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コーパスに基づく日本語の温度形容詞「冷たい」の 多義性に関する認知意味論的分析

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A Corpus-Based Cognitive Semantic Analysis of the Polysemy of the Japanese Temperature Adjective *Tsumetai*

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Abstract

Meaning is grounded in human sensorimotor experiences, which include our experiences of temperature phenomena. The study of temperature concepts provides a fundamental perspective to explore cognitive mechanisms. Temperature term *tsumetai* (cold) constitutes a crucial concept in the basic temperature domain. This study adopted a corpus-based descriptive approach to explore the semantic structure of the polysemous Japanese temperature adjective *tsumetai*. First, 4,402 instances of *tsumetai* were retrieved from the Balanced Corpus of Contemporary Written Japanese (BCCWJ). Manual analysis and semantic annotation of each instance were performed based on eleven dictionaries and a sense-identifying criterion. Consequently, eight senses of *tsumetai* were identified. Second, sense 1 : (*of objects*) *having a relatively low temperature* was identified as the prototype of *tsumetai* based on its frequency and earliest acquisition. Sense 1 is the most frequently occurring sense in the BCCWJ data (57.20%), indicating its predominance in the semantic network. Also, sense 1 is the earliest acquired and used sense in the Sumihare component of the CHILDES corpus. Third, semantic extension mechanism among each sense was analyzed by means of cognitive principles including metaphor, metonymy, and specialization. The semantic extensions of *tsumetai* shift from physical tactile experience to emotional states and abstract characteristic evaluation. Within the semantic extensions of *tsumetai*, temperature domain can be mapped to domains of color, emotion, manner, relationship, and atmosphere. Finally, a hypothesized semantic network of *tsumetai* was constructed to present the semantic relationships between the prototype and extended senses. New senses and usage characteristics of each sense identified in this study may serve as a reference for Japanese language teaching and lexicography. The patterns of semantic extension identified can serve as a reference for analyzing the polysemy of other temperature adjectives in Japanese or other languages.

1 Introduction

Within the realm of Cognitive Linguistics, the embodiment thesis posits that our cognitive processes are deeply grounded in our bodily experience and interactions with the physical, social and cultural environment we live in (Lakoff and Johnson, 1999). It is claimed that meaning is grounded in our sensorimotor experiences, and this embodied meaning is extended through imaginative mechanisms, such as conceptual metaphor and metonymy, to shape the abstract conceptualization and reasoning (Johnson and Lakoff, 2002, p. 245). Temperature phenomena are universally experienced by humans. Temperature experiences constitute a critical aspect of our sensorimotor experiences. Investigating temperature concepts thus provides a fundamental and primal perspective for exploring cognitive representation and enhancing our understanding of human cognitive mechanisms.

Japanese temperature adjectives have received considerable attention in linguistic literature since the 1960s. Until the 1980s, research on Japanese temperature adjectives has primarily devoted attention to differentiating between tactile and non-tactile temperature adjectives through the lens of sememes (e.g., Hattori, 1964; Kunihiro, 1967; Watanabe, 1970; Kageyama, 1980; Yamaguchi, 1982;

Hosogawa, 1985). From the 1990s, influenced by the rise of Cognitive Linguistics, studies began focusing on the conceptual metaphors that explain the semantic extensions of these adjectives (e.g., Shindō, 1998; Tamura, 1999; You, 1999; Imai, 2011; Liu, 2021). More recently, researchers have turned to corpora to investigate the usage of these adjectives (e.g., Zhang, 2010; Shindō, 2015; Wang et al., 2023).

The Japanese temperature adjective *tsumetai* (cold) is a crucial concept in the basic temperature domain. Previous cognitive studies on the semantic extensions of *tsumetai* have remained under-researched. Shindō (1998) limited the scope of the discussion to the meanings of temperature and interpersonal emotions. Tamura (1999) primarily analyzed the synesthesia of *tsumetai* with dictionary example sentences. You (1999) did not explore the semantic extensions among the various metaphorical expressions of *tsumetai*. None of these studies has been able to thoroughly explore the semantic relations among all meanings of *tsumetai*. In light of this, the present study employs a large-scale corpus to investigate the meanings of *tsumetai* and explore the relationships among these meanings.

2 Literature review

The Japanese temperature adjective *tsumetai* has been an important aspect of research on temperature terms in linguistic literature. From the 1960s to the 1980s, studies primarily focused on the differences in literal temperature meanings between *tsumetai* and *samui* (chilly/cold). Hattori (1964) defined *tsumetai* as referring to a non-unpleasant cold sensation felt on a specific part of the skin, while *samui* refers to a discomforting cold felt by the body or a substantial part of it, potentially extending to the deeper tissues. Kunihiro (1967) noted that *tsumetai* and *samui* differ in terms of their sensory impact on the body: *samui* is associated with a sensation that encompasses the entire body, while *tsumetai* is characterized by a sensation localized to specific parts of the body, such as the fingertips or the skin's surface. Watanabe (1970) noted that *samui* typically involves a sensation without direct contact, whereas *tsumetai* includes a tactile sensation upon contact.

Moving beyond these dichotomies of partial versus total or tactile versus non-tactile sensations, Kageyama (1980) suggested that *tsumetai* pertains to the temperature of an external object, contrasting with *samui*, which describes an internal bodily sensation. Building on this, Hosogawa (1985) expanded the distinction by emphasizing that while *tsumetai* still pertains to localized, external sensations, *samui* encompasses a broader, environmental perception, capturing how cold is experienced in relation to surrounding conditions rather than purely internally. Interestingly, Yamaguchi (1982) examined historical texts and observed that during the *Chūko* (A.D. 784 to 1184) period of Japanese history, *tsumetai* and *samui* were used interchangeably, existing almost synonymously with overlapping semantic fields.

Since the 1990s, researchers have adopted a Cognitive Linguistics approach to explore the figurative meanings and semantic extensions of *tsumetai*. Shindō (1998) examined temperature expressions as metaphorically extended concepts rooted in bodily experiences. Concerning the context of conveying affection and hostility, She analyzed how *tsumetai* is used to symbolize the exchange of these emotions, conceptualizing them as fluids that can be poured or flow between individuals. This approach illustrates how temperature expressions, deeply rooted in bodily experiences, extend to metaphorically convey complex emotional interactions. Tamura (1999) extracted instances from

dictionaries and analyzed the semantic mapping of temperature adjectives. The research indicates that *tsumetai* not only refers to a physical sensation of coldness but can also extend to visual and psychological sensation through physiological metonymy. You (1999) conducted a comparative analysis of metaphorical expressions in Chinese and Japanese temperature adjectives using dictionary examples. The study found that *tsumetai* can express aspects such as emotion, state, money, attitude, facial expression, speech style, visual, attribute, and personality.

In recent years, researchers have turned to corpora to investigate the usage of *tsumetai*. Zhang (2010) employed the Chinese-Japanese Translation Corpus to study the collocation patterns of *tsumetai*, discovering that it frequently collocates with nouns related to emotion, attitude, and behavior. The study found that since *tsumetai* generally relates to a tactile sensation, such as touching cold objects, the associated nouns often carry negative connotations, depicting a lack of emotional warmth or detachment in various contexts. Meanwhile, Shindō (2015) employed the Balanced Corpus of Contemporary Written Japanese (BCCWJ) to explore the semantic features and usage patterns of the Japanese temperature adjectives. The research found that *tsumetai* can be used in both comfortable and uncomfortable contexts, unlike *samui* which is typically associated with discomfort. Additionally, *tsumetai* frequently appears in attributive usage, modifying nouns directly, and can also be employed metaphorically in casual conversation to criticize a person's demeanor as lacking warmth or kindness.

In previous studies, the focus before the 1990s was primarily on the difference in literal meanings between *tsumetai* and *samui*. Cognitive studies on the semantic extensions of *tsumetai* from the 1990s have remained under-researched. Specifically, Shindō (1998) focused the discussion primarily on the meanings of temperature and interpersonal emotions. Tamura (1999) concentrated on analyzing the synesthesia associated with *tsumetai* using examples from dictionaries. You (1999) did not investigate the semantic extensions within the metaphorical uses of *tsumetai*. Recent corpus-based studies have been limited in their scope. For instance, Zhang (2010) limited the investigation to nouns modified attributively by *tsumetai*. Shindō (2015) focused primarily on comparing the differences between *tsumetai* and *samui* in the corpus, neglecting to explore the metaphorical usage of *tsumetai* in detail. None of these studies has thoroughly explored the semantic relations among all meanings of *tsumetai*. In light of this, the present study employs a large-scale corpus to investigate the meanings of *tsumetai* and explore the relationships among these meanings.

3 Methodology

The present study employs a corpus-based descriptive approach to investigate the polysemy of the Japanese temperature adjective *tsumetai*. The approach was adopted through the following three steps:

Step 1: Collecting corpus data. The BCCWJ, compiled by the National Institute for Japanese Language and Linguistics (NINJAL), comprises 104.3 million words and is the only balanced corpus currently available for Japanese. We input *tsumetai* with lexeme retrieval of short unit words in BCCWJ. As a result, 4,402 instances of *tsumetai* were returned and downloaded into a spreadsheet in the form of a concordance. After excluding 472 instances where *tsumetai* was not used as an adjective, the dataset for subsequent analysis was finalized to include 3,930 instances of *tsumetai*.

Step 2: Identifying the senses and prototype. Manual analysis and annotation were performed on each instance of *tsumetai* to identify its various senses. During this process, eleven dictionaries, including *Nihongo Tagigo Gakushū Jiten Keiyōshi-fukushi Hen* (A Learner's Dictionary of Multi-

sense Japanese Words: Adjectives and Adverbs), *Gendai keiyōshi yōhō Jiten* (Japanese adjectives usage dictionary), and *Nihon Kokugo Daijiten* (Shogakukan's Japanese Dictionary), were consulted. Furthermore, this study employed the criterion proposed by Seto (2007, p. 49) for identifying distinct senses: If there is a metaphorical, metonymic, or synecdochic extension (involving generalization and specialization) between two senses, they are considered distinct; otherwise, they are merged into the same sense. With regard to the prototype, this study employed frequency and acquisition as criteria to determine prototypicality.

Step 3: Determining semantic extension mechanisms and semantic network. For the semantic extension mechanisms, This paper employs general cognitive principles including metaphor, metonymy, and specialization, to interpret the relationships between the senses of *tsumetai*. According to Momiyama (2021, pp. 99–100, 105), metaphor is defined as a figure of speech that represents an object or concept by resorting to another object or concept based on their similarity. Metonymy is defined as a figure of speech that refers to an entity or concept by using a form representing a different entity or concept, based on their spatiotemporal contiguity or conceptual relevance. Additionally, Geeraerts (2010, p. 26) defines specialization as the process whereby the range of application of a new meaning is a subset of the range of the original meaning. Finally, after confirming the semantic relationships among different senses, a hypothesized semantic network is constructed to capture the semantic structure of *tsumetai*.

4 Results and discussion

Upon completing Step 2 of the corpus-based descriptive approach, eight senses of *tsumetai* were identified, as detailed in Table 1. The sense “(of objects) having a relatively low temperature” was identified as the prototype. This section is divided into two parts. Section 4.1 elaborates on the identification of the prototype. Section 4.2 details the senses and analyzes the semantic extensions for the eight senses of *tsumetai*.

Table 1: Senses of *tsumetai*

Senses
1 (of objects) having a relatively low temperature
2 chilly; the air temperature is very low
3 feeling or producing an uncomfortable sensation of low body temperature
4 (of color) producing a cold sensation to the visual
5 lacking ardor, friendliness, or affection
6 calm, unexcited, free from emotions
7 (of relationship) aloof, distant
8 (of atmosphere) quiet, subdued, not lively

4.1 Prototype of *tsumetai*

The first concern in polysemy research is identifying the prototypical sense. Based on the criteria of frequency and acquisition, we identified sense 1: (of objects) having a relatively low temperature, as the prototype of *tsumetai*. The reasoning behind this identification is detailed as follows:

First, Sense 1 is the most frequently occurring sense of *tsumetai* in the BCCWJ, accounting for 57.20% of the instances, thereby determining it as the prototypical sense. Schmid (2000, p. 39) proposed the “From-Corpus-to-Cognition Principle”, according to which frequency in text instantiates entrenchment in the cognitive system. In our study, among the 3,930 retrieved instances of *tsumetai* from the BCCWJ, Sense 1 is the most frequent, indicating its predominance in the semantic network with a frequency of 57.20%.

Second, sense 1 is further identified as the prototype from a vocabulary-acquisition perspective. Seto (2007) proposed that the prototype is the one which is acquired the earliest in a child’s development. We analyzed utterances of *tsumetai* in the data for Sumihare, in the CHILDES corpus (cf. Noji, 1973-77; MacWhinnery, 2000). The following instance is the initial utterance of *tsumetai* by Sumihare.

(1) Sumihare:

*MOT: *Tsumetai-deshoo.*

cold-COP.POL

‘It’s cold, isn’t it?’

*MOT: *Pai shimashoo ne.*

throw.away do.POL let’s

‘Let’s throw it away, shall we?’

*CHI: *Tsumetai.*

cold

‘It’s cold’

[1;07.20]

In Example (1), the mother comments on the low temperature of an object and suggests discarding it. Sumihare then affirms the mother’s initial comment about the coldness of the object. This example demonstrates that Sumihare first used *tsumetai* to describe the low temperature of an object at the age of 1 year, 7 months, and 20 days, thereby supporting the identification of sense 1 as the prototype.

4.2 Senses and semantic extension of *tsumetai*

This section provides a detailed description of each sense presented in Table 1. It also analyzes the semantic extensions among the eight senses of *tsumetai* by means of metaphor, metonymy, and specialization. All examples are taken from the BCCWJ.

Sense 1: (of objects) having a relatively low temperature

As analyzed in Section 4.1, sense 1 is identified as the prototype of *tsumetai*. Sense 1 describes the low temperature of external objects in the physical world.

(2) *Jyuuni-gatsu-da kara, mizu-wa tsumetakatta.*

december-COP because water-TOP cold-PAST

‘Because it was December, the water was cold.’

In Example (2), *tsumetai* describes the low temperature of the water, indicating that it was cold to the touch. Based on information gained from corpus data, sense 1 is frequently used to modify solids and liquids.

Sense 2: chilly; the air temperature is very low

Numerous previous studies (e.g., Hattori, 1964; Kunihiro, 1967; Watanabe, 1970; Kageyama, 1980; Yamaguchi, 1982; Hosokawa, 1985; Shindō, 2015) have devoted attention to differentiating the literal temperature meanings of *tsumetai* and *samui*. However, we found instances where *tsumetai*, similarly to *samui*, describes the temperature of the surrounding space and is felt by the whole body of the perceiver.

- (3) *Aki-ga rin-to tsumetaku naru.*
 autumn-NOM briskly cold become
 ‘Autumn becomes briskly cold.’

In Example (3), *tsumetai* describes the intense and sharp coldness of autumn, with *rin-to* emphasizing the severity and briskness of the cold. A closer examination of the corpus data shows that *tsumetai* in sense 2 commonly collocates with nouns related to time or space, such as *asa* (morning), *yoru* (night), *aki* (autumn), and *tokoro* (place).

Concerning semantic extension, sense 1 describes the low temperature of objects, while sense 2 expresses the low temperature of the air surrounding the perceiver. The usage range of Sense 2 is a subset of Sense 1. Therefore, it can be conjectured that the semantic shift from sense 1 to sense 2 is semantic specialization (cf. Geeraerts, 2010, p. 26).

Sense 3: feeling or producing an uncomfortable sensation of low body temperature

In this sense, the adjective *tsumetai* describes an internal, lower-than-usual body heat of the perceiver.

- (4) *Hieshou-de, tokuni ashi-saki-ga natsu demo*
 poor.circulation-CAUS, especially toes-TOP summer even
tsumetai-desu.
 cold-COP.POL
 ‘I have poor circulation, and especially my toes are cold even in summer.’

In Example (4), *tsumetai* describes the subjective sensation of coldness in the toes, experienced by an individual with poor circulation, even during summer. In the corpus, this sense consistently modifies and collocates with nouns referring to parts of the human body.

For semantic extension, sense 3 describes the low body temperature of the perceiver. The scope of application for Sense 3 is encompassed within that of Sense 1, indicating that the semantic shift from Sense 1 to Sense 3 represents a case of semantic specialization.

Sense 4: (of color) producing a cold sensation to the visual

In this sense, the adjective *tsumetai* describes a cold sensation suggested visually by colors or tones.

- (5) *Itsumo-no kiniro-ga-katta pinku-iro-de-wa-naku, ao to gin*
 usual-GEN gold-tinted pink-color-COP-NEG, blue and silver
to-o awaseta you-na tsumetai iro-da.
 and-OBJ combined like cold color-COP
 ‘It is not the usual gold-tinted pink color, but a cold color like one combined from blue and silver.’

In Example (5), *tsumetai* describes the color that results from combining blue and silver. It characterizes the color as “cold,” suggesting a visual impression that evokes a sense of coolness or chilliness, rather than warmth. This usage extends the concept of physical coldness to describe a visual attribute, enhancing the description of the color with a sensory dimension. Thus, in the corpus, this sense consistently modifies and collocates with nouns that denote cold colors, such as *gin* (silver) and *shiro* (white).

With regard to semantic extension, the association between the two independent concepts of cold colors and coldness may be derived from experienced associations (cf. Marks, 1990; Sandford, 2011; Hamilton, 2016). For instance, blue and white are commonly associated with coldness; blue evokes the chill of ice, water, and glaciers, often imagined in shades of blue, while white is linked to the cold through its representation of snow and frost in snow-covered landscapes. The common association of these two sensory experiences constitutes the spatiotemporal contiguity or conceptual relevance (Momiya, 2021, p. 105) between sense 4 and sense 1. Thus, the semantic shift from sense 1 to sense 4 can be considered a metonymic extension from touch to sight.

Sense 5: lacking ardor, friendliness, or affection

In this sense, the adjective *tsumetai* is defined as unfriendly, unkind, or lacking ardor or affection toward something or someone.

- (6) *Nanda aitsu? tsumetai yatsu-da-na.*
 what that.one cold guy-COP-EXCL
 ‘What’s with that guy? He’s a cold one, isn’t he?’

In Example (6), *tsumetai* characterizes the person’s demeanor as emotionally distant or unfriendly, indicating a lack of ardor or affection in their attitude or behavior. In the corpus, this sense frequently modifies and collocates with nouns that describe people’s attitudes or behaviors, such as *me* (eyes), *henji* (reply), *taido* (attitude), and *taiou* (interaction). Moreover, it is often used in the construction: *hito ni/ni taishite tsumetai* (being cold to someone).

As for semantic extension, the conceptual metaphor UNFRIENDLY IS ICY indicates that human demeanor can take the coldness of ice as its source domain (Kovecses, 2010, p. 153). In this metaphor, the qualities of ice—cold, hard, and unyielding—are applied to human interactions to express a lack of warmth or affection, characteristics often associated with friendliness. Consequently, sense 5 can be analyzed as a metaphorical extension from sense 1.

Sense 6: calm, unexcited, free from emotions

In this sense, *tsumetai* characterizes a psychological state of calmness, devoid of excitement, anxiety, or excessive emotion.

- (7) *Higoro kara reisei-na koudou-ga toreru-you sonae-te*
 usually from calm-GEN action-NOM can.take-INF prepare-CONJ
oki-tai-to omoi-masu. Karada-wa atsuku, shikashi atama-wa
 keep-want-COMP think-POL body-TOP hot, but head-TOP
tsumetaku.

calm.

‘Usually, I want to be prepared to take calm actions. Keep the body hot, but the head cool’

In Example (7), *tsumetai* describes the state of the head. It metaphorically emphasizes the need for maintaining a cool, composed, and rational mindset in contrast to the body, which may be in a state of action and energy. A closer examination of the corpus data reveals that *tsumetai* in sense 6 consistently modifies the psychological state of calmness in humans and collocates with nouns such as *atama* (head) and *ishiki* (consciousness).

Concerning semantic extension, the conceptual metaphor EMOTION IS HEAT OF FIRE and CONTROLLING THE INTENSITY OF THE EMOTION IS CONTROLLING THE FIRE indicates that the emotion concepts can take the heat of fire as their source domain (Kovecses, 2010, p. 141). Staying cool or calm represents self-control and rationality, akin to managing a fire's intensity. Thus, sense 6 can be analyzed as a metaphorical extension from sense 1.

Sense 7: (of relationship) aloof, distant

In this sense, the adjective *tsumetai* characterizes relationships as aloof and distant.

- (8) *Nanjuu-nen-mo-no aida, Bei-In kankei-wa ikura*
 several-decades-GEN during, US-India relation-TOP how.much
yoku mi-temo tsumetai mono-datta.
 well look-even cold thing-was.PAST

‘For several decades, the US-India relationship, no matter how closely observed, was a cold affair.’

In Example (8), *tsumetai* describes the US-India relationship as ‘cold,’ implying that it was distant, formal, and lacking in close interaction and cooperation. In this context, *tsumetai* highlights the emotionally reserved and minimally engaged nature of the diplomatic ties between the two nations over many years. In the corpus, this sense consistently modifies and collocates with the nouns *kankei* (relationship) and *naka* (relations)¹.

¹ In the BCCWJ, we retrieved seven instances of the phrase *tsumetai sensou* (cold war). Although this phrase is categorized under Sense 1 in several dictionaries (e.g., *Iwanami Kokugo Jiten Daihachiban* [Iwanami Japanese Dictionary, 8th Ed.], we propose reclassifying it under Sense 7. The phrase metaphorically describes a state of ongoing opposition where each party views the other as an enemy, mirroring the dynamics observed in Example 8.

For semantic extension, an aloof and distant relationship is typically characterized by both individuals being unfriendly or lacking affection towards each other. The association between human demeanor and relationships constitutes the spatiotemporal contiguity or conceptual relevance. Thus, the semantic shift from sense 5 to sense 7 can be considered a metonymic extension.

Sense 8: (of atmosphere) quiet, subdued, not lively

In this sense, the adjective *tsumetai* describes an atmosphere as quiet and subdued, indicating a lack of liveliness.

- (9) *Hiruma-wa danran supe-su toshite kaihou-sareta sono*
 daytime-TOP gathering space as open-PASS.PAST that
basho-wa, kensou kara tooku, shizuka de sabishiku tsumetakatta.
 place-TOP noise from far, quiet and lonely cold-PAST
 ‘During the day, that place, which was opened as a gathering space for enjoyable family time, was far from the noise, and was quiet, lonely, and cold.’

In example (9), *tsumetai* describes the atmosphere of the place that was intended to be a gathering space. It highlights how the place felt devoid of lively interaction typically associated with a gathering space, emphasizing its quietness, loneliness, and emotional chilliness. In the corpus, sense 8 consistently collocates with nouns such as *fun'iki* (atmosphere), *seijaku* (silence), and *chinmoku* (stillness).

With regard to semantic extension, it is easy to notice that an atmosphere that is quiet and subdued results from people lacking ardor or affection toward the place. This causal connection between human attitudes and behaviors, and the atmosphere of a place, constitutes the spatiotemporal contiguity or conceptual relevance. Thus, sense 8 is considered an extension of sense 5 through CAUSE FOR EFFECT metonymy.

Based on the analysis above, a hypothesized semantic network of *tsumetai* can be constructed, as presented in Figure 1, to summarize the semantic relationships between the prototype and extended senses.

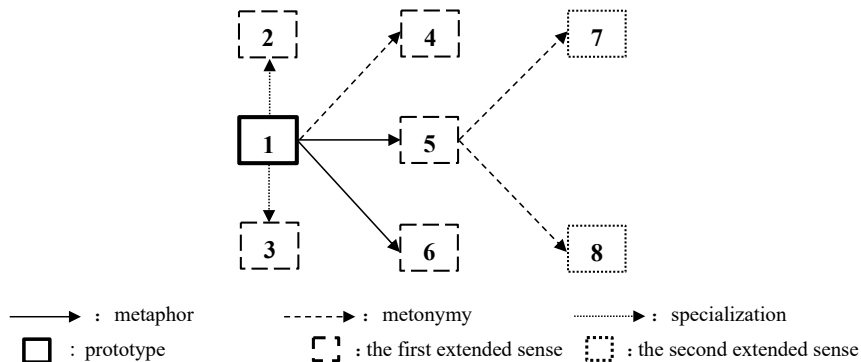


Figure 1: Cognitive semantic network of *tsumetai*

The semantic extensions of *tsumetai* shift from physical tactile experience to emotional states and abstract characteristic evaluation. Within the semantic extensions of *tsumetai*, temperature domain can be mapped to domains of color, emotion, manner, relationship, and atmosphere.

5 Conclusion

The present study adopted a corpus-based descriptive approach to investigate the polysemy of the Japanese temperature adjective *tsumetai*. First, after analyzing 3,930 instances of *tsumetai* obtained from the BCCWJ, eight senses of *tsumetai* have been identified. Second, sense 1 : (*of objects*) *having a relatively low temperature* has been identified as the prototype of *tsumetai* based on its frequency and earliest acquisition. Third, semantic extension mechanism among each sense has been analyzed by means of cognitive principles including metaphor, metonymy, and specialization. Finally, a hypothesized semantic network of *tsumetai* has been constructed to present the semantic relationships between the prototype and extended senses.

This study contributes to the current literature in the following ways. Firstly, senses 4,7 and 8 appear to be novel findings, as none of the dictionaries consulted by the researchers had definitions for these three senses. These new senses and usage characteristics identified in Section 4.2 may help to update existing dictionaries and contribute to Japanese language teaching. Secondly, this study detailed how experiences of temperature are extended to emotional states and evaluations of abstract characteristics. The patterns of semantic extension identified can serve as a reference for analyzing the polysemy of other temperature adjectives in Japanese or other languages.

Finally, compared to the period before the mid-1990s, the study of polysemy has turned to more diverse data, using psychological experimentation and corpus data (Gries, 2019, p. 29). Moreover, combining corpus-based analysis with psychological experiments has proven to be fruitful (cf. Arppe and Järvikivi, 2007; Divjak and Gries, 2008; Liu, 2013). In this sense, further research, such as corpus-based computational linguistic approach and psychological experimentation, should be conducted to corroborate and complement the findings of this research.

Abbreviations

CAUS	Causative	NOM	Nominative case marker
COMP	Complementizer	OBJ	Object marker
CONJ	Conjunction	PASS	Passive
COP	Copula	PAST	Past tense
EXCL	Exclamative	POL	Polite form
GEN	Genitive	INF	Infinitive
NEG	Negative	TOP	Topic marker

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