The Colexification of *Xià* in Modern Chinese

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Abstract

Xià 'down' is a hot topic in the study of directional verbs in modern Chinese. Previous studies mainly focus on its syntactic property, syntax-semantics, and diachronic evolution. Few studies explore the lexical-semantic meanings of *xià* 'down', let alone taking a cross-dialectal or cross-linguistic perspective. This paper discusses the lexical semantics of *xià* 'down' in modern Chinese and builds the colexificational network for *xià* 'down' based on its 21 different meanings. Through analyzing the colexifications for *xià* 'down' in Mandarin Chinese and different languages, it is found that the common colexification between the two networks. This paper also discusses the mechanisms for colexification of *xià* 'down', i.e., similarity and metaphorical rules. The similarity mechanism calls for the Goldilocks principle: meanings are more likely to attach to the same word when they are related to an optimal degree. The metaphorical rules of *xià* 'down' map onto the space domain, time domain, state domain, and quantity domain, following the cline of "SPACE > TIME > STATE> QUANTITY".

Keywords: *xià* 'down', directional verb, lexical-semantics, colexification, mechanism

1. Introduction

Directional verb is one of the hot topics in the study of modern Chinese. Many scholars have made profound research synchronically and diachronically. *Xià* 'down', as a pivotal directional verb in Chinese, its basic meaning is "moving to a lower position" (Liu, 1998). *Xià* 'down' is sensitive to semantic changes like many other directional verbs. Previous studies mainly focus on syntactic property, syntax-semantics, and diachronic evolution of *xià* 'down' in Mandarin Chinese. Few studies explore the lexical-semantic meanings of *xià* 'down', let alone taking a cross-dialectal or cross-linguistic perspective. The rise of typology and the Database of Cross-linguistic Colexifications3 (CLICS3) have provided a new perspective for the in-depth study of its lexical-semantics. Using the data from CLICS3 and cross-dialectal evidence, this paper attempts to build a modern Chinese-specific colexificational network, and then discusses mechanisms for colexification of *xià* 'down'.

This paper is unfolded as follows. Section Ⅱ discusses the semantics of *xià* 'down' in Mandarin Chinese and 15 dialects. The dialects selected in this paper are based on the nine main dialectal families from *the Language Atlas of China*, specifically, Taiyuan dialect from Jinyu dialectal family, Chongming dialect and Danyang dialect from Wuyu dialectal family, Nanchang dialect from Ganyu dialectal family, Changsha dialect from Xiangyu dialectal family, Fuzhou dialect and Dongguan dialect from Minyu dialectal family, Guangdong dialect from Yueyu dialectal family, Nanning dialect from Pinghua dialectal family, Meixian dialect from Kejiahua dialectal family, Chengdu dialect, Guiyang dialect, Harbin dialect, Yinchuan dialect and Urumqi dialect from Guanhua dialectal family, which can mostly represent the complete dialects in modern Chinese. And based on the semantic meanings found in Mandarin Chinese and 15 dialects, the colexficational network of xià 'down' in modern Chinese is built. And section Ⅲ employs the CLICS3 to find cross-linguistic colexifications for the concept "DOWN", and finds the commonality between the two networks. Section Ⅳ attempts to discuss mechanisms for colexification of *xià* 'down'.

2. The Lexical Semantics of Xià 'Down'

Few studies explore the lexical-semantic meanings of *xià* 'down', let alone taking a cross-dialectal or cross-linguistic perspective. And directional verbs in some dialects are expressed in a specific way where they are different from those in Mandarin or most other dialects (Cai, 2014). The differences among meanings of

'down' in different languages throughout the world are much stronger. François (2008) initiatively adopts the notion of colexification in cross-linguistic lexical studies and defines colexification as that a given language is said to colexify two functionally distinct senses iff it can associate them with the same lexical form.

The following part discusses the lexical semantics of *Xià* 'down' in Modern Chinese. The data is mainly collected from the Modern Chinese Dictionary (7th ed.), and Chinese Dialectal Dictionaries. Firstly, 13 senses of *Xià* 'down' have been identified in Mandarin Chinese. Then, as more dialects are explored, another 8 meanings of *Xià* 'down' are added to the semantic list. Finally, 21 senses of *lái* 'come' are identified as follows (Mao, 2020; Guo, 2021):

(i) Go down (descent): This is the basic meaning of *Xià* 'down' which indicates the direction that is opposite to *Shàng* 'up', meaning "moving to a lower place or position". This meaning can be found in Mandarin Chinese and all dialects. Examples are as follows:

1)快　看，那些人　　都　　　下来了。(Mandarin Chinese)

quick look those people　DOU　　down PERF

Look, those people have gone down.

2)你　跑　到　　屋　上去做哩啊？快些下来。（Nanchang Dialect）

you run PERF house up do　what　quick down

Why did you come onto the roof? Go down quickly.

(ii) Behind (follow): The meaning of "behind (follow)" in the phrase of *xià gè yuè* (下个月) 'behind the month', *xià nián* (下年) 'behind this year' can be found in Mandarin Chinese and all Chinese dialects. Examples are as follows:

3)下　半　年　我　要出一趟　远　门。(Mandarin Chinese)

down half year　me　go　CL　remote door

I will go to a remote place behind (following) the first half year.

4)下　二 回故有　机会无？(Fuzhou Dialect)

down CL level have opportunity

Whether do I have opportunity behind (following) this time?

(iii) At a lower place: The meaning of "at a lower place" in the phrase of *xià bā* (下巴) 'jaw', *xià bàn shēn* (下半身) 'the lower part of the body' can be found in every Chinese dialect. And its extended meaning in the phrase of *xià děng* (下等) 'lower level', and *xià zuò* (下作) 'low down' also can be found in every Chinese dialect. Examples are as follows:

5)他下巴 很　长，看起来 很　　搞笑。(Mandarin Chinese)

he jaw very long　look　very hilarious

He is hilarious because of his long jaw.

6)佢　食野咁　下作嘅! (Guangzhou Dialect)

you　eat food　low

You are too low down while eating.

(iv) Fall: The meaning of "fall" can be found in Mandarin Chinese, Urumqi dialect, Yinchuan dialect, Harbin dialect, Nanning dialect, Nanchang dialect, Changsha dialect, Taiyuan dialect, Guiyang dialect, Danyang dialect Chongming dialect and Chengdu dialect. For example:

7)天　　黑　了，开始下　大雨了。(Mandarin Chinese)

Heaven dark PERF begin down big rain

It begins raining after the darkness coming.

8)一　下 露水，菜就　　活泛了。(Yinchuan dialect)

one fall dew vegetables live PERF

Once the drew falls, vegetables revive.

(v) End: The meaning of "end" refers to "the finish of task". It can be found in Mandarin Chinese and Urumqi

dialect, Yinchuan dialect, Harbin dialect, Nanchang dialect, Meixian dialect, Taiyuan dialect, Guiyang dialect, Danyang dialect and Chengdu dialect. Here are some specific examples:

9) 学习了　　　这么 久，　终于　下课了。(Mandarin Chinese)

   study PERF　so　long　finally down class

   The class ends finally after learning a long time.

10) 下　　　学　　　　了。(Taiyuan dialect)

   down　school　PERF

   The school day ends.

(vi) Give birth: *Xià* 'down' can mean "give birth". For example, *xià dàn* (下蛋) 'lay eggs' in the Harbin dialect refers to that some animals give birth to eggs. Such sense can be found in Mandarin Chinese and Urumqi dialect, Yinchuan dialect, Harbin dialect, Nanchang dialect, Meixian dialect, Taiyuan dialect, Guiyang dialect, and Chengdu dialect. Examples as follows:

11) 听 声音　就知道 母鸡　下　　　蛋　　了。(Mandarin Chinese)

   listen voice　know　hen　down　eggs PERF

   The hen is giving birth to eggs hearing its voice.

12) 母猪　　下　　了无? (Meixian dialect)

   sow　　down PERF

   Have the sow given birth to piglets?

(vii) Give (judgment or order): The meaning of "give (judgment or order)" is manifested in the phrases *xià jié lùn* (下结论) or *xià dìng lùn* (下定论) 'make judgment' in Guangzhou dialect, *xià dìng* (下定) 'make engagement' in Chengdu dialect and Guiyang dialect, *xià wén dìng* (下文定) 'give order' in Dongguan dialect. Such senses can be found in Mandarin Chinese and Urumqi dialect, Yinchuan dialect, Harbin dialect, Guangzhou dialect, Changsha dialect, Guiyang dialect, Danyang dialect, Taiyuan dialect, Fuzhou dialect, Dongguan dialect and Chengdu dialect. For instance:

13) 没有　依据　不能过 早　　下 定论。(Mandarin Chinese)

   NEG　evidence NEG early down judgment

   We cannot give judgment too early without evidence.

14) 下　　帖子? (Danyang dialect)

   down invitation

   Give you an invitation?

(viii) Unload: The meaning of "unload" refers to "remove or take down". It has many examples, such as *xià huò* (下货) 'unload goods', *xiè xià luó sī* (卸下螺丝) 'remove the screw' in Mandarin Chinese, and it extends the meaning as *xià huǒ* (下火) 'unload temper' in Urumqi dialect, Guiyang dialect and Guangzhou dialect, *xià qì* (下气) 'unload anger' in Guangzhou dialect. Examples as follows:

15) 看　了　　半　天，　货车司机　还在下货。(Mandarin Chinese)

   see　PERF half day　truck driver down goods

   We　the truck driver is unloading goods for a half day.

16) 把门　下下　来。(Urumqi dialect)

   door　down　come

   Please unload the door.

(ix) Use: The meaning of "use" as shown in *xià zhàng zi* (下账子) 'use curtain', *xià lì qì* (下力气) 'use strength' and *xià jiā huo* (下家伙) 'use tools' is found in Urumqi dialect, Yinchuan dialect, Harbin dialect, Nanning dialect, Meixian dialect, Changsha dialect, Fuzhou dialect, Danyang dialect, Chongming dialect, and Chengdu dialect. And *xià gōng fū* (下功夫) 'use energy and time' often appear in Mandarin Chinese. For example:

17) 年轻　人　　只有肯 下　　功 夫，　才能 有　一番作为。(Mandarin Chinese)

   young people　only　down　Kung fu　can　have CL action

The youth will achieve success only they are willing to use energy and time.

18) 再不　老实就　下　家伙　干掉　他们。(Harbin dialect)

NEG　honest down tools　kill　they

We will use tools to kill them if they are not honest again.

(x) Play: The meaning of "play" is often associated with board games, as shown in the phrases of *xià qí* (下棋) 'play chess', *xià shì* (下士) 'jargon of chess', and *xià xiàng* (下象) 'jargon of chess', which are found in Mandarin Chinese, Urumqi dialect, Yinchuan dialect, Harbin dialect, Nanchang dialect, Changsha dialect, Taiyuan dialect, Guiyang dialect, Chongming dialect, Chengdu dialect, etc. For example:

19) 我 经 常　和 我 爸爸　下　象棋。(Mandarin Chinese)

I　usually　and I　father　down chess

I usually play chess with my father.

20) 下　　象，　拦住　进攻 的小卒。(Nanchang dialect)

down elephant hinder attack DE pawn

Play the piece of chess to hinder the attack of the pawn.

(xi) Invest: The meaning of "invest" is manifested in the phrases like *xià zhù* (下注) 'invest chips' and *xià běn qián* (下本钱) 'invest money' in Urumqi dialect, Guangzhou dialect, etc. For example:

21) 做 生 意　就 要 舍得下　本钱。(Urumqi dialect)

do　business　should dare down money

Investing money is necessary for business.

22) 买 大 买 小，下 注　翻倍。(Guangzhou dialect)

buy big buy small down chips multiply

Big or small? The chips investing can be multiplied.

(xii) Go into: The meaning of "go into" can be found in Mandarin Chinese and Urumqi dialect, Yinchuan dialect, Harbin dialect, Nanchang dialect, Guangzhou dialect, Changsha dialect, Taiyuan dialect, Guiyang dialect, Danyang dialect Chongming dialect and Chengdu dialect. Examples as follows:

23) 这个男人下　　矿 挖 煤，扛起　了整 个 家庭 的　重任。(Mandarin Chinese)

CL man　down mine dig coal shoulder　PERF CL family DE responsibility

This man go into the mine to feed his whole family.

24) 下　　　种　底　时节　误　不得!! (Urumqi dialect)

down　　seeds　DE season delay NEG DE

Do not miss the season when making seeds go into the soil.

(xiii) Directional meaning: The directional meaning of *xià* 'down' is found when *xià* 'down' serves as a directional verb, or directional complement to refer to "moving to a lower position". This use is found in Mandarin Chinese and many Chinese dialects. For example:

25) 教导　下　学生。(Mandarin Chinese)

teach down　student

Teach the students.

26) 把这本书　抄　下　来。 (Nanchang dialect)

this　book copy down come

Please copy down this book.

(xiv) Resultative meaning: The resultative meaning of *xià* 'down' refers to the change of state. It can be found in Mandarin Chinese, Urumqi dialect, and Yinchuan dialect. For example:

27) 打　下　基础。(Mandarin Chinese)

Beat down foundation

Lay the foundation.

28) 东 西 搁下了。(Yinchuan dialect)

things down PERF

Things have been laid down.

(xv) Few: The meaning of "few" is often found in Mandarin Chinese, Urumqi dialect, and Yinchuan dialect. For example:

29) 这次 会议 不 下于 五 人。(Mandarin Chinese)

This meeting NEG down CL people

There has no fewer than five people in this meeting.

30) 这些 座位坐 不 下。(Urumqi dialect)

these seats sit NEG down

There are fewer seats than what we needs.

(xvi) Concede: The meaning of "concede" is loose colexification for *xià* 'down' in Mandarin Chinese and Urumqi dialect, because it only consists in the compounds of *xià* 'down' such as *xiāng chí bú xià* (相持不下) 'without conceding'. For example:

31) 他们 相 持   不 下。(Mandarin Chinese)

they   each other   NEG down

They are not willing to concede each other.

(xvii) Blow or under a place: The meaning of "blow or under a place" is often found in the phrase of *dǐ xià* (底下) 'under the ground' in Chongming dialect, Dongguan dialect, Meixian dialect, Nanning dialect, Chengdu dialect and Fuzhou dialect. For example:

32)张 枱 桌子 下底 有 本 書。(Dongguan dialect)

CL   desk down have   CL book

There is a book under the desk.

33) 山   顶上面 栽 树， 下底 载 豆。(Fuzhou dialect)

mountain top up   plant tree   down plant potato

Plant tree on the top of the mountain, and potato under the ground.

(xviii) Go: The meaning of "go" is often found in the phrase of *xià tián* (下田) 'go to land' or *xià guǎn zi* (下馆子) 'go to restaurant' in Urumqi dialect, Yinchuan dialect, Harbin dialect, Taiyuan dialect, Guiyang dialect, Danyang dialect and Chengdu dialect. For example:

34) 他 病 了 一个 月， 现在才能 下 地 干活。(Taiyuan dialect)

He sick PERF CL   month now   down land do work

He can come to land to farm after being sick for a month.

35) 今天 我们下   馆子。(Chengdu dialect)

today we down restaurant

We come to restaurant to have dinner today.

(xix) Cook: The meaning of "cook" is often found in the phrase of *xià miàn* (下面) 'cook noodle' in Urumqi dialect, Guangzhou dialect, Changsha dialect, Dongguan dialect, Danyang dialect and Chongming dialect. For example:

36) 下   饺子。(Urumqi dialect)

down   dumpling

Cook the dumplings.

(xx) Small: The meaning of "small" is often found in the phrase of *xià xì* (下细) 'be careful' in Chengdu dialect and Guiyang dialect. For example:

37) 做 事要 下细点。(Chengdu dialect)

doing thing down thin

Be careful when doing things.

(xxi) Accompany: The meaning of "accompany" is often found in the phrase of *xià fàn* (下饭) 'accompany food' in Urumqi dialect, Yinchuan dialect, Changsha dialect, Taiyang dialect and Guiyang dialect.

38) 找点　下　　饭　菜。(Yinchuan dialect)

　　find　down rice vegetable

　　Find some vegetable to accompany the rice.

Based on the above investigation, the lexical meanings of *xià* 'down' in Mandarin Chinese and 15 dialects of nine Chinese dialectal families can be represented as follows:

Table 1. The lexical-semantic functions of xià 'down' in Mandarin Chinese and 15 dialects

	Mandarin	Danyang	Harbin	Chengdu	Chongming	Dongguan	Fuzhou	Guangzhou	Guiyang	Taiyuan	Changsha	Meixian	Nanchang	Nanning	Yinchuan	Urumqi
go down	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
follow	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+
at a lower place	+			+	+	+	+	+	+	+	+	+	+	+	+	+
fall	+			+	+				+							
end	+			+					+	+		+	+		+	+
give birth			+	+					+	+		+	+		+	+
give (judgement or order)	+	+		+		+	+	+	+		+				+	+
unload	+					+		+	+	+		+	+		+	+
use	+			+	+		+				+	+		+	+	+
play	+			+					+	+	+		+		+	+
go into				+	+			+	+	+	+		+		+	+
invest	+							+								+
directional meaning									+	+		+	+		+	+
resultative meaning	+														+	+
few	+						+								+	+
concede	+															+
blow or under a place				+	+	+	+					+		+	+	
go				+					+	+					+	+
cook					+	+		+			+					+
small				+	+				+							
accompany									+	+	+				+	+

3. The Colexificational Network of Xià 'Down'

To clarify the semantic classifications of *xià* 'down' in Modern Chinese, this paper resorts to the Database of Cross-linguistic Colexifications3 (CLICS3) which covers more than 3100 language varieties of the world, showing the concepts that share the same lexical form with the target concept. CLICS3 has been proved to be scientific in psychological and cognitive researches (Jackson et al., 2019).

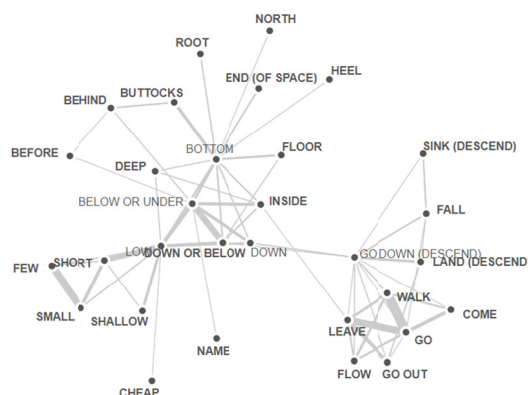When DOWN is selected as the target concept, the result can be presented as follows：

Figure 1. The colexification network for DOWN across languages

From the above pictures, the central concepts DOWN are the pivot notions that can effectively avoid shifting boundaries of the colexification network. The nodes stand for the concepts that can share the same lexical form with the target concept. The edges between two concepts signify that they share the same linguistic form. The width of the edges represents how frequently two concepts colexify with each other. When the mouse is put on the edge between two concepts, the graphs will show the languages and language families of the two concepts colexified and the lexical form they share.

The colexifications for *xià* 'down' in Chinese dialects are found to share some commonalities with cross-linguistic evidence. Whereas, the colexifications for *xià* 'down' in Chinese dialects are also found to demonstrate some specificity. For example, the colexifications for *xià* 'down' and "give birth" are found in 8 dialects: Chengdu dialect, Guiyang dialect, Taiyuan dialect, Meixian dialect, Nanchang dialect, Harbin dialect, Urumqi dialect and Yinchuan dialect. The concept of *xià* 'down' and "invest" are colexified in Guangzhou dialect and Urumqi dialect. However, these links between concepts are not found in the cross-linguistic network for DOWN and thus it is language-specific for Chinese.

Many links of colexifications (e.g. give birth) for *xià* 'down' in Chinese dialects do not have corresponding concepts in cross-linguistic data, so it is necessary to construct a colexification network for *xià* 'down' in Chinese dialects. According to Table 1 and Figure 1, the colexifications for *xià* 'down' with DOWN as the pivot notion in Chinese dialects can be established as follows:
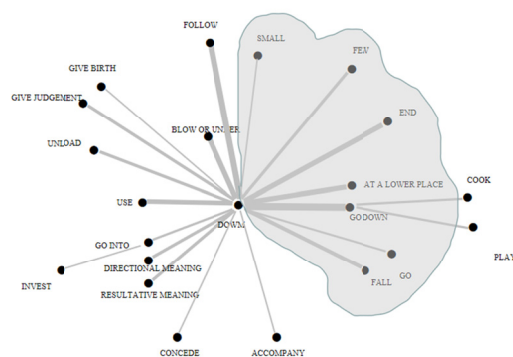

Figure 2. The colexification network for *xià* 'down' in modern Chinese

In the above figure, lines that connect the extended meanings of *xià* 'down' show that the two concepts are colexified and the width of the edges indicates the frequency of colexifications for concepts. The meanings of "cook" and "play" are derived from the basic meaning of *xià* 'down', that is "go down", and the meaning of "invest" is from "go into" (Guo, 2021). The shadowing region of the figure manifests the common colexification

of *xià* 'down' in word languages according to Figure 1. The colexifications for DOWN across languages provide cross-linguistic evidence for colexifications for *xià* 'down' in modern Chinese which in turn supplement the former.

4. Colexification Mechanisms of *Xià* 'Down'

This session discusses mechanisms for semantic colexification of *xià* 'down'. The colexification of *xià* 'down' is not evolved arbitrarily, but is guided by similarity and metaphorical rules.

4.1 Colexificational Similarity of Xià 'Down'

Similarity plays a significant role in human's cognition, and is also important for shaping colexification patterns. A series of experiments (Karjus et al., 2021; Floyed et al., 2021) has been conducted and provided a multitude of evidence for the important role of similarity in colexification. Whereas, it does not show the trend that more similar senses are more prone to be colexified. Brochhagen and Boleda (2022) propose that colexification follows a Goldilocks principle that balance the two pressure: meanings are more likely to attach to the same word when they are related to an optimal degree, that is, neither too much, nor too little. And they found a large quantity of evidence suggesting that languages evolve to strike a balance between competing functional and cognitive pressure, or in other words, a balance between simplicity and informativeness.

The colexification of *xià* 'down' in Mandarin Chinese also observes the Goldilocks principle. As Figure 2 expresses, the colexificational network is built on the bases of the principle, or in other words, it expresses the Goldilocks zone or colexificational zone. And the shadowing region expresses the sharing colexificational zone between Mandarin Chinese and different languages throughout the world. *Xià* 'down' has the basic meaning of moving to a lower position, and its colexified meanings are related to this basic one. Distributional similarity and associativity are two measures that can be used to test the similarity in the process of colexification (Brochhagen & Boleda, 2022). Distributional similarity measures how similar the contexts of use of different linguistic expressions are, quantifying their contextual overlap based on a large amount of data, especially the text corpora (Harris, 1954; Landauer & Dumais, 1997). For example, in Mandarin Chinese and most Chinese dialects, the meaning of "follow" as in "follow this month", has the similar contexts of the use to xià 'down' as in "*xià yì gè yuè* (下一个月)", which manifests a strong distributional similarity between the two meanings. Mao (2020) collects 13,687 items of *xià* 'down' in the "*xià* 'down'+ Noun" construction, providing solid evidence for the strong distribution similarity of the meanings of xià 'down' in modern Chinese. On the other side, the associativity is derived from large-scale association norms from daily uses (Deyne et al., 2018). For example, in Mandarin Chinese and most Chinese dialects, the meaning of "end" as in "class ends" or "schooling day ends" shares a similar association norm with the use of xià 'down' as in "*xià kè* (下课)" or "*xià xué* (下学)", expressing the two meanings have a strong associativity. Mao (2020) adopts the method of constructional analysis to test the association strength of *xià* 'down' in the construction of "*xià* 'down'+ Noun" and "Verb + *xià* 'down'", and Guo (2021) also used the similar method to calculate the association strengthen and analyze the meanings of *xià* 'down' in Chinese and English from the perspective of crossing languages, both expressing strong evidence for a strong associativity of the meanings of xià 'down' in modern Chinese.

While the strong distributional similarity and associativity do not indicate that *xià* 'down' can colexify the meanings as long as the meanings are related or similar. For example, the meaning of "go" as in "go to restaurant to have dinner" can only be found in a few dialects like the Chengdu dialect and Danyang dialect as in "*xià guǎn zi* (下馆子)". Besides, *lái* 'come' has the meaning of "give birth" in Mandarin Chinese (Wang, 2021), which is similar to *xià* 'down' expressing the meaning of "give birth". Only the meanings of "go" and "give birth" can be found in both *lái* 'come' and *xià* 'down', providing the evidence that the optimal degree of similarity can best predicate the tendency to colexification.

To sum up, similarity holds an indispensable role in the process of colexfication, while it does not mean that stronger similarities among senses indicate higher tendency to be colexified by the same linguistic form. Instead, it follows the Goldilocks principle that meanings colexify if they are neither too unrelated, nor too related, that is, just to an optimal degree. Besides, communicative needs also need to take into consideration in the process of colexification, or in other words, they should be highlighted in the analyses of colexification (Karjus et al., 2021; Floyed et al., 2021). Communicative need varies in different language communities relying on such factors as environment and culture, which is corresponded to the view that lexicon meaning is language-specific in which different environments and cultures have specific cognitive lexicon zone sharing some similarities and differences across the communities (Croft, 2001, 2021).

4.2 Metaphorical Rules of Xià 'Down'

When one concept is constructed by another, they share the same cognitive typology (Lakoff & Johnson, 2003). To put it simply, the structural metaphor is at work when the source meaning and the extended meaning belong to two different cognitive domains, but the cognitive typology is similar in the two domains.

Previous studies have shown that many abstract linguistic concepts derived from space concepts are generally considered as the most fundamental concepts in human language (Heine et al., 1991; Anderson, 1971). *Xià* 'down' has the basic meanings of "go down", "at a lower place" and "blow or under a place" (Guo, 2021), and as a directional verb, it is typically a space concept. The meanings of *xià* 'down' are found to map onto four domains, i.e., the space domain, the time domain, the state domain, and quantity domain.

4.2.1 Space Domain

The metaphoric mappings in the space domain account for the commonest way for semantics of xià 'down'. This can be illustrated as follows:

The first cline of semantic extension is "from none to existence" or "from higher to a lower place":down > fall, down > give birth, down > unload, down > play, down > cook, down > invest, down > accompany, down > use, down > go into, down > come, down > directional meaning

As mentioned before, the image schema of *xià* 'down' represents that something or somebody moves toward a lower position. When something or someone is moving to a lower position, the thing being observed would be "closer, visible, and perceptible". When the meanings of *xià* 'down' map onto the space domain, it involves physical or virtual movement in the space. For example, the meaning of "fall" in *xià yǔ le* (下雨了) 'it is raining' refers to that "rain" moves to the ground so that *xià* 'down' can refer to the "the rain is falling". "Rain" here is metaphorically conceptualized as a moving entity. When it moves to the lower place, the ground, it becomes visible or perceptible so that the speaker can realize that something fell.

Besides, Mao (2020) points out that *xià* 'down' can indicate an increase of prominence. This is in accordance with Shen (1999), who proposes that something big is more salient than something small, and something visible is more prominent than something invisible. The meaning of "give birth" in *xià zhū zǎi* (下猪崽) 'give birth to the piglets' refers to that the "piglets" move from the inside of the sow's body toward the outside and thus the piglets become visible. Therefore, we use xià 'down' to express the meaning of "be born".

The meaning of "unload" is extended from the meaning of *xià* 'down' in the space domain and refers to "remove something or take something down". Since "being closer and lower" is more salient than "being farther and higher", *xià* 'down' can be used to express "unload". "To unload something" can be construed as "to remove from a higher position to a lower position" so that the result becomes salient. For example, in the phrase of *xià huò* (下货) 'unload goods', the ground is conceptualized as "the destination" when the goods have reached the ground. And the sense of "use" can also be conceptualized as taking down the tools to use as in the instance of *xià jiā huo*（下家伙）'use tools'. Lakoff and Johnson (2003) points out that "no metaphor can ever be comprehended or even adequately represented independently of its experiential basis". The experiential basis here is that when the entity moves to the handy position, it becomes closer to the speaker so that the speaker can use it.

In the same vein, the sense of "go into" can be construed to move from a higher position into a lower position that can be regarded as a container. When someone or something moves into the container and becomes part of it, *xià* 'down' derives the meaning of "go into". In *xià kuàng* (下矿) 'go into the mine', "the mine" is regarded as a container. The concept of "going into" focuses on the path of how someone travels.

The meaning of "play" is derived from the meaning of *xià* 'down' in the space domain in which the chess piece is moving from the higher position toward a lower one, focusing on the path of playing. And the meaning of "cook" is also from the process of cooking in which food moves toward the lower place, the cooker, emphasizing the path of cooking.

The meaning of "invest" is extended from the process of investing in which putting a part of money down to the gambling desk as in the instance of *xià zhù* (下注) 'invest money'. And the meaning of "accompany" is derived from the space domain in which the dish is used to accompany the rice moving toward the stomach, as in the example of *xià fàn cài* (下饭菜) 'accompany the rice'.

The meaning of "come" is extended from the meaning of *xià* 'down' in the space domain and refers to "something or someone comes from a far place to a closer one". In *xià guǎn zi* (下馆子) 'go to the restaurant', "the restaurant" is regarded as a destination. The concept of "go" focuses on the goal of the place where

someone arrives.

When *xià* 'down' serves as a directional complement to indicate the direction of moving, it derives the "directional meaning". For example, in *fàng xià shū bāo* (放下书包) 'put down bags', "the bag moves towards the ground" implies "the transfer of the bag". The concept of "directional meaning" emphasizes the path from a higher place to a lower place.

4.2.2 Time Domain

The metaphoric mapping in the time domain can be illustrated by the following cline:

The second cline of semantic extensions "moving time": down > follow, down > end

The process of moving from a higher position to a lower position takes time, and thus the image schema of *xià* 'down' can map onto the time domain. The meaning of "follow" as in *xià yí gè yuè* (下一个月) 'the following month' can be understood through the orientation metaphor that "DOWN IS FUTURE", which is different from the English-speaking culture, that is, "UP IS FUTURE" (Qi, 2014). And Nisbett (2003) points out that Chinese people think that people's ability to control the environment is limited, so they tend to think that time is moving and they cannot influence the direction or speed of how time moves. As the basic meaning of *xià* 'down' refers to "move to a lower place", when it maps onto the time domain, it adopts the Moving Time instead of the Ego Moving metaphor, that is, the observer or ego is stationary and time moves from the high to the low. According to the figure and ground relation, the moving time is a figure and the stable Ego is the ground or reference point, which serves as the deictic center of the temporary frame, labeled as "Ego's Now" (Sweetser & Gaby, 2017).

According to THE PAST IS UP metaphor from the Chinese culture, there is a tendency to regard the time up the "Ego's Now" as "past", while the time down the "Ego's Now" as "future" in accordance with the metaphor "DOWN IS FUTURE". When "Ego's Now" is taken as the reference point and time moves from the higher side to the lower one, as seen in the expression "*xià yì nián* (下一年) 'the following year'", it acquires the meaning of "follow". When time moves from the higher side to the lower end, *xià* 'down' derives the meaning of "end", focusing on the endpoint of the motion, as demonstrated in *xià kè* (下课) 'the class ends'. Therefore, when "Ego's Now" serves as the reference point, time can move from two directions on the vertical level, but "time" is conceptualized as a "moving object" moving from the higher past to the lower future in Chinese.

4.2.3 State Domain

The metaphoric mappings in the state domain can be illustrated by the following cline:

The third cline of semantics "moving towards a state": down > give, down > concede, directional meaning > resultative meaning

The meaning of "give judgement" as in *xià dìng lùn* (下定论) 'give final judgment' refers to that the "conclusion" moves from the air to action. In this situation, where the question hanging in the air is set as the reference point. When the reference point moves to the conclusion, they are conceptualized as "come to conclusion". Therefore, *xià* 'down' derives the meaning of "give judgment". The sense of "concede" can be similarly conceptualized as moving from the state of "balancing" to the state of "conceding" as in the instance of *jiāng chí bú xià* (僵持不下) 'without conceding'.

Hu (2012) argues that when the image schema of *xià* 'down' maps from the space domain onto the state domain as in *dǎ xià* (打下) 'conquer', it can be understood as "to move toward the peaceful state". The destination in the physical space can be mapped onto the final state in the state domain. Liu (1998) points out that there is an obvious derivative relationship between the resultative meaning and directional meaning. The directional meaning of *xià* 'down' is "to move toward a lower place or a referential point", while the resultative meaning of *xià* 'down' is "to step into a state". Directional meaning focuses on the change of position after movement while resultative meaning focuses on the change of state. For example:

39) 快　　快　　坐下。(Mandarin Chinese)

　　quick quick sit down.

　　Sit down, please.

40) 打　　下　　一片 江山。(Chengdu dialect)

　　fight down　CL　mountain

　　Conquering the land.

Xià 'down' in instance *zuò xià* (坐下) 'sit down' serves as directional meaning expressing the motion of the

body from a higher place to a lower place. While *xià* 'down' in instance *dǎ xià* (打下) 'conquer' focuses on the results of the action, that is the conquering of the lands, serving as resultative meaning.

4.2.4 Quantity Domain

The metaphoric mappings in the quantity domain can be illustrated by the following cline:

The fourth cline of semantic extensions "lower than a quantity": down > few, down > small

The meaning of "few" as in *bú xià yú wǔ rén* (不下于五人) 'no fewer than 5 people' refers to that the quantity moves to a lower one. In this case, where the quantity is set as the reference point. When the fact moves under the reference point, they are conceptualized as "fewer than the quantity". Therefore, *xià* 'down' derives the meaning of "few". The sense of "small" can be similarly conceptualized as moving from the quantity of "sketch" to the quantity of "detail" as in the instance of *xià xì diǎn* (下细点) 'be more careful'.

Xià 'down' observes the metaphorical rules, expanding its meaning through mapping its image schema onto the space domain, time domain, state domain, and quantity domain. In general, the semantic meanings of *xià* 'down' are in line with the metaphoric hierarchy proposed by Heine et al. (1991): person > object > activity > space > time > quality. Wu (2003) explains that the essence of this hierarchy is in accordance with the concept of "embodiment" that people understand things from the most familiar empirical category to the empirical category that is away from people's vision. So the meanings of *xià* 'down' follow the metaphorical rules of "SPACE > TIME > STATE > QUANTITY".

5. Conclusion

Few studies explore the lexical-semantic meanings of *xià* 'down' in modern Chinese, let alone taking a cross-dialectal or cross-linguistic perspective. This paper has identified 21 meanings of *xià* 'down' in Mandarin and Chinese dialects by the data from the Modern Chinese Dictionary (7th ed.), and Chinese Dialectal Dictionaries, and then the colexificational network of xià 'down' in Mandarin Chinese is built based on the 21 meanings. Using the apparatus of CLICS3, the colexificational network of *xià* 'down' is built across languages throughout the world, then the common area of colexification of *xià* 'down' can be found after the comparison between the two networks. This paper then explores the colexificational mechanisms for the semantic meanings of xià 'down', that is, similarity and metaphorical rules. The similarity mechanism calls for the Goldilocks principle: meanings are more likely to attach to the same word when they are related to an optimal degree, that is, neither too much, nor too little. The metaphorical rules of *xià* 'down' map onto the space domain, time domain, state domain, and quantity domain, following the cline of "SPACE > TIME > STATE> QUANTITY". This paper elaborates on the colexificational mechanisms of *xià* 'down', that is, similarity and metaphoric rules that will shed light on studies of other directional verbs.

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