



Gastronomy and Neurolinguistics

Lilik Rita Lindayani

Indonesian Literary Department, Halu Oleo University, Kendari, Southeast Sulawesi, Indonesia

Email: lilik.lindayani@uho.ac.id

Abstract

This study explores the relationship between gastronomy and neurolinguistics through the perspective of *gastro linguistics*, a field that examines the connection between language, taste, and human sensory experience. Gastronomy is not only understood as the art and science of eating but also as a cultural symbol system reflecting identity and collective emotion. Meanwhile, neurolinguistics investigates how the brain processes language and taste perception simultaneously. The activation of brain areas such as the *insula*, *orbitofrontal cortex*, and *amygdala* demonstrates that food-related words “savory,” “sour,” “sweet” can evoke neural responses similar to actual eating experiences. The concept of *embodied cognition* explains that the understanding of culinary language is formed through bodily experiences and episodic memory. Culinary language, idioms, and metaphors such as “the bitterness of life” or “sweet memories” illustrate the interconnection between sensory perception and emotion. This study emphasizes that the lexicon of food is not cognitively neutral but rooted in sensory and cultural experiences. Through the integration of linguistics, culture, and neuroscience, this research contributes to a new understanding of how humans construct the meaning of taste through language and how language itself can stimulate taste-related experiences at the neurological level.

Keywords: gastronomy, neurolinguistics, gastro linguistics

INTRODUCTION

Gastronomy was initially understood as the art and science of food and eating practices. However, within contemporary humanities and social science scholarship, gastronomy has evolved into a multidisciplinary object of study encompassing cultural, linguistic, identity-related, emotional, and collective memory dimensions. Food is not only physically consumed but also socially constructed and culturally interpreted through language. Taste-related terms such as *sweet*, *bitter*, *sour*, and *savory* are frequently used not only to describe sensory experiences but also to articulate emotional states and lived human experiences.

From a linguistic perspective, this phenomenon indicates that culinary language possesses strong symbolic and metaphorical functions. Expressions such as *the bitterness of life* or *sweet memories* illustrate how gustatory experience functions as a conceptual foundation for understanding abstract realities. This view aligns with the assumption that linguistic meaning is neither neutral nor purely arbitrary, but rather grounded in bodily experience and cultural context. Neurolinguistics, as an interdisciplinary field bridging linguistics and neuroscience, examines how language is processed in the human brain. Recent findings in cognitive neuroscience demonstrate that language processing involves the activation of sensory and emotional brain regions. Words related to taste and food have been shown to activate the same neural areas involved in direct eating experiences, such as the *insula* and the *orbitofrontal cortex*. These findings open a productive scholarly dialogue between gastronomic studies and neurolinguistics.

Based on this background, the present article aims to examine the relationship between gastronomy and neurolinguistics through a gastro linguistic perspective, with particular emphasis on how culinary language is understood, processed, and experienced at both neurological and cultural levels.

Within cultural studies, gastronomy is understood as a semiotic system that represents social values, collective identity, and the historical experiences of a community. Fischler (1988) argues that food functions as a powerful marker of social and cultural identity, as food choices and consumption practices reflect social structures and cultural values. In this context, language plays a central role as the primary medium through which gastronomic meanings are articulated and transmitted.

Neurolinguistics investigates the relationship between brain structures and language functions. Neuroscientific research has shown that the comprehension of sensory-related words involves activation of brain regions directly associated with perceptual experience. Binder et al. (2009) and Pulvermüller

(2013) explain that lexical meaning is represented within distributed sensorimotor networks in the brain. In the case of taste-related words, activation has been observed in the insula and the orbitofrontal cortex, which are responsible for gustatory perception and affective evaluation.

Gastrolinguistics is an interdisciplinary field that examines the relationship between language, food, and sensory experience. A key concept relevant to this study is *embodied cognition*, which posits that human cognition is fundamentally grounded in bodily experience (Lakoff & Johnson, 1999). From this perspective, linguistic understanding—including culinary language—is shaped through interactions between the body, the brain, and the environment. Consequently, taste-related words are not processed solely at a linguistic level but are also sensorily simulated within the brain.

A growing body of research has investigated the interconnections between language, taste, and the brain. Simmons et al. (2005) demonstrated that reading taste-related words activates the primary gustatory cortex. This finding was further supported by Barrós-Loscertales et al. (2012), who reported that taste metaphors simultaneously trigger neural responses in both emotional and sensory brain regions. In cognitive linguistics, Lakoff and Johnson (1980) showed that taste-based conceptual metaphors constitute an important component of the human conceptual system. Meanwhile, within food studies, Mintz (2004) emphasized that taste experience is always mediated by historical and cultural contexts. Nevertheless, studies that explicitly integrate gastronomy, neurolinguistics, and cultural linguistics remain relatively limited, particularly in the context of Indonesian language and culture. Therefore, this study seeks to address this gap by proposing a gastrolinguistic approach that integrates linguistic, neuroscientific, and cultural perspectives to understand how language about food shapes and reflects human taste experience.

METHODS

This study adopts a qualitative research design using an interdisciplinary linguistic approach that integrates cognitive linguistics, neurolinguistics, and cultural studies. This approach is employed to explain how gastronomic-related linguistic units function not merely as semantic markers, but also as representations of sensory experience and emotion rooted in cognitive processes and the cultural contexts of speakers. The research is descriptive–interpretative in nature, focusing on the meaning-making of taste-related language in everyday communicative practices. The research was conducted in Kendari City, Southeast Sulawesi, Indonesia. This location was selected because it represents a dynamic linguistic and cultural space in which local gastronomic practices interact with the use of Indonesian and regional languages. Research participants consisted of adult speakers residing in Kendari City who possess direct experience in culinary practices, either as food producers, preparers, or consumers of local cuisine. Participants were selected purposively to ensure representation of diverse linguistic and gastronomic experiences.

The data consist of linguistic units including words, phrases, clauses, and metaphorical expressions related to taste and food, such as *sweet*, *bitter*, *sour*, and *savory*, as well as taste-based metaphors found in everyday discourse. Data sources include: (1) oral utterances in natural interactions, (2) written culinary texts such as menus and food descriptions, and (3) reflective utterances from informants concerning their experiential associations and meanings related to taste words. All data are treated as linguistic data and analyzed from a linguistic perspective. Data collection was carried out through linguistic observation, semi-structured linguistically oriented interviews, and documentation studies. Linguistic observation was used to record the use of taste-related linguistic units within natural pragmatic contexts. Semi-structured interviews focused on speakers' meaning construction, conceptual associations, and sensory experiences elicited by taste-related language. Documentation was employed to collect gastronomic texts representing local culinary language practices.

The primary research instrument was the researcher herself, functioning as the key human instrument responsible for observation, data collection, and interpretation. Supporting instruments included linguistic observation guidelines, interview protocols grounded in embodied cognition theory, audio recording devices, and linguistic data coding sheets. Data analysis proceeded through stages of linguistic data reduction, coding, meaning categorization, and interpretation. Semantic and pragmatic analyses were employed to identify both literal and metaphorical meanings of taste-related language units. The findings were subsequently interpreted using cognitive linguistic and neurolinguistic frameworks—particularly the concept of embodied cognition—to explain the relationship between language, sensory experience, and cognitive processing. Data validity was ensured through source triangulation and methodological triangulation.

RESULTS AND DISCUSSION

Patterns of Taste Lexicon Usage in Culinary Language

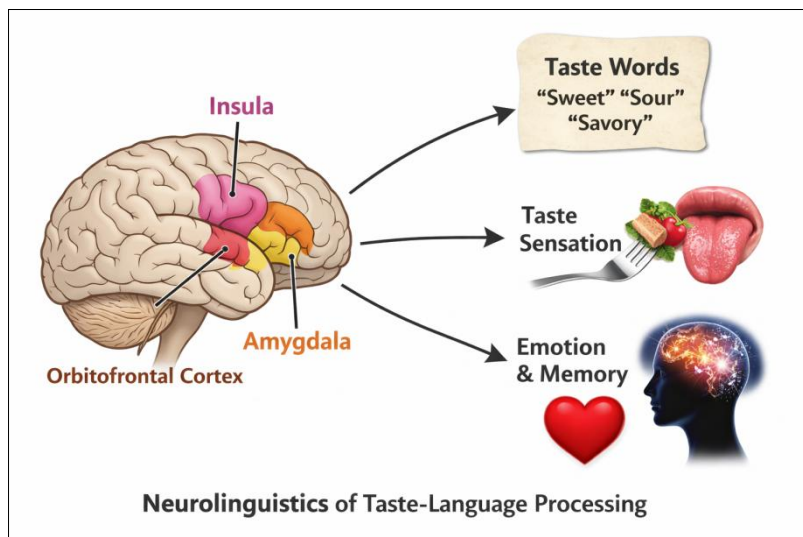
The analysis of linguistic data collected in Kendari City reveals that taste-related lexicon is used productively across various communicative contexts. Linguistic units such as *sweet*, *bitter*, *sour*, and *savory* appear not only in literal descriptions of food but also in evaluative, affective, and metaphorical contexts. Linguistically, these usages can be classified into three primary patterns: literal usage (describing food taste), evaluative–affective usage, and metaphorical usage to represent non-culinary experiences.

The metaphorical use of taste lexicon, as seen in expressions such as *the bitterness of life* or *sweet memories*, indicates that gustatory experience serves as a source domain for understanding abstract experiences. This finding aligns with conceptual metaphor theory, which posits that sensory experience functions as a foundational conceptual resource for abstract meaning construction (Lakoff & Johnson, 1980). Thus, the data confirm that taste-related language plays a significant role in the speakers' conceptual system and is not limited to purely referential functions.

Neurolinguistic Processing of Taste-Related Language

Findings from reflective interviews indicate that specific taste-related words consistently elicit sensory and emotional responses among participants. The word *sweet* is generally associated with pleasant feelings, comfort, and nostalgia, whereas *bitter* is linked to negative emotional experiences. These responses suggest that the processing of taste-related language involves the activation of sensory and affective representations within speakers' cognitive systems.

From a neurolinguistic perspective, these findings are consistent with studies demonstrating that the processing of sensory-related words can activate brain regions associated with perceptual experience. Simmons et al. (2005) and Binder et al. (2009) report that taste-related words activate the gustatory cortex, particularly the insula and orbitofrontal cortex, which are involved in taste perception and affective evaluation. Although this study does not employ neuroimaging techniques, the linguistic data and participants' reflective responses support the assumption that understanding taste-related language involves mechanisms of sensory simulation at the cognitive level. Language, therefore, is not processed as a purely abstract symbolic system but functions as a trigger for the activation of embodied sensory experiences stored in speakers' cognitive memory.



Picture: Neurolinguistics of Taste-Language Processing

Taste Language, Emotion, and Memory within an Embodied Cognition Framework

Another salient finding concerns the close relationship between taste-related language and episodic memory. Participants frequently associated taste words with specific memories, such as childhood experiences, family interactions, or socially meaningful events. This suggests that taste-related language functions as a powerful cue for memory and emotion encoded through bodily experience. This phenomenon can be explained through the concept of embodied cognition, which holds that linguistic meaning emerges from interactions between the body, sensory experience, and the environment (Lakoff & Johnson, 1999; Pulvermüller, 2013). Within this framework, taste-related words are not only

linguistically processed but are also sensorily and emotionally simulated in the brain. The involvement of the amygdala known for its role in emotional processing and emotional memory helps explain why taste-related language has strong evocative power.

From a cultural perspective, these findings are consistent with the view that taste experience is always mediated by social and cultural contexts (Fischler, 1988; Mintz, 2004). In the context of Kendari City, the meaning associations of taste-related words are shaped by local culinary practices and speakers' social experiences. This demonstrates that the processing of taste-related language results from the interaction of cognition, culture, and embodied experience.

Furthermore, this study aligns with and extends previous gastrolinguistic research in the Indonesian context. For instance, Lindayani et al. (2024) demonstrate that the naming of Kabasa ritual dishes within the Muna community functions not merely as labeling, but as a reflection of semantic structures deeply embedded in cultural values, social norms, and local philosophy. These findings provide empirical support for the relevance of a gastrolinguistic approach in understanding culinary meaning as a comprehensive language culture phenomenon. Similar conclusions are drawn from studies on Betawi traditional food lexicon (Nisa et al., 2025) and culinary linguistics in Nias Island (Zai & Daulay, 2023), which emphasize the inseparable relationship between language, culture, and food. In the field of language education, Sutiandari et al. (2023) further demonstrate that gastronomic studies contribute meaningfully to discourse comprehension and language practice. Collectively, these studies reinforce the argument that the study of food-related language is both theoretically significant and contextually grounded across diverse Indonesian linguistic communities.

CONCLUSION

This study demonstrates that culinary language, particularly taste-related lexicon, constitutes an embodied, cognitive, and cultural linguistic phenomenon. Words such as *sweet*, *bitter*, *sour*, and *savory* function not only as descriptive markers within gastronomic contexts but also as conceptual tools for expressing emotions, life experiences, and speakers' memories. Consequently, taste lexicon cannot be considered semantically neutral; rather, it is deeply rooted in human sensory and affective experience. Through an interdisciplinary linguistic approach integrating cognitive linguistics and neurolinguistics, this study shows that the comprehension of taste-related language involves mechanisms of sensory and emotional simulation. Participants' reflective responses indicate the involvement of cognitive representations associated with gustatory perception, emotion, and episodic memory. These findings align with embodied cognition theory and reinforce previous research demonstrating the close relationship between language processing and the sensorimotor systems of the brain. Culturally, the findings confirm that the interpretation of taste-related language is shaped by local gastronomic experience and social practices. The Kendari case study illustrates that culinary experience and cultural environment play a crucial role in forming meaning associations of taste words, underscoring the fact that language processing cannot be separated from speakers' social and cultural contexts. This contributes to neurolinguistic research, which has predominantly relied on experimental and Western-centric settings. Overall, this research contributes to the development of gastrolinguistics as an interdisciplinary domain bridging linguistics, neurolinguistics, and cultural studies. The findings open avenues for further research employing experimental neurolinguistic methods or cross-cultural approaches to gain a more comprehensive understanding of how language shapes and stimulates taste experience in human cognition.

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