

A Corpus-Based Cognitive Linguistic Analysis of Taste Words: The Case of English “Bitter” and Chinese *Ku*

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Abstract. This study explores the polysemy of the word “bitter” in English and *ku* in Chinese. It examines the similarities and differences between their semantics and identifies the cognitive mechanisms that motivate their semantic expansion. The study attempts to answer two questions: (1) What are the similarities and differences between Chinese *ku* and English “bitter” in terms of meaning? (2) What cognitive mechanisms motivate meaning extensions of these two words? To this end, 汉语大词典 (*Chinese Dictionary*), 英汉大词典 (*English-Chinese Dictionary*), the British National Corpus (BNC) and BLCU Corpus Center (BCC) were employed. The two dictionaries were utilised to investigate the multiple meanings of the two terms, while the BNC and the BCC were employed to identify metaphors and metonymies in sentences. Theoretically, the study is informed by Lakoff and Johnson’s conceptual metaphor and conceptual metonymy. The results showed that half of the meanings of “bitter” and *ku* overlapped, but there were still some differences. Their semantic expansion is motivated by both conceptual metonymy and conceptual metaphor. In addition, the words under investigation differ in the emotions expressed. English “bitter” is more negative, while Chinese *ku* is more positive. The present findings have important implications for education and cross-cultural communication in language.

Keywords and phrases: bitter, polysemy, conceptual metaphor, conceptual metonymy, source domain, target domain

Introduction

The vocabulary is the basic unit of language and meaning lies at its heart. Polysemy, or the occurrence of numerous meanings, is common in language. This linguistic

phenomenon has garnered substantial scholarly attention across various disciplines within the field (Carston 2021; Rodrigues et al. 2020; Srinivasan and Rabagliati 2021; Vicente 2018). Perception serves as the initial foundation for human cognition of the world (Peng 2019) and taste, as one of the five human senses, holds significant importance in the cognition process. It enables us to perceive and experience the world and serves as a medium for expressing our comprehension of the world (Wang 2010). Rooted in the cognitive principle, the ancient Chinese held that getting inspirations about what lies near the body and getting inspirations about what lies afar from the universe (Wang and Han 1999). Similarly, in the west, Protagoras proclaimed that “Man is the measure of all things”.¹ Both traditional Chinese and Western civilisations show that the natural world is being humanised. Taste, as a bodily sense, is universally intertwined with personal preferences and dislikes in various domains. For instance, an individual’s taste in clothing or art might be indicative of their interests in those areas and serve as a form of self-expression and identification (Sweetser 1990). Taste terms, which serve as the cornerstone for human cognition, not only play a crucial role in interpreting the world but also exhibit interconnectedness with other affective concepts. From a cognitive perspective, a systematic comparison and examination of taste terms between English and Chinese taste terms contribute to the investigation of their underlying cognitive systems. Furthermore, language is the reflection of thought. Cognitive linguistics, by encompassing the cognitive aspect of “human beings” within its research scope, not only diverges from previous theories but also provides valuable insights into the nature and essence of language.

The cognitive semantic research on taste words in English and Chinese has far-reaching implications because it not only improves our understanding of the semantic system of taste words in both languages, but it also helps us understand the cognitive similarities and differences between English and Chinese cultures. However, research into the semantic features of taste terms is still limited. In comparison to colour words (red, green, blue and so on), which belong to the same category of sensory vocabulary, research on taste words lag behind in terms of the volume of literature and depth of conclusions (Liu 2011). Existing studies on taste words, according to the relevant literature, primarily focus on their classification (Hartley, Liem and Keast 2019; Liu 2011), diachronic changes in the semantic meanings of taste words (Ni and Zhu 2023; Mo 2020; Pettersson-Traba 2018) and cross-linguistic comparative research on the meaning of taste words (Zhao, Huang and Long 2018; Juanjuan and Ya 2020; Li 2021; Zawisławska and Falkowska 2018). There is, however, a scarcity of study on the cognitive semantics of taste terms, particularly in English and Chinese. As a result, this topic provides substantial research area and significance. This study investigates the cognitive

semantics of basic taste terms, specifically “bitter” in English and *ku* in Chinese, with a particular focus on conceptual metaphor and metonymy theory.

Overall, this article presents a comprehensive comparative analysis of the polysemy of “bitter” and *ku*, investigating the metaphors and metonymies in these two terms and identifying similarities and differences from the standpoint of cognitive linguistics. This study not only improves our comprehension of the cognitive patterns and thinking tendencies of English and Chinese speakers, but it also advances semantic theories. Furthermore, it offers valuable insights for a variety of linguistic applications such as vocabulary training, English-Chinese translation and cross-cultural communication. The study attempts to answer two questions:

1. What are the similarities and differences between Chinese *ku* and English “bitter” in terms of meaning?
2. What cognitive mechanisms motivate the meaning extensions of these two words?

Related literature

Metaphor, in traditional sense, is a figure of speech discussing one topic by reference to another. Conceptual metaphor theory, however, expands and develops “traditional metaphor” into “cognitive instrument” (Black 1979) or “cognitive mechanism” that enables us to comprehend and conceptualise a relatively abstract concept with the help of a more concrete, more directly experienced and more acquainted one (Lakoff and Johnson 2008; Lakoff 1993; Kövecses 2000). The mappings from the source domain to the target domain actualise a metaphor (Ungerer and Schmid 2013) and there is a systematic mapping relationship between two conceptual domains (Kövecses 2020). For instance, TIME IS MONEY conceptual metaphor underpins sentences like “Don’t waste time” and “Find a better use for your time”. In these sentences, MONEY (the source domain) is mapped onto TIME (the target domain). Both these domains possess the shared attribute of being precious and irretrievable, thus establishing a systematic mapping and forming a metaphorical representation. Sweetser (1990) introduced the conceptual metaphor of MIND-AS-BODY. In this image, the bodily terms are metaphorically used to talk about the mind. This metaphorical mapping is driven by the correspondence between our external experiences and our internal emotional and cognitive states. Subsequently, numerous scholars have built upon Sweetser’s viewpoint to further deepen their research on metaphor (Baek 2020; Mezghani 2021; Kim 2019).

Metonymy and metaphor exhibit both similarities and differences. Many scholars have provided definition of metonymy. According to Lakoff and Johnson (1999), metonymy is the process of conceptualising an item through its contiguity with other items. For instance, the “White House” stands for American government. At the same time, they believe that like metaphor, metonymy is a cognitive mechanism rooted in experience. Barcelona (2003) suggests that in many or even all cases, metonymy is the basis of metaphorical mapping. He further underscores metonymy’s fundamental cognitive nature, asserting its crucial role in enabling and motivating certain types of metaphors. Many scholars have followed this viewpoint from Barcelona (Bolognesi and Vernillo 2019; Przymus 2023; Ria and Tau 2022; Kashanizadeh and Forceville 2020). In China, Shu (2003) defines metonymy as the substitution of one salient thing with another within a single cognitive domain, for instance, in the sentence “There are a few new faces in our class, new faces refer to new classmates”. This mapping involves PART FOR WHOLE and occurs within the PEOPLE domain.

As a basic way of perceiving the world, the distinction between metaphor and metonymy may seem clear-cut, but it is not. Metaphor and metonymy interact and form a continuum between them (Barnden 2010; Goossens 1990; Zhang 2016; Choi 2019). Ibáñez and Masegosa (2011) delved deeper into the relationship between metaphor and metonymy, positing that metonymy is a subset of metaphor and thus an integral component thereof. Liu and Zhang (2020) put forward a “nonlinear interaction” model of metaphonymy based on cognitive linguistics, with the aim of providing explanations for a broader range of metaphor-metonymy interactions. In another study, Hu (2022) conducted a comprehensive analysis of Geeraerts’ prism model, highlighting its role as a specific and process-oriented elaboration of Goossens’ metaphonymy. In recent years, metaphonymy has gained wide acceptance and has been the subject of extensive research conducted by scholars from diverse academic disciplines (Chatti 2020; Jin, Lin and Oakley 2021; Kovyazina 2020). In summary, metaphors and metonymies serve as crucial means for individuals to comprehend the world. Recognising the link between source and target domains via metaphorical and metonymic mappings will make abstract concepts more accessible to individuals (Lahlou 2021; 2023; Lahlou and Hajar 2020; 2023).

In the realm of taste word research, numerous studies have extensively explored taste words from various perspectives. For instance, Liu (2011) compared the morphological characteristics, grammatical function characteristics and syntactic characteristics of Chinese and Korean taste words to draw the similarities and differences between them. Based on the theory of synesthetic metaphor, Ni and Zhu (2023) conducted a systematic investigation into the semantic evolution of the

taste word *ku* using a comprehensive quantitative and qualitative methodology, drawing upon the extensive CCL corpus. The study findings demonstrated that the semantic evolution of *ku* in synesthetic terms adheres to the established mapping regularities of Chinese synesthetic metaphors. This research contributes to a better understanding of the fundamental and metaphorical meanings of *ku* in the context of teaching Chinese as a foreign language. Li (2021) applied the corpus analysis toolkit Antconc to analyse the metaphors of taste in Chinese and English based on the corpus of *Fortress Besieged* written by Ch’ien Chung-shu and its translations by Jeanne Kelly and Nathan K. Mao. The study utilised quantitative and qualitative methods to examine the taste words used in the original text and their translation techniques, exploring the similarities and differences in the metaphorical meanings of Chinese and English taste words. The findings revealed that the metaphors of taste are more prevalent in the original Chinese text compared to its translation, with Chinese exhibiting a richer metaphorical meaning of taste words. This research held practical implications for future translation endeavours.

From the research, it is evident that scholars from various countries have extensively investigated taste words from diverse perspectives, yielding valuable insights in certain areas. However, these studies exhibit several weaknesses that can be categorised as follows. Firstly, there is a lack of synchronic comparative study of “bitter” and *ku* from the perspective of cognitive linguistics. For example, a comparative study of multiple meanings and cognitive mechanisms motivate meaning extensions of these two words. Secondly, there is no in-depth analysis of the two terms from the cultural and historical levels. In view of the limitations and gaps in previous research, the authors attempt to conduct a comparative study of English and Chinese taste words from several perspectives, revealing the similarities and differences between “bitter” and *ku* in different languages.

Methods

This research mainly compares the semantics and conceptual metaphors and metonymies of “bitter” and *ku* in English and Chinese. The Chinese and English data were selected from the 汉语大词典 (*Chinese Dictionary*) (22 volumes in total, edited by Luo Zhufeng [1994]) and 英汉大词 (*English-Chinese Dictionary*) (2nd Ed.), edited by Lu Gusun (1989). These dictionaries are widely recognised and published by reputable publishing houses.

The 汉语大词典, compiled by the Chinese Dictionary Editorial Committee, is a comprehensive reference work encompassing various aspects of social life, ancient and modern customs, Chinese and foreign cultures and even teachings from different religions. The dictionary consists of 12 volumes, containing approximately

50 million characters and 2,253 illustrations. On the other hand, the 英汉大词 is the first large-scale comprehensive English-Chinese dictionary compiled by English professionals. It comprises 200,000 words, with a total word count of around 15 million. This well-established reference dictionary serves both academic and practical purposes, focusing on objectively recording and describing the actual usage of diverse English varieties, literary and linguistic styles. It places emphasis on collecting firsthand linguistic information. In this study, two dictionaries were used to provide all meanings of “bitter” and *ku* respectively, enabling the authors to identify and analyse the corresponding relationships between these meanings in English and Chinese.

In addition to the dictionaries, part of the data of this study comes from the corpus of the British National Corpus (BNC) and BLCU Corpus Center (BCC). The data on “bitter” was collected from BNC, which was originally created by Oxford University Press in the 1980s to early 1990s and it contains 100 million words of text from a wide range of genres (e.g., spoken, fiction, magazines, newspapers and academic). The data related to *ku* was collected from BCC, which comprises a comprehensive collection of approximately 9.5 billion words. It includes various domains such as newspaper (2 billion), literature (3 billion), comprehensive (1.9 billion), ancient Chinese (2 billion), dialogue (0.6 billion, from microblog and film and television subtitles) and others. This large-scale corpus provides a comprehensive representation of the language used in contemporary society. The selection of the BNC and BCC corpora for this study is based on their similarity in terms of language diversity, as both corpora contain data from newspapers, literature, spoken language and written texts. They offer a substantial volume of data covering metaphorical and metonymical extensions of meaning, accompanied by examples derived from real-life language usage, ensuring the relevance and currency of the research findings.

With the dictionaries and corpora mentioned earlier, there are ample resources for data collection. Firstly, the data collection process from the dictionaries involves extracting the meanings of “bitter” and *ku* from their respective dictionaries and establishing their corresponding relationships. Secondly, we turn our attention to the data collection process from the corpora.

Before discussing the collection of Chinese language data, it is important to consider the characteristics of the Chinese language. Due to the limited use of individual Chinese characters, they often appear in association with other characters, resulting in the variability of a particular character’s meaning. In the current study, *ku* as the object of the research is a single character. In the dictionary, *ku* can function as

both an adjective and an adverb and these parts of speech are also reflected in its contextual usage, whether appearing alone or in combination with other characters.

As previously mentioned, Chinese characters are frequently combined to form compound words, which enhances the understanding of individual characters through their association with other characters. In the search process, we conducted searches for *ku* along with characters that possess metaphorical meanings and identified the literal meanings and metaphorical meanings of these words while excluding those without metaphorical meanings. Most words demonstrate both metaphorical and literal meanings like *ku se* (苦涩), which can refer to the taste of coffee and pills, as well as the unpleasant experience. Hence, it was imperative to discern and extract the metaphorical meaning within the contextual usage of these words.

While searching the BNC corpus, the word “bitter” is examined along with its adjacent words to identify the domains in which it is employed. Contrasts are made to check the differences and similarities between the domains the “bitter” is used in and the domains where their counterpart in Chinese are used. Notably, the metaphorical use of “bitter” can be easily distinguished from its literal use, making it relatively easier to identify the English domain compared to the Chinese counterpart. At last, the collected data are juxtaposed and contrastively analysed. In this process, we meticulously identified and extracted the metaphorical meanings within the contextual usage of the words.

The data analysis consists of two steps. First, two dictionaries were employed to collect all the meanings of English “bitter” and Chinese *ku*, comparing and analysing their meanings. This was achieved by identifying the different meanings of two terms that emerge from an analysis of the concordance data generated from the 汉语大词典 and the 英汉大词. Second, the meaning projection of “bitter” and *ku* is examined based on the cognitive mechanisms that appear in the corpora. This step relies on the rich data of two corpora, where the authors can find all semantic extensions and ample examples for research.

Results and Discussion

This part focused on the use of dictionaries to analyse the polysemy of “bitter” and *ku* in English and Chinese and the use of corpora to examine the conceptual metaphors and metonymies of the two terms and to explore their similarities and differences. The transliterations of the Chinese texts are provided in brackets while the translations of the texts are in parentheses.

The polysemy of “bitter” and *ku*

Table 1. The polysemy of “bitter” and *ku*

Polysemy	Examples	
	English	Chinese
1. Having a sharp, pungent taste or smell; Not sweet	He said it’s a bitter pill to swallow.	那些味苦、味酸的食品，大多偏寒，如苦瓜、苦菜、芋头、梅子、木瓜等。 [na xie wei ku, wei suan de shi pin, da duo pian han, ru ku gua, ku cai, yu tou, mei zi, mu gua deng.] (And those foods that taste bitter and sour are mostly cold, such as bitter gourd, bitter vegetables, taro, plum, papaya and so on.)
2. Painful or unpleasant to accept or contemplate	...although it might have taken them six months or longer to discover the bitter truth.	我读着这些怨苦、沉痛乃至绝望的话，难以想象... [wo du zhe zhe xie yuan ku, chen tong nai zhi jue wang de hua, nan yi xiang xiang...] (I read these bitter, painful and even desperate words, it is hard to imagine...)
3. (Of a conflict, argument, or opponent) full of anger and acrimony	...the first tragic deaths in one of the world’s longest and more bitter conflicts.	–
4. Feeling or showing anger, hurt, or resentment because of bad experiences or a sense of unjust treatment	To escape this bitter betrayal, she decides to fake her own death and disappear.	–
5. (Of wind and weather) intensely cold	Oxfam say woman and children are particularly at risk from the bitter winter weather.	外面凄风苦雨。里头温暖如春。 [wai mian qi feng ku yu, li tou wen nuan ru chun.] (The bitter wind and miserable rain outside. It’s warm like spring inside.)
6. Extremely and sharply	–	人生苦短，及时行乐。 [ren sheng ku duan, ji shi xing le.] (Life is too short and have fun in time.)

Note: The literal meaning of *ku duan* is “bitter short”.

(Continued on next page)

Table 1 (*Continued*)

Polysemy	Examples	
	English	Chinese
7. In trouble	...refuge in their open shelters looking out from the frozen draughty shadows on to a bitter world.	他应用旧量子论从事研究，却苦于无法找到适当的突破口。 [Ta ying yong jiu liang zi lun cong shi yan jiu, que ku yu wu fa zhao dao shi dang de tu po kou.] (He applied the old quantum theory to his research, but he was in trouble by finding a proper breakthrough.) Note: The literal meaning of <i>ku yu</i> is “feel bitter for something”.
8. Try the best; Do one’s utmost	–	像小张这样苦读12年，最后却为了一笔入学费用而大伤脑筋的学子并不少见。 [xiang xiao zhang zhe yang ku du 12 nian, zui hou que wei yi bi ru xue fei yong er da shang nao jin de xue sheng bing bu shao jian.] (It is not uncommon for students like Zhang to study as hard as they can for 12 years, only to struggle with the cost of admission.) Note: The literal meaning of <i>ku du</i> is “bitter study”, that is try one’s best to study.
9. Acerbic and ironic	Apologies from the shepherding sergeant drew from Charity a bitter comment about having discovered Hell on Earth at Willesden.	–
10. Laborious; Tired; Overworked	–	看我那么辛苦，不是应该补偿我吗？ [kan wo na me xin ku, bu shi ying gai bu chang wo ma?] (Seeing that I have worked so tired, shouldn’t you make up for me?) Note: The literal meaning of <i>xin ku</i> is “hardworking; doing much hard work”.

(Continued on next page)

Table 1 (*Continued*)

Polysemy	Examples	
	English	Chinese
11. Sincerely; Earnestly	–	<p>他们经历的对抗、学到的东西，是我们苦求不来的。 [ta men jing li de dui kang, xue dao de dong xi, shi wo men ku qiu bu lai de.] (They have experienced confrontation and learned things that we cannot ask for sincerely.)</p> <p>Note: The literal meaning of <i>ku qiu</i> is “bitterly request”, that is sincerely request for something.</p>

As depicted in Table 1, “bitter” and *ku* share certain common meanings. In Table 1, both “bitter” and *ku* denote “having a sharp, pungent taste or smell”, representing their primary denotation. Both terms refer to a common taste in people’s lives that evokes disgust or unpleasantness. Examples 1, 2 and 7 in Table 1 can be interpreted as unpleasant physical conditions, psychological feelings and environmental circumstances. These meanings can be attributed to SENSORY ICM, which pertains to individuals’ subjective feelings, moods and experiences and some other similar cultures. Through the aforementioned analysis, it evident that Chinese and English speech communities may share analogous physical experiences.

However, “bitter” and *ku* exhibit differences in some other meanings, particularly in relation to people’s emotions and attitudes. In general perception, attitudes can be categorised into three types: positive, negative and neutral. “bitter” carries more negative emotions and extreme disgust. Examples 3, 4 and 9 in Table 1 present unique meanings associated with “bitter”, such as “anger and acrimony”, “anger, hurt, or resentment” and “acerbic and ironic”, which clearly convey negative extensions. On the other hand, Examples 6, 8, 10 and 11 illustrate the distinctive meanings of *ku* in Chinese, expressing positive connotations such as “try the best; do one’s utmost” and “sincerely; earnestly”. For instance, in the examples of *ku du* (苦读), where *du* signifies learning as a verb, the literal meaning of *ku du* is “try one’s best to learning”. Similarly, in the case of *ku qiu* (苦求), where *qiu* is also a verb meaning to ask for. So *ku* serves as an adverb in both *ku du* and *ku qiu* to modify the verbs. The terms “laborious; tired; overworked” and “extremely and sharply” carry neither positive nor negative meaning, signifying a more apparent neutral attitude. It is worth noting that in Example 6, *ku* functions as an adverb to modify the adjective *duan* (短, short), indicating the degree. The above analysis

reflects Chinese have a more accepting and tolerant attitude towards *ku*. It is worth mentioning that in Chinese, *ku* can be used as an adjective or an adverb without undergoing any form changes, whereas in English, “bitter” can only be used as an adjective and needs to be transformed into “bitterly” to become an adverb.

The conceptual metaphors and metonymies on “bitter” and *ku*

In conceptual metaphor, two key concepts are involved, the source domain and the target domain. Lakoff (1993) describes the source domain as the vehicle and the target domain as the tenor. The interaction between the two domains is mapping, wherein metaphors are understood as mappings from the source domain to the target domain.

Table 2. The conceptual metaphors of “bitter” and *ku*

Conceptual metaphors		Examples		
Source domain	Target domain		English	Chinese
Bitter/ <i>ku</i> (TASTE domain)	VISION domain	Sad visual experience	Ex. 1: A bitter smile crossed his face as his eyes ranged over the top men in the giant corporation. Ex. 2: Mark’s face hardened into an expression of bitter hatred.	Ex. 3: 短暂的沉默之后，他忽地露出苦笑。 [duan zan de chen mo zhi hou, ta hu de lu chu ku xiao.] (After a short silence, he broke into a bitter smile.) Ex. 4: 她轻揉着僵硬的肌肉并露出痛苦的表情。 [ta qing rou zhe jiang ying de ji rou bing lou chu tong ku de biao qing.] (She rubbed her stiff muscles and gave a bitter expression.)
	EXPERIENCE domain	Miserable life or experience	Ex. 5: A great deal of bitter experience had taught him how to lose gracefully. Ex. 6: The exception was a former aristocratic beauty who had led a bitter life...	Ex. 7: 但存在第二次手术问题，增加病人的痛苦和负担。 [dan cunzai di er ci shou shu wen ti, zeng jia bing ren de tong ku he fu dan.] (But there is the problem of the second operation, which increases the pain and burden of the patient.) Ex. 8: 我宁肯比现在穷一百倍，也不愿过这种痛苦的生活。 [wo ning ken bi xian zai qiong yi bai bei, ye bu yuan guo zhe zhong tong ku de sheng huo.] (I would rather be a hundred times poorer than lead this miserable life.)

(Continued on next page)

Table 2 (*Continued*)

Conceptual metaphors		Examples	
Source domain	Target domain	English	Chinese
			Ex. 26: 西安城里冬天苦冷。 [xi an cheng li dong tian ku leng.] (Xi'an city is bitter cold in winter.)
	EXPERIENCE domain	Fierce struggle/argument	—
		Ex. 9: After much bitter debate, in March 1986 Britain quietly announced that it would be...	
		Ex. 10: ...and over a year later, after much bitter argument, agreed to accept 3,450 from the surveyor's insurers.	
	EMOTION domain	Unpleasant mental state	Ex. 13: 多日来的愁苦、愤怒转瞬间化为烟云... [duo ri lai de chou ku, fen nu zhuan shun jian hua wei yan yun...] (The sadness and anger of many days turned into clouds in an instant...)
		Ex. 11: I don't know Norman's reaction to Fergie's story but I can say they have left me with a bitter feeling.	Ex. 14: 或是身体有病痛，或是与人难相处，再不就是缺少金钱，精神苦闷... [huo shi shen ti you bing tong, huo shi yu ren nan xiang chu, zai bu jiu shi que shao jin qian, jing shen ku men...] (Or physical pain, or difficult to get along with people, or lack of money, mental distress...)
		Ex. 12: So they are bitter about proposals which could leave them without a future.	Ex. 17: 不尖刻，不苦毒，不怨恨，不自以为地骄傲。 [bu jian ke, bu ku du, bu yuan hen, bu zi yi wei yi de jiao ao.] (No bitterness, no resentment, no self-righteous pride.)
		Resentment/hate	Ex. 15: He says he's also suing the police because he's bitter about his treatment during the murder investigation.

(Continued on next page)

Table 2 (*Continued*)

Conceptual metaphors		Examples	
Source domain	Target domain	English	Chinese
		Ex. 16: She is quite bitter about what has happened, resentful at what she sees as the inconsistent attitudes...	Ex. 18: 她干枯的双眼里涌出了浑浊的泪，里面饱含着心灵深处的苦恨。 [ta gan ku de shuang yan yong chu le hun zhuo de lei, li mian bao han zhe xin ling shen chu de ku hen.] (Her dry eyes welled up with muddy tears, full of bitter and hatred in the heart.)
	EMOTION domain	Unbearable consequences	–
		Ex. 19: ...family’s residence at Italice and amid scenes of bitter sorrow issued a statement...	
		Ex. 20: The Frenchman’s release was going to be a bitter pill to swallow if it was the price to pay for finding Clarion Call.	
	ECONOMY domain	Poor	–
			Ex. 21: 他出生于浙江省乐清一个农民家庭，小时候家里生活很穷苦。 [ta chu sheng yu zhe jiang sheng le qing yi ge nong min jia ting, xiao shi hou jia li sheng huo hen qiong ku.] (He was born into a peasant family in Yueqing, Zhejiang Province and his family was very poor when he was a child.)
			Ex. 22: ...但其经济发展滞后，地方财政匮乏，人民相对贫苦。 [...dan qi jing ji fa zhan zhi hou, di fang cai zheng kui fa, ren min xiang dui pin ku.] (...but its economic development lags behind, the local finances are deficient and the people are relatively poor.)

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Table 2 (*Continued*)

Conceptual metaphors		Examples	
Source domain	Target domain	English	Chinese
	TOUCH domain	Chilly weather	<p>Ex. 23: From behind them, they could feel the wind driving in, wild and bitter cold, from the open sea.</p> <p>Ex. 24: Even in that bitter weather the plant was beginning to blossom and...</p> <p>Ex. 25: 草原在蒙古高原上, 冬季长而春季短暂, 春季多风而冬日苦寒。 [cao yuan zai meng gu gao yuan shang, dong ji chang er chun ji duan zan, chun ji duo feng er dong ri ku han.] (The grasslands are located on the Mongolian plateau, with long winters and short springs, windy springs and bitter cold winters.)</p>
	MANNER domain	Patience/try one's best	<p>Ex. 27: 老师说话时故意失误, 更容易让学生接受, “反弹琵琶” 有时胜过苦口婆心。 [lao shi shuo hua shi gu yi shi wu, geng rong yi rang xue sheng jia shou, “fan tan pi pa” you shi sheng guo ku kou po xin.] (It is easier for the students to accept the intentional mistakes of the teacher when he speaks and “rebounding the pipa” is sometimes better than advising students patiently.)</p> <p>Ex. 28: 要知道, 华侨城能有今日成就, 是苦心经营18年的结果。 [yao zhi dao, hua qiao cheng neng you jin ri cheng jiu, shi ku xin jing ying 18 nian de jie guo.] (You should know that the achievements of OCT are the result of 18 years of painstaking effort.)</p>
		Through hardship/suffering	<p>Ex. 29: 要教育他们健康成长, 就必须消除娇气, 让他们吃点苦。 [yao jiao yu ta men jian kang cheng zhang, jiu bi xu xiao chu jiao qi, rang ta men chi dian ku.] (To educate them to grow up healthily, we must eliminate squeamishness and let them bear hardships.)</p>

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Table 2 (*Continued*)

Conceptual metaphors		Examples	
Source domain	Target domain	English	Chinese
			Ex. 30: 这位历尽人生苦难、却始终坚守着道德底线和做人原则的老人... [zhe wei li jin ren sheng ku nan, que shi zhong jian shou zhe dao de di xian he zuo ren yuan ze de lao ren...] (The old man who went through all the hardships of life, but always adhered to the moral bottom line and the principle of life...)
SOUND domain	Sorrowful, faint sound	Ex. 31: A small, rather bitter voice. “Pardon, mademoiselle?” Mr Willoughby’s gone to join the army. Ex. 32: “Look at you!” Inanna made a bitter sound and sat down on tapestried coverlet.	Ex. 33: 他走到门外又走回来, 叹息着, 并且发出一种痛苦的声音。 [ta zou dao men wai you zou hui lai, han xi zhe, bing qie fa chu yi zhong tong ku de sheng yin.] (He walked to the door and back again, sighing and making a bitter sound.) Ex. 34: “别猜了, 小叔。她们笑的是我。” 苦涩的声音响起... [“bie cai le, xiao shu. Ta men xiao d shi wo”. ku se de sheng yin xiang qi...] (“Don’t guess, little uncle. It’s me they’re laughing at”. A bitter voice rang out...)

As evident from the aforementioned table, despite the differences in geographical and social contexts between English and Chinese speakers, there exist numerous shared cognitive patterns in their thinking processes. This shared cognitive foundation is also manifested in their conceptualisation of the taste word “bitter”/*ku*. Hence, there are numerous analogous metaphorical projections of “bitter” and *ku* in these two languages. Further in this discussion, Examples 1 to 34 are derived from Table 2.

The common metaphors in English and Chinese

“Bitter” denotes a taste resembling bile or *coptis coptidis*, which is generally not favoured by individuals. When people consume bitter food, their facial expressions are naturally display pain and discomfort. Interestingly, a worried or unhappy

expression bears resemblance to the facial expression people make when tasting something bitter. In Examples 1, 2, 3 and 4, the terms “smile”, “expression”, *xiao* (笑 “smile”) and *biao qing* (表情 “expression”) belong to visual perception. Consequently, Figure 1 presents the conceptual metaphor SAD FACIAL EXPRESSION IS BITTERNESS, showing the conceptual mapping TASTE (the source domain) onto VISION (the target domain).

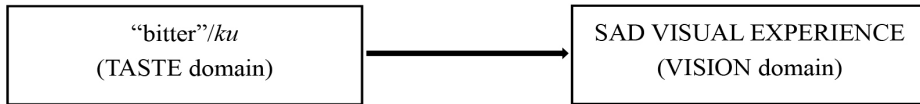


Figure 1. The meaning expansion of “bitter”/*ku* from TASTE domain to VISION domain

Human beings initially perceive the objective world through the sensations received by their various sense organs. Bitter foods not only cause significant discomfort in the oral system but also evoke irritating and unpleasant taste sensations. The experience of tasting bitterness is inherently unpleasant, leading to similar associations with other unpleasant experiences. This association is based on the conceptual metaphor MISERABLE EXPERIENCE IS BITTERNESS, showing the conceptual mapping TASTE (the source domain) onto EXPERIENCE (the target domain) (as shown in Figure 2). Although “bitter”/*ku* can be a metaphor for unpleasant experiences in both English and Chinese, *ku* in Chinese encompasses all the physical and mental hardships and misfortunes experienced by an individual, as exemplified in Examples 7 and 8. In Example 7, *bing ren de tong ku* (病人的痛苦) refers to patient’s physical pain. While in Example 8, *tong ku de sheng huo* (痛苦的生活) represents the miserable experience in one’s life. Conversely, in English, “bitter” primarily refers to painful lessons, as evident in Example 5.

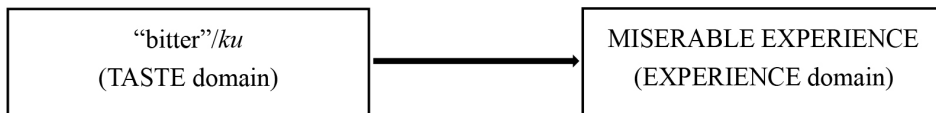


Figure 2. The meaning expansion of “bitter”/*ku* from TASTE domain to EXPERIENCE domain

People often have a resistant reaction to bitter-tasting foods and as a result, their internal experience is often unpleasant when confronted with bitterness. This connection is reflected in language, where “bitter”/*ku* is frequently employed to express negative emotional states, ranging from mild sadness and disappointment to intense anger and resentment. The correlation exemplifies the conceptual metaphor UNPLEASANT FEELING IS BITTERNESS in Figure 3, demonstrating

the conceptual mapping TASTE (the source domain) onto EMOTION (the target domain). In Examples 11 and 12, “bitter” is used to convey the sadness experienced after hearing a story, as well as the dejection felt from an inability to envision the future. Similarly, in Examples 13 and 14, *ku* is utilised to express the sorrow of being unable to escape the current predicament or the frustration of being trapped in a challenging situation. These usages in English and Chinese bear similarities. Thus, the word “bitter”/*ku* in both English and Chinese is used as a metaphor for mental suffering. This process of arousing emotional sense from physiological sense completely conforms to the cognitive principle of transitioning from concrete to abstract and from physiological to psychological.

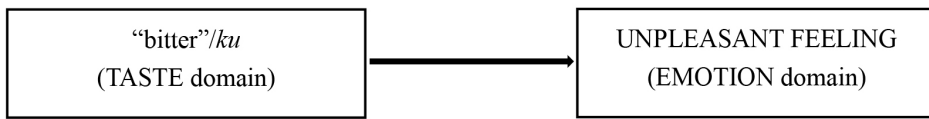


Figure 3. The meaning expansion of “bitter”/*ku* from TASTE domain to EMOTION domain

Building upon the aforementioned, the deepening of the unpleasant feeling associated with bitterness gives rise to the transformation into emotions of resentment and hate. Consequently, Figure 4 presents the conceptual metaphor RESENTMENT IS BITTERNESS, showing the conceptual mapping TASTE (the source domain) onto RESENTMENT/EMOTION (the target domain). In Table 2 (Target Domain 5), “bitter” and *ku* expressed resentment and dissatisfaction towards a particular treatment or a past event. This metaphorical mapping aligns with the findings of Sweetser (1990). Her research suggests that sensory experiences, such as touch and taste, are highly subjective, leading to their extended meanings often being associated with emotions. Specifically, taste-related words tend to extend to encompass meanings related to personal preferences.

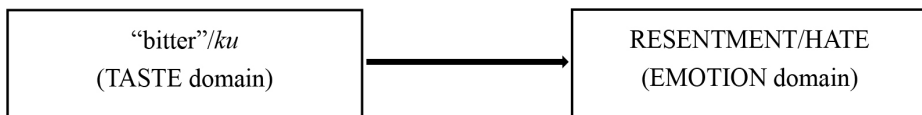


Figure 4. The meaning expansion of “bitter”/*ku* from TASTE domain to EMOTION domain

As mentioned earlier, Sweetser (1990) proposed the conceptual metaphor MIND-AS-BODY, which highlights the relationship between our external experience and internal and emotional cognitive states. In line with this perspective, the perception

of coldness in the world by individuals bears resemblance to the taste experience of bitterness when consuming food, motivated by the conceptual metaphor of COLD IS BITTERNESS. As shown in Figure 5, TASTE (the source domain) is mapped onto CHILLY WEATHER/COLD (the target domain). In Examples 23 and 24, “bitter cold” and “bitter weather” directly link taste word “bitter” with chilly weather. The cognitive process involved in expressions such as *ku han* (苦寒) in Example 25 and *ku leng* (苦冷) in Example 26 is similar to “bitter” in English. Furthermore, in Chinese, *ku han* can also signify poverty. In old days, productivity was generally low throughout the country, the northeastern region of China produced even less food due to the cold climate, resulting in limited resources and hardships for survival. Although technological advancements have significantly improved this situation, the use of the term *ku han* remains closely associated with poverty.

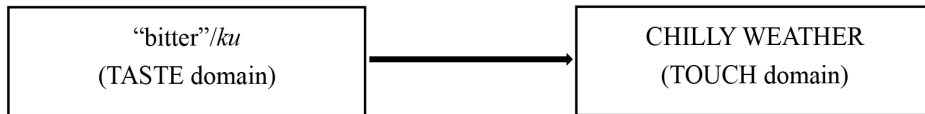


Figure 5. The meaning expansion of “bitter”/*ku* from TASTE domain to TOUCH domain

The aforementioned research indicates that “bitter”/*ku* is mapped onto the experience domain, signifying adversity and suffering. When encountering hardships, our mental state is often not elevated and when sharing our experiences with others, our voices also exhibit a tone of sadness and vulnerability. When we hear someone’s tragic story or experience, we also associate it with a bitter taste sensation. This correlation can be exemplified by the conceptual metaphor SORROWFUL SOUND IS BITTERNESS, illustrating the conceptual mapping TASTE (the source domain) onto SOUND (the target domain) as shown in Figure 6. In Examples 31, 32, 33 and 34, “bitter”/*ku* directly modifies voice and sound, conveying sadness, vulnerability and suffering in the tonality of speech. This metaphor is widely accepted by Chinese and English speech communities.

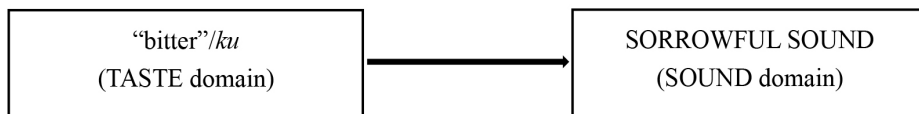


Figure 6. The meaning expansion of “bitter”/*ku* from TASTE domain to SOUND domain

The analysis shows that “bitter” and *ku* share similar metaphorical mappings in English and Chinese, highlighting the great consistency between the two speech communities in employing the concept of “bitter”/*ku* to comprehend related

abstract concepts. However, due to the distinctive social cultures shaped by different nations and variations in thinking patterns, some conceptual metaphors of “bitter” and *ku* differ across the two languages, resulting in differ.

Language exhibits a close connection to real-life circumstances. China is a country with many disasters. In the process of historical development, due to natural disasters and outdated social system, ordinary people live in great poverty. In the preceding analysis, it is mentioned that individuals from different linguistic communities associate “bitter” with the hardships they encounter. However, in the specific sociopolitical context of China during that period, where poverty stood as the predominant plight, it naturally became intertwined with the concept of *ku*. As a result, terms such as *qiong ku* (穷苦) in Example 21 and *pin ku* (贫穷) in Example 22 representing poor, emerged in the Chinese language. These examples exemplify the conceptual metaphor POOR IS *KU*, denoting a conceptual mapping from the TASTE (the source domain) to the ECONOMY (the target domain) as shown in Figure 7. In contrast, “bitter” does not have the mapping of “poor” in English, necessitating the use of additional terms such as “poverty” or “poor” to convey the same meaning. Therefore, the utilisation of *ku* to describe poverty in Chinese reflects the unique characteristics generated within China’s specific history and culture.

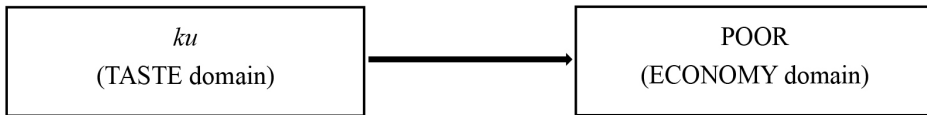


Figure 7. The meaning expansion of *ku* from TASTE domain to ECONOMY domain

In this metaphor, *ku* as an adverb signifies maintaining patience. In Examples 27 and 28, both of *ku kou po xin* (苦口婆心) and *ku xin jing ying* (苦心经营) convey the meaning of work patiently, striving to achieve something. This mapping embodies the conceptual metaphor MAINTAINING PATIENCE IS *KU*, establishing a connection between TASTE (the source domain) and EMOTION (the target domain) (as shown in Figure 8). It conveys that when substantial effort and patience are required to attain desired results, the taste experience associated with it is *ku*. This mapping is unique to Chinese and is related to traditional Chinese medicine culture. The Chinese word *ku* confirms the traditional Chinese medicine saying that “good medicine tastes bitter to the mouth and benefits the disease”. The term *ku* is consistently employed in proverbs and old sayings to encourage the cultivation of one’s character through challenging experiences. It serves as a symbol for sincere advice or earnest suggestions that may initially appear harsh but ultimately prove beneficial for personal development. This usage underscores

the motivational and inspirational potency of candid recommendations. Thus, in this particular context, *ku* metaphorically represents a sincere and patient manner to advising or behaving, indicating a positive meaning rarely found in English. Indeed, all medicines are bitter. English culture also has the proverb “A good medicine tastes bitter” conveying a positive connotation. However, this meaning has not been extensively expanded within food culture. As a result, the metaphorical usage of “bitter” predominantly remains confined to negative implications without further extension into positive connotations.

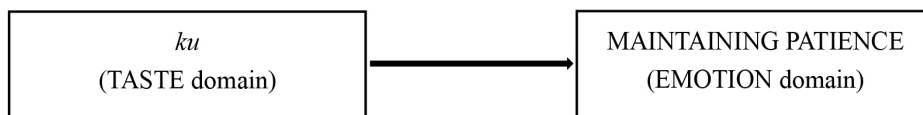


Figure 8. The meaning expansion of *ku* from TASTE domain to EMOTION domain

The Chinese term *ku* encompasses the mental and physical misfortunes, such as illness, poverty and a difficult life. *Ku* is a kind of taste not favoured by people, but it possesses remarkable word-forming abilities in Chinese, reflecting the arduous journey of survival and development undertaken by the Chinese nation. In the face of *ku*, individuals do not always exhibit pessimism and negativity; instead, they often adopt an optimistic attitude. Moreover, within the Chinese language, it is believed that enduring hardships (吃苦 *chi ku* in Example 29) or experiencing suffering (历尽苦难 *li jin ku nan* in Example 30) are the secrets of success, embodying a fundamental quality that every aspiring individual should possess. Thus, in Figure 9, *KU/TASTE* (the source domain) can be metaphorically mapped onto the EXPERIENCE (the target domain), symbolising the journey of enduring suffering and torment as a pathway to eventual triumph. This embodies the conceptual metaphor ENDURING HARDSHIP IS *KU*, linking the difficulty to achieve success with consuming bitter food. This ideology also finds reflection in English culture, albeit typically expressed in terms of suffering, hardships and similar concepts, rather than explicitly expressing in terms of “bitter”.

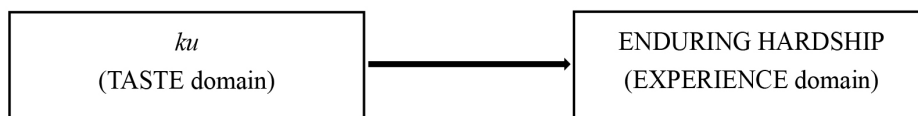


Figure 9. The meaning expansion of *ku* from TASTE domain to EXPERIENCE domain

The unique metaphors of “bitter” in English

The consumption of bitter food triggers a potent sensory response within the human body. Likewise, engaging in debates or arguments often evokes heightened emotional states and intense passion. The existence of commonalities between the two is evident. Consequently, Figure 10 presents the conceptual metaphor FIERCE STATE IS BITTERNESS, showing the conceptual mapping TASTE (the source domain) onto the FIERCE STATE/EXPERIENCE (the target domain) (as shown in Figure 10). In addition to debate and argument appearing in Examples 9 and 10, “bitter” can be paired with terms such as dispute, criticism, fighting, argument, struggle, comment and conflict.

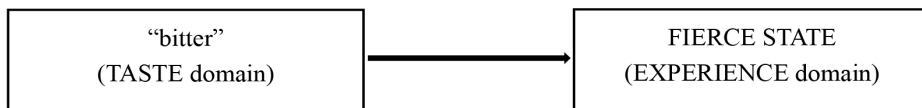


Figure 10. The meaning expansion of “bitter” from TASTE domain to EXPERIENCE domain

When we fall ill and are compelled to use medications for treatment, their inherent bitterness often makes it difficult for us to swallow or accept. Similarly, when people encounter sudden and unexpected setbacks, there can be situations that are difficult to accept, such as the tragic loss of a loved one or the irreparable consequences resulting from seemingly simple decision. Hence, a resemblance between the two emerges, forming the conceptual metaphor UNBEARABLE CONSEQUENCE IS BITTERNESS in Figure 11, showing the conceptual mapping TASTE (the source domain) to EMOTION (the target domain). “bitter” as an unacceptable taste metaphorically represents the unacceptability of emotional states. The depiction of “scenes of bitter sorrow” in Example 19 alludes to a profoundly sorrowful and unacceptable scene. Similarly, “a bitter pill to swallow” in Example 20 conveys an excruciatingly heavy price to pay.

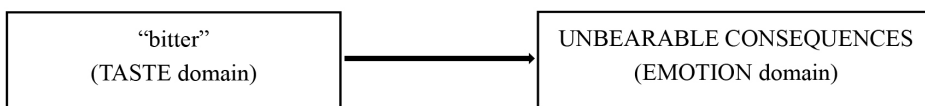


Figure 11. The meaning expansion of “bitter” from TASTE domain to EMOTION domain

The comparative analysis reveals that the metaphors of “bitter” and *ku* exhibit a “largely identical but with minor differences” relationship on the whole. These

metaphors are deeply rooted in human perception and everyday experience associated with “bitter”/*ku*. These findings confirm the point of Lakoff and Johnson (2008), that is, metaphor arises from the cognitive process of constructing intricate and abstract concepts based on vivid and tangible experiences.

Conceptual metonymies of “bitter”/*ku*

By searching a large number of example sentences in corpora for analysis, it becomes evident that the metonymy mechanism plays a crucial role in the semantic expansion of “bitter”/*ku*. The following is an analysis of metonymy in English and Chinese.

Example 35: “Pint of bitter, please”, he said with obvious reluctance.

Example 36: Two halves of bitter please, thanks, love.

Example 37: 肺苦气上逆，急食苦以之。

[Fei ku qi shang ni, ji shi ku yi zhi.]

(The lung qi goes up and the bitter food lowers the lung qi.)

Example 38: 春无食酸，夏无食苦。

[Chun wu shi suan, xia wu shi ku.]

(Don’t eat sour food in spring and don’t eat bitter food in summer.)

According to Shu (2003), metonymy is characterised by perceiving the entirety of something through the prominence of a specific part or feature, or through the proximity of something that shares a special relationship within one conceptual domain. Under the principles of proximity and prominence, the meaning of the word undergoes expansion. In Examples 35 and 36, “bitter” is used to refer to “bitter beer”. It is worth noting that almost every one of the beers in the world has a bitter taste to a greater or lesser extent, primarily attributed to the presence of hops in their ingredients. However, when it comes to “bitter beer”, it mostly refers exclusively to Bitter, a kind of British beer. This specific beer exhibits a more pronounced bitterness due to its high hop content. Consequently, in the English examples provided, “bitter” is used to refer to “bitter beer”. This is a typical conceptual metonymy ATTRIBUTE FOR OBJECT, where bitter, as the most prominent attribute, represents the concept of bitter beer (as shown in Figure 12).

Nevertheless, it is essential to acknowledge that this usage is contextually limited and predominantly relevant within English-speaking communities that possess a drinking tradition. Outside of such contexts, its applicability may be diminished.

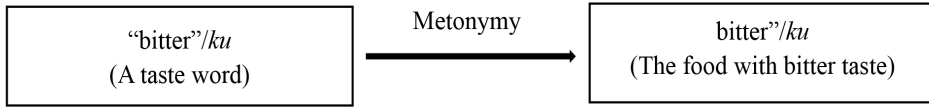


Figure 12. The meaning expansion of “bitter”/*ku* in TASTE domain

Example 37 contains two instances of *ku*. The meaning expansion of the first *ku* is based on the aforementioned conceptual metaphor MISERABLE EXPERIENCE IS BITTERNESS, linking the EXPERIENCE (the target domain) with TASTE (the source domain). The meaning of the first half sentence is “the sign of lung disease is the lung qi upward reversal”. The second *ku* in Example 37 and *ku* in Example 38 share a similar pattern, both reflecting the conceptual metonymy ATTRIBUTE FOR OBJECT. The surface meaning of *shi ku* (食苦) is “eat bitter”, whereas *ku* refers to foods with bitter taste, such as bitter gourd and bitter vegetables. The latter half of the sentence in Example 37 indicates the urgent need to consume bitter foods in order to alleviate the elevated lung qi.

Metaphonymy (metonymy within metaphor) on “bitter”/ku

The meaning extension processes of “bitter” and *ku* in these four examples exemplify the metaphonymy mechanism.

Example 39: ...in which Job demanded why light was given to him that was in misery and life to the bitter in soul.

Example 40: Best song of the night though, is the bitter.

Example 41: 南人不善乘船，谓之苦船。北人不善乘车，谓之苦车。

[nan ren bu shan cheng chuan, wei zhi ku chuan. Bei ren bu shan cheng che, wei zhi ku che.]

(The southern people are not good at sailing, which is called the seasickness. North people are not good at riding, called the carsickness.)

Example 42: 宝庆仔细看了看女儿，她近来瘦了，也许是苦夏。

[bao qing zi xi kan le kan nv er, ta jin lai shou le, ye xu shi ku xia.]

(Baoqing took a closer look at his daughter, who had lost weight recently, perhaps due to a loss of appetite caused by the hot summer.)

In Example 39, based on conceptual metaphor UNPLEASANT FEELING IS BITTERNESS, “bitter” in TASTE (the source domain) mapping onto EMOTION (the target domain), specifically denoting the psychological experience of suffering. However, the simple interpretation of “bitter” as “the unpleasant psychological feeling” is inadequate from syntactic and semantic perspective. The sentence relies on the conceptual metaphor while being supplemented by conceptual metonymy, which contains a metonymic meaning to “bitter” in the context of the whole sentence, referring to a person who is experiencing suffering in his soul. In this content, “an unpleasant feeling” is metonymically projected to “an individual with such a feeling”, driven by CHARACTERISTIC FOR PERSON metonymy. The process of meaning expansion is depicted in Figure 13. Similarly, the meaning expansion process in Example 40 closely resembles that in Example 39, which is illustrated in Figure 14. This semantic extension can be explained in terms of SORROWFUL SOUND IS BITTERNESS metaphor. In this image, TASTE (the source domain) is mapped onto SOUND (the target domain). However, considering the context, it is evident that the “bitter” here refers to the bitter song, thereby exemplifying the embodiment of the metonymic mechanism. In this instance, “an unpleasant or sorrowful sound refers to a song possessing such characteristics”, motivated by the conceptual metonymy ATTRIBUTE FOR OBJECT.

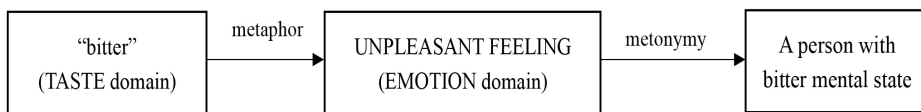


Figure 13. The meaning expansion of “bitter” in Example 39

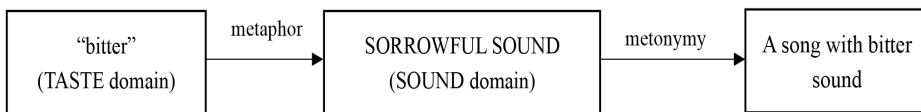


Figure 14. The meaning expansion of “bitter” in Example 40

In Examples 41 and 42, 苦船 (*ku chuan*), 苦车 (*ku che*) and 苦夏 (*ku xia*) are not their literal meanings “bitter boat”, “bitter car” or “bitter summer”. Instead, they hold alternative connotations, as elucidated in the following analysis. Within these three terms, the taste sensation of *ku* bears resemblance to the physical experience of discomfort. Consequently, based on the conceptual metaphor MISERABLE EXPERIENCE IS BITTERNESS, the term *KU/TASTE* (the source domain) extends its meaning to physical discomfort in EXPERIENCE (the target domain). Further examination reveals that this uncomfortable physical experience is attributable to a car, boat, or hot summer. Hence, this extension is motivated by the conceptual metonymy EFFECT FOR CAUSE. The process of semantic expansion is illustrated in Figure 15:

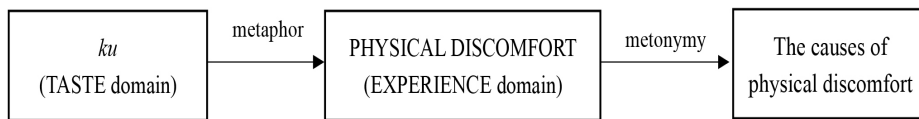


Figure 15. The meaning expansion of *ku* in Examples 41 and 42

The aforementioned analysis highlights the significant role of metonymy in the semantic expansion of “bitter” and *ku* in both English and Chinese. Furthermore, it reveals certain similarities in the process of metonymic semantic extension between the two terms, albeit with slight differences.

Conclusion

The present study delved into the polysemy of the term “bitter” in English and *ku* in Chinese, shedding light on the cognitive mechanisms that drive their semantic expansion.

The findings of the study indicate that there is a considerable overlap in the semantic perception of “bitter” and *ku* across English and Chinese speech communities. The basic meaning of “bitter”/*ku* activates the framework of taste, mental perception, weather and experience. However, due to diverse cultures and histories, the two speech communities have maintained their own understanding for “bitter”/*ku*, the emotional expression of “bitter” in English tends to be more negative and intense, whereas the emotional expression of *ku* in Chinese is predominantly positive or neutral. It is worth noting that in Chinese, *ku* also activates the degree framework.

At the same time, the authors discovered that the semantic expansion of “bitter”/*ku* is mainly through conceptual metaphor and conceptual metonymy. The roles

played by these mechanisms in the process of semantic expansion are meticulously analysed. The metaphorical mechanism is based on the similarity between cognitive domains, whereby “bitter” and *ku* form conceptual metaphor based on various factors such as shared experience (physical and psychological experience), similarities in perception (vision, sound, touch) and manner. The analysis reveals that there is substantial overlap in the metaphors associated with “bitter”/*ku* in both English and Chinese. Both of them map from the source domain (TASTE domain) to the same target domains (VISION domain, EXPERIENCE domain, TOUCH domain, EMOTION domain, SOUND domain), thereby sharing certain metaphors. However, notable differences do exist. In Chinese, ECONOMY and MANNER domains are unique for *ku*. Conversely, in English, “bitter” in the TASTE domain mapping into the “fierce struggle/argument and unbearable consequence”, is absent in the Chinese context.

The metonymy mechanism is based on the correlation and proximity within the same cognitive domains. The metonymy process of “bitter” and *ku* reflects similar ways of thinking, whereby “bitter” for “bitter beer”, *ku* for *ku gua* (bitter gourd). These semantic extensions are processed within same domain and can be explained in terms of ATTRIBUTE FOR OBJECT metonymy.

Furthermore, our research highlights the significant role of metaphonymy in the semantic extension of “bitter” and *ku*. While the metaphorical processes have been discussed in the previous analysis, it is crucial to note that their metonymic mechanisms differ entirely. The extension of the meaning of “bitter” to “bitter people” or “bitter song” mainly reflects the metonymy mechanism of CHARACTERISTIC FOR PERSON and ATTRIBUTE FOR OBJECT, respectively. On the other hand, in Chinese, the expansion from *ku* to *ku che*, *ku chuan* and *ku xia* employs the metonymy mechanism of EFFECT FOR CAUSE. Through the combined influence of metaphor and metonymy, “bitter” and *ku* have effectively expanded their semantic domains. Overall, the relationship between “bitter” and *ku* can be characterised as “largely identical but with minor differences”, reflecting both the universal and culture-specific features of the languages.

This study offers a comprehensive comparative research on “bitter” and *ku* from various linguistic dimensions. The inclusion of cultural factors throughout the research process provides a fresh perspective for understanding the underlying reasons behind semantic expansion. Consequently, this study delves deeper into the rationale and regularity of semantic expansion. The findings of this research have significant implications for education and cross-cultural communication in language. By recognising the distinction between “bitter” and *ku*, educators can effectively explain the difference in the educational contexts. For instance,

Chinese-speaking teachers instructing Chinese as a foreign language to English-speaking students, or English-speaking teachers teaching English as a foreign language to Chinese-speaking students can benefit from this understanding.

The explanation provided by educators will facilitate learners in enhancing their comprehension of these two terms. Furthermore, exploring the similarities and differences of language, cognition, thinking and culture through the contrasting analysis of English and Chinese contributes to the field of cross-language and cross-cultural communication. Finally, the current study elaborated the practical application of conceptual metaphor and conceptual metonymy in linguistics, serving as the comprehensive comparative study of “bitter” and *ku* from the cognitive linguistic perspective.

Note

1. This quotation is recapitulated in Plato’s *Theaetetus* at 152a. Sextus Empiricus gives a direct quotation in *Adv. Math.* 7.60: πάντων χρημάτων μέτρον ἐστὶν ἄνθρωπος, τῶν μὲν ὄντων ὡς ἔστιν, τῶν δὲ οὐκ ὄντων ὡς οὐκ ἔστιν. The translation “Man is the measure...” has been familiar in English since before the rise of gender-neutral language; in Greek, Protagoras makes a general statement, not about men, but about human beings (his word is *anthrōpos*).

Acknowledgements

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