including semantics, pragmatics, psycholinguistics, sociocultural studies and computational linguistics. However, existing studies often remain fragmented across disciplinary boundaries. Building on this gap, the present study integrates pragmatics, psycholinguistics, and digital communication theory to systematically examine how emojis, emotional valence, and textual cues interact in emotional language comprehension. By focusing on cognitive-affective processing in multimodal discourse, this paper aims to advance a more unified account of emotional meaning construction in digital communication.

2. Emotional Valence

Emotional valence involves the intrinsic attractiveness or aversiveness of an event, object or situation. It captures the fundamental positive-negative dimension of affective experience, typically conceptualized along a bipolar continuum ranging from pleasure to displeasure (Barrett, 2006). As a core dimension of emotion, valence plays a crucial role in guiding human cognition, shaping decision-making processes, and regulating social interaction, thereby constituting a foundational mechanism in both psychological and communicative behavior. The conceptual origins of valence can be traced back to Lewin's field theory, where it was first introduced as a motivational force that attracts individuals toward desirable objects and repels them from undesirable ones (Lewin, 1997). Building on this foundational notion, subsequent research expanded valence into a broader emotional classification system distinguishing between positive and negative affective states. Within this framework, dichotomous descriptors such as positive-negative, good-bad, and pleasure-displeasure have become widely adopted across emotion research, particularly in studies of motivation, cognition, learning, and decision-making (Colombetti, 2005; Barrett, 2006). This widespread adoption reflects the theoretical utility of valence as a simplified yet powerful descriptor of emotional experience.

Beyond this basic dimensional model, multiple theoretical perspectives have been proposed to refine the conceptualization of emotional valence. One influential approach is the adaptive value-tagging theory, which posits that emotional systems function to assign value to environmental stimuli, thereby guiding adaptive behavior. From this perspective, Panksepp (1998) argues that mammalian affective systems rooted in subcortical and neuroendocrine circuits encode valence through primary emotional systems such as FEAR, PANIC, PLAY, CARE, SEEKING, RAGE, and LUST. These systems generate consistent positive or negative affective states or context-dependent valence shifts, thereby providing an evolutionary mechanism for survival-oriented decision-making. In this sense, valence is not merely a subjective feeling but a biologically grounded mechanism for environmental valuation and behavioral regulation.

One complementary perspective conceptualizes valence as an outcome of evaluative appraisal processes, in which emotional experiences are shaped by cognitive and social judgments of events. LaBar & Cabeza (2006), for instance, emphasizes

that emotions such as pity, sympathy, and compassion may be positively valenced due to their perceived social and relational benefits, even if they involve negative situational contexts. Similarly, Ben Ze'ev (2004) highlight the role of reflective evaluation in determining whether an emotional experience is perceived as positive or negative. From this standpoint, emotional valence is not inherent in stimuli but emerges through appraisal processes that incorporate social meaning, moral judgment, and interpersonal context. This evaluative framework is particularly relevant in communicative environments where emotional interpretation is mediated by social expectations and pragmatic inference (Ben Ze'ev, 2004).

In addition, normative and culturally embedded perspectives further extend the concept of valence beyond psychological appraisal. Within certain philosophical and cross-cultural traditions, emotional valence is closely tied to moral and normative evaluation. For example, in Buddhist psychology, mental states are categorized as *virtuous* or *non-virtuous*, corresponding respectively to positive and negative valence, where virtuous emotions contribute to psychological well-being and ethical development, whereas non-virtuous emotions are associated with psychological disturbance and moral deviation (Dreyfus, 2002). Similarly, normative theories of emotion propose that valence reflects not only affective quality but also alignment with socially constructed moral and behavioral norms. In this sense, emotional valence functions as a marker of both psychological experience and socio-moral appropriateness, linking individual affect with collective evaluative systems (Dreyfus, 2002).

Despite the predominance of one-dimensional models that classify emotions along a simple positive–negative axis, contemporary research increasingly recognizes the limitations of such binary conceptualizations. Barrett (2006) proposed a more dynamic and multi-layered understanding of valence, suggesting that emotional experiences often involve complex and sometimes ambivalent affective states. Within this framework, micro-valences refer to fine-grained evaluative components that may co-occur and generate mixed emotional responses, while macro-valence operates as an integrative system that organizes diverse affective inputs into a coherent overall emotional judgment. This hierarchical perspective highlights that emotional valence is context-sensitive, dynamic, and potentially non-unitary, thereby challenging overly simplistic dichotomies and better capturing the complexity of lived emotional experience.

Emotional valence serves two primary analytical functions in this paper. Firstly, it provides a systematic framework for categorizing both textual stimuli and emojis into distinct affective groups, enabling controlled comparison of emotional content across modalities. Secondly, it functions as an evaluative metric for examining how facial emojis modulate, reinforce, or transform the perceived emotional valence of sentence-level meaning. By comparing valence judgments between plain textual conditions and emoji-augmented conditions, this paper aims to investigate the extent to which emojis influence emotional interpretation in digital discourse. In doing so, it directly operationalizes emotional valence as a cognitive-affective interface between linguistic structure and visual-symbolic input, thereby contributing to a more integrated understanding of multimodal emotional language processing.

3. Emotional Language Comprehension

Emotional Language Comprehension Theory (ELCT) explains how emotional information interacts with linguistic processing to shape language comprehension, interpretation and memory. Contrary to traditional models that treat emotion as peripheral to language, ELCT posits that emotional factors are intrinsic components of linguistic cognition, dynamically influencing how semantic information is attended to, integrated, and retained (Fossati et al., 2003). Within this framework, language comprehension is understood as a cognitive-affective process, in which emotional valence and arousal continuously interact with lexical, syntactic, and discourse-level processing. One central assumption of ELCT is the emotional modulation of attentional allocation. Emotional language, particularly words or symbols carrying positive or negative valence, captures attentional resources more efficiently than neutral linguistic stimuli. Empirical evidence consistently demonstrates that emotionally salient words are processed faster and more accurately in lexical decision and word recognition tasks, indicating prioritized cognitive access (Kissler et al., 2007). This attentional advantage is explained by the evolutionary relevance of emotionally significant stimuli, which are perceived as more behaviorally and socially salient, thereby receiving enhanced processing priority (Pessoa, 2009). In multimodal contexts such as digital communication, this mechanism extends beyond verbal stimuli to include visual-emotional signals such as emojis, which similarly attract rapid attentional engagement.

Another core component of ELCT is the emotional enhancement of memory encoding and retrieval. Emotional language has been shown to facilitate deeper encoding and more durable memory traces compared to neutral language. Emotional stimuli are more likely to be consolidated into long-term memory, leading to improved recall performance (LaBar & Cabeza, 2006). Neurocognitively, this effect is supported by interactions between the amygdala and hippocampus, which play a key role in emotion-enhanced memory consolidation (Dolcos et al., 2004). Emotional arousal further strengthens memory binding processes, ensuring that emotionally charged linguistic material is retained more effectively over time (Talmi & Moscovitch, 2004). Within digital communication, emojis may amplify or modify such memory effects by adding redundant or supplementary emotional cues to textual content. In addition, ELCT emphasizes the contextual dependency of emotional language comprehension. Emotional interpretation is not fixed but is dynamically shaped by contextual cues, including discourse environment, prior knowledge, and situational framing. Research shows that emotionally congruent contexts facilitate comprehension by reducing cognitive conflict, whereas incongruent emotional contexts increase processing difficulty and integration costs (Van Berkum et al., 2013). In this sense, emotional context serves as a predictive framework that guides

interpretation and reduces uncertainty during language processing. This contextual mechanism is particularly relevant for emoji-text interaction, where visual symbols may either align with or contradict textual emotional tone, thereby influencing interpretive outcomes.

One further dimension of ELCT concerns the interaction between emotional and semantic processing systems. Emotional valence and arousal are not independent of semantic meaning but interact directly with lexical and conceptual integration processes. Emotionally charged linguistic elements can enhance or alter semantic interpretation by influencing how meaning is constructed at both word and sentence levels (Bayer et al., 2010). This interaction becomes especially salient in figurative and pragmatic language use, such as metaphor, irony, and sarcasm, where emotional cues are essential for inferring speaker intent (Schmidt & Seger, 2009). Kutsuzawa et al. (2022) further demonstrate that emotional valence facilitates semantic access, suggesting that emotion is deeply embedded in conceptual representation rather than merely attached to it. Beyond comprehension, ELCT also extends to decision-making and social communication processes. Emotional language influences evaluative judgments, preferences, and behavioral intentions by altering perceived relevance and motivational significance (Fossati et al., 2003). In interpersonal communication, emotionally loaded language shapes message interpretation, relational dynamics, and persuasive effectiveness. Emotional framing can significantly influence attitudes and behavior change, particularly in contexts involving persuasion, negotiation, or social influence (Nabi, 2003). In digital environments, emojis function as strategic emotional cues that enhance persuasive impact and interpersonal engagement by modulating perceived tone and relational meaning.

From the pragmatic perspective, ELCT has been widely adopted across multiple disciplines, including psycholinguistics, cognitive neuroscience, communication studies, and affective computing (Tan et al, 2019). In psycholinguistics, it provides a framework for understanding how emotional content influences reading behavior, comprehension strategies, and lexical access. In digital communication research, ELCT is particularly valuable for explaining how non-verbal cues---especially emojis---shape online interaction and emotional expression (Winkielman, Coulson, & Niedenthal, 2018). The theory is also relevant in applied domains such as education, marketing, and mental health, where emotional framing significantly affects engagement, persuasion, and behavioral outcomes (Dillard & Peck, 2000). In synthesis, Emotional Language Comprehension Theory offers a comprehensive account of how emotion and language are co-constructed during cognitive processing. By integrating attentional, mnemonic, contextual, semantic, and social mechanisms, ELCT conceptualizes language comprehension as an inherently emotional-cognitive system. This theoretical perspective provides a strong foundation for investigating multimodal communication, particularly in digital environments where textual and visual emotional cues coexist. Building on ELCT, the paper incorporates the principles of emotional consistency, cognitive load, and semantic integration to examine whether and how facial emojis influence the perceived emotional valence of sentences. Specifically, it investigates how congruence or incongruence between emojis and textual content affects emotional interpretation, processing efficiency, and cognitive-affective integration. By applying ELCT to emoji-text interaction, this study aims to further elucidate the mechanisms through which visual emotional symbols shape language comprehension in digital discourse.

4. Conclusion

The paper systematically demonstrates that emojis function as integral semiotic and affective components in emotional language communication. By integrating Emotional Valence Theory and ELCT, the study establishes a unified explanatory framework in which emojis interact dynamically with textual information to shape cognitive-affective processing during language comprehension. Emotional valence serves as the core mediating mechanism linking visual symbols and linguistic meaning: emojis can reinforce, attenuate or even invert the perceived valence of sentences depending on contextual congruence and semantic alignment. This interaction is not merely additive but involves complex integrative processing, in which emotional cues from multiple modalities jointly influence attentional allocation, semantic interpretation, and evaluative judgment. The findings conceptually support the view that emotional language comprehension is inherently multimodal, and that meaning construction in digital discourse emerges from the continuous interplay between verbal structure and visual-emotional signals.

Furthermore, grounded in ELCT, this paper highlights that emoji effects on emotional language comprehension are mediated by mechanisms of emotional consistency, cognitive load and semantic integration. When emoji valence is congruent with sentence content, it facilitates processing efficiency, strengthens emotional clarity and enhances memory encoding; conversely, emotional incongruence increases cognitive load, disrupts semantic integration, and may lead to interpretive bias or ambiguity. These results indicate that emotional stimuli modulate attentional prioritization and memory consolidation during language processing. Crucially, the paper extends existing research by specifying emotional valence as the key theoretical bridge between linguistic and visual modalities in digital communication. Thus, the paper contributes to the understanding of emotional language comprehension, offering new insights into how emojis reshape emotional meaning construction, providing a theoretical foundation for future research in digital discourse, psycholinguistics and cross-cultural communication.

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