

Comparisons between Chinese and English metaphorical metal words

Comparações entre palavras metafóricas de metal em chinês e em inglês

Huang Qianrong*

Beijing Language and Culture University, Beijing, China

Shuai Zhisong**

Beijing Language and Culture University, Beijing, China

Abstract: Abundant amount of Metaphorical Metal Words can be observed in both Chinese and English, which are well-developed and widely used, ready for comparisons. We applied to simple statistic analysis as our main research method in revealing structural and semantic characters, referring to coagulation, internal structure, and property for the former, and through the way senses being scattered in dictionaries, the part bearing metaphorical meanings and the concentration of meanings for the latter. Through analysis, we discover that astonishing similarities exist in both languages and similarities outweigh differences, which is an overall symptom concerning all comparisons held, revealing human cognitive collectiveness to a certain extent. But in more specific regions, differences do appear, reflecting the varieties in mankind.

Keywords: Metaphor. Metal Words. Comparisons between Chinese and English. Statistic Analysis.

Resumo: Uma quantidade abundante de palavras metafóricas com “metal” pode ser observada tanto em chinês como em inglês, que são bem desenvolvidas, amplamente utilizadas, prontas para comparações. Nós aplicamos uma simples análise estatística como nosso método principal para revelar características estruturais e semânticas, referindo-se à coagulação, estrutura interna e propriedade para o primeiro, e através de como os sentidos se espalham, como os significados se concentram para o segundo. Através da análise, descobrimos que existem semelhanças surpreendentes em ambas as línguas e as semelhanças superam as diferenças, o que é um fenômeno geral em relação a todas as comparações aqui realizadas, revelando, em certa medida, a coletividade cognitiva humana. Mas, em regiões mais específicas, verificam-se diferenças que vão ao encontro da diversidade humana.

Palavras-chave: Metáfora. Palavras com “metal”. Comparações entre chinês e inglês. Análise estatística.

* Undergraduate student, Research Institute of International Chinese Language Education, Beijing Language and Culture University, Beijing, China; ronggg20160909@163.com

** Researcher, Research Institute of International Chinese Language Education, Beijing Language and Culture University, Beijing, China.

1 INTRODUCTION

The Modern linguistic theory of metaphor had been thus named by Lakoff (1980, p. 1-3) for the first time, while generalized and put forward. The nature of metaphor has been referred to as understanding a concept through interpreting it with another through similarity, reflecting systematic matches of sources and targets. Metaphor is more than being a figure of speech, but functions as a significant cognitive mode and mechanism of linguistic changes, reflecting collective features human recognition and ways of thinking. When concerning words and their meanings, metaphor is reflected by adding entries of extended senses, especially abstract ones, formed out of similarities. As varieties of expressions are long required under social development and linguistic evolution, metaphor has been well applied as a way to meet such needs.

“Metal words” is referred here as words or expressions containing morphemes or words designating certain metallic material. In modern Chinese, metal words have formed an abundant, well-distributed, systematic and meaningful collection. They have been widely used in social contacts, and developed quite of few systematically distributed metaphorical members under diachronic changes. With the theory being more acknowledged, linguistic researches through this viewpoint widely developed in recent years. Scholars including Lan Chun (1999), Lu Weizhong (2003), Wang Shaohua (2001), Lin Shuwu (1998), Wang Wenbin et al. (2001), contributed to the indigenization of such theory.

Although metal words are abundant and distinguished, specialized studies in this category is nearly absent. We held a quantitative study on Chinese and English commonly used metaphorical metal words based on dictionaries, draw comparisons between them and outline the main similarities and differences in terms of structures and semantics. In view of the actual distribution of members and the feasibility of research design, we searched and studied the metaphorical members in the family of “金(gold)” “铁(iron)” “银(silver)” “铜(bronze)” in Chinese, and “gold” “iron” “silver” “copper/brass/bronze” as its English counterpart.

2 RESEARCH DESIGN

2.1 *Corpora*¹

2.1.1 Chinese *corpora*

Firstly, we determined the general scope of commonly used metal words in modern Chinese through *the List of Modern Chinese Common Words* (2nd edition, 2021), and we applied to *the Modern Chinese Dictionary* (7th edition, 2016) to include certain

¹ All reference books applied are written in paper except *the Dictionary of Chinese Idiom* (2017). Available at: <https://gongjushugb.global.cnki.net/refbook/default.aspx>.

amount them. Next, we referred to *the Dictionary of Chinese Idiom* (2017), *the Great Dictionary of Chinese Idiom* (1985), *the Dictionary of Chinese Locution* (1985), and *the Dictionary of Chinese Loan Words* (1984) and included some words selectively. In order to determine the classification of members in terms of structure and semantics, we also turned to *the Great Chinese Dictionary* (1993) and *the Modern Chinese Dictionary* (2015) for authoritative definitions. Besides, we checked and took into consideration the actual usage of some members through the BCC corpus, CCL corpus.

2.1.2 English corpora

We determined the general range of commonly used words in English “metal” words through *Roget’s International Thesaurus* (7th edition, 2010). Also, we referred to *Webster* (1987), *Oxford Advanced Learner’s Dictionary* (9th edition, 2016), *Eric Partridge: A Dictionary of Slang and Unconventional English* (8th edition, 1984), *Oxford Idioms Dictionary* (2005), to screen out qualified members and their metaphorical symptoms.

2.2 Related instructions

2.2.1 Study subjects

We choose the modern and contemporary common words as our subjects, namely, Chinese words since the May Fourth Movement (1919) and English words since the 18th century. As many idioms derived from modern Chinese are still being used today, which is just the area where metaphors are very concentrated, we selectively included some into the range as well.

In observation, the families of “gold”, “iron”, “silver” and “bronze” have the largest number of metaphorical words in both languages. Metaphorical words composed of other metal words also exist, such as “铅刀一割(a cut of lead knife)” “alloy” “metallic”, but they are only sporadic and difficult to compare. Concerning the family of “钢(steel)”, we found 9 metaphorical members in English, such as “steely”, “steel-chest”, “steel-trap”, “steel oneself against something”, “arm / hand / nerve of steel”, etc. However, only two members of “steel” are found in Chinese, which is low in quantity. Besides, main characters of “steel” family in metaphors are narrowly covered up by the “iron” family. Therefore, we choose to compare the metaphorical members of “gold”, “iron”, “silver” and “copper”.

2.2.2 How to judge metaphorical members

Metaphorical words reflect the similarity between the source and target. Being a metaphorical word, the similarity shall be solid, listed as entries in dictionaries. All our metaphorical members included in the text and Appendix meet this qualification.

Closely related with metaphor is the metonymy mechanism, which is reflected in the correlation between the original meaning and the extended meaning. Sometimes,

metaphor and metonymy goes hand in hand, such as “铁马(iron horse)”², “铁骑(iron cavalry)”, “铁血(iron blood)”³. The original meaning of these words is related to war, reflecting the close relationship between wars and weapons, which is the result of the metonymy mechanism. But it later stressed on the strong power of army, rulers, and military means, which is a result of metaphor. Although the formation of the above words is based on the metonymy mechanism, it finally rely on the metaphorical mechanism to achieve semantic expansion, we prefer to include these words into our research.

2.2.3 Relevant instructions

i. If the metaphorical words included in the dictionary are scattered in two or more entries, which are semantically irrelevant to each other, they are counted repeatedly, such as iron horse¹, iron horse².

ii. If one of the two metaphor words included in the dictionary is composed of the other one, and related in meaning, only the simplest form is retained. For example, when “三寸金莲(three-inch golden lotuses)” and “金莲(golden lotus)”are both listed in dictionaries, we choose the latter. The same with “silversides” and “silverside”.

iii. Metaphorical words or expressions which include metal words in their written form, but takes no metal-related meaning, are not included in this study. Such as “帕金森病(Parkinson’s disease)”, “金字塔(Pyramid)”, “goldfish bowl” etc.

iv. Proper nouns are not included in the study, such as “金田起义 (Jintian Uprising)”, “金砖五国(BRICS)”, “Silver Horde”, “Iron Division”, etc.

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3 GENERAL COMPARISON

We have identified 455 common modern Chinese “metal” words, including 105 metaphors and 271 English "metal" words, including 134 metaphors.

Table 3-1 Distribution of metal words and its metaphorical members in Chinese.

	金(gold)	铁(iron)	银(silver)	铜(bronze)	tote
Common words	234	129	60	38	455 ⁴
Metaphor words	45 (19.23%)	53 (41.09%)	8 (13.33%)	2 (5.26%)	105 ⁵ (23.08%)

⁴ Some members of Chinese metaphorical metal words contain two different metal component, such as “点金成铁(pointing iron into gold)”, “铁画银钩(iron painting silver strokes)”, “铜墙铁壁(iron and copper wall)”. They are repeatedly counted under both metal families, for example, “点石成金(pointing iron into gold)” is counted under both families of iron and gold. Thus, the tote does not equal the sum of members in all metal families.

⁵ Same as above.

Table 3-2 Distribution of metal words and its metaphorical members in English.

	Gold	iron	silver	copper	brass	bronze	tote
Common words	78	56	66	27	37	7	271
				71			
Metaphor words	38 (48.72%)	33 (58.93%)	24 (36.36%)	12 (44.44%)	25 (67.57%)	2 (28.57%)	134 (49.45%)
				39 (54.93%)			

Through the comparison, we observe that abundant commonly used metal words can be found in both languages, in which metaphorical members takes up a certain proportion. The proportion of Chinese metaphorical metal words by half lower than in English. In Chinese, the family of “iron” counts the most, and “gold” the second, while in English “gold” and “copper / brass / bronze” have the most members, but in all more balanced than the Chinese counterpart.

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4 STRUCTURE

We can analyze the structure of Chinese and English metaphorical metal words from three dimensions: coagulation, internal structure and word property.

4.1 Coagulation of words

Concerning coagulation of words, we need to figure out the gap between words and phrases. Jiang Shaoyu (2015, p. 49-51) pointed out that the distinction between words and phrases in Chinese is a difficult problem, especially when handling with the intermediate region. In general sense, the coagulation of words and set phrases, which includes idioms and locutions, are higher. All Chinese metaphorical members collected here are words or fixed phrases, by which we expect the coagulation to be high. In each category, we judge by the length of words⁶ and the language intuition of native speakers to divide out those of higher or lower coagulation.

⁴ Some members of Chinese metaphorical metal words contain two different metal component, such as “点金成铁(pointing iron into gold)”, “铁画银钩(iron painting silver strokes)”, “铜墙铁壁(iron and copper wall)”. They are repeatedly counted under both metal families, for example, “点石成金(pointing iron into gold)” is counted under both families of iron and gold. Thus, the tote does not equal the sum of members in all metal families.

⁵ Same as above.

⁶ Lv Shuxiang (1979) proposed that words can not be too long or too phonetically complex according to human cognitive common sense, roughly the same with entries in dictionaries.

Table 4-1 The coagulation of metaphorical metal words in Chinese.

Words		idioms		locution	
45		38		22	
High	Low	high	low	high	low
42 (93.33%)	3 (6.67%)	34 (89.47%)	4 (10.53%)	18 (81.82%)	4 (18.18%)

Members of low coagulation members in the table above are:

- 1) a. Words: 铁蚕豆(iron bean)、铁交椅(iron chair)、铁哥们儿(iron buddy)
- b. Idioms:真金不怕火炼 (genuine gold fears no fire)、一寸光阴一寸金(time is gold)、沙里淘金(wash gold from sand)、黄金时代(golden age)
- c. Locutions: 脸上贴金 (stick gold on face)、恨铁不成钢(hate iron for not being steel)、银样鑊枪头(silver like pewter spear)、此地无银三百两(referring to silver three hundred liang in somewhere none)

In general, the Chinese metaphorical “metal” words is high in coagulation.

As for English, we are also faced with the puzzles in identifying words. Murphy (2010, p. 11-14) proposed a method for distinguishing words in languages with spaces in between written words including English:

- orthographically – based on the written form
- semantically – based on the meaning
- phonologically – based on the word’s pronunciation
- grammatically – based on positions in phrases

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“Using the grammatical or phonological criteria for wordhood, some expressions usually written with spaces within them count as words. These are compound words whose orthographical representations have not caught up with their lexical status.”

According to these criteria, we can take the perspective of a *continuum*, in which members meeting all four criteria can be taken as the prototypical, while those meeting only one or none are marginal. The more prototypical ones are words while their marginal counterparts being phrases, whose coagulation are much lower than the former, such as:

	write	semantic	phonetic	grammar
Goldbrick	+	+	+	+
gold brick	-	+	+	+

“Goldbrick” is a verb for “lazy” while “gold brick” is a noun for “lazy”. Both have explicit syntactic functions, a single accent, semantically intact on the first syllable. By definition, both should be words. But by the criteria above, we think “goldbrick” is more prototypical as words. We divide English metaphorical “metal” words

according to the number of criteria they meet:

Table 4-2 The coagulation of metaphorical metal words in English.

condition	quantity	Examples
++++	45 (33.58%) ⁷	gold, gold-digger, iron-bound, silverfish, copperhead, brass-collar
+++-	67 (50.00%)	gold mine, golden goose, silver cord, iron cow, brass ring, bronze wing
++--	11 (8.21%)	goldsmith's window, a crock/pot of gold, on a silver platter, ironmongery department, ironstone china, brassed off
+---	9 (6.72%)	like gold dust, all that glistens is not gold, have several irons in fire
----	2 (1.49%)	be golden, not to have a brass razoo

Among English metaphorical metal words, members meeting four or three criteria takes the largest proportion, over 80%, indicating a high coagulation in general. We can conclude that this collection of words in both languages are high in coagulation.

4.2 Internal word structure

As metaphorical “metal” words in Chinese consists a considerable proportion of idioms and locutions, structural forms commonly used in analyzing disyllabic words prevailing in Chinese are not suitable. It is hard to tell if “金城汤池(golden wall and boiled moat)” “斩钉截铁(cutting nail and breaking iron)” should be analyzed as a juxtaposition or a modifier-core structure. Instead, we can look into the internal structures according to the semantic roles metal words or morphemes play. We divide roles mainly into two categories, one is the “modifying component”, such as “金点子(golden idea)”, “铁将军(iron general)”, “铜墙铁壁(copper and iron wall)”, while the other is “non-modifying component”, they are modified, dominated, explained, such as “含金量(content of gold)”, “点金成铁(touch gold and turn it into iron)” etc. Contained inside the “non-modified component” category, exists another class of parallel structure, such as “金玉(gold and jade)”, “金石(gold and stone)”, “铁石心肠(iron and stone hearted)” etc. We can also link the categories with the distribution of internal positions in the words.

⁷ We also regard members containing conjunctions as written words, such as “gold-digger”, “iron-bound”, etc.

Table 4-3 Location and functional distribution of metal components within Chinese metaphorical metal words.

	Initial(79) ⁸	Not initial (22)	Tote (101) ⁹
Modifier	71	5	76 (75.25%)
Non-modifier	3	16	19 (18.81%)
conjuncts	5	1	6 (5.94%)

The table above shows that in Chinese metaphorical “metal” words, a larger proportion of metal components tend to perform as modifier than others. Meanwhile, metal components distributed initially in words or expressions greatly exceeds those non-initial. In all, it can be indicated that being a modifier and distributed initially is the mainstream in Chinese metaphorical “metal” words.

English members of this collection sounds more flexible than Chinese, in which some components can be alternative catering to specific contexts. For example, in the phrase “have several irons in the fire”, it would not matter when “have” is being replaced by “get”.

2) She’s still got several irons in the fire: her television work, her film work, and her writing. (Oxford Idioms Dictionary, 2005, p. 234)

Sometimes, functional words are included in certain members, such as “like gold dust”, “on a silver platter”, “get down to brass tack”, etc. Therefore, taking the distribution of metal components inside English metaphorical “metal” words may not be practical. However, we can check over merely from the modifying role it played inside words.

Table 4-4 Functional distribution of metal components within English metaphorical metal words.

modifying	Non-modifying	other
102 (76.12%)	14 (10.45%)	18 (13.43%)

Similar to Chinese, the collection of English metal components being modifiers owns far more members than those non-modifying, such as “ironclad”, “ironfisted”, “copper-bottomed”, etc. Different from Chinese, no members in the English collection directly involved parallel structures like “金玉(gold and jade)” and “金石(golden jade)”. Although “brass-bound and copper-fastened” is a parallel expression as a whole, it is still different from the direct parallel structure in the Chinese collection.

⁸ The words “黄金时代(golden ages), “黄金时间(golden time)” are also included in the category of “Initial”.

⁹ “金(gold)” “铁(iron)” “银(silver)” and “金刚怒目(King Kong with angry eyes)” do not meet the classification rules, thus are not included here.

4.3 Word property

Owing to the distinguished property of adjectives in Chinese, which seems closer to verbs on the continuum of verb and noun as both poles, it is more practical to treat it as nominal and predicates. We may associate the property with the distribution of metal components in words.

Table 4-5 Distribution of metaphorical metal words concerning property in Chinese.

	Initial (79)	Non-initial (22)	The Rest	Tote
Nominal ¹⁰	64	6	—	70 (66.67%)
Predicative	16 ¹¹	15	4 ¹²	35 (33.33%)

Through the table above, it can be observed that the proportion of nominal members outgoes that of the predicative. Among those nominal, members with metal component distributed initially exceeds those non-initial. In predicate words, member are more evenly distributed concerning the position of metal components.

- 3)a. Nominal: 金汤(boiled golden liquid)、金点子(golden idea)、铁证(iron evidence)、铁嘴(iron mouth)、银鹰(silver eagle)、铜臭(smells of bronze)
- b. Predicative: 铁青(iron black)、掉金豆 (dropping golden beans)、固若金汤 (as invincible as boiled golden liquid)、趁热打铁(strike while the iron is hot)、真金不怕火炼(genuine gold fears no fire)

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Real words in English can be divided into verbs, nouns and adjectives¹³.

Table 4-6 Distribution of metaphorical metal words concerning property in English.

noun	verb	adjectives	preposition	other
95 (70.90%)	13 (9.70%)	20 (14.93%)	3 (2.24%)	3 (2.24%)

Both languages are quite similar in word property, with nominal members or nouns taking up the largest proportion.

- 4)a. nouns: gold-finder, golden goal, golden goose, golden parachute, golden stairs, silver glance, silver spoon, silver surfer, iron hoop, iron ration, iron skull, copper-captain, copper-show, brass candlestick, brass man, bronze wing

¹⁰ If controversy exists on word property, we classify it according to the main property that expresses metaphorical meaning, such as “铁杆(iron bar)” is nominal when expressing the original meaning, but it is predicative when it expresses the metaphorical meaning of “loyal in following someone else”, so we generalize it under the category of “predicative”.

¹¹ Although we did not include the family of “steel” into consideration, we think it is more reasonable to include the word “钢筋铁骨(steel and iron bone)” into the category of “initial”.

¹² “金(gold)” “铁(iron)” “银(silver)” and “金刚怒目(King Kong with angry eyes)” are predicative, but can cannot be divided according to positions of metal components inside words.

¹³ Thomas E. Payne (1997, p. 63-69) pointed out that the word property of adjectives exists clearly in English, which seldom shares core characters with noun and verb.

- b. verbs: goldbrick, iron horse, iron out, brass along, brass it out, brassed off
 c. adjectives: golden, silver-laced, silverly, iron-bound, ironclad, ironhearted, copper-bottomed, copper-stick, brassbound, brass neck/nerve

The English collection also includes some prepositional words, such as “as good as gold”, “in irons”, “on a silver platter”, etc. Besides, other structures functioning as clauses can not be identified in terms of word property, like “all that glistens is not gold”, “brasses cleaned by candlelight should be inspected by moonlight”.

5 SEMANTICS

5.1 Distribution of senses in dictionaries

Metaphorical “metal” words contain at least one metaphorical senses. We divide the collection of words into the following three categories according to the distribution of senses in dictionaries:

I. The word has only one sense, and the sense is metaphorical;

- 5) 【铁公鸡】[名]铁制的公鸡，比喻非常吝啬的人。（《新华汉语词典》2015, p. 1296）([Iron rooster] a metaphor for a very stingy person.(Xinhua Chinese Dictionary, 2015, p. 1296))

II. The word has more than one senses, one of which is metaphorical meaning;

- 6) 【镀金】[动]①在器物的表明镀上一层薄薄的金子；②比喻为取得虚名而到某种环境去深造或锻炼：我出国留学可不是为了～。 （同上, p. 323）([Gold plated] ① coated with a thin layer of gold; ② refers to further study or exercise: I did not study abroad for ~. (Ditto, p. 323))

III. The word has more than one senses, with two or more metaphorical ones.

- 7) 【铁血】①[名]武器和鲜血，借指战争或暴力：～宰相|～政策；②[形]属性词。指具有刚强意志和富于牺牲精神的：～青年|～男儿。（同上, p. 1297）([Iron blood] ① weapons and blood, borrow refers to war or violence: ~ prime minister | ~ policy; ② refers to a strong will and the spirit of sacrifice: ~ young | ~ men. (Ito, p. 1297))

The specific distribution of Chinese metaphorical “metal” words are as following:

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Table 5-1 Distribution of senses of metaphorical metal words in Chinese.

	quantity	examples
I.	73 (69.52%)	金兰、金曲、金汤、金乌、金玉、金点子、铁军、铁流、铁律、铁票、铁人、铁蹄、铁腕、铁心、铁证、铁嘴、铁蚕豆、掉金豆、脸上贴金、恨铁不成钢、此地无银三百两
II.	21 (20.00%)	金锭、金粉、金莲、金瓯、铁杆、铁骑、铁树、银锭、金童玉女、金字招牌
III.	11 (10.48%)	金、铁、金石、金星、铁马、铁拳、铁血、铁将军

Class I, closely related to the character of metal or other components, has the largest proportion of members, much higher than the other two categories. For members of class II, senses aside from metaphorical ones are generally literal or metonymic ones. As for members in class III, more than one metaphorical senses prevail, reflecting the diversified functioning of metaphorical mechanism.

We can treat English metaphorical “metal” word according to the distribution of senses similarly.

Table 5-2 Distribution of senses of metaphorical metal words in English.

	Quantity	Example words
I.	108 (80.60%)	golden goal, golden goose, silver lining, silvertail, have several irons in fire, brass monkey
II.	14 (10.45%)	gold, gold mine, silver, silverfish, iron out, brassbound
III.	12 (8.96%)	gold brick, golden, golden rivet, like gold dust, iron, brass

In comparison, metaphorical “metal” words in both languages own astonishing similarities in distributions of senses. Members of class I in both languages take up the largest proportion, accounting for 70% to 80% each. The number of class II and class III are much less, of which Chinese is a bit higher than English. Therefore, it can be proved that metaphorical “metal” words are more likely to be newly created under metaphorical mechanism to meet the need of daily expressions. In contrast, members whose metaphorical senses are derived from literal meanings are much less, revealing the fact that in the evolution of this collection, creating new words are more dominant than evolving new senses.

5.2 The component undertaking metaphor

Concerning the component that mainly undertakes metaphorical meaning, the collection in both languages can be divided into three categories:

Class A: undertaken by the metal components;

Class B: undertaken by other components;

Class C: indivisible.

Both languages have a certain distribution of members under the three classifications.

Table 5-3 Distribution of components mainly undertaking metaphorical meaning of Chinese metaphorical metal words.

	金(gold)	铁(iron)	银(silver)	铜(copper)	tote
Class A	30 (66.67%)	38 (71.70%)	2 (25.00%)	1 (50.00%)	69 (65.71%)
Class B	3 (6.67%)	2 (3.77%)	2 (25.00%)	0	7 (6.67%)
Class C	12 (26.67%)	13 (24.53%)	4 (50.00%)	1 (50.00%)	30 (28.57%)
tote	45	53	8	2	105 ¹⁴

8) Class A: 金曲(golden disc)、金点子(golden idea)、金钥匙(golden key)、金科玉律(golden rules)、黄金时代(golden ages)、铁票(iron ticket)、铁证(iron evidence)、银粉(silver powder)、铁饭碗(iron rice bowl)、铁门关(iron gate pass)、铁卧单(iron berth)

Class B: 银弹(silver bullet)、银鹰(silver eagle)、掉金豆(dropping golden beans)、铁将军(iron general)、铁西瓜(iron watermelon)

Class C: 金锭(golden ingot)、金莲(golden lotus)、金甌(golden jar)、铁杆(iron bar)、铁蹄(iron heel)、铜臭(smells of bronze)、铁公鸡(iron cock)、铁板一块(iron block)、铁杵磨针(grinding iron rod into a needle)

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In Chinese, class A has the largest proportion of members, followed by class C, with class B being the least.

Table 5-4 Distribution of components mainly undertaking metaphorical meaning of English metaphorical metal words.

	Gold	iron	silver	copper/brass/bronze	Tote
Class A	18 (47.37%)	18 (54.55%)	8 (33.33%)	13 (33.33%)	57 (42.54%)
Class B	7 (18.42%)	7 (21.21%)	7 (29.17%)	1 (2.56%)	22 (16.42%)
Class C	13 (34.21%)	8 (24.24%)	9 (37.50%)	25 (64.10%)	55 (41.04%)
tote	38	33	24	39	134

9) Class A: gold disc, golden goal, golden mean, golden rule, golden section, silver age,

¹⁴ “点金成铁(pointing iron into gold)”, “铁画银钩(iron painting silver strokes)”, “铜墙铁壁(iron and copper wall)” are repeatedly counted in different metal families, for the same reason explained in note 4.

silver, tongue, ironbark, iron curtain, iron fist/hand (in velvet gloves), fresh/new off the irons, have several irons in fire, brass-face, brass man, brass neck/nerve, bronze wing

Class B: gold-digger, golden handcuffs, golden handshake, golden hello, golden parachute, silver cord, silver glance, silver saddle, iron lung, iron maiden, iron mitten, iron toothpick, copper-show

Class C: goldbrick, goldmine, goldsmith's window, like gold dust, silver lining, silver pheasant, iron compass, iron out, copper-belly, copper-bottom, brass candlestick, brass monkey, brasses cleaned by candlelight should be inspected by moonlight

English metaphorical metal words are distributed in all three classes, with class A and class C sharing the most, while class B accounting for the lowest proportion. It can be seen that in both Chinese and English languages, metal components are the main undertaker of metaphorical meanings. However, compared with Chinese, members in class C words in English takes a higher proportion, indicating that undertaking metaphorical mechanism as a whole is regularly practiced as well.

5.3 Concentrated semantic categories of metaphorical meanings

Derived from the property of metal, the metaphorical meaning of the collection in Chinese focuses systematically on two main categories: “value” and “strength”. The distribution of members in both categories are shown below.

Table 5-5 Distribution of concentrated semantic categories of Chinese metaphorical metal words.

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Related to value				Related to strength		
34 (32.38%)				38 (36.19%)		
Gold	Silver	Iron	Copper	Gold	Iron	Copper
31 (68.89%)	1 (12.50%)	1 (1.89%)	1 (50.00%)	3 (6.67%)	34 (64.15%)	1 (50.00%)

Members in the family of “gold” gather mostly in the semantic categories related to “value” and members in the family of “iron” in that of strength. This derives from the property and metaphorical meaning of “gold” and “iron” themselves, of which the former is closely related to “value”, while the latter is closely related to “strength”.

10) 【金】 [gold] ⑩像金子的颜色(in color like gold)
⑪比喻贵重之物(used in describing valuable things) (《汉语大词典》

(1993, p. 1137)

11) 【铁】 [iron] ①强硬，精锐(strong and mighty)
②比喻坚固，刚强(firm and unyielding)
③形容确定不移(determined)
④十足，非常(high in degree)(《近代汉语词典》2015, p. 2143)

However, exception exists when “gold” is used for “strength” and “iron” is used for “value”. Such as “点石成金(philosopher’s stone)”, “金城汤池(boiled golden liquid)”, “金石之交(friendship like gold and stone)”, which owes to the function that “gold” also bear the meaning of metal substance as a whole. However, the use of “iron” in expressing “value” indicate that the scale of “value” is further extended than gold and silver which is generally more associated with precious usages. Although expressing value with “iron” metaphorically is far from the mainstream, there are also some examples of “iron” for “value” in modern Chinese:

- 12) a. 丰年 好 大雪, 珍珠 如土 金 如 铁。
Harvest year very heavy snow, pearls like soil gold like iron.
 Heavy snow falls in harvest years, pearls and gold are left as worthless as soil and iron.
- b. 生铁 必 难 成 金, 化 龙 定 是 鳅 鳢。
Raw iron must hard become gold, become dragon must be loach or eel.
 It hard to become gold for iron, and for loach or eel to be dragon.

Besides “iron”, “copper” is also distributed in two semantic categories, such as “铜臭(smells of bronze)” and “铜墙铁壁(copper and iron wall)”.

Similarly, the semantic concentration of “value” and “strength” is also visible English, which is attached to metal components inside.

- 13) golden adj. 2 bright yellow in color like gold: golden hair
 3 special, wonderful: golden memories (Oxford Advanced Learner’s Dictionary 2016, p. 673)
- 14) iron adj.[only before noun] very strong and determined: She was known as the ‘Iron Lady’. (Ditto, p. 832)

Although “silver” and “copper / brass / bronze” do not have listed metaphorical senses annotated in dictionaries, some members of their word families can also be generalized under this two gatherings. We may maintain using the scales of “value” and “strength” to examine the corresponding distribution of the English collection.

Table 5-6 Distribution of concentrated semantic categories of English metaphorical metal words

Related to value			Related to strength	
36(26.67%)			16(11.85%)	
gold (38)	silver (24)	copper/brass/bronze (39)	iron (33)	copper/brass/bronze (39)
29 (73.17%)	5 (20.83%)	2 (5.13%)	10 (30.30%)	6 (15.38%)

Comparing with Chinese, English metaphorical “metal” words showed similarities in two perspectives. Firstly, the family of “gold” takes up a high proportion in the category of “value”, reaching 60% to 70% each. Secondly, the family of “铜 (copper)” in Chinese and “copper/brass/bronze” in English are distributed in both categories of “value” and “strength”. As for differences, in Chinese both “gold” and “iron” have members of the cross-categories distribution, while not in English. This can be explained that in Chinese “金(gold)” is the upper word for metal substances, but in English the upper word is “metal”. Another difference is revealed that the family of “铁(iron)” in Chinese takes a higher proportion in the category of “strength” than that in English.

6 REASON ANALYSIS OF THE COMPARATIVE FEATURES

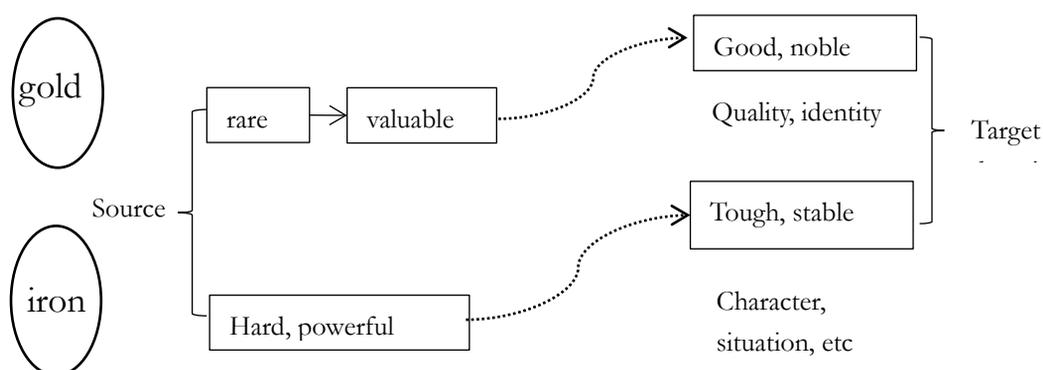
By comparing the structure and semantic characters of metaphorical metal words in Chinese and English, we observed that both languages share more similarities than differences. Behind those comparative features, physical and social experiences, as well as language factors of contributions.

6.1 Similar physical experiences

The empirical realism proposed by Lakoff (1987) on categories, meanings, thinking and reasoning holds that meaning can be reflected through human physiological functions and the physical and social experiences born through interactions with natural and social environments. The physical experience of creating metaphorical metal words is achieved through human interaction with metal substances and metal products. Due to the unity of metal substances, metal products are also similar concerning nature and use, and a high degree of cognition of metal overlaps in the cultural background of Chinese and English languages.

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Table 6-1 The trace of metaphor of metal words.



Chinese and English metaphorical metal words are created from similar source domain and are formed into similar target domain, which is the material characteristics of gold and silver and iron as the former, human quality, identity and character

characteristics as the latter. Common physical experiences take an important reason for similarities of both languages in this field.

6.2 Linguistic and cognitive differences

Chinese and English belong to the Sino-Tibetan and Germanic languages, respectively. Both languages are far-related, bound with many typological differences, some of which are also seen in Chinese and English metaphorical metal words. For example, Chinese has experienced diachronic changes from synthetic to analytic languages, which is reflected in the long-term existence of disyllabic trend in words. The trend of metaphorical metal words in Chinese shows a high proportion of disyllabic words and quadra-syllabic idioms. Although English metaphorical metal words are relatively high in coagulation, they are less limited by the length of words, syllables and other factors.

Cognitive differences cause metaphorical mechanisms to produce different specific manifestations. For example, in Chinese, “iron” can be used as an adjective, which is applicable as a predicate or modified by adverbs. In English however, only “golden”, the adjective form of “gold”, can be applied in expressing metaphorical meanings. While cognitive commonalities are widespread, the specificity of cognition also arouses the complexity of linguistic phenomena and the detailed differences among languages. Thus forming the macroscopic similarities and microscopic differences side by side in comparisons.

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7 CONCLUSION

Through simple quantitative studies, astonishing similarities can be observed shared by Chinese and English metaphorical “metal” words, while in general, similarities outgo differences, reflecting cognitive commonalities working behind human languages. More specifically, however, subtle differences exist, revealing uniqueness and sole characters of each language. The application of metaphorical mechanisms prevailing language formation and usage are meaningful. Thus taking the perspective of metaphor, researches of language compare can bring about profits in both overall and specific scales.

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Appendix I : Chinese metaphorical metal words

金、金锭、金粉、金兰、金莲、金瓯、金曲、金石、金汤、金乌、金星、金玉、金点子、金饭碗、金钥匙、小金库、含金量、掉金豆、万金油、金刚怒目、金鸡独立、金口玉言、金漆马桶、金童玉女、金字招牌、金蝉脱壳、金城汤池、金科玉律、金口玉牙、金无足赤、金相玉质、金枝玉叶、黄金时代、黄金时间、火眼金睛、点金成铁、点金乏术、点石成金、脸上贴金、良金美玉、披沙拣金、沙里淘金、真金不怕火炼、一寸光阴一寸金

铁、铁打、铁定、铁杆、铁军、铁流、铁律、铁马、铁票、铁骑、铁青、铁拳、铁人、铁树、铁蹄、铁腕、铁心、铁血、铁证、铁嘴、铁蚕豆、铁饭碗、铁公鸡、铁汉子、铁交椅、铁脚板、铁门关、铁拳头、铁扫帚、铁石人、铁算盘、铁将军、铁卧单、铁西瓜、铁案如山、铁板钉钉、铁板一块、铁哥们儿、趁热打铁、铁杵磨针、铁画银钩¹⁵、铁面无私、铁石心肠、铁树开花、铁砚未穿、铁中铮铮、心如铁石、斩钉截铁、铮铮铁骨、铜墙铁壁、钢筋铁骨、点金成铁、恨铁不成钢

银、银弹、银锭、银粉、银鹰、银样镗枪头、此地无银三百两

铜臭

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¹⁵ The underlined section are words including more than one metal components.

Appendix II : English metaphorical metal words

gold, gold-backed one, goldbrick, gold brick, goldbug, gold-digger, gold disc, golden, golden age, golden ager, golden balls, golden ballocks, golden doughnut, golden duck, Golden Eagle shits on Friday, golden goal, golden goose, golden grease, golden handcuffs, golden handshake, golden hello, golden mean, golden oldie, golden parachute, golden rivet, golden stairs, goldeneye, golden rule, golden section, goldfinch, gold-finder, goldilocks, gold mine, goldsmith's window, like gold dust, all that glistens is not gold, a crock/pot of gold, (as) good as gold

silver, silver age, silver bell, silver bullets, silver cord, silverfish, silver glance, silver hell, silver hook, silver-laced, silver lining, silverly, silvern, silver paper, silver pheasant, silver saddle, silver sausage, silver spoon, silver surfer, silvertail, silver tongue, silvery, silvery moon, on a silver platter,

iron, ironbark, iron-bound, ironclad, iron compass, iron cow, iron curtain, iron doublet, Iron Duke, iron-fighter, iron fist/hand (in velvet gloves), ironfisted, ironhearted, iron hoof, iron hoop, iron horse¹, iron horse², ironing, iron lung, iron maiden, iron making, iron man, iron mitten, ironmongery department, keep an ironmongery's shop by the side of a common, iron out, iron ration, iron skull, ironstone china, iron tank, iron toothpick, fresh/new off the irons, have several irons in fire,

copper-arse, copper-belly, copper bolts, copper-bottom, copper-bottomed, copper-captain, copper-clawing, copperhead, copper-rattle, copper-show, copper-stick, copper-tail

brass, brass along, brass ball, brassbound, brass candlestick, brass-collar, brass-face, brass hat, brass it out, brass-knocker, brass man, brass monkey, brass monkey weather, brass-nail, brass neck/nerve, brass-plate merchant, brass-plater, brass rags, not to have a brass razoo, get down to brass tacks, brassed off, brasser, brasses cleaned by candlelight should be inspected by moonlight, brassy¹, brassy²

bronze wing, bronzie

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