

# Embodied Cognition and Metaphorical Expressions of English Perceptual Vocabulary

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## ABSTRACT

Understanding abstract concepts is not a purely logical process but is deeply rooted in humans' bodily interactions with the external world. Based on the theory of embodied cognition, this paper conducts a systematic analysis of the metaphorical and metonymic mechanisms underlying perceptual vocabulary in English. Firstly, it demonstrates the view that linguistic meaning originates from bodily experiences, clarifies the core mediating role of perceptual vocabulary in the construction of abstract meaning, and expounds on the cognitive projection principle of conceptual metaphors as applied to perceptual terms. Secondly, it critiques the limitations of traditional research on English perceptual vocabulary, including the separation of language from embodied experience, the lack of a systematic framework for exploring metaphorical mechanisms, and the disconnection between theoretical research and practical applications (e.g., language teaching). Finally, the paper proposes an embodied research paradigm for studying perceptual vocabulary, and employs corpus-based research methods to empirically reveal the mapping patterns between perceptual domains and abstract domains. On this basis, it further develops targeted embodied vocabulary teaching strategies. In conclusion, deconstructing the metaphorical generation and interpretation process of English perceptual vocabulary not only deepens the cognitive explanation of linguistic phenomena related to perceptual terms but also provides a new theoretical basis and practical guidance for English vocabulary teaching.

## KEYWORDS

Embodied cognition; Perceptual vocabulary; Metaphorical expression

## 1 Introduction

As the fundamental building block of the cognitive representation system that is language, vocabulary has long been framed within the constraints of subject-object dualism in traditional linguistic studies. Early structuralist and formalist paradigms, for instance, tended to treat vocabulary as discrete symbolic entities, namely arbitrary signifiers detached from the embodied experiences of language users. This disembodiment assumption, however, is continually challenged by ubiquitous linguistic phenomena in everyday communication: when “warm reception” is employed to convey interpersonal friendliness, “bitter memory” to articulate emotional pain, or “bright future” to embody hopeful expectation, these expressions do not merely rely on arbitrary symbolism. Instead, they fundamentally conceptualize abstract notions by grounding them in embodied perceptual vocabulary—drawing on sensory experiences of temperature, taste, and light to make intangible ideas tangible.

This cross-domain projection, from concrete embodied perception (e.g., tactile warmth, gustatory bitterness) to abstract conceptual categories (e.g., emotion, memory, expectation), is not an occasional linguistic device, but a foundational cognitive mechanism that underpins human language and thought <sup>[1]</sup>. It is precisely this mechanism that the theory of embodied cognition seeks to unpack. Unlike traditional cognitive theories that position the mind as a discrete “symbol processor” operating independently of the body, embodied cognition argues that cognitive processes are inherently rooted in the dynamic interaction between bodily configuration (e.g., physical structure, sensory organs), the sensorimotor system (e.g., the ability to perceive and act on the environment), and the external world <sup>[2]</sup>. From this perspective, language is not a mere reflection of abstract concepts, but a crystallization of embodied experiences, wherein perceptual vocabulary serves as a critical bridge between bodily sensation and conceptual meaning.

Against this backdrop, a systematic examination of how English perceptual vocabulary generates abstract meanings through metaphorical and metonymic mechanisms addresses a core ontological proposition in cognitive linguistics: do humans construct conceptual systems primarily through embodied cognition? This inquiry transcends the narrow scope of etymological analysis (e.g., tracing the historical origins of individual perceptual words) to engage with a more fundamental question: how does the body's perceptual experience shape the very structure of linguistic meaning-making? By unpacking the metaphorical processes of perceptual vocabulary, this study not only responds to the limitations of disembodied linguistic theories but also contributes to a deeper understanding of the interplay between body, mind, and language—an issue that has become central to contemporary cognitive linguistics research.

## 2 Embodied theoretical foundations

### 2.1 Bodily grounding of meaning

The core breakthrough of embodied cognition theory in challenging traditional cognitive science lies in its repositioning of cognition's foundational origin: not as abstract symbolic computation, but as embodied, contextually situated bodily experience. It posits that human cognitive processes, including concept formation, reasoning, and meaning construction, are inherently dependent on the body's perceptual and motor systems, with language, human mind, and the physical-social environment engaging in continuous, dynamic interplay<sup>[3]</sup>. Crucially, the nature, structural features, and organizational logic of human concepts are not pre-determined by abstract rules, but are shaped and constrained by the body's physiological attributes, sensory capacities, and interactive experiences with the world<sup>[4]</sup>. Meaning, in this framework, does not exist a priori as fixed entities within words or concepts; instead, it emerges and is dynamically constructed through the ongoing interaction between the body and its physical and social environments.

Our bodies, endowed with specific physiological structures, sensory channels, and motor capabilities, serve as the primary "interface" and "interpretive framework" through which we perceive, categorize, and make sense of the external world<sup>[3]</sup>. For instance, humans possess a vestibular system that perceives gravitational forces, and a somatosensory system that registers spatial positions of the body. This bodily endowment renders spatial orientations like "up" and "down" not mere geometric abstractions, but primal, embodied experiences infused with physiological and emotional connotations: "up" is consistently associated with positive, elevated states (e.g., "spirits rise", "high hopes"), while "down" is linked to negative, low-valence sentiments (e.g., "feeling down", "low spirits").

Such embodied imagery schemas—abstracted from recurring bodily experiences, such as container, path, and force, constitute the most fundamental, pre-linguistic structural framework for organizing abstract thought. Notably, these schemas are not arbitrary; their formation directly stems from the body's ability to interact with the environment. For perceptual vocabulary, this means that the meaning of terms like "warm", "bright", or "bitter" is not limited to their literal sensory references, but is rooted in the bodily experiences of temperature, light, and taste—experiences that then serve as the basis for metaphorical extension to abstract domains (e.g., "warm friendship", "bright insight", "bitter regret").

### 2.2 Perceptual vocabulary as linguistic bridge

Human cognition and language are not isolated mental constructs but are dynamically constructed through the continuous engagement and interaction of the body and brain with the physical and social world, with sensory systems serving as the core "mediator" of this interaction<sup>[5]</sup>. If bodily experience is the primary wellspring of meaning generation, then perceptual vocabulary functions as the central linguistic conduit that channels this experiential "stream" into the realm of abstract concepts, enabling humans to conceptualize and communicate intangible ideas.

Perceptual vocabulary refers to a category of lexical items that directly encode sensory experiences derived from the five major sensory modalities: vision (e.g., "see", "bright"), audition (e.g., "hear", "loud"), touch (e.g., "feel", "hard"), gustation (e.g., "taste", "bitter"), and olfaction (e.g., "smell", "fragrant"). Unlike abstract vocabulary that lacks direct experiential grounding, perceptual vocabulary constitutes the most direct and intimate link between bodily sensation and linguistic expression. It serves as the "linguistic port" for the body's sensory channels: by encoding pre-linguistic and subjective perceptual experiences into discrete and shared linguistic symbols, perceptual vocabulary completes the critical transition from private bodily sensation to public communicative meaning.

This isomorphism with bodily experience endows sensory vocabulary with a natural, potent capacity for generating imagery. When we hear the word "warm", our brain activates not merely an abstract definition of temperature, but also neural pathways associated with bodily sensations and emotional memories tied to warmth. This characteristic makes sensory vocabulary an ideal intermediary bridging the concrete and abstract realms. A lexeme originally describing perceptual properties of the physical world can holistically transfer its richly bound imagery schemas and evaluative connotations into an entirely new abstract domain through metaphorical mechanisms. This provides that abstract domain with a perceptible, comprehensible cognitive foundation.

### 2.3 Conceptual metaphor: cross-domain projection

As a cornerstone of Cognitive Linguistics, Conceptual Metaphor Theory profoundly illuminates the cognitive mechanisms through which perceptual experiences are transposed across domains to form abstract concepts. Its core proposition holds that metaphor is not merely a linguistic rhetorical device, but a fundamental mode of human thinking—understanding a relatively unfamiliar, abstract target domain via a familiar, concrete source domain<sup>[1]</sup>. In the context of perceptual vocabulary metaphorization, the source domain usually consists of humans' basic sensory experiences, while the target domain covers abstract concepts such as emotions, thoughts, and social relationships. Notably, this

metaphorical transfer is not a random association; instead, it adheres to systematic mapping principles.

Take the core conceptual metaphor UNDERSTANDING IS SEEING as an example: visual clarity corresponds to comprehension (e.g., “I see your point”), visual obstacles map to understanding difficulties (e.g., “blind to the facts”), and a visual perspective translates to a viewpoint (e.g., “from my point of view”). This cross-domain projection mechanism allows humans to rapidly construct an internally consistent framework for understanding the abstract world—all by leveraging their highly structured and deeply internalized perceptual experiences.

### 3 Limitations of traditional research

#### 3.1 Disconnection from bodily experience

For a long time, mainstream linguistic research paradigms, especially those influenced by formalist linguistics, have tended to regard language as an autonomous and closed sign system<sup>[6]</sup>. Within this framework, metaphorical expressions in vocabulary are often interpreted as either internal semantic derivations of language itself or rhetorical devices that deviate from conventional usage.

Traditional approaches can identify, for instance, that the adjective “warm” can modify “person” to convey a sense of kindness, yet they lack a unified theoretical framework to explain two key questions: why “warm”, rather than “cold”, is used for this positive connotation, and why “hard” can modify a person to signify emotional coldness or sternness. By failing to trace the semantic roots of such expressions back to the distinct emotional valences and imagery schemas triggered by the physically contrasting tactile experiences of “warmth” and “hardness”, these analyses remain superficial and are unable to access the deep-seated cognitive drivers behind metaphor generation.

#### 3.2 Lack of systematic mapping patterns

While a wealth of studies has explored metaphorical usage in English perceptual vocabulary, such research remains fragmented in its scope and methodology. Most investigations either focus on individual or a small set of perceptual terms, or conduct case studies on metaphorical expressions for specific abstract concepts. Though this localized approach yields in-depth insights into specific issues, it lacks systematic comparison and integration of different perceptual domains as metaphorical source domains at the macro level.

A critical gap lies in the lack of clarity regarding three core questions: Do different perceptual channels exhibit systematic differences in their metaphorical projection capacity? What preferences guide their selection as source domains for abstract concepts? And what distinct mapping patterns do they follow in this process? For example, visual perceptual vocabulary is more frequently used to metaphorically describe cognitive and intellectual activities (e.g., “insight” derived from visual perception of clarity, “blind spot” from visual obstruction), while tactile vocabulary tends to map to emotional and social relationship concepts (e.g., “touching” for emotional resonance, “distant” for interpersonal alienation). Yet existing research fails to address whether such phenomena reflect universal cognitive principles, or if there exists a hierarchical order in metaphorical projection across sensory domains.

The insufficient exploration of these systemic patterns means current research cannot provide a comprehensive understanding of how sensory experiences holistically and structurally shape the abstract conceptual world, leaving a key gap in our grasp of perceptual vocabulary’s role in metaphorical cognition.

#### 3.3 Detachment from practical application

A prominent issue in current research on metaphors of perceptual vocabulary lies in the disconnect between theoretical exploration and practical application, particularly evident in English language teaching and cross-cultural communication.

In English vocabulary instruction, when addressing the polysemy of perceptual words, educators frequently rely on traditional rote memorization methods, treating the metaphorical meanings of such words as isolated usages that require independent memorization. This approach disregards the intrinsic cognitive connections between a word’s literal and metaphorical meanings, which are established through metaphorical mapping mechanisms. As a result, students only learn “what” the metaphorical meanings are, but not “why” such meanings emerge. This not only increases students’ memorization burden but also fails to cultivate their ability to infer and extend word meanings through cognitive reasoning<sup>[7]</sup>.

In cross-cultural communication, neglecting the bodily experiential roots of sensory vocabulary metaphorical expressions may further lead to communication barriers. Individuals from different cultural backgrounds often exhibit subtle differences in bodily experiences and perceptual modes; these differences can result in divergent metaphorical projection pathways for the same perceptual lexeme across languages. For instance, a tactile term with positive

connotations in one language may map to negative abstract concepts in another, yet without recognizing the role of cultural-specific bodily experiences in shaping such metaphors, communicators may misinterpret the intended meaning.

## 4 Embodied research approaches

### 4.1 Body-centered analytical framework

To address the limitations of traditional research, the primary new approach entails constructing a systematic, body-experience-centered framework for analyzing perceptual vocabulary metaphors. Unlike conventional methods that take a lexeme's metaphorical meaning as the starting point of analysis, this framework positions metaphorical meaning as the endpoint of a cognitive process, shifting the focus to reverse-tracing the generative path of metaphor.

The core analytical unit of this framework is concrete sensorimotor schemata. For any metaphorical usage of a perceptual lexeme, the analysis follows two key steps: First, researchers must identify the core bodily experience underlying the metaphor. For example, analyzing the metaphorical expression "grasp an idea" requires activating the embodied experience of manual grasping<sup>[8]</sup>, an experience that encompasses core imagery schemas such as "exerting force", "exercising control", and "achieving possession". Second, researchers need to clarify which elements of these imagery schemas are retained and which are discarded during the cross-domain mapping process.

Through this two-step analysis, a complete analytical chain can be established, that is from bodily experience to imagery schema, conceptual metaphor, and linguistic expression. This chain not only connects metaphor's cognitive origin (bodily experience) to its linguistic manifestation but also provides a replicable analytical path for decoding the generative mechanism of perceptual vocabulary metaphors.

### 4.2 Corpus-integrated cognitive methods

To systematically uncover metaphorical projection patterns across different perceptual domains, research must move beyond the introspection and case-study reliance of traditional methods, shifting toward empirical inquiry grounded in large-scale, authentic language data. The integration of corpus linguistics methods provides robust technical support for this transition.

First, researchers can construct a specialized English corpus explicitly annotated for perceptual vocabulary and its metaphorical usages, with annotations specifying key information such as the source perceptual domain, target abstract domain, and contextual cues of metaphorical meaning. Based on this annotated corpus, quantitative statistical methods can then be applied to systematically examine three core dimensions: the frequency of metaphorical usage across distinct perceptual domains, the scope of target domains each perceptual domain projects to, and the collocation patterns of perceptual lexemes in metaphorical contexts.

Building on these quantitative findings, researchers can further integrate cognitive linguistic theoretical frameworks to interpret the statistical patterns, delving into the underlying cognitive mechanisms that drive differences in metaphorical projection across perceptual domains. This combination of corpus-based empiricism and cognitive theoretical analysis ensures both the objectivity of data and the depth of cognitive explanation, effectively addressing the fragmentation of traditional research.

### 4.3 Embodied vocabulary teaching pathways

The ultimate goal of this new research-derived pathway is to translate embodied cognition theory into practical teaching strategies, thereby tangibly enhancing the efficiency of English perceptual vocabulary instruction and improving students' learning outcomes<sup>[9]</sup>. Rooted in embodied cognition, this pedagogical approach centers on two core shifts: from "rote memorization of metaphorical meanings" to "comprehension of cognitive origins", and from "static knowledge acquisition" to "dynamic meaning construction".

In specific teaching practice, when introducing the metaphorical meaning of a perceptual lexeme, educators should avoid treating it as isolated knowledge to be memorized. Instead, they should guide students to trace the meaning back to its source in bodily experience. For example, when teaching the metaphorical expression "He gave me the cold shoulder", the teacher can guide students to recall or simulate the physiological sensations of "physical cold" (e.g., shivering, discomfort) and the corresponding psychological feelings (e.g., unease, alienation). Then, they can connect this embodied experience to the social scenario of "being ignored or rejected". Through this integration of bodily sensation, emotional experience, and linguistic meaning, students gain a profound understanding of why "cold", rather than other perceptual terms, conveys the meaning of "social rejection".

Additionally, teaching activities should incorporate multimodal inputs like movement, gestures, and imagery to activate students' bodily experiences. For instance, when teaching spatial metaphors, having students physically perform

the gestures of “looking up” and “looking down” while associating these actions with the expressions “look up to someone” (respect) and “look down on someone” (contempt) significantly deepens their internalization of the metaphorical rationale (i.e., how spatial height maps to social status). This pedagogical model not only reduces students’ memorization burden but also cultivates their ability to interpret existing metaphors and generate new ones by leveraging bodily experience, ultimately realizing a profound cognitive shift in English language learning, from memorizing forms to grasping meanings.

## 5 Conclusion

The metaphorical expression of English perceptual vocabulary constitutes a linguistic representation of embodied cognition mechanisms, embodying the essential process by which humans construct abstract concepts through bodily experience. Embodied cognition theory transcends the cognitive isolation of traditional paradigms, revealing the generative connection between linguistic symbols and embodied sensory experience. Subsequent research should establish the following principles to construct a semantic analysis framework grounded in embodied origins: rely on corpus metrics to uncover cross-sensory mapping patterns; and integrate cognitive rationale to innovate language teaching paradigms. This approach will address ontological propositions in linguistic cognition, guiding language practice to its essential embodied-interactive nature.

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