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Forum for Linguistic Studies

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ORIGINAL ARTICLE

Generic structure and APPRAISAL resources in the editorial article *Free money*

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Abstract: Editorial is one of news genres aiming for opinion making and persuading. These functions determine that there are abundant evaluative resources in this genre. Exploring evaluative resources in the editorial could be conducive to understanding editorial text better and providing sensible suggestions for English learners to produce effectively persuasive writings. In view of this, the present study sets out to analyze the generic structure of the editorial *Free money*, then examine usage patterns of APPRAISAL resources in this text, and finally explore variations of APPRAISAL resources at different stages of the genre of this text. All APPRAISAL resources were coded based on APPRAISAL system and analyzed from quantitative and qualitative perspectives. It shows that *Free money* employed discussion genre with exposition and challenge embedded in the Background stage. An investigation into the usage of APPRAISAL resources found that negative ATTITUDE resources were mainly used to form the prosody of the text; more negation and concession resources within ENGAGEMENT were deployed to contract the dialogue; far more force raising GRADUATION resources were applied to amplify the evaluation. The APPRAISAL resources used at different stages of the editorial demonstrate distinct features with the aim of serving specific function of each stage. For instance, attribution resources were used in Issue stage to expand the dialogue and engage the readers; invoked resources were primarily employed in Background stage to make the statement objective; far more negative impressions in Side stage indicated the author's concern, and more inscribed resources in Resolution stage manifested author's attitude and made the conclusion impressive.

Keywords: Genre Theory; APPRAISAL system; editorial article

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1. Introduction

Since the outbreak of Corona Virus Disease 2019 (COVID-19) pandemic, the international financial market has been in severe turmoil and the global economy at the risk of recession. In order

to counteract the negative effects of epidemic on the economy, the government around the world has employed unprecedented macroeconomic policies, such as increasing government subsidies, cutting interest rates, expanding asset purchases, etc., which feature a supersized level of state intervention. However, opportunities and risks coexist behind these economic schemes. The government's main priority will be weighing up the pros and cons of politicized takeover of the economy. *Free money*, an article from *Leader* section of *The Economist* issued on July 25th 2020, demonstrated the author's attitude towards the phenomenon mentioned above.

Articles from *Leader* section of *The Economist* are editorials by nature. Scholars in the western press believe that four fundamental functions of media are informing, persuading, opinion making and entertaining (Zhang, 2003). In terms of news genres, compared with news report and features, the communicative purpose of editorials is opinion making and persuading, namely remarking on significant events and indoctrinating the public with their viewpoints so as to influence the readers' ideology and to have an impact on the readers' social behavior so that the readers are persuaded to take actions to change the social facts (Zhao, 2014). These characteristics determine the abundant appraisal or evaluation resources in editorials.

Previous discourse studies of editorials are mainly concerned with the (1) writing style, genre and rhetoric (Bonyadi, 2010; Liu, 2009); (2) titles (For and Burns, 2015; Peng, 2009); (3) comparative studies of Chinese and English editorials (Ran, 2012) and (4) interpersonal meaning and APPRAISAL resources (Cheng, 2008; Liu, 2009). With regard to the last category of studies, researchers have investigated distribution features of APPRAISAL resources in English editorial texts. However, these studies have only explored the features of some (not all) aspects of APPRAISAL system. Such incompleteness in examination was complemented in Zhao's (2014) doctoral dissertation. Zhao (2014) set out his study to investigate distribution patterns of APPRAISAL resources covering all aspects of APPRAISAL system in English editorials by collecting 30 editorial texts from 6 English newspapers. The main findings in his study can be summarized as follows: (1) judgement and appreciation resources occur most frequently with almost the same frequency within ATTITUDE resources; (2) English editorials employ a large number of modality resources; (3) the invoked APPRAISAL resources are mainly realized through ideational meanings and GRADUATION resources. Besides the distribution pattern of APPRAISAL resources, the variations of APPRAISAL resources at different stages of genre also deserve an in-depth discursive exploration.

To bridge the research gap, the present study, based on Martinian Genre Theory (Martin and Rose, 2008) and APPRAISAL system (Martin and White, 2005), aims to first analyze the genre of the editorial, *Free money*, then examine the general use patterns of APPRAISAL resources in this text, and finally explore the variations of APPRAISAL resources at different stages of the genre of this text.

This study is of significance from both theoretical and practical perspectives. Theoretically, although previous studies have systematically analyzed the distribution patterns of APPRAISAL resources in English editorials, the variation of APPRAISAL resources at different stages of genre is still worthwhile to research. Practically speaking, by investigating the APPRAISAL resources in editorials written by native speakers, it could help readers to understand editorial texts better and provide sensible suggestions for English learners to produce effectively persuasive writings.

In the following sections, this article first offers the theoretical and analytical framework adopted by this study. Then, the generic structure of *Free money* is described, and overall usage patterns and variations of appraisal resources at different stages of the genre are discussed from both quantitative and qualitative analyses. Finally, major findings, implications, limitations and suggestions for future studies are concluded.

2. Theoretical and analytical framework

2.1. Systemic functional linguistics

As a social semiotic theory of language, SFL focuses on language use in social context. SFL regards context as realized by language rather than disassociated from language, i.e. context is the social reality “that we construe for ourselves by means of language” (cf. Halliday and Matthiessen, 1999: 3). **Figure 1** illustrates the relationship between language and context.

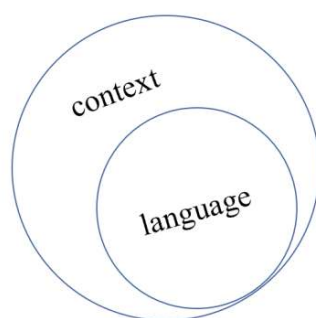


Figure 1. The relationship between language and context (cf. Halliday and Matthiessen, 1999: 36).

In the more recent model developed by Martin (2016), the context is composed of two strata: genre and register. Language is made up of three strata: (discourse) semantics, lexicogrammar and phonology. The relationship between the immediate strata is realization, with the upper stratum realized by the lower stratum. In the present study, two dimensions most relevant to our analysis are reviewed—genre and part of the discourse semantic stratum (APPRAISAL).

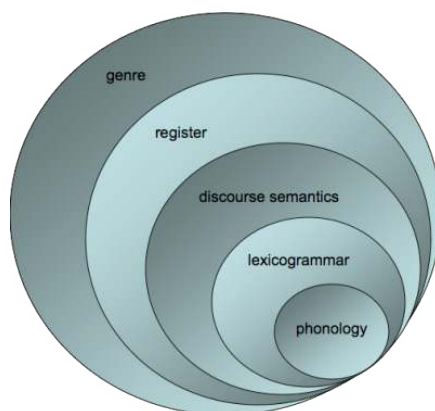


Figure 2. Context as higher strata of meaning (Martin, 2016).

2.1.1 Genre

Martin and his colleagues have adopted a working definition of genre as a ‘staged, goal-oriented social process’ (Martin and White, 2005: 32). The research done by the Sydney School on genre has identified a range of genres in the school curriculum in Australia (e.g. Martin and Rose, 2008). Genres which share specific criteria for similarities form genre families (categories of genre). For example, exposition and discussion are two types of genre within the Argument genre family, as they both function to justify one or several points of view (Martin and Rose, 2008). The differences lie in that the former argues for a point of view, characterized by a ‘Thesis ^ Argument ^ Reiteration of thesis’ structure, while the latter discusses two or more points of view, featured by a ‘Issue ^ Side (n) ^ Resolution’ structure (Martin and Rose, 2008: 137). Notably, a basic genre (or elemental genre) can be embedded in another—where the embedded genre functions as a stage in the genre it is embedded in.

SFL argues for clear linguistic evidence to categorize genres, as genre is realized (manifested) by linguistic choices. In light of functional features of editorials, abundant APPRAISAL or evaluation resources would be employed in editorials, and part of description of resources for appraisal or evaluation in English is known as APPRAISAL.

2.1.2 APPRAISAL system

Situated within the broader theoretical framework of SFL (Halliday, 1994), the APPRAISAL system (Martin 2000; Martin and White, 2005) offers a functional model of interpersonal meaning at the level of discourse semantics, categorizing the attitudes negotiated in a text (i.e. ATTITUDE), the ways in which values are sourced and readers aligned (i.e. ENGAGEMENT) and the strength of the feelings involved (i.e. GRADUATION) (Martin and Rose, 2007).

Within APPRAISAL, the system of ATTITUDE lies at the heart of appraisal semantics (Zhao, 2014). “ATTITUDE is itself divided into three regions of feeling, ‘affect’, ‘judgement’ and ‘appreciation’” (Martin and White, 2005: 35). These three aspects concern the positive or negative expressions of emotion and feelings, the assessment of human behaviors, and the evaluations of semiotic or natural phenomena (Martin and White, 2005). Affect deals with our emotions, including reactions to phenomena we experience and desires for things we want. Judgement evaluates people’s behaviors in terms of social esteem (personal judgement of admiration and criticism) and social sanction (moral judgement of admiration and criticism). Appreciation attends to evaluating things by virtue of our ‘reaction’ to it, its ‘composition’ and its ‘value’. Moreover, Martin and White (2005) proposed strategies for inscribing (explicitly expressing) and invoking (implying) attitudes. ATTITUDE can be realized through lexis that explicitly conveys the attitudinal stance of the writer or speaker; it can be also implicitly ‘invoked’ through ideational meanings (Martin 2000; White, 2002), such as *a desperate scramble to enact policies*. Although *scramble* is not an explicitly evaluative lexis, it connotes negative meaning. By associating the negative meaning with *government*, the text invokes readers’ negative judgement of *government*. Invoke attitudes are more sensitive to the co-text and the context.

The ENGAGEMENT system within APPRAISAL distinguishes between single voiced (or monoglossic) and multi-voiced (or heteroglossic) utterances. Through monoglossic utterances, the writer ‘presents the current proposition as one which has no dialogistic alternatives which need to be recognized, or engaged with’ (Martin and White, 2005: 99). Heteroglossic utterances, on the other hand, invoke or allow for dialogistic alternatives. There are four different ways of indicating

heterogloss: attribution (Martin and White, 2005), modality, negation and concession.

One distinctive feature of attitudes is that they are gradable. GRADUATION deals with grading attitudes whereby emotions can be amplified or downgraded and categories can be sharpened or blurred (Martin and White, 2005: 35). GRADUATION also plays a significant role in ENGAGEMENT system. ENGAGEMENT resources can be graded according to ‘the degree of interlocutors’ investment in the dialogue’ or according to ‘the degree of their intensity’ (Martin and White, 2005: 135-136). Grading allows us to turn the volume of our feelings up or down, using a range of resources, which are termed as force resources. Grading is also involved in adjustments that can be made to the classification of ideational meanings—either sharpening the boundary between categories or softening it. These resources are referred to as focus. Force can be divided into raise and lower, and is usually realized through intensification and quantification. Focus can be divided into sharpen and soften. The overview of APPRAISAL is diagrammatically shown in **Figure 3**.

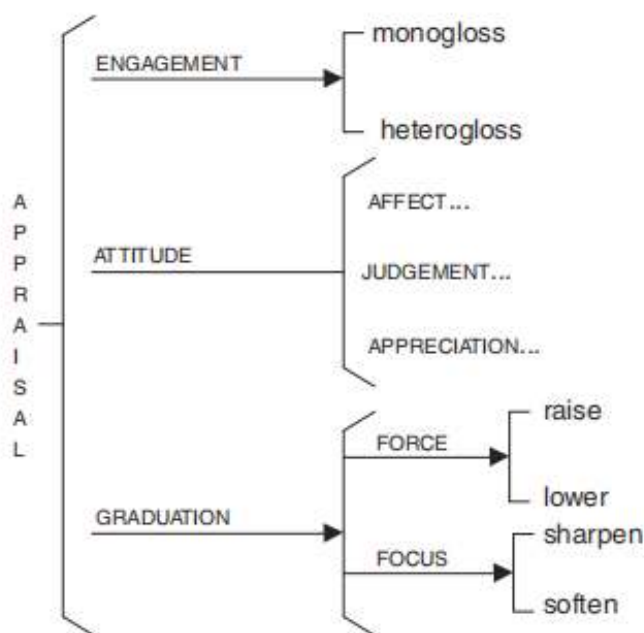


Figure 3. An overview of APPRAISAL resources (Martin and White 2005: 38).

2.2. Analytical framework

Drawing on the above theoretical frameworks, this study develops an analytical framework in accordance to the aims of the research, as shown in **Figure 4**.

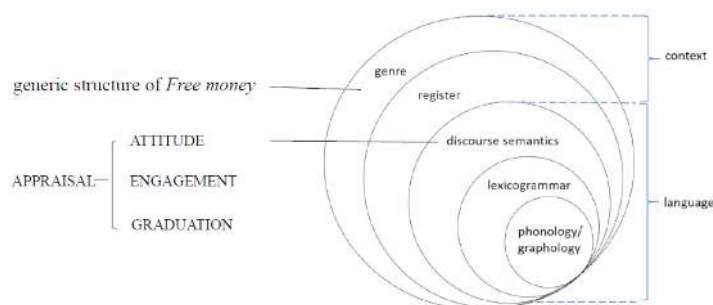


Figure 4. Analytical framework of the present study.

In the next section, we first analyzed the generic structure of the editorial text—*Free money*. Then all APPRAISAL resources in the text were coded and demonstrated in the **Appendix** in order to examine the whole use patterns and their variations at different stages of the genre. Quantitative and qualitative analyses are adopted in this study.

The three research questions guiding this study are listed below:

- (1) Which type of genre is used in the editorial—*Free money*?
- (2) What are the general usage patterns of APPRAISAL resources in this text?
- (3) What are the variations of APPRAISAL resources at different stages of the genre?

3. Genre analysis of *Free money*

As stated above, the function of editorial is opinion making and persuading (Zhao, 2014). This determines that editorials normally belong to Argument genre family. As for *Free money*, the author introduced two points of view from one issue that epidemic marks the start of new era in economy. On the one hand, the new era creates some opportunities; on the other hand, the new era also presents grave risks. The non-single point of view features discussion in Argument genre family (Martin and Rose, 2008). In a word, the whole text discusses one ‘Issue’ from two ‘Sides’.

Some linguistic resources could be found in the text to categorize each stage of the discussion genre. In the first paragraph, after listing the facts that ‘*A profound shift is now taking place in economics*’, the author uses ‘*so*’ to introduce the main thought that ‘*the pandemic marks the start of a new era*’. The following sentence further demonstrates the problems against such new era—‘*Its overriding preoccupation will be exploiting the opportunities and containing the enormous risks that stem from a supersized level of state intervention in the economy and financial markets*’, which is also the content of ‘Issue’ stage. Then in the paragraph 7, the first sentence ‘*A state with a permanently broader and deeper reach across the economy creates some opportunities*’ provides the first ‘Side’ of the discussion, which focuses on the opportunities brought by the new era. Next, paragraphs 8 to 10 unfold around the first sentence of paragraph 8—‘*Yet the new era also presents grave risks*’, which offers the second ‘Side’ of the discussion and focuses on the risks presented by the new era. It is worth noting even in the discussion genre, other genres such as exposition and challenge are embedded as ‘Background’ stage. Paragraph 2 to 5 can be seen as explosion which arguing for one point of view—the four defining features of the new era. And paragraph 6 offers a challenge which rebuts the position that the state will return to normal once the pandemic passes. Both explosion and challenge complements the background information of the issue discussed in the text. The last paragraph demonstrates the ‘Resolution’ to the issue that ‘*the task for policymakers is to create a framework that allows the business cycle to be managed and financial crisis to be fought without a politicized takeover of the economy*’. **Figure 5** displays the generic structure of *Free money*.

4. General usage patterns of appraisal resources

This section is intended to report what kinds of appraisal resources are employed and how they are distributed in *Free money*. The statistics tell us that, there are 67 ATTITUDE resources, with

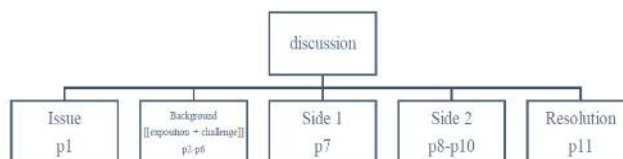


Figure 5. The generic structure of *Free money*.

2 affect resources, 9 judgement resources and 56 appreciation resources. As for ENGAGEMENT, there are 12 ENGAGEMENT resources, with 3 attribution resources, 2 negation resources, 0 modality resource and 7 concession resources. With regard to GRADUATION, there are 34 GRADUATION resources with 33 force resources and 1 focus resource. The general distribution in *Free money* is provided in **Table 1**.

Table 1. APPRAISAL resources and their use patterns in *Free money*

ATTITUDE			ENGAGEMENT				GRADUATION	
affect	judge.	appre.	attribution	negation	modality	concession	force	focus
2	9	56	3	2	0	7	33	1

From Table 1, we can see that within ATTITUDE resources, *Free money* prefers to employ appreciation resources and rarely uses affect resources (56 vs. 2). Within ENGAGEMENT resources, concession resources are used most frequently, while the other types of ENGAGEMENT resources are rarely used. Within GRADUATION resources, there is a sharp contrast between the force resources and focus resources in terms of the use frequency (33 vs. 1). On the whole, we can find that ATTITUDE resources were used most, then GRADUATION resources with engagement resources used least (67 vs. 34 vs. 12). In the following parts, these APPRAISAL resources will be discussed one by one.

4.1. ATTITUDE resources

Table 1 tells us the general distribution of ATTITUDE resources, and the detailed distribution of negative/positive and inscribed/invoked will be provided in **Table 2**.

Table 2. ATTITUDE resources and their detailed use patterns in *Free money*

affect (total 2)				judgement (total 9)				appreciation (total 56)			
neg.	pos.	insc.	inv.	neg.	pos.	insc.	inv.	neg.	pos.	insc.	inv.
1	1	2	0	7	2	6	3	48	8	25	31

White (2012) argues that in affect, the attitude is something the appraiser explicitly is involved in, while in both judgement and appreciation, the attitude is something apparently held by the target (e.g. Affect: ‘I hate it’ vs. Appreciation: ‘it is disgusting’). Therefore, the ratio between affect on the one hand, vs. judgement + appreciation on the other hand can be seen as a measure of the projected objectivity of the appraiser (O’Donnell, 2014). On this basis, we find the ratio above in this study is 2 vs. 65, which clearly shows the objectivity of this editorial. On the other hand, the highest frequency of appreciation is also determined by the abstract and objective target of this editorial, namely the new economic era, and therefore the author prefers to employ more appreciation resources. Although affect resources occur less frequently than judgement and appreciation resources, they do occur in this editorial. English editorial writers make use of affect resources to align the readers, provide color and stimulate human interest (Zhao, 2014). Ungerer holds that it is not likely “that the reader can process emotional descriptions without any kind of emotional

response” (Ungerer, 1997: 319).

With regard to the ratio of direct vs. sublime, O’Donnell (2014) claims the degree to which writers use inscribed attitude instead of invoked attitude could be related to their level of directness, with those authors who use more inscribed attitude being taken as more direct, and those with more invoked attitude as more indirect. In the present study, we find that the ratio between inscribed attitude resources and invoked attitude resources is 33 vs. 34. The nearly equal results show that the author attempted to keep a balance between directness and indirectness in terms of attitude expression. In addition, this ratio also reflects that the author assumed that intended readers have relevant background knowledge to some extent, because authors would avoid invoked appraisals if they assume readers do not share the same values (O’Donnell, 2014).

The positive and negative evaluations in a single text say more about the writer’s attitude towards the target being evaluated in that text (O’Donnell, 2014). From the above table, we get that the ratio between negative attitude resources and positive ones is 56 vs. 11, which reveals that the author held negative attitude towards the issue discussed in this text, namely governments’ supersized level of intervention in the economy and financial markets.

4.2. ENGAGEMENT resources

From Table 1, we can find that among 12 heteroglossic ENGAGEMENT resources, there are 3 attribution resources, 2 negation resources and 7 concession resources. Among heteroglossic expressions, the distribution is made between dialogic expansion and dialogic contraction. The former refers to expressions that allow for dialogically alternative positions and the latter consists of expressions that challenge or fend off the scope of alternative positions (Martin and White, 2005). On this basis, the attribution resources belong to dialogic expansive resources, while negation and concession belong to dialogic contractive resources. Such categorization is illustrated in **Table 3**.

Table 3. ENGAGEMENT resources in *Free money*

dialogue contraction		dialogue expansion
negation	concession	attribution
2	7	3

From Table 3, we can find the ratio between dialogue contractive resources and expansive resource is 9 vs. 3, which reveals that the author attempts to limit the alternative voices. Following extracts are co-texts of some ENGAGEMENT resources in *Free money*.

1. **Yet** (concession) *the new era also presents grave risks.*
2. **And even if** (concession) *inflation stays low [...].*
3. **However** (concession), **though** (concession) *that would provide a brief stimulus [...].*
4. **Yet** (concession) *today interest rates, so close to zero [...].*
5. **Don’t** (negation) *fool yourself that the role of the state will magically return to normal [...].*

From above examples, we could find the author used many concession resources and negation resources to counter readers’ expectancy on the opportunities brought by the new era and therefore foreground the dangers presented by the state’s intervention in the economy.

The co-texts of three Attributions in the text are:

- 6. *It is sometimes **said** [...].*
- 7. *The IMF **predicts** [...].*
- 8. *As our briefing this week **explains** [...].*

We can find that the author reported the third-party’s utterances in order to keep objective and make his argument more persuasive.

4.3. GRADUATION resources

From Table 1, there are 33 forces resources and 1 focus resource. As mentioned above, the force resources can be further divided into quantification and intensification and focus can be divided into soften and sharpen resources. A more detailed categorization of GRADUATION resources in *Free money* is provided in **Table 4**.

Table 4. GRADUATION resources in *Free money*

force				focus	
quantification		intensification		soften	sharpen
raise	lower	raise	lower		
16	0	17	0	1	0

From Table 4, we can find for force resources, the number of quantification resources and intensification resources is nearly equal (16 vs. 17). Notably, all force resources in this text are used to amplify attitude and meaning, which is in line with view that “in English we seem to have more resources for turning the volume up than down, and use them more often (Martin and Rose, 2007: 42)”. The only focus resource in the text appears in the co-text ‘*money worth some \$3.7trn*’, which show author’s uncertainty about the exact number of the money.

4.4. Summary

In this section, we have taken a look at what APPRAISAL resources are employed in *Free money*. With regard to ATTITUDE resources, we have calculated three ratios: personal vs. objective; direct vs. sublime; and negative vs. positive and analyzed implying meanings behind the results of these ratios. As for ENGAGEMENT, we counted the ratio between dialogic expansive resources and contractive resources, and then analyzed author’s purposes by citing specific examples. With GRADUATION, we have found that forces resources far outnumbered focus resources in *Free money*, and all forces resources are used to amplify attitude and meanings in the text.

5. Variations of APPRAISAL resources at different stages of the genre

As stated above, the goal of editorials is to steer the public opinion, to guide the audience, or to interpret the news issues for the audience (Zhao, 2014). It is not only informing readers but guiding them—recommending, persuading, advocating, cajoling—that distinguished opinion writing from news writing (Fink, 2004: 6). In order to realize their goals, English editorials need several stages or schematic structures. In this study, the genre of the editorial is discussion, and it has four main stages, Issue, Background, Side and Resolution. Since English editorials employ

a variety of language resources to interact with audience so as to persuade them to accept the editorials’ opinions, the genre of editorials is also a social process. These stages of the genre are conducive to realizing the goal of editorials, so it is of great significance to figure out the variations of APPRAISAL resources across these different stages so as to explore the appraisal patterns of English editorials.

5.1. APPRAISAL resources in headline

Before exploring the appraisal resources in stages of the genre, we first examine them in the headline of this editorial. Headline is the “eye” of editorials, and therefore are required to be judgemental, simple, clear, eye-catching, and clear-cut (Zhao, 2014). One point that needs mentioning is that some editorials have sub-headline, serving as an explanation for the main headline. Obviously, the headline of the editorial examined in this study is ‘*Free money*’, and its sub-headline is ‘*Governments can now spend as they please. That presents opportunities—and grave dangers*’. We compile a table to illustrate the APPRAISAL resources in the headline.

Table 5. APPRAISAL resources in the headline

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	invc/inv	
free	author	money	Ap	N	inv	
free money	author	government	J	N	inv	
please	governments	\	Af	P	invc	
grave	author	dangers	Ap	N	invc	[force: intensification & raise]

From **Table 5**, we can see that the author uses four ATTITUDE resources and one GRADUATION resource in a short headline.

‘Free’ in the main headline is an appraisal resource used by the author to evaluate ‘money’. It is an invoked resource since ‘Free money’ sounds like a paradox and functions as a metaphor. It easily reminds us of a proverb—there’s no such thing as a free lunch. Although ‘Free money’ is not an explicitly evaluative lexis, it connotes negative meaning with ‘free lunch’. By doing so, the text invokes readers’ negative judgement of government. ‘[P]lease’ implies currently governments are willing to spend ‘free money’. However, such spending may lead to good as well as bad results. Remarkably, compared with ‘opportunities’, the author put the ‘danger’ at the end of sentence introduced by a dash and used a combination of ATTITUDE and GRADUATION resource ‘grave’ before ‘dangers’. Such combination is called ‘coupling’. Coupling refers to the combination of meanings across simultaneous systems (Martin, 2010). The dash and the coupling here function to turn up the volume of author’s attitude—the dangers of ‘Free money’ are larger than its opportunities. Therefore, by employing these APPRAISAL resources, the headline implies author’s stance in the text.

5.2. APPRAISAL resources in Issue stage

The Issue stage in the discussion genre functions as demonstrating the topic of an article. As the first section in the editorial, it should be composed to be interesting, distinctive and attractive so as to grab the readers’ eyeballs. And the APPRAISAL resources in Issue stage decide to some extent whether introduction of the editorial are successful or not. Due to the word limit, the whole text and all appraisal resources coded are provided in the Appendix and only part of resources would be

shown in the following tables.

At the beginning of the text, the author used two attribution resources to expand the dialogue, such as ‘*It is sometimes said [...]*’ and ‘*Nobody will say [...]*’. These heterogloss resources indicate that editorial writers expect readers to participate in the interaction with writers and texts, therefore stimulating the readers’ interest.

With regard to ATTITUDE resources, we selected 6 out of 9 attitudinal resources concerning governments and policies in **Table 6**. We can find all evaluative resources regarding governments and policies are negative and therefore a negative prosody of evaluation is created. Besides resources appraised by the author, there are two negative judgement resources (i.e. “*wasted*” and “*failing to rethink*”) from non-author. By doing so, the evaluation appears to be less personalized and more convincing.

Table 6. Part of APPRAISAL resources in Issue stage

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
wasted	unspecified	governments	J	N	insc	
failing to rethink	unspecified	governments	J	N	insc	
desperate scramble	author	governments	J	N	inv	[force: intensification & raise]
unimaginable	author	policies	Ap	N	insc	
heretical	author	policies	Ap	N	inv	
supersized level	author	state intervention	J	N	inv	[force: quantification & raise]

In addition, we can find in Appendix that many GRADUATION resources are employed in the Issue stage. Some of GRADUATION resources are coupled with ATTITUDE to amplify negative evaluation towards governments’ intervention in the economy, and some function solely to tone up the swiftness, rarity and profundity of the economic shift.

In a word, the author used expanding ENGAGEMENT resources in the Issue stage to establish interaction with readers, ATTITUDE resources to create negative prosody and GRADUATION resources to amplify the negative attitude towards governments’ intervention and profundity of the economic shift.

5.3. APPRAISAL resources in Background stage

Different from other stages, there are two genres—exposition and challenge—embedded in the Background stage. The exposition introduces four defining features of new economic era. And the position that the state will return to normal once the pandemic passes is rebutted in the challenge genre.

For exposition genre (paragraphs 2 to 5), the invoked ATTITUDE resources obviously outnumber the inscribed resources (12 vs. 3). This is because the author stated lots of hard facts to interpret

the features of new era in this stage. In order to make his statement convincing, the author should hide attitude or implicitly express attitude in this stage. Moreover, all attitudinal resources in the exposition genre are negative, which further strengthens the negative prosody in the text.

However, the change happens in the challenge genre (paragraph 6). The author used a negation resource ‘*Don’t*’ to engage readers. By contracting alternative voices, the author here shows authoritative position that state will not return to normal.

Then we can see in **Table 7** that more positive attitude resources appear but all of them are employed by the author to evaluate shadow banks and capital markets, while those resources evaluating central banks are negative. This is because in the new era, the financial market becomes abnormal. Originally, central banks function as monitor of the market, but now the central banks begin to directly participate in the economic activities. Positive appraisals of shadow banks actually highlight the decline of the central banks to some extent. In addition, we can see from Appendix that 7 out 8 attitudinal resources in this paragraph are inscribed. Unlike the content in the exposition genre, author explicitly expresses attitude in order to persuasively rebut the people’s original expectancy to the financial market.

Table 7. Part of APPRAISAL resources in challenge genre

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
stagnation	author	banks as intermediaries	Ap	N	insc	
prominence	author	shadow banks and capital markets	Ap	P	insc	
innovative	author	shadow banks and capital markets	Ap	P	insc	
risk-hungry	author	shadow banks and capital markets	Ap	P	insc	
get their hands dirty	author	central banks	Ap	N	insc	

5.4. APPRAISAL resources in Side stage

From above genre analysis, we have known that two Sides are involved in this editorial. Paragraph 6 is Side one, which argues for the opportunities brought by the new era; paragraphs 7 to 10 are Side two, which on the other hand, states the dangers presented by the new era. In this stage, the editorial writers are supposed to present all the pertinent facts, persuasive language and logical arguments (Newsom and Wollert, 1985).

In this editorial, we can clearly see the polarity of attitude between Side one and Side two. In Side one, most of attitudinal resources (5 out of 7) are positive while in Side two all attitudinal resources are negative (see Appendix). This corresponds with the two contrary points of view in these two Sides. In addition, different from Background stage in which most evaluative resources are invoked, the inscribed attitudes get the upper hand in Side stage (17 vs. 11). As explained above, in this stage, the author is supposed to explicitly demonstrate his stance in order to make his argument impressive and persuasive.

With regard to ENGAGEMENT resources, four concession resources occur respectively in transition sentence in paragraphs 8 and 10. By employing concession resources, the author counters readers’ expectancy and steer the views that new era not only brings opportunities but also risks which are even more than opportunities.

After discussing the ATTITUDE and ENGAGEMENT resources, we turn our attention to GRADUATION resources. This stage has only four paragraphs out of eleven, but it employs nearly half of ENGAGEMENT resources (16 out of 34). Sometimes, the GRADUATION resources could invoke the ATTITUDE. For instances, the ‘*sprawling*’ in ‘*sprawling macroeconomic management*’ connotes the author’s negative attitude towards states’ intervention in the economy. By employing several raise force resources, the volume of the attitude is increased.

5.5. APPRAISAL resources in Resolution stage

As the conclusion part of the editorial, the Resolution stage is where the author delivers his opinions, suggests (demands) actions, and calls for reader involvement (Fink, 2004). The APPRAISAL resources are provided in the **Table 8**.

Obviously different from the Side stage, the attitudinal resources in Resolution are all invoked and negative. As we know, the author makes suggestions in this part, and therefore he is supposed to be objective so as to make his advice as convincing as possible. The author attempts to hide his attitude in this stage; however, by connecting the context (or prosody), we can reveal the negative attitude behind these implicitly evaluative resources, which show the difficulty of the tasks and severity of the stakes.

Table 8. APPRAISAL resources in Resolution stage

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
holy grail	author	task	Ap	N	inv	
politicised	author	takeover	Ap	N	inv	
high	author	stakes	Ap	N	inv	
The stakes are high.	author	New era	Ap	N	inv	
staggering	author	price	Ap	N	inv	[force: intensification & raise]

5.6. Summary

A short headline contains four ATTITUDE resources and one GRADUATION resource to lay a foundation of the prosody of the text. In Issue stage, the author uses engagement resources to expand the dialogue so as to attract readers’ attention. At the same time, by employing authorial and non-authorial attitudinal resources, the author attempts to keep objective on the issue discussed. However, more negative attitudes towards governments and state’s intervention reveal author’s stance to some extent. In Background stage, the author employs more invoked attitudes to avoid explicit personal attitudes to make the hard facts statements more convincing. In Side stage, more negative attitudes than positive attitudes are used to steer the view that more dangers than opportunities are involved in the new era. Finally, in Resolution stage, more inscribed attitudes occur to keep conclusions and suggestions impressive and persuasive.

6. Conclusion

Drawing upon Martinian Genre Theory (Martin and Rose, 2008) and APPRAISAL system (Martin and White, 2005), this study has analyzed the generic structure of the editorial—*Free money*, examines general patterns of usage of appraisal resources in this text and explores the variations of

APPRAISAL resources at different stages of the genre. The major findings are followings:

First, *Free money* employed discussion genre on the whole with exposition and challenge genres embedded in the Background stage. Second, with regard to APPRAISAL resources, the author mainly used negative appreciation resources within ATTITUDE to form the prosody of the text, and the number of invoked and inscribed ATTITUDE resources are nearly equal. Within ENGAGEMENT resources, the author deployed more dialogue contractive ENGAGEMENT resources like negation and concession. As for GRADUATION, nearly all resources are raising force resources which function to amplify the attitudes and meanings. Third, the APPRAISAL resources at different stages of the genre demonstrate distinct features which can be justified by the function of each stage. For instance, the Issue stage used two out of three attribution resources within ENGAGEMENT at the beginning of the text to open the dialogue and draw the readers' attention; in Background stage, more invoked resources were employed to hide the attitude, thereby making the fact reporting more objective and convincing; far more negative resources were used in Side stage to deliver the opinion that the dangers behind the new economic era outweigh the opportunities, and finally more inscribed resources were employed in Resolution stage to manifest the author's attitude and make the suggestions more impressive.

This study has its implications for exploring the variations of APPRAISAL resources at different stages of the genre of the editorial. Moreover, by investigating the APPRAISAL resources in editorials written by native speakers, it could help readers to understand editorial articles better and provide sensible suggestions for English learners to produce effectively persuasive writings. However, due to time and word limit, this study could not collect more editorials to make its results more comprehensive, which is expected to be enhanced in future studies.

Conflict of interest

No conflict of interest was reported by all authors.

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Appendix: APPRAISAL resources in *Free money*

Coding scheme:

ATTITUDE resources italicized; GRADUATION resources highlighted; ENGAGEMENT resources marked in bold.

Af = affect J = judgement Ap = appreciation P = positive N = negative Insc = inscribed
Inv = invoked

Para. 1

It is sometimes **said** (attribution) that governments *wasted* the global financial crisis of 2007-09 by *failing to rethink* economic policy after the dust settled. **Nobody** (negation) will **say** (attribution) the same about the covid-19 pandemic. It has led to a desperate scramble to enact policies that **only** (concession) a few months ago were *either unimaginable or heretical*. A profound shift is now taking place in economics as a result, of the sort that happens only (concession) once in a generation. Much as in the 1970s when clubby Keynesianism gave way to Milton Friedman's austere monetarism, and in the 1990s when central banks were given their independence, so the pandemic marks the start of a new era. Its overriding preoccupation will be exploiting the opportunities and containing the enormous risks that stem from a *supersized level* of state intervention in the economy and financial markets.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
wasted	unspecified	governments	J	N	insc	
failing to rethink	unspecified	governments	J	N	insc	
desperate scramble	governments	to enact policies	Af	P	insc	[force: intensification & raise] *2
	author	governments	J	N	inv	
a few months ago	author	/				[force: quantification & raise]
unimaginable	author	policies	Ap	N	insc	
heretical	author	policies	Ap	N	inv	
profound	author	shift				[force: intensification & raise]
once in a generation	author	the happening of a profound shift				[force: quantification & raise]
overriding	author	preoccupation	Ap	P	insc	[force: intensification & raise]
preoccupation	author	/				[force: intensification & raise]
enormous	author	risks				[force: quantification & raise]
supersized level	author	state intervention	J	N	inv	[force: quantification & raise]
state intervention	author	/	Ap	N	inv	

Para. 2

This new epoch has four defining features. The first is the *jaw-dropping scale of today's government borrowing*, and the seemingly *limitless* potential for yet more. The IMF **predicts** (attribution) that rich countries will borrow 17% of their combined GDP this year to fund \$4.2trn in spending and tax cuts designed to keep the economy going. They are **not done**. In America Congress is debating another spending package (see United States section). The European Union

has just agreed on a new stimulus funded by common borrowing, crossing a political Rubicon (see next Leader).

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
jaw-dropping	author	scale of today's government borrowing	Ap	N	insc	[force: intensification & raise]
jaw-dropping scale of today's government borrowing	author	new epoch	Ap	N	inv	
limitless	author	potential for borrowing more	Ap	N	insc	[force: quantification & raise]
yet more	author	amount of borrowing				[force: quantification & raise]
not done	author	rich countries	Ap	N	insc	

Para. 3

The second feature is the *whirring of the printing presses*. In America, Britain, the euro zone and Japan central banks have created new reserves of money worth some \$3.7trn in 2020. Much of this has been used to buy government debt, meaning that central banks are *tacitly financing the stimulus*. The result is that long-term interest rates stay low even while public-debt issuance soars.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
whirring	author	printing process	Ap	N	inv	
whirring of the printing presses	author	new epoch	Ap	N	inv	
some	author	\$3.7trn				[focus: soften]
tacitly financing the stimulus	author	central banks	Ap	N	inv	

Para. 4

The state's growing role as capital-allocator-in-chief is the third aspect of the new age. To see off a credit crunch, the Federal Reserve, acting with the Treasury, has waded into financial markets, buying up the bonds of AT&T, Apple and even Coca-Cola, and lending directly to everyone from bond dealers to non-profit hospitals. Together the Fed and Treasury are now backstopping 11% of America's entire stock of business debt. Across the rich world, governments and central banks are following suit.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
capital-allocator-in-chief	author	the state's growing role	Ap	N	inv	
The state's growing role as capital-allocator-in-chief	author	new epoch	Ap	N	inv	

(continued)

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	invc/inv	
waded into financial markets	author	Federal Reserve and the Treasury	Ap	N	inv	
buying up the bonds ...	author	Federal Reserve and the Treasury	Ap	N	inv	
lending directly to everyone	author	Federal Reserve and the Treasury	Ap	N	inv	
following suit	author	governments and central banks	Ap	N	inv	

Para. 5

The final feature is the most important: *low inflation*. The absence of upward pressure on prices means there is no immediate need to slow the growth of central-bank balance-sheets or to raise short-term interest rates from their floor around zero. Low inflation is therefore the fundamental reason not to worry about public debt, which, thanks to accommodative monetary policy, now costs *so little* to service that it looks like free money.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	invc/inv	
most important	author	the final feature				[force: intensification & raise]
low inflation	author	new epoch	Ap	N	inv	
fundamental	author	reason				[force: intensification & raise]
so	author	little	Ap	N	inv	[force: quantification & raise]

Para. 6

Don't (negation) *fool* yourself that the role of the state will magically return to normal once the pandemic passes and unemployment falls. Yes, governments and central banks may dial down their spending and bail-outs. **But** (concession) the new era of economics reflects the culmination of long-term trends. Even before the pandemic, inflation and interest rates were subdued despite a jobs boom. Today the bond market still shows no sign of worrying about long-term inflation. If it is right, deficits and money-printing may well become the standard tools of policymaking for decades. The central banks' growing role in financial markets, meanwhile, reflects the *stagnation* of banks as intermediaries and the *prominence* of *innovative* and *risk-hungry* shadow banks and capital markets (see Finance section). In the old days, when commercial banks ruled the roost, central banks acted *as lenders of last resort* to them. Now central banks increasingly have to *get their hands dirty* on Wall Street and elsewhere by acting as mammoth "*market makers of last resort*".

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	invc/inv	
fool	author	readers	J	N	invc	
stagnation	author	banks as intermediaries	Ap	N	invc	
prominence	author	shadow banks and capital markets	Ap	P	invc	
innovative	author	shadow banks and capital markets	Ap	P	invc	

(continued)

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
risk-hungry	author	shadow banks and capital markets	Ap	P	insc	
lenders of last resort	author	central banks	Ap	P	insc	
get their hands dirty	author	central banks	Ap	N	insc	
mammoth	author	central banks				[force: intensification & raise]
market makers of last resort	author	central banks	Ap	N	inv	

Para. 7

A state with a permanently broader and deeper reach across the economy creates some opportunities. Low rates make it cheaper for the government to borrow to build new infrastructure, from research labs to electricity grids, that will *boost growth* and *tackle threats such as pandemics and climate change*. As societies age, rising spending on health and pensions is inevitable—if the resulting deficits help provide a *necessary stimulus* to the economy, *all the more reason to embrace them*.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
permanently	author	broader and deeper reach				[force: quantification & raise]
broader	author	reach				[force: intensification & raise]
deeper	author	reach				[force: intensification & raise]
cheaper	author	government's borrowing				[force: intensification & raise]
boost growth	author	government's building infrastructure	J	P	insc	
tackle threats	author	government's building infrastructure	J	P	insc	
threats such as pandemics	author	pandemics	Ap	N	insc	
threats such as climate change	author	climate change	Ap	N	insc	
boost growth and tackle threats	author	a state with a permanently broader and deeper reach across the economy	Ap	P	inv	
rising	author	spending				[force: quantification & raise]
necessary stimulus	author	resulting deficit	Ap	P	insc	
all the more reason to embrace them	author	resulting deficit (state intervention)	Ap	P	insc	[force: intensification & raise]

Para. 8

Yet (concession) *the new era* also presents *grave risks*. If inflation jumps unexpectedly the *entire edifice of debt* will shake, as central banks have to raise their policy rates and in turn pay out vast sums of interest on the new reserves that they have created to buy bonds. And **even if** (concession) inflation stays low, the new machinery is *vulnerable* to capture by lobbyists, unions and cronies.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
grave	author	risks	Ap	N	insc	[force: intensification & raise]
risks	author	new era	Ap	N	insc	
jump	author	inflation				[force: quantification & raise]
entire edifice of debt	author	debt/new era	Ap	N	inv	[force: quantification & raise]
vast sums of	author	interest				[force: quantification & raise]
vulnerable	author	the new machinery/new era	Ap	N	insc	[force: intensification & raise]
the new era	author	/	Ap	N		

Para. 9

One of monetarism’s key insights was that *sprawling macroeconomic management leads to infinite opportunities for politicians to play favorites*. Already they are deciding which firms get tax breaks and which workers should be paid by the state to wait for their old jobs to reappear. Soon some loans to the private sector will *turn sour*, leaving governments to choose which firms fail. When money is free, why not *rescue companies, protect obsolete jobs and save investors*?

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
sprawling	author	macroeconomic management	Ap	N	inv	[force: quantification & raise]
sprawling macroeconomic management lead to...	author	macroeconomic management	Ap	N	inv	
play favorites	author	politician	J	N	inv	
infinite	author	opportunities				[force: quantification & raise]
politicians to play favorites	author	/	Ap	N	inv	
turn sour	author	loans to the private sector	Ap	N	insc	
obsolete	author	jobs	Ap	N	insc	
rescue companies, protect obsolete jobs and save investors	author	free money policy	Ap	N	inv	

Para. 10

However (concession), **though** (concession) that would provide a *brief stimulus*, it is a recipe for *distorted markets, moral hazard and low growth*. *Fear of politicians’ myopia* was why many

countries delegated power to independent central banks, which wielded a single, simple tool—interest rates—to manage the economic cycle. **Yet** (concession) today interest rates, so close to zero, seem *impotent* and the *monarchs* who run the world’s central banks are becoming rather like *servants* working as the government’s debt-management arm.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
brief stimulus	author	free money/state intervention	Ap	N	inv	
distorted	author	markets	Ap	N	insc	
a recipe for distorted markets	author	free money/state intervention	Ap	N	insc	
a recipe for low growth	author	free money/state intervention	Ap	N	insc	
fear	many countries	politician’s myopia	Af	N	insc	
myopia	many countries	politician	J	N	insc	
many	author	countries				[force: quantification & raise]
so	author	close to zero	Ap	N	inv	[force: quantification & raise]
impotent	author	today’s interest rates	Ap	N	insc	
monarchs/servants	author	central bank leaders	J	N	inv	
the monarchs ...are becoming rather like servants	author	free money/state intervention	Ap	N	inv	[force: intensification & raise]

Para. 11

Free markets and free lunches

Each new era of economics confronts a new challenge. After the 1930s the task was to prevent depressions. In the 1970s and early 1980s the *holy grail* was to end stagflation. Today the task for policymakers is to create a framework that allows the business cycle to be managed and financial crises to be fought without a *politicized* takeover of the economy. As **our briefing** this week **explains** (attribution), this may involve delegating fiscal firepower to technocrats, or reforming the financial system to enable central banks to take interest rates deeply negative, exploiting the revolutionary shift among consumers away from old-style banking to fintech and digital payments. *The stakes are high*. Failure will mean the age of free money eventually comes at a *staggering* price.

APPRAISAL resources	appraiser	appraised	ATTITUDE			GRADUATION
			attitude type	pos/neg	insc/inv	
holy grail	author	task	Ap	N	inv	
politicized	author	takeover	Ap	N	inv	
high	author	stakes	Ap	N	inv	
The stakes are high.	author	new era	Ap	N	inv	
staggering	author	price	Ap	N	inv	[force: intensification & raise]

ORIGINAL ARTICLE

The historical characteristics of the source domains in Chinese LIFE metaphor

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Abstract: This research investigates the diachronic variation of the source domains in Chinese LIFE metaphor. Close examination of data from historical corpora has revealed that the source domain types evolve gradual diversified changes based on the social material and cultural life. Specifically, the results show that (1) harsh living environment and farming understanding account for Chinese ancestors' preference for crops as the source domain in their life metaphors, (2) the territory extension and duplicate metaphysics together give reasons why the Tang Chinese favor transportation as well as natural phenomenon as the source domains in their life metaphors, (3) the increasing material enrichment and cultural diversification of modern times provide experiential motivation of the gamut of source domain types in Mandarin life metaphors. Thus, a conclusion can be reached that metaphor variation reflects social material level and intellectual level throughout the ages.

Keywords: Chinese LIFE metaphor; source domain; historical characteristics; material level; intellectual level

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1. Introduction

Conceptual Metaphor Theory (Lakoff and Johnson, 1980) believes that metaphor comprises the source domain and the target domain. Generally speaking, concepts in the source domain are used to be more concrete or physical, while those in the target domain are more abstract or elusive. As a way of thinking and cognition, metaphor shows both universality and cultural differences.

Social culture influences the metaphorical expressions in different ways; metaphor is created and accepted in a certain cultural context (Kövecses, 2005, 2015). Culture helps to select and filter the appropriate physical experience, and form a conventionalized metaphoric expression (Yu, 2008; Yu and Jia, 2016). Owing to the significant role of culture in the formation of conceptual metaphor, the topic of comparing metaphorical expressions in different cultural backgrounds is not a new one (Guo, 1998; Ding, 2004; Kövecses, 2006; Li, 2007; Wang, 2009; Zhang, 2012; Qin and Huang, 2014).

From the perspective of embodied philosophy and culture, these studies have revealed the influence of culture in different periods on metaphorical expressions, but there is still a lack of systematic and in-depth research on the historical characteristics of metaphors and its underlying motivation.

As a cross-domain mapping process, metaphor is a series of correspondences from the concrete concept to the abstract concept, which is rooted in our embodied experience and life knowledge, and is based on the cognitive experience of national culture and daily language. This paper focuses on the metaphorical expressions of “life” (人生 *rensheng*) in Chinese, with particular attention to its diachronic evolution and the underlying motivations. For the convenience of discussion, this study compares LIFE metaphor in modern Chinese¹ with those in *The Book of Poetry* of the pre-Qin Period (Qin Dynasty 221 B.C.E.–207 B.C.E.) and *300 Tang Poems* of the Tang Dynasty (618 A.D.–907 A.D.). The reason for choosing these two books lies in: on the one hand, in the past and present, numerous writers share ideas and express emotions with metaphors in poems; on the other hand, *The Book of Poetry* is the first collection of poems in China, representing the Chinese ancestors’ world view, while *300 Tang Poems* is a representative of the Tang civilization.

2. The LIFE metaphor in *The Book of Poetry*

“Fu” (赋 *fu*), “Bi” (比 *bi*) and “Xing” (兴 *xing*) are three important artistic features of *The Book of Poetry*, heralding the poetic compositions in ancient China. For a long time, when Chinese scholars talk about the origin of metaphors, they usually highlight the great contributions made by 比 *bi* and 兴 *xing* in *The Book of Poetry*. In short, 比 *bi* means to make comparisons, including metaphors and similes. That is, the poet should write about one object by comparing it to another. In other words, the object that the poet depicts in the poem is not what he really means to sing of. He only makes a comparison to convey his thoughts and feelings. 兴 *xing* means “to stimulate”. That is, the poet is prompted to sing when certain objective things arouse his emotions. Therefore, it usually appears at the beginning of a poem or a stanza within a poem. As a matter of fact, 兴 *xing* is a kind of metaphor (Wang, 2006: 484). Therefore, this study regards both 比 *bi* and 兴 *xing* as metaphorical expressions in *The Book of Poetry*.

By collecting and analyzing the corpus, 24 life metaphors are found in 305 poems of *The Book of Poetry*. Through further generalization, we can roughly summarize the source domains of life metaphors in *The Book of Poetry* into the following several upper-level conceptual domains and rank them from high to low according to the proportion of mappings contained in each upper-level conceptual domain. The results are as follows: (i) animal/plant domain (83.3%); (ii) action/transportation domain (8.3%); (iii) natural phenomenon domain (4.2%); (iv) matter/object domain (4.2%) (see **Table 1**).

2.1. The animal/plant domain

According to Table 1, people usually use concepts of the animal/plant domain to metaphorically understand “life” in *The Book of Poetry*, especially the plant concepts (among the 20 life metaphors projected from the animal/plant domain, 19 are mapped from the plant concepts). The ancient Chinese often use the growth cycle of plants to refer to the different stages of life:

1. The Mandarin corpus in this study comes from the Modern Chinese Corpus of the Chinese Linguistics Research Center of Peking University.

Table 1. LIFE metaphor in *The Book of Poetry*

Source domain	Concrete concepts	Number of mappings (%)	Total 24 (100%)
Animal/plant	Fruits and trees: peach (tree), plum, jujube tree, mulberry, gourd, and grape vine; Crops: millet, and sorghum; Ornamental plants: Chinese bush cherry, and lotus; Herbaceous plants: motherwort, weeds, tarragon, wormwood, mugwort, creeper, reeds and sweet sedge; Animals: mayfly	20 (83.3%)	
Action/transportation	Swimming, and taking a boat	2 (8.3%)	
Natural phenomenon	Snow, and graupel	1 (4.2%)	
Matter/object	Stone	1 (4.2%)	

(1) 桃之夭夭，灼灼其华。之子于归，宜其室家。桃之夭夭，有蕢其实。之子于归，宜其家室。桃之夭夭，其叶蓁蓁。之子于归，宜其家人。 (《周南·桃夭》)

The peach tree stands wayside, with blossoms glowing pink. I wish the pretty bride, affluence in food and drink. The peach tree stands wayside, with fruits hanging rife. I wish the pretty bride, abundant wealth in life. The peach tree stands wayside, with leaves thick and dense. I wish the pretty bride, a pleasant home e'er hence.

(*Southern Zhou: The Beautiful Peach*, translated by Wang, 2008: 11)

Example (1) is a poem congratulating a young girl on her marriage. The whole poem consists of three chapters. In each chapter, the concept of peaches is metaphorically used first to mapped onto the life concept, and then flowers, fruits and leaves. From flowering to fruiting, and then fruits abscission to a profusion of leaves, it metaphorically refers to the happy life of the newlyweds after marriage, in which the gradual change of metaphorical mappings naturally integrates with the plant growth.

(2) 標有梅，顷筐墜之。求我庶士，迨其谓之。 (《召南·標有梅》)

I cast you plums from the tree, in baskets on the way. If you want to marry me, you'd better come and say.

(*Southern Shao: The Plums*, translated by Wang, 2008: 33)

(3) 桑之落矣，其黄而陨。自我徂尔，三岁食贫。 (《卫风·氓》)

The mulberry leaves are dry, When from the tree they fly. Since I became his wife, I've led a wretched life.

(*Songs of Wei: My Man*, translated by Wang, 2008: 105)

Example (2) and (3) use the growth of “plum” and “mulberry” respectively to refer to the life process. As time goes by, the growth process of plants from the germination to the fallen blossom is just like the passing of life time. Thus, these two examples both use the decaying plum and mulberry leaves to metaphorically understand people’s fading youth.

Besides, the luxuriant plants growing at the edge of the water can be metaphorically used to describe the vigorous development of life as well as the young man in love, as illustrated in example (4):

(4) 彼泽之陂，有蒲与荷。有美一人，伤如之何？ (《陈风·泽陂》)

Along the lakeshore by the edge, grow the lotus and sweet sedge. A handsome man is standing there; how he fills me with despair!

(*Songs of Chen: The Lakeshore*,

translated by Wang, 2008: 245)

The following example (5) uses different concepts in the animal/plant domain, namely, “tarragon”, “wormwood”, and “mugwort”, to metaphorically describe different ways of life. Tarragon (莪 *e*) is a plant with leaves that have a strong taste and are used in cooking as a fragrant and delicious herb; here, it is a metaphor to describe someone who becomes a useful person and shows filial obedience. However, wormwood (蒿 *hao*) and mugwort (蔚 *wei*) are scattered plants; wormwood is a plant with a bitter flavor and not edible here, while mugwort cannot bear seeds and be eaten as food either. Here, they are jointly used to metaphorically refer to a person who is not able to be successful and filial:

(5) 蓼蓼者莪，匪莪伊蒿。哀哀父母，生我劬劳。 (《小雅·蓼莪》)

Unlike thick tarragons that grow, the worthless wormwood crawls below. Alas, my father; alas, my mother! You helped me more than any other.

(*Minor Odes: Thick Tarragons*,

translated by Wang, 2008: 419)

There are many other metaphorical expressions of LIFE IS PLANTS GROWTH in *The Book of Poetry*. Due to limited space, they cannot be discussed one by one. The following example (6) is a metaphorical expression of LIFE IS ANIMALS GROWTH in *The Book of Poetry*:

(6) 蜉蝣掘阅，麻衣如雪。心之忧矣，于我归说。 (《曹风·蜉蝣》)

The mayfly puts on wings, just like a white hemp dress. I’m filled with deep distress; what is it that fate brings!

(*Song of Cao: The Mayfly*,

translated by Wang, 2008: 253)

Mayfly, which is born in the morning and dies at night, usually has a very short lifespan. At the beginning of example (6), the poet firstly describes how the mayfly flaunts its wings and appearance.

By focusing on the brevity of this beautiful but weak insect's life, this example understands the living conditions of human beings metaphorically with the concept of mayflies.

2.2. The action/transportation domain

There are two metaphorical expressions projected from the action/transportation domain in *The Book of Poetry*, as illustrated in the following examples (7) and (8):

(7) 就其深矣，方之舟之。就其浅矣，泳之游之。 (《邶风·谷风》)

When river water's deep and wide, I'll take a boat upon the tide. Where river water's low and slow, I'll swim or wade across the flow.

(*Song of Bei: The Mountain Gales*,
translated by Wang, 2008: 61)

By stating the view of “taking a boat when river water is deep and wide, while swimming when river water is low and slow”, in example (7), the concept of journey is mapped onto the concept of life. More specifically, the water depth is described as a metaphor for numerous difficulties in life, and the poet here expresses his attitude that no matter what kind of difficulties people encounter in their life, we should find ways and means to solve the problems.

(8) 泛泛杨舟，载沉载浮。既见君子，我心则休。 (《小雅·菁菁者莪》)

Unsteady the poplar boat goes, on the river afloat. Pleasing are gentlemen like those; in ease and content I gloat.

(*Minor Odes: The Thick Tarragon*,
translated by Wang, 2008: 323)

Example (8) begins with a pledge that two people will pull together in times of trouble and share their joys and sorrows forever by metaphorically describing an unsteady poplar boat floating on the river. Through the LIFE IS JOURNEY metaphor, this example illustrates that no matter in good or bad times, women will always feel happy as long as they are accompanied by their love.

2.3. The natural phenomenon domain

In *The Book of Poetry*, there is a life metaphor which is mapped from the natural phenomenon domain as shown in example (9). Here, the concepts of snow and graupel are used to metaphorically refer to the life that will die at an unknown time, which demonstrates the poet's short-lived and precarious outlook on life:

(9) 如彼雨雪，先集维霰。死丧无日，无几相见。乐酒今夕，君子维宴。(《小雅·頍弁》)

Life is like a heavy snow—it comes and swiftly it will go. Death befalls within a night, as time is short and life is slight. Let's enjoy ourselves tonight, at the banquet in delight.

(*Minor Odes: The Thick Tarragon*,
translated by Wang, 2008: 467)

2.4. The matter/object domain

As shown in the following example (10), the poet describes one's bullied life as the stepped stone under others' feet with the conceptual metaphor LIFE IS STONE, which expresses the miserable fate of a woman after she was dethroned, just like the flat stone being trampled on:

(10) 有扁斯石，履之卑兮。之子之远，俾我疚兮。（《小雅·白华》）

The stepping stone is flat and low, the man who steps on it can't grow. My man has gone far, far away, leaving me in severe dismay.

(*Minor Odes: The Reeds*,

translated by Wang, 2008: 497)

3. The LIFE metaphor in 300 Tang Poems

In the Tang Dynasty, the Chinese poems reached a peak of development and one representative work, the objects-describing poetry (咏物诗 *yong-wu-shi*), is a clever use of metaphorical thinking in poetry writing. The so-called “understanding virtues with objects (观物比德 *guan-wu-bi-de*)” and “expressing emotions with objects (咏物寓兴 *yong-wu-yu-xing*)” are to use objects characteristics to metaphorically understand people's virtues, aspirations and behaviors, which means the poet does not directly describe certain emotions, but makes them a symbol to convey his inner emotional experience by describing those external objects that are closely related to the poet's inner experience. The present corpus analysis shows that there are altogether 36 life metaphors in *300 Tang Poems*, including 14 mapped from the animal/plant domain, 12 from the natural phenomenon domain, 9 from the action/transportation domain, and 1 from the matter/object domain (see **Table 2**).

Table 2. LIFE metaphor in *300 Tang Poems*

Source domain	Concrete concepts	Number of mappings (%)	Total 36 (100%)
Animal/plant	Flower, grass, and spring silkworm, etc.	14 (38.9%)	
Natural phenomenon	Season, morning, and dusk	12 (33.3%)	
Action/transportation	Travailing, mountain-climbing, and journey	9 (25%)	
Matter/object	Candle	1 (2.8%)	

3.1. The animal/plant domain

The Tang people also used the growth cycle of plants to metaphorically refer to different life stages, but the frequency was lower than that of the pre-Qin Period:

(11) 自小刺头深草里，而今渐觉出蓬蒿。时人不识凌云木，直到凌云始道高。

（杜荀鹤《小松》）

While young, the pine tree thrusts its head amid tall grass; now by and by we find it outgrow weed in mass. People don't realize it will grow to scrape the sky; seeing it tower in cloud, then they know it's high.

(Du Xunhe: *The Young Pine*,
translated by Xu, 2008: 86)

Example (11) is a poem based on the conceptual metaphor of HUMAN BEINGS ARE PINES. The concept of pines in the animal/plant domain is mapped onto the image of the poet himself. In this way, the poem expresses the poet's eagerness to get noticed, appreciated and promoted.

(12) 去日儿童皆长大, 昔年亲友半凋零。 (窦叔向《夏夜宿表兄话旧》)

The children of the past have all grown tall and high; half of our friends and kinsmen are gone and departed.

(Dou Shuxiang: *Talking with My Cousin One Summer Night*,
translated by Xu, 2008: 153)

Example (12) is from one of Dou Shuxiang's poems, *Talking with My Cousin One Summer Night*, which is about Dou's visit to his cousin, drinking at his cousin's home and chatting about old times. The Chinese expression 凋零 *diaoling* in this example, originally means the withering of flowers and plants. Here, the poet uses it to metaphorically describe the separations in life or death, which further reflects the vicissitudes of one's life.

(13) 娉娉袅袅十三余, 豆蔻梢头二月初。 (杜牧《赠别二首(其一)》)

Not yet fourteen, she's fair and slender. Like early budding flower tender.

(Du Mu: *At Parting I*,
translated by Xu, 2008: 209)

The Chinese expression 豆蔻 *doukou*, which is similar to the English word "cardamom", is a plant grown widely in the south of the Yangtze River, and is usually used to metaphorically describe the teenage of girls and the budding beauty in Chinese. In example (13), the concept of "early budding cardamom flower" is mapped onto the image of the poet's young love, a thirteen or fourteen young singing girl. This poem is the poet's farewell to his beloved singer in the city of Yangzhou.

It is thus clear that the conceptual metaphor of LIFE IS PLANTS GROWTH also exists in the Tang poetry. However, the concrete concepts that the Tang poets used to map onto the concept of life are usually catch-all terms, such as "flowers" and "grass", while those in *The Book of Poetry* are more concrete and diversified. According to Table 1, the ancient Chinese tend to use various kinds of plants to understand the concept of life in *The Book of Poetry*, including the concept of ordinary fruits and trees (e.g, peach, plum, jujube tree, and melon, etc.), the concept of crops (e.g, millet, and sorghum, etc.), the concept of ornamental plants (e.g, Chinese bush cherry, and lotus, etc.), the concept of herbaceous plants (e.g, motherwort, weeds, and tarragon, etc.) and so on.

Similarly, there is also a metaphorical expression of LIFE IS ANIMALS GROWTH in *300 Tang Poems*:

(14) 春蚕到死丝方尽,蜡炬成灰泪始干。 (李商隐《无题》)

Spring silkworm till its death spins silk from love-sick heart; a candle but when burned out has no tears to shed.

(Li Shangyin: *To One Unnamed*,
translated by Xu, 2008: 213)

Spring silkworm (春蚕 *chuncan*) binds itself in a cocoon and never stops until the last moment of its life. In the first half of example (14), the poet uses the concept of spring silkworm as a metaphor for a life-long love, which indicates that the missing for one's love is just like the silkworm spinning silk till its death.

3.2. The natural phenomenon domain

There is also a kind of life metaphor in Tang poetry, which maps from the change of the seasons or the passing of the days and nights in the natural phenomenon domain, as shown in the following example (15):

(15) 雨中黄叶树,灯下白头人。 (司空曙《喜外弟卢纶见宿》)

A yellow-leaved tree in the rain, by lamplight but white hairs remain.

(Sikong Shu: *My Cousin Lu Lun's Visit*,
translated by Xu, 2008: 152)

This poem records that Lu Lun, the poet's cousin, came to his home to have a talk and stay for night. In example (15), the poet and his cousin looked at each other's white hairs and lamented the change of seasons and the flow of time. The Chinese expression 黄叶树 *huang-ye-shu* (a yellow-leaved tree) implies that it is about autumn, which is closely related to the concept of desolation, so here the poet uses autumn to metaphorically refer to the aging life and expresses his sorrowful mood.

(16) 两处春光同日尽,居人思客客思家。 (白居易《望驿台》)

Spring comes to end in two places on the same day; you think of home and she of you far, far away.

(Bai Juyi: *For Roaming Yuan Zhen*,
translated by Xu, 2008: 165)

In example (16), the Chinese phrase 春光 *chunguang* (spring sights), not only refers to the beautiful scenery of spring, but also indicates the beautiful youth of life, especially the happy time with one's love.

However, 夕阳 *xiyang* (setting sun) and 黄昏 *huanghun* (dusk) in example (17) express their metaphorical meanings in two aspects: on the one hand, the concepts of setting sun and dusk are used to metaphorically indicate the poet's late in his life; on the other hand, these two concepts also imply the declining fate of the country. By using the conceptual metaphor of LIFE IS THE

ALTERNATION OF SUN AND MOON, the poet sighs his inability to retain a better life with regret in example (17):

(17) 夕阳无限好, 只是近黄昏。 (李商隐《乐游原》)

The setting sun seems so sublime, but it is near its dying time.

(Li Shangyin: *On the Plain of Imperial Tombs*,
translated by Xu, 2008: 374)

Based on the conceptual metaphors of LIFE IS THE CHANGE OF SEASONS and LIFE IS THE ALTERNATION OF SUN AND MOON, there are altogether 12 life metaphors projected from the natural phenomenon domain in *300 Tang Poems*. Due to the limited space, we will not analyze them one by one. Nevertheless, as for the life metaphor mapped from the natural phenomenon domain, it is worth noting that the concrete concepts used in *300 Tang Poems* are different from those in *The Book of Poetry*. In *The Book of Poetry*, there are only a few life metaphors that are mapped from the concepts of “snow” and “graupel” in the natural phenomenon domain; however, in *300 Tang Poems*, the life metaphors mapped from the natural phenomenon domain are not only numerous, but also focus on some other concrete concepts, such as “the change of seasons”, and “the change of days and nights” or “the alternation of sun and moon”.

3.3. The action/transportation domain

The metaphorical expressions of LIFE IS JOURNEY can also be found in *300 Tang Poems*, as illustrated in the following examples (18–20):

(18) 长风破浪会有时, 直挂云帆济沧海。 (李白《行路难》)

A time will come to ride the wind and cleave the waves; I'll set my cloud-like sail to cross the sea which raves.

(Li Bai: *Hard Is the Way of the World*,
translated by Xu, 2008: 348)

Example (18) uses the concrete concept of “riding a boat” from the action domain to metaphorically understand life. By using the LIFE IS TAKING A BOAT metaphor, the poet expresses his belief that despite the obstacles ahead, one's life will ride the wind and waves and cross the sea to reach the other side of success one day.

(19) 生者为过客, 死者为归人。天地一逆旅, 同悲万古尘。

(李白《拟古十二首(其九)》)

The living are but passers-by, and those are going home who die. The sky and earth are hotels just, for all to grieve over age-old dust.

(Li Bai: *Life and Death*,
translated by Xu, 2008: 356)

In example (19), the concept of passers-by in a hurry on the journey is used to metaphorically describe the insignificant life, and the comings and goings in the journey is another metaphor for life and death. Centered on the LIFE IS JOURNEY metaphor, the poet illustrates his forlorn plaint of short life.

(20) 欲穷千里目,更上一层楼。 (王之涣《登鹳雀楼》)

You will enjoy a grander sight, by climbing to a greater height.

(Wang Zhihuan: *On the Stork Tower*,

translated by Xu, 2008: 341)

Example (20) metaphorically understands the struggle process of life as ascending a height to enjoy a distant view. As everyone knows, those farsighted who climb high only want to seek higher and see further, and this kind of climbing experience is mapped onto the enterprising and exploring spirit in life as shown in the above example (20).

As has been said before, there are altogether 9 life metaphors mapped from the action/transportation domain in *300 Tang Poems* and thus it is obvious that the metaphorical expressions mapped from the action/transportation domain in *300 Tang Poems* are richer than those in *The Book of Poetry*. Specifically, the former relates to various activities and transportation methods, such as boating, mountain-climbing, and traveling, etc.; while the latter only takes 2 concrete concepts from the action/transportation domain to construct the life metaphor, namely, LIFE IS SWIMMING and LIFE IS TAKING A BOAT.

3.4. The matter/object domain

(21) 春蚕到死丝方尽,蜡炬成灰泪始干。 (李商隐《无题》)

Spring silkworm till its death spins silk from love-sick heart; a candle but when burned out has no tears to shed.

(Li Shangyin: *To One Unnamed*,

translated by Xu, 2008: 213)

In 3.1, we have already discussed the LIFE IS ANIMALS GROWTH in the first half of example (21) 春蚕到死丝方尽 *chun-can-dao-si-si-fang-jin* (spring silkworm till its death spins silk from live-sick heart). The second half of the above example 蜡炬成灰泪始干 *la-ju-cheng-hui-lei-shi-gan* (a candle but when burned out has no tears to shed) is a metaphor for the pain of not being able to get together. Here, 泪 *lei* (tear) refers to both the melted wax dribbled down the side of the candle and the tears of separated love. The poet uses an ordinary object—a red candle, to metaphorically describe two people's melancholy and worries because they can't meet each other.

On the whole, the numbers of source domain types of LIFE metaphor in the pre-Qin Period as well as in the Tang Dynasty are both very limited, involving only 4 kinds of source domains, namely, the animal/plant domain, the action/transportation domain, the natural phenomenon domain and the matter/object domain. As shown in **Figure 1**.

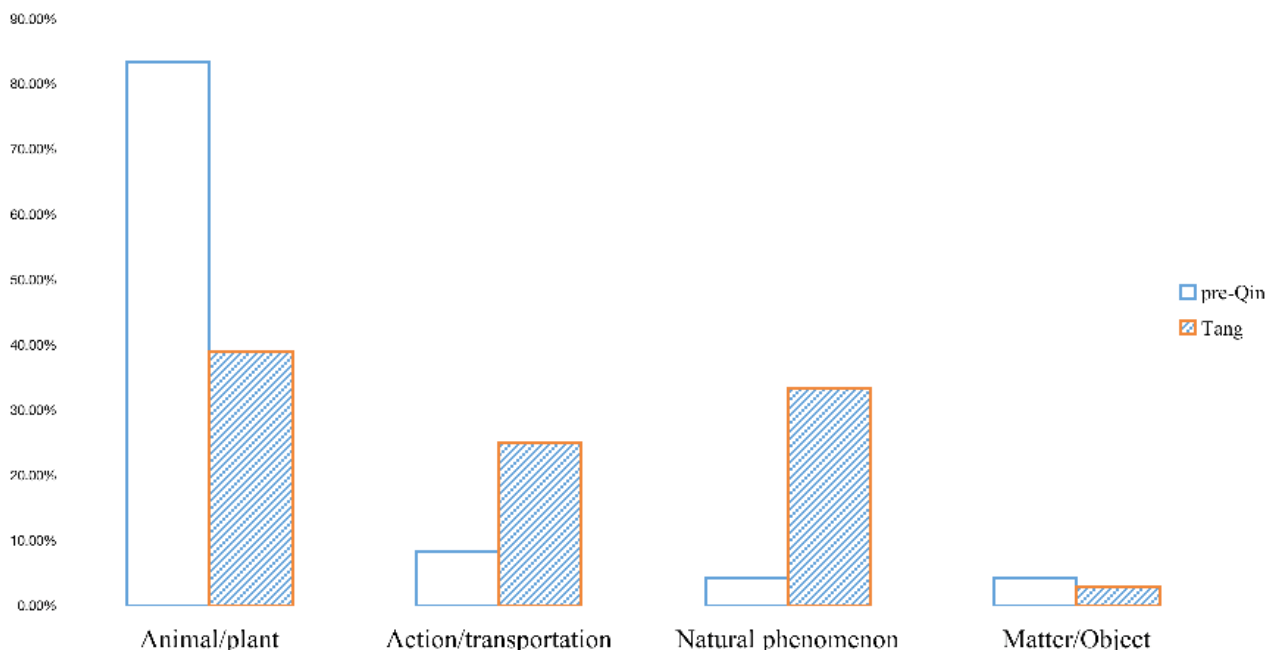


Figure 1. The source domain distribution of LIFE metaphor in the pre-Qin Period and the Tang Dynasty.

(i) More than 80% of LIFE metaphor in *The Book of Poetry* of the pre-Qin Period are projected from the animal/plant domain represented by crops; while the source domains of LIFE metaphor in *300 Tang Poems* of the Tang Dynasty are relatively evenly distributed in the three major domains, namely, the animal/plant domain, the natural phenomenon domain and the action/transportation domain.

(ii) As for the LIFE metaphorical expressions projected from the plant domain, the concrete concepts or specific instances used in *The Book of Poetry* are more abundant than those in *300 Tang Poems*; that is to say, people of the pre-Qin Period are good at understanding the life concept from various plant types, including common fruits, trees, crops, and ornamental plants, etc.

(iii) As for the LIFE metaphorical expressions mapped from the natural phenomenon domain as well as the action/transportation domain, the types of concrete concepts in *300 Tang Poems* are more than those in *The Book of Poetry*.

(iv) There is little difference in the concrete concepts from the source domain of animals between the two ages.

4. A comparative analysis on the source domains in Chinese LIFE metaphor of three historical periods

The foregoing paragraphs have discussed the historical characteristics of Chinese LIFE metaphor in the pre-Qin Period and the Tang Dynasty in detail. Tie (2016) also fully analyses and summarizes 16 representative types of source domains in Mandarin LIFE metaphor (see **Table 3**).

Based on the findings of the present study and Tie (2016), the historical characteristics of the source domain in Chinese LIFE metaphor are gradually clear: in the pre-Qin Period, the ancient Chinese often use the concept of plants (especially, crops) to map onto the “life” concept; in the

Table 3. LIFE Metaphor in Mandarin

Source domain	Number of mappings	Percentage (%)	Examples
Action/transportation	316	38.2	导航人生 <i>dao-hang-ren-sheng</i> (navigate one's life), 人生旅途 <i>ren-sheng-lü-tu</i> (life journey), and 人生方向 <i>ren-sheng-fang-xiang</i> (life direction), etc.
Economy/commerce/occupation	103	12.5	人生本钱 <i>ren-sheng-ben-qian</i> (life capital), 职场人生 <i>zhi-chang-ren-sheng</i> (life of workplace), and 财富人生 <i>cai-fu-ren-sheng</i> (life of wealth), etc.
Perception/emotion	90	11.0	咀嚼人生 <i>ju-jue-ren-sheng</i> (chew one's life), 人生最灰暗的时期 <i>ren-sheng-zui-hui-an-de-shi-qi</i> (the darkest period of one's life), and 一缕清香说人生 <i>yi-lü-qing-xiang-shuo-ren-sheng</i> (a breath of fragrance on life), etc.
Education/culture/art/sport	85	10.3	人生舞台 <i>ren-sheng-wu-tai</i> (life stage), 人生重要一课 <i>ren-sheng-zhong-yao-de-yi-ke</i> (an important life lesson), 悲剧人生 <i>bei-ju-ren-sheng</i> (life tragedy), 人生竞技场 <i>ren-sheng-jing-ji-chang</i> (life arena), and 人生之歌 <i>ren-sheng-zhi-ge</i> (song of life), etc.
Universe/earth	48	5.8	人生的春天 <i>ren-sheng-de-chun-tian</i> (the spring of one's life), 人生气象 <i>ren-sheng-qi-xiang</i> (one's life meteorology), 人生朝露 <i>ren-sheng-zhao-lu</i> (the morning dew of one's life), and 风雨人生 <i>feng-yu-ren-sheng</i> (the storm of one's life), etc.
Thought/language/information	40	4.8	人生的逻辑 <i>ren-sheng-de-luo-ji</i> (life logic), 人生哲学 <i>ren-sheng-de-zhe-xue</i> (life philosophy), 书写人生 <i>shu-xie-ren-sheng</i> (to write one's life), and 人生篇章 <i>ren-sheng-pian-zhang</i> (a chapter of one's life), etc.
Quantity	30	3.6	人生的轨迹 <i>ren-sheng-de-gui-ji</i> (life trajectory), and 人生坐标 <i>ren-sheng-de-zuo-biao</i> (life coordinate), etc.
Matter/object	21	2.5	单面的人生 <i>dan-mian-de-ren-sheng</i> (single-sided life), 提高人生质量 <i>ti-gao-ren-sheng-zhi-liang</i> (enhance the quality of one's life), and 人生截面 <i>ren-sheng-jie-mian</i> (a cross section of one's life), etc.
Living things	19	2.3	人生的养料 <i>ren-sheng-de-yang-liao</i> (the nourishment of one's life), and 人生后花园 <i>ren-sheng-hou-hua-yuan</i> (the rear garden of one's life), etc.
Diet/clothing/housing/property	17	2.1	浪费人生 <i>lang-fei-ren-sheng</i> (waste one's life), and 人生就像白兰地 <i>ren-sheng-jiu-xiang-bai-lan-di</i> (life is like a glass of brandy), etc.
Politics/law/military affairs	15	1.8	人生斗争 <i>ren-sheng-dou-zheng</i> (contend for one's life), and 人生的“判决书” <i>ren-sheng-de-pan-jue-shu</i> (the verdict of one's life), etc.
Human body/health care	12	1.5	人生如梦 <i>ren-sheng-ru-meng</i> (life is but a dream), and 人生创伤 <i>ren-sheng-chuang-shang</i> (a life trauma), etc.
Agriculture	11	1.3	耕耘人生 <i>geng-yun-zi-ji-de-ren-sheng</i> (life ploughing and weeding), and 收获人生 <i>shuo-huo-ren-sheng</i> (reap one's life), etc.
Industry/technology	11	1.3	人生实验 <i>ren-sheng-shi-yan</i> (life experiment), and 建设人生 <i>jian-shen-ren-sheng</i> (build one's life), etc.
Religion/folk belief	7	0.8	人生信仰 <i>ren-sheng-xin-yang</i> (life belief), and 人生修行 <i>ren-sheng-xiu-xing</i> (life austerity), etc.
State of affairs	2	0.2	人生循环 <i>ren-sheng-da-xun-huan</i> (life cycle), and 人生圆满 <i>ren-sheng-yuan-man</i> (a satisfactory life), etc.
Total	827	100	

Tang Dynasty, Chinese people usually understand “life” with various concepts from the animal/

plant domain, the natural phenomenon domain, and the action/transportation domain; while the source domains in Mandarin LIFE metaphor presents a multi-level distribution of 16 types of source domain with open and comprehensive characteristics.

Kövecses (2005: 232) tries to explain the causes of metaphor variation from two aspects: one is the differential experience, and the other is the differential cognitive preferences and styles. He puts forward that there are several distinct causes that produce differential experience and hence different metaphors, including awareness of context, differential memory, differential concerns and interests, and their various subcases; and the factors appear to account for differential preferences and styles include experiential focus, viewpoint preference, prototype and framing, and metaphor versus metonymy preference. Then, Kövecses (2006: 2) emphasizes the important role of experiential focus in the diachronic evolution of metaphor and makes a point that experiential focus is the main factor that affects both cross-cultural variation and within-cultural variation in metaphor.

According to the present study on the source domain distribution of Chinese LIFE metaphor in three different historical periods, the following conclusion can be drawn that there are two aspects that influence the choice of source domain, namely, the material level and the intellectual level. The material level mainly refers to material elements such as physical environment, food and clothing, construction, transportation and production tools, etc.; while the intellectual level means the dominant cultural thoughts in certain historical period. Generally speaking, different historical periods often have different experiential focuses; and the historical characteristics of the source domains are determined by the corresponding characteristics of certain experiential focus.

4.1. The pre-Qin Period

The Book of Poetry is the first collection of Chinese poems, which collects the ancient Chinese folk songs from the early years of Western Zhou Dynasty (1046 B.C.E.–771 B.C.E.) to the middle of the Spring and Autumn Period (770 B.C.E.–476 B.C.E.). As far as its natural geographical environment is concerned, the Chinese ancestors mainly settle along the Yellow River and the Yangtze River, where the climate is humid and the land is fertile. From the beginning, the ancient Chinese have developed a sense of worship for the nature of heaven and earth, and then gradually form the faith of “harmony between nature and human beings” (天人合一 *tian-ren-he-yi*) in the frequent contact with nature (Feng, 2013: 13). It is important to note that the idea of harmony between man and nature has also become a basic feature of Chinese traditional culture. The Chinese ancestors believe that nature gives birth to human beings, protects human beings and endows them with food and life. Therefore, people tend to use the natural concepts, such as animals and plants, to help express their emotions and wishes. By explaining or describing the abstract spiritual activities in the concrete natural forms, the rhythm of nature is mapped onto the fate of mankind, and the growth of human life is the growth of all animals and plants bred by nature. Henceforth, the metaphorical mapping between man and nature has been established.

It is particularly worth observing that in the pre-Qin Period where *The Book of Poetry* was written, manual gathering and working are the major source and style of people’s life. Due to the limitation of productivity development, agriculture occupies a special position in the socioeconomic system. Thus, Chinese ancestors are more inclined to use the concept of crops that they encounter frequently during their daily farming to understand those abstract concepts in the human world. As a result, a lot of metaphorical expressions based on LIFE IS CROPS GROWTH projected from the

plant domain can be found in *The Book of Poetry*.

Generally speaking, the material level represented by the limited products in the pre-Qin Period restricts Chinese ancestors' experience and cognition of the external world. On the other hand, to a certain extent, the germination of farming understanding (农事思想 *nong-shi-si-xiang*) as well as the idea of "harmony between man and nature" together influence the ancestors' LIFE metaphorical thinking model based on the concept of crops. Hence, the life metaphors in *The Book of Poetry* are mostly projected from the plant domain, whose representative concrete concepts include mulberry, millet, melon as well as other fruits and crops.

4.2. The Tang Dynasty

The Tang Dynasty was a golden age of Chinese feudal society with a vast territory. Presented the Zhenguan Period (贞观之治 *zhen-guan-zhi-zhi*) and the Flourishing Kaiyuan Region Period (开元盛世 *kai-yuan-sheng-shi*) constituted the prosperous Tang Dynasty featured with political oneness and economic prosperity, which witnessed unprecedented frequent exchanges between China and foreign countries and created unparalleled opportunities for the development of interaction between the Tang people and the outside world. Along with the rapid development of farming instruments, handicraft industry and commerce in the Tang Dynasty, an inclusive and innovative cultural atmosphere is being promoted within the enlightened and flourishing political environment.

重玄学 *chongxuanxue* (duplicate metaphysics), which is originated in the Eastern Jin Dynasty (317 A.D.–420 A.D.), reached its peak in the Tang Dynasty. The so-called 重玄 *chongxuan* comes from the first chapter of *Tao Te Ching* (the classic of Taoist Philosophy):

玄之又玄，众妙之门 *xuan-zhi-you-xuan, zhong-miao-zhi-men*

Together we call them the Mystery. Where the Mystery is the deepest is the gate of all that is subtle and wonderful. (Legges, 1891: 9)

The purport of 重玄 *chongxuan* is to get rid of all constraints and achieve a realm of absolute freedom by using the method of double negation (Liu, 2007: 68). Duplicate metaphysics (重玄学 *chongxuanxue*) advocates that Tao (道 *dao*) is the principle of nature, and its ultimate stratum belongs to the nature of heaven and earth. The invisible Tao shifts people's attention from the real tangible world to the visionary universe. Metaphysics (玄学 *xuanxue*), in this sense, is not only a realm of life pursued by scholars, but also a goal of their life. The concepts of "nature" and "universe" are not only the objects of scholars' philosophical thinking, but also the symbol of their good taste, which are often used in their speeches and writings (Ge, 2015: 310).

In terms of the LIFE metaphor, it is found that the types of the source domains in LIFE metaphor of *The Book of Poetry* and *300 Tang Poems* are basically the same, but the concrete concepts that are used to be mapped onto the life concept are quite different: first, under the influence of duplicate metaphysics, the Tang people constructed many life metaphors projected from the natural phenomenon domain, such as LIFE IS THE CHANGE OF SEASONS and LIFE IS THE ALTERNATION OF SUN AND MOON, shifting their experiential focus to the invisible universe; second, as the Tang Dynasty still attached importance to the development of agriculture, it inherited the conceptual metaphor of LIFE IS PLANTS GROWTH of the pre-Qin Period, but varied the concrete concepts from crops to common plants and flowers, which reflects the elegant life taste of

the Tang people; third, with the frequent need of foreign exchanges and daily traveling, the Tang Chinese had further developed the life metaphors projected from the transportation domain, such as LIFE IS TAKING A BOAT and LIFE IS MOUNTAIN-CLIMBING, whose number is significantly larger than that of *The Book of Poetry*, and the concrete concepts used to metaphorically understand “life” are also more diversified. In a word, the increasingly rich material life as well as the dominant culture model characterized by duplicate metaphysics and individual pursuits of personality development worked together to produce a marked effect on the LIFE metaphor of the Tang Dynasty, presenting a trend of gradual opening to the overall scheme of things.

4.3. Modern times

Compared with *The Book of Poetry* and *300 Tang Poems*, the source domains of LIFE metaphor in modern Chinese have the following characteristics:

(i) The LIFE metaphor in Mandarin presents the gamut of source domains with 16 different types (as shown in Table 3). On the one hand, Chinese people use concrete concepts based on physical experience to refer to “life”, such as perception, emotion and so on; on the other hand, many concrete concepts based on social experience such as arts, sports, agriculture, industry, commerce, and military affairs can also be used metaphorically to understand the life concept in modern Chinese.

(ii) Most of the life metaphors in *The Book of Poetry* and *300 Tang Poems* are projected from concepts of the outside world (such as the animal/plant domain, etc.), while modern Chinese also takes concepts from people’s physical experience (such as the perception/emotion domain, etc.) to metaphorically understand the concept of life. This is because, with the increasing enrichment of people’s knowledge about the external world, they begin to turn their attention from the external visible world to the internal invisible world, and from the objective material world to the subjective human existence, which is also called the awakening of human beings’ subjective self-consciousness (Guo, 1998: 90).

Table 4 shows how experiential focus influences Chinese LIFE metaphor in different historical periods from both the material level and the intellectual level.

Table 4. The motivations for the historical characteristics of the source domains in Chinese LIFE metaphor

Historical period	Material level	Intellectual level	Experiential focus
Pre-Qin	Poor and harsh living environment; and limited material products.	The idea of harmony between man and nature; and farming understanding.	The plant domain represented by crops.
Tang	Wide territory and rapid development of agriculture, industry and commerce.	Duplicate metaphysics; and individual pursuits for personality development as well as good taste.	Focusing on the plant domain, the action/transportation domain and the natural phenomenon domain.
Modern times	Overall improvement of productivity; and increasing enrichment of material life.	A people-oriented and all-round coordinated social value system.	Comprehensive distribution of the source domains from the perspectives of both natural world and human existence.

5. Conclusion

The diachronic evolution of language is the essence of linguistic structure, not a defect of language (Li, 2015: 45). Each historical period has its characteristic experiential focus, which reflects its unique material and intellectual life. The different experiential focuses of different historical periods will be reflected in the metaphors they construct. This study investigates the source domains of Chinese LIFE metaphor in *The Book of Poetry*, *300 Tang Poems* and the Mandarin. It demonstrates that people's choice of the source domains in different historical periods is determined by the experience focus from two aspects: one is the material level, the other is the intellectual level. With the deepening of people's understanding about nature, society and human existence, the distribution of the source domains in Chinese LIFE metaphor presents a trend of gradual diversity. On the one hand, it is shown that there is a feature of inheritance on the source domains between two different historical periods, which means that Chinese in different periods share certain kind of source domain in LIFE metaphor. On the other hand, the source domains of LIFE metaphor in different periods have their own distinctive characteristics. That is, the social material level and the intellectual level are labeled by certain historical characteristics, which leads to the diachronic characteristics of embodied conceptualization in different historical periods. Thus, the source domains of Chinese LIFE metaphor present a diachronic evolution of historical characteristics.

Conflict of interest

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ORIGINAL ARTICLE

Ethical naturalism and the meaning of “good”

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Abstract: How to explicate the meaning of “good” is a classic philosophical question, one reason is that “good” has metaphysical properties which are difficult to interpret. The development of ethical naturalism opens a door to answer the “good” question. This theory proposes to view the moral world and the natural world as a continuum, in that the moral world is built on the basis of the natural one. This study aims to introduce a sort of reductive ethical naturalism—end-relational theory—to interpret “good” assertions. According to this theory, most “good” assertions are end-relational and thus “good” can be reduced to “end”. By doing so, metaphysical moral meaning can be converted into concretized natural meaning, and then “good” morality will not be high up above anymore.

Keywords: “good”; ethical naturalism; “end”; reductionism

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1. Introduction

In his seminal work *Principia Ethica*, Moore and Baldwin (1993) declare that Ethics is a discipline of arguing what is right or wrong for people to do and explores why statements about personality or morality are true or false. In a variety of ethical or normative disputes, “good” is a word always at the center of the storm. When people make statements about any of the following topics, like “virtue”, “vice”, “duty”, “rightness”, “obligation”, “justice”, explicitly or implicitly, the concept of “good” is present all the time. This is also the reason why pursuing answers to the question of “What is good?” is one of the eternal undertakings of ethicists.

The contemporary debate over the meaning of “good” is a tangled and bewildering web. This is largely due to its semantic peculiarity and the special status of morality in human society. Generally speaking, the purpose of uttering a descriptive sentence, like “The cat is on the table”, usually lies in describing a natural fact that *the cat is on the table*. However, when a moral sentence like “Helping people in need is good” is uttered, the speaker is not only describing a moral fact but also encouraging the audience to help others who are in trouble. That is, “good” utterances are often

used to guide actions, especially actions with positive effects. In order to account for the meaning of “good” (as well as other moral utterances), various philosophical theories have been developed after Moore. For example, non-cognitivists propose that the aim of uttering moral utterances is to express noncognitive mental states (such as desire, attitudes, preference, etc.), and nothing else. While cognitivists assert that moral statements can express cognitive beliefs, and thus they are truth-evaluable because they have truth conditions. Other widely discussed theories for “good” include intuitionism, quasi-realism, realism, expressivism, ethical relativism, ethical contextualism, just name a few.

This article will introduce another important moral theory which enjoys increasing popularity among philosophers in recent years, it is ethical naturalism. According to non-naturalism, moral properties are not identical with or equivalent to natural properties, moral concepts or terms cannot be explained by natural concepts or terms, moral statements cannot be translated into descriptive statements, etc. For non-naturalists, the good is good for it is good in nature, not because it can inspire positive attitudes or bring about good effects or results. In this sense, the meaning of “good” is *sui generis*. Ethical naturalists take an opposite view. They believe that moral properties at least in the loose sense are identical with/ equivalent to natural properties, and moral concepts can be explained by natural concepts. In essence, “ethical naturalism” is more like a philosophical tradition than an ethical doctrine because it is an umbrella term for a series of different sub-theories, such as (non-) analytical naturalism, normative naturalism, and (non-) reductive naturalism. The aim of this essay is to find a reductive, naturalistic interpretation for “good”. Before this, the semantic properties of “good” will be analyzed, and the development of reductive naturalism will be introduced.

2. The semantic properties of “good”

2.1. The indefinability of “good”

In daily communication, we are accustomed to using “good” to evaluate one’s personality, behavior(s), or event(s), and such evaluations are positive in most cases. For example, people often say something like “Joe is a good husband”, “Bullying is not good”, and “Helping somebody in need is good” to praise Joe, to condemn the bullying, and to encourage people to help others. Nonetheless, not all uses of “good” are associated with morality. “The chocolate tastes good” and “good weather” are two telling examples. These non-moral “good” expressions are obviously not the object of this study. Owing to the tremendous occurrences and multifarious uses of “good” in moral utterance, to unveil the meaning of “good” is not as easy as child’s play. In order to achieve this ultimate goal, to make clear the semantic properties of “good” seems to be more fundamental and more significant. This section will focus on some classic semantic properties of good.

From Moore and Baldwin (1993), many philosophers (especially Moore’s followers) hold that “good” is indefinable. Moore once asserted that “how ‘good’ is to be defined is the most fundamental question in all Ethics” (1993: 57). But this assertion is not a self-evident axiom, it has to be proved. Therefore, for a long time, the debate over how to define “good” headlined in a large number of philosophical works. Some scholars like Hansson (1990) tried to define “good” by “better”, “desire”, or “pleasure”, because in many circumstances what is “good” is what is better, what is desired, or what is pleasant. However, those philosophers themselves are often caught

in endless and desperate disputes about how to single out an appropriate definition from various alternatives. There is no answer to satisfy all. On the other hand, if “good” is definable, why cannot it be defined as easily as, say, “quadrangle”, is defined?

A fairly persuasive viewpoint is that “good” means “desire to desire” because the “good” thing often has the property of being desired, so saying “x is good” amounts to saying that “x is something I desire to desire” (Moore and Baldwin, 1993). Wealth is good because it is something people desire to desire. However, there are bad desires. Imagine a scenario where Joe’s sworn enemy was injured severely in a traffic accident, after hearing this news, Joe said that “That’s really good news”. Although the injury of Joe’s sworn enemy is what Joe desires to desire, the morality generally does not allow people to say something meaning that a desire for somebody’s being hurt is good. Similarly, what is good is usually what makes people happy, but not vice versa. Still, the injury of Joe’s sworn enemy makes Joe happy, but it is not good at all. And sometimes, say, not to tell somebody the truth might be good, but it is hard to judge whether or not it is right. As a result, it seems that neither “desire to desire” nor “pleasure” is the property of “good”. Some readers may consider that the common property of all “good” things is “goodness”, but “how is ‘goodness’ to be defined?” is a question as desperate as “How is ‘good’ to be defined?”.

The failure of trying to define “good” with other concepts to some extent seems to show that “good” is indefinable. Moore and Baldwin (1993: 58) claims that “[good] cannot be defined...that propositions about the good are all of them synthetic and never analytic”. That is, “good” cannot be defined because it is a simple notion, just like color terms. It is hard by using language to explain what “red” is to someone who never sees anything red before. Similarly, it is difficult by using language to explain what “good” is to a child who never perceives anything good. The best way to explain “good” is showing him/her some good acts in reality.

2.2. The duality of “good” assertions

As stated in Ayer’s classic work *The Language, Truth and Logic* (1936), non-cognitivists often suggest that moral assertions (e.g., Murder is wrong) simply voice certain types of sentiment, commitment, or more generally specific types of pro- or con- attitudes, rather than describe moral features of persons, objects, or states of affairs. That is to say, moral assertions are not meaningful in the sense of describing the reality but of expressing the speaker’s ethical sentiments and arousing similar feelings in his/her audience. For this reason, many early ethicists claim that moral assertions are not truth-apt because they only express desire-like attitudes but not beliefs. However, with the deepening of the research, more and more philosophers found that the traditional view seems untenable. Syntactically, moral assertions share the same grammatical structures as descriptive assertions. If descriptive assertions are truth-evaluable, why are moral assertions not? Given this, moral assertions theoretically express beliefs because they point to moral facts. In some sense, it is this argument that opens the chapter of moral cognitivism in ethics. Nowadays, more and more philosophers hold that moral assertions can both express moral attitudes and moral beliefs.

Ethics is the foundation of humanity, and it is the source and meanwhile the end of humans’ personal development. The significance of having a right ethical attitude, in this sense, consists in its function of continuously improving the humanness. Pursuing humanness is a need (not a want), and it is the reason why normal people listen to the totality of reality in their mind before they make any ethical decisions, the reason why they sometimes struggle between satisfying the excessive desire

and conforming to codes and rules, and the reason why they sacrifice much in the ongoing pursuit of truth, justice, and perfection. For an individual, having a correct ethical outlook is the groundwork of being a better person. This is determined by what Pink (2004) calls the “voluntariness” of morality, i.e., the morality inside would automatically lead us to behave morally (even do something that may hurt ourselves). For example, if someone sees an evildoer is robbing a woman, he can impassively choose to go away, but his morality might urge him to take some action to help the woman regardless of his own safety.

Although moral attitudes are ubiquitous, they cannot be observed directly but only inferred from agents’ self-reports or body language. Theoretically, answering a question of ethical attitudes is a complex interplay of cognitive and communicative systems, in which five processes are usually involved (Schwarz, 2007). First, the addressee has to analyze the question to seek out the attitude object and evaluative dimension the addressor has in mind. Second, the addressee needs to retrieve relevant information from memory, including properties of the attitude object, addressor’s emotional response to the object, or the features of the addressor himself. Third, grounded on these messages, the addressee would form an ethical judgment. Bearing this judgment in mind, the addressee then needs to map it onto a series of response alternatives offered by the addressor. Lastly, for one reason or another, the addressee may edit this moral judgment further before he speaks it out to the addressor. None of these processes can function as expected without the intervention of context; hence, the expression of moral attitudes is always context-dependent (Kauppinen, 2014).

Different from moral attitudes, the attempt to unfold moral beliefs is both innovative and full of difficulties. As the pioneers of this field, Terence Horgan and Mark Timmons are the representatives who have worked diligently and fruitfully in this field. According to Horgan and Timmons (2000, 2006a, 2006b), beliefs fall into two types: descriptive beliefs, and non-descriptive beliefs. The former involves an “is-commitment” (in their words), concerning how the actual world is like; while the latter involves an “ought-commitment”, concerning what ought to be the case in the world. For non-evaluative and non-moral beliefs, their core descriptive content is the overall content. The proposition that “Grass is green” exhausts the content of the belief that grass is green, so it is descriptive in nature. However, for moral beliefs (and evaluative ones), their content is twofold. Take “Rescuing the drowning is good” as an example. On the one hand, it expresses a descriptive content to the effect that “Pulling the drowning out of water is a good behavior”; on the other hand, it expresses the moral content that “It ought to be the case that someone saves the drowning”. But Horgan and Timmons claim that the moral content usually overrides the descriptive one, so the overall content of moral beliefs is still non-descriptive, moral beliefs are thus non-descriptive.

Majors (2008) alleges that the best way to understand beliefs might be to identify the aspects by which they distinguish themselves from other mental states. Bearing this in mind, he very carefully dissects mental states layer by layer. First, he claims that mental states fall into two types: representational mental states, and non-representational ones. The former (e.g., believing, desiring, expecting) has intentional content, representing the world as being a certain way, while the latter (e.g., pain) has qualitative content. Second, representational mental states can be divided into mental states that are conceptual, and those that are non-conceptual. Conceptual mental states, constituted by concepts, are propositional attitudes, playing the role of tying their holders to particular propositions in a certain way. Non-conceptual mental states are of perceptual experience which may be perceived with no relevant concepts. For example, when a person sees chess on the table,

he knows that it is chess, but he may not know how to play it because he does not have the concept of playing chess. Third, conceptual mental states are further split into “thetic” ones and “telic” ones, according to the direction of fit (Tenenbaum, 2006). Thetic mental states (include believing, conjecturing, guessing, etc.) have the mind-to-world direction of fit, aiming to adapt oneself to the real world; but telic mental states (including desiring or intending) have the world-to-mind direction of fit, aiming to change the world in order to make it fit people. Finally, we can also make a distinction between fundamental thetic mental states and non-fundamental thetic mental states. Beliefs are the most fundamental thetic conceptual attitudes for the reason that it is the cornerstone of performing higher level mental activities like making decisions, inferring or conjecturing.

So to speak, beliefs are the most important conceptual mediator for us to understand and represent the reality. As an indispensable sub-class of beliefs, moral beliefs share all the aforementioned properties of ordinary beliefs, that is, they are in nature representational (or descriptive), conceptual, *thetic*, and fundamental.

3. Ethical naturalism

3.1. Varieties of ethical naturalism

The rise of naturalism occurred in the thirties of twentieth century mainly in American, its early representatives are John Dewey, Ernest Nagel, Sidney Hook and Roy Wood Sellars. Unquestionably, since its birth, naturalism has been successful in shaping the philosophical landscape like no other philosophical tradition, especially it has exerted a great impact on analytic philosophy. In this context, ethical naturalism came into being, and many ethicists started devoting themselves to exploring this “new” field. However, perhaps as a result of having faced forceful objections such as (non-cognitive) eliminativism and Moore’s Open Question Argument (OQA), ethical naturalism gradually went out of favor. Until the end of twenties century, more and more scholars found that neither eliminativism nor OQA are invulnerable, whereby ethical naturalism got the opportunity to regain its lost territory. What’s more, the blossom of philosophy of mind and philosophy of language at that time has also accelerated the recovery of ethical naturalism. Nowadays, the rapid development of science and technology sets off a new wave of naturalistic study in philosophy all over the world.

Then, what is ethical naturalism? Narrowly, ethical naturalism is construed as the conjunction of two core theses: (1) There are moral properties and facts, (2) At least some such properties and facts are natural properties and facts. But for different philosophers, formulations of ethical naturalism are a little bit different. Some classic versions are: “moral properties are identical with natural properties”, “moral concepts are identical with natural concepts”, “moral terms are definable via natural terms”, “moral judgments are nothing but factual judgements”, “descriptive statements entail moral statements”, “descriptive propositions support moral propositions”, etc. In fact, all these versions are the result of philosophers’ different understanding of ethical naturalism. Some comprehend it within a realist framework, some favor a relativist gloss, and some focus on the relation between moral properties and natural properties. Therefore, it is possible to divide ethical naturalism into different families.

Philosophers’ categorization of naturalistic theories is various. Scott (1980) distinguishes five

types of ethical naturalism: analytical naturalism, reductive naturalism, methodological naturalism, contingent naturalism, and eliminative naturalism. Analytical naturalists claim that (at least) some principles which link ethical with natural predicates are analytic; reductive naturalists hold that ethical properties can be reduced to natural properties; methodological naturalists assert that moral phenomenon can be studied by similar procedures applied in scientific research; contingent naturalists accept the view that some moral rules which connect ethical predicates with natural predicates are at least contingently true; and at last, eliminative naturalists deny the existence of some ethical entities like ethical properties and ethical facts. In fact, the latter two sorts of naturalism are seldom discussed nowadays, but the first three are still hot topics. Different from Scott, Fink (2006) divides ethical naturalism into materialist naturalism, idealist naturalism, and absolute naturalism, based on McDowell’s (1998) neo-Humean naturalism (which claims that reality is exhausted by the natural world, in the sense of the world as the natural sciences are capable of showing it to us) and Aristotelian naturalism (which claims that reality might be exhausted by the natural world, but all human potentials are included in it).

In contemporary literature, philosophers intend to read naturalism by considering the research area a research subject belongs to. When the research topic concerns whether moral terms and sentences are semantically equivalent to factual terms and sentences, it is analytical naturalism. If the relevant relationship between the moral and the natural is about properties and facts exclusively, it is in the scope of metaphysical naturalism. What’s more, there is epistemological naturalism which shows that all ethical knowledge we human learn is obtainable only or foremost through the application of scientific methods. Also, there is ontological naturalism asserting that all that exists in the ethical world in principle can be studied by natural science. In recent years, more and more philosophers, like Copp (2004, 2012) and Parfit (2011), pay much attention to the study of normativity, this greatly stimulates the generating of a new type of naturalism—normative naturalism. This theory mainly investigates how to analyze or interpret the normative properties of morality in naturalistic ways. Certainly, the taxonomic exploration of ethical naturalism will never stop as long as there are people who are interested in Ethics.

3.2. Reductive ethical naturalism

In this part, a specific naturalistic view—reductive ethical naturalism—will be elaborated. This is also the version which will be tentatively used to interpret the meaning of “good” utterances.

Generally, reductive naturalism makes the claim that there are moral facts/properties which are reducible to natural facts/properties about the world (Lutz and Lenman, 2018). Being a form of realism, reductive naturalism takes moral facts as something “real”, that we are justified in accepting them as facts about what the actual world is like. Traditionally, moral facts are often defined as the facts about what is right or wrong to do, or what one ought to do or not to do according to some widely accepted moral principles in a community. Accordingly, moral properties are the properties of moral acts or events. The basic premise of reductive naturalism is that, if an act has a moral property, it has it in virtue of some non-moral properties which it has. These non-moral properties are usually the reasons why this act has the very moral properties. For instance, the act “rescuing the drowning” has the property of goodness, but it is the result of combining a series of non-moral properties (e.g., the killing power of water and the significance of oxygen to human). Different from non-moral properties, moral properties are often normative. “Normativity” is a new word being

accepted quickly and widely in ethics. It is the property distinguishing *value* from *fact*, *ought* from *is*, and *the descriptive* from *the ethical*. In this sense, normativity is the distinctive feature of moral phenomenon.

Certainly, natural properties are different from moral ones. There are four fundamental approaches to define natural properties. First, a property is natural if it is of the sort exemplified by paradigmatically natural objects, such as “mattress, grass, table, etc.” (Jackson, 1998: 7). This is dubbed ostensive method. But this method doesn’t exclude the possibility that some instantiations of moral properties (like goodness or wrongness) are natural. Second, natural properties are understood as the facts observed or discovered by natural science. This is called deferential method. Strictly, natural science can be classified into two types: hard science and soft science. Typical examples of hard science are Physics, Chemistry, and Biology, and some examples of soft science are Psychology, Management, and Ethology. But most naturalists do not make such a strict distinction when natural facts or properties are considered. The drawback of this method is that ethical properties might also be among the properties natural scientists will one day in fact posit. If so, the boundary between ethical properties and natural properties will get blurred. The third way to elucidate natural properties is termed as metaphysical account, which proposes that natural properties are descriptive or factual properties (Moore, 1922), or natural properties are properties with causal powers (Gibbard, 1990: 9). The deficiency of the descriptive account is that it conflicts with ethical dualism to the effect that moral utterances are both descriptive and normative. The problem of the causal account is that causality isn’t exclusive to natural properties, non-natural properties sometimes have causal powers as well. Relatively, the last approach—epistemological account—for natural properties seem more convincing. This account concedes that natural property is the sort of property posited by natural sciences, but our knowledge of its instantiations is empirical (Copp, 2003: 189). This study will confirm to the epistemological account of natural property.

How to understand the term “reduction” is another important issue. In fact, the precise nature of reduction is controversial. Many philosophers hold that, if A is reducible to B, then A is B, or A is “nothing over and above” B, i.e., A is identical with B (Dowell, 2013). However, this is not the only way to construe “reduction”. It can be read variously in terms of scientific domains of study (e.g., chemistry can reduce to physics), or particular scientific theories (e.g., thermodynamics can reduce to statistical mechanics), or individual properties or property types (e.g., “the mental” can reduce to “the physical”), or substantial kinds (e.g., “the mind” can reduce to “the brain”), etc. Additionally, the reduction relation itself has also been understood in different ways. When A-sentences/principles can be translated into B-sentences/principles, these two types of sentences/principles stand in the reduction relation. When A-related particular items are identical with B-related items, or A-facts entail B-facts, then the reduction relation is built as well. This study will take reductive naturalism as a thesis of property reduction, i.e., moral properties are reducible to natural properties, and take reduction relation as an entailment instead of identity.

When reductive naturalism is discussed, a central argument is unavoidable. That is, moral properties always supervene on natural properties. Moral supervenience is reductive for the reason that it warrants that moral properties and disjunctive sets of natural properties are mutual entailing. In order to explain this claim, we must first clarify what supervenience is. Supervenience is “a non-symmetric relation of necessary co-variance between families of related properties, according

to which changes with respect to the supervenient properties are dependent upon changes with respect to the subvenient base properties” (Klocksiem, 2019: 1995). Specifically, the moral properties supervene on the natural properties if and only if in any two possible worlds that are indistinguishable regarding to the natural properties must also be indistinguishable regarding to the moral properties. In other words, the value of a world relies on its natural properties.

4. A reductionistic interpretation of “good”

4.1. Good and end

In many cases, the purpose of uttering moral assertions is to realize certain ends. For example, the end of saying “murder is wrong” is to discourage listeners from killing the innocents. In this sense, ethical goodness is reducible to natural “end”. The “end” here is defined as “a term of art for any proposition conceived as a potential outcome” (Finlay, 2014: 32). The implicit end of uttering, say, that “Facing danger bravely is good”, might be telling the audience how to protect themselves in danger. What is noteworthy is that the concern of end-relational theory is agents’ end(s), the individuals who are involved in the states of affairs depicted by the normative utterances. In daily communication, though the role of agents is often played by speakers, there are many situations in which agents are not identical to speakers. When this kind of situations arises, agents’ ends and speakers’ ends must be differentiated prudentially.

In effect, many philosophers have realized that the meanings of normative sentences are end-relational.¹ As early as 1967, Paul Ziff concluded that all assertions about goodness are related to ends or purposes, attributive ‘good’ and ‘good for’ sentences are two important syntactic patterns to explicate these ends or purposes. To say that “Chocolate is good for Mary” makes the end, e.g., to bring Mary enormous gustatory enjoyment, explicit, and to say that “X is a good anchor” makes the end of fastening a boat securely (say) explicit. Schroeder (2007) invents a similar concept named “baseline”, and claims that an action counts as promoting a proposition p only if it increases the likelihood of p based on certain context determined baseline. In the process of exploring the issue of “Is rationality normative?”, Broome (2008) finds that rationality is essential for agents to realize their ends. Other researchers, like Wallace (2001) and Evers (2014), who are interested in instrumental normative conditionals, cannot bypass the means-end relation as well. Terminologically, philosophers and linguists probably use different words or phrases, like a proposition “promotes”, “serves”, “answers to”, “satisfies”, or “is conducive to” an end, but their motives are alike, that is, to show that ethical sentences are end-relational.

Undeniably, reducing “good” to “end” provides a possible way to interpret “good” assertions from the perspective of philosophy of language. In fact, many “philosophical disputes over (inter alia) the nature of normative facts and properties are due to ‘a confusion of tongues’ in the different sense of a failure to understand our own use of normative language” (Finlay, 2014: 1). If some philosophical puzzles result from the confusion of the uses of normative language, then they can

1. In metaethics and ethics, the definition of normative utterances varies from philosopher to philosopher, most of them agree that standard normative utterances are those constituted by normative terms including “good”, “bad”, “wrong” (normative adjectives), “ought”, “should”, “must”, “can” (normative verbs), and “reason” (normative noun). Although some uses of these normative terms are non-normative, they are still called “normative terms” for convenience. Take “ought” as an example, in the sentence that “The storm ought to arrive at this island tonight”, “ought” is used non-normatively, but in “You ought to rescue the drowning”, it is normative.

be resolved by studying normative language. Similarly, many disputes over “good” assertions are caused by diverse, confusing uses of “good”. Familiarly, there are “good at”, “good for”, “good to”, “good with”, “good as”, etc. If “good” assertions are end-relational, then most uses of “good” can be explained through one concept “end”. This move will greatly simplify the convoluted processes of interpreting multiform occurrences of “good” in different assertions (see more detail in the next section). Significantly, the end-relational theory successfully converts the meaning of abstract, illusory ‘good’ assertions into a meaning complex constituted by substantial, non-ethical concepts.

Analyzing normative “good” in terms of natural “end” brings in another two benefits. Primarily, this strategy creates opportunity for experimental ethics. Through many decades, philosophical study has been mocked by some experimental scientists as “armchair theorizing” (Ingold, 2007: 82). But the rise of experimental philosophy opens up new frontier for philosophy. If the content of ‘good’ assertions (as well as other normative claims) can be disintegrated into naturalistic parts, the experimental methods which are adopted in scientific research are equally applicable to analyzing “good” assertions. The consequent result is that philosophical reflection will no longer be taken as the only leading way of philosophy study. Besides, relativizing ‘good’ to “end” directly demonstrates the relation between “good” utterance and motivation. To judge whether a person has an uncle is to verify whether his/her parents have a brother, but to judge whether an action is good depends on whether the agent is, to achieve his aim, motivated to perform the action.

Reducing normative “good” to naturalistic “end” offers many advantages, but the trouble is how to maintain the attitudinal content of “good” assertions. As is well-known, the distinctive feature of all moral assertions is the function of expressing attitudes, which separates them from ordinary descriptive assertions. Any theory that deletes this feature is not worth the candle. Then, how can this feature be preserved? This study suggests viewing the attitudes expressed by “good” assertions as a kind of implicature. Again take “Facing danger bravely is good” as an example, its explicit meaning is that “Facing danger bravely is good to protect yourself”, but its attitudinal meaning might be that “The speaker is expressing his positive attitude towards the behavior of facing danger bravely”. Sometimes the explicit meaning is salient in context, and sometimes it is the attitudinal meaning that is salient.

4.2. The end-relationality of “good” assertions

The main attraction of employing “end” to explain “good” assertions is that it provides a unifying semantics to analyze different uses of “good”. The purpose of this section is to show how such a unifying semantics, i.e., end-relational theory, works. Syntactically, “good” is relativized in disconcertingly manifold ways. Generally speaking, “good” occurs in at least nine syntactic forms as illustrated in (a)-(i) (φ is for verb phrases, ‘ s ’ and ‘ n ’ for noun phrases standing for individuals and objects respectively, ‘ K ’ for predicates, and ‘ p ’ for sentences) (Finlay, 2014: 22):

- (a) good to φ
- (b) good for s
- (c) good for φ -ing
- (d) good with n / good with Ks

(e) good at φ -ing

(f) good as a K

In addition, “good” takes different kinds of objects, such as:

(g) n is good/ K s are good

(h) good that p

(i) good K

For the cause of constructing a unifying semantics for “good”, the primary task is to uncover the possible implicit arguments of different kinds of “good” assertions, and then inspect whether making them explicit completes or alters the propositions expressed by the original sentences. Some philosophers (e.g., Suikkanen, 2008) found that the uses of “good” in (a)-(f) are relativized to *action-types* which can be explicated by adding proper infinitive phrases. For instance, to say that “The knife is good” is to say that “The knife is good *to kill (somebody or something)*”, and to say that “The plan is good” is to say that “The plan is good *to follow*”. Nonetheless, it seems that the resulting sentences remain incomplete, because people will still ask, “*For whom or what, n is good to φ ?*”. Consequently, a more complete logical form for “ n is good” is:

G1: n is good for s to φ .

To avoid ambiguity, the subject s splits itself further into two categories: the agent s_a ; and the patient or beneficiary s_p . An assertion, say, “Torment is good”, involves two types of subjects, that is, “Torment is good [for murderers], [for victims] to suffer.” Therefore, G1 is augmented to:

G2: n is good for s_p , for s_a to φ .

That’s to say, the simplest sentential pattern that “ n is good” is usually used as an ellipsis of the pattern that “ n is good for s_p , for s_a to φ .” According to the principle of subject movement, G2 can be transformed into:

G3: It is good for s_p , for s_a to φn .

without altering the proposition it expresses (Grodzinsky, 1986). Therefore, saying that “Milk is good for one to drink” amounts to saying that “It is good for one to drink milk” (here, s_a is identical with s_p). In this way, G3 can be taken as the full-fledged form of the prepositional uses of “good” as in (a) and (b).

As to the uses of “good” in (c)-(f), some additional modifications are required. For Finlay, the phrase “for φ -ing” in “good for φ -ing” relates to an *end*, so the utterance that “Milk is good to drink” on numerous occasions implies that “It is good for supplementing calcium, for one to drink milk.” Clearly, drinking milk is the *means* to reach the *end* of supplementing calcium. As a result, a fuller form for sentences containing “for φ -ing” is (the subscript e stands for *end*, and m stands for *means*):

G4: It is good for s_p ’s φ_e -ing, for s_a to $\varphi_m n$.

In the same way, (d) “good with K s” can be completed as “good [for e , for s to φ_m] with K s”.

Accordingly, “good with kids” means that “for an agent s , it is good for some end e (e.g., to amuse kids) by means of φ (like to play or stay with them)”. And (e) “good at φ -ing” can be completed as “good [for e , for s to be the person engaged] at φ -ing” (Finlay, 2014: 35). “Mary is good at swimming” means “Being good for e (e.g., to rescue the life of a drowning people), for Mary to be the person engaged in the rescuing activity”.

With respect to (f) “good as a K ” and (i) “good K ”, similar tactic is employable. First, sentences in the form of “ n is a good K ” can be viewed as an ellipsis of “ n is a K such that it is good for e , for s to φ it”. Hence, to say that “ n is a good intercontinental missile” is to say that “ n is a intercontinental missile such that it is good for destroying some place, for someone to detonate it” (Finlay, 2014: 37). The elucidation of “ n is good as a K ” is a little bit complex. On the one hand, the structure “ n is good as a K ” often specifies the function of K s, that is, directing towards some particular end e_K . Therefore, “being good as a K ” entails “being good for e_K ”. Then, “It is good as a poison” entails that “It is good [for killing some living beings, for one to use it] as a poison”. On the other hand, if “good as a K ” is not used functionally, then it equals “good K s” in semantics and in deep logical form. In terms of the above elaboration, the full-fledged structures of the prepositional uses of ‘good’ from (a) to (i) can be represented as in **Table 1**.

Table 1. The full-fledged forms of various prepositional uses of “good”

good to φ	It is good for s_p , for s_a to φn .
good for s	
good for φ -ing	It is good for s_p 's φ_e -ing, for s_a to $\varphi_m n$.
good with n /good with K s	It is good for e , for s to φ_m with K s.
good at φ -ing	It is good for e , for s to be the person engaged at φ -ing.
good as a K	1. It is good for e_K , for s_a to $\varphi_m n$ as a K . (functional use)
	2. n is a K such that it is good for e , for s to φ it. (nonfunctional use)
good K	n is a K such that it is good for e , for s to φ it.

In a nutshell, almost all simple predicative uses of “good” can be taken as variants of the form G4. This practice passes the test of answering to the very question of “What is it good for?” on the one hand, and echoes philosophers’ observation that all uses of “good” are *patient-relative* on the other. In many cases, concealing agents is tolerable for us to understand the majority of moral sentences, while deleting patients usually damages or even distorts the meaning of the whole sentence. “Torment is good for murderers to suffer” is acceptable, but “Torment is good for victims to suffer” is odd and even cruel.

5. Conclusion

A successful reductive naturalism will be ontologically unifying, so that it unifies what might seem to be different ontological categories. A successful reductive naturalism will also be

explanatorily powerful, so that it unveils the explanations of seemingly coarse and mysterious features of the reduced category in terms of the reducing category. What’s more, a successful reductive naturalism will be metaphysically simplifying, so that it simplifies a complicated or multifarious phenomenon to plainer or more basic elements. Given these, reducing moral “good” to natural “end” can be counted as a successful maneuver, because it not only offers a unifying explanation for different uses of “good” but also decodes the metaphorical and ethical gene innated in “goodness” in virtue of naturalistic “end(s)”.

Conflict of interest

No conflict of interest was reported by the author.

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ORIGINAL ARTICLE

Is Cognitive Linguistics deadly sinful? On the pros and cons of Cognitive Linguistics and its development

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Abstract: Cognitive Linguistics started from the 1980s, and it has become a mainstream since the end of the last century and the beginning of this century, which has got widespread attention, with a nickname as the third revolution in linguistic circles after the Saussurean Revolution and the Chomskyeen Revolution. According to the dialectical principle of “negation of negation”, theoretical research is always advancing, thus the linguists are beginning to think of the shortcomings of Cognitive Linguistics and new developments in the future. For instance, Dabrowska (2016) pointed out the seven deadly sins of Cognitive Linguistics, which, we think, are overstated and too radical. Cognitive Linguistics has its own historical significance and makes great contributions to the criticism of Saussurean “Linguistic Apriorism” and Chomskyeen “Linguistic Nativism”, but Cognitive Linguistics also has its own weaknesses, which are to be exposed in brief in this paper. We have also tried to propose “Embodied-Cognitive Linguistics as a revision in order to emphasize the philosophical views of “materialism” and “humanism” as a basic start in linguistic research.

Keywords: Cognitive Linguistics; seven deadly sins; pros & cons; Embodied-Cognitive Linguistics

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1. Introduction

Dabrowska (2016) has published a paper in Cognitive Linguistics (shorted in CL), titled in *Cognitive Linguistics' seven deadly sins*, which has sharply criticized CL and pointed out seven serious problems, namely:

- (1) Excessive reliance on introspection;
- (2) Not treating the cognitive commitment seriously.
- (3) Not enough serious hypothesis testing.
- (4) Ignoring individual differences.

- (5) Neglecting the social aspect of language.
- (6) Assuming that we can deduce mental representations from patterns of use.
- (7) Assuming that distribution equals meaning.

This has aroused great attentions from academic circles and caused a lot of controversies. Inspired by it, we have carefully considered the pros & cons of CL based on the two-part dialectical standpoint and put forward a repair plan for the reference of colleagues.

According to dialectics, everything has two sides, and so does language theory which also has pros and cons. And subverters also will follow a revolution. Although CL has made up for the shortcomings of previous language theories which is very remarkable, it's also undoubtedly flawed, but is not seriously like Dabrowska's expressions of deadly sins. Obviously her overheated rhetoric also falls into the old mistake of some scholars of "overusing exaggerated words for novelty".

2. The origin and historical contribution of CL

In the mid-1970s, Lakoff and Johnson began to reflect on the two "shut-door"¹ linguistic revolutions initiated by Saussure and Chomsky and proposed completely different approaches to research. In view of their standpoint of idealism theory (apriorism, nativism), Lakoff and Johnson constructed the "Embodied Philosophy" and on the basis of which they proposed CL.

These two scholars' book named *Metaphors We Live By* was published in 1980, which sensationalized academic circles and made countless scholars bow in respect. They believed that metaphor was not only a rhetorical device, but also a basic way for humans to understand the world. There was a deep-rooted mental mechanism of "understanding and experiencing one kind of thing in terms of another" in people's mind, thus metaphor was formally promoted to the level of "cognition", conforming to the basic train of thought of the prevailing cognitive science, which had paved the way of theoretical thinking for the birth and development of CL. Since then, they (Lakoff, 1987; Johnson, 1987) had continued to publish on this emerging discipline respectively, which found an echo among other scholars (such as Langacker, Taylor, Dirven, etc.), and led to the establishment of the International Association of Cognitive Linguistics in Europe in 1989. This trend swept the world and soon became the mainstream of linguistics. In particular, Lakoff and Johnson (1999) had collaborated again and published the monumental work named *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*, which had laid a solid philosophical foundation for CL.

As we all know that the biggest characteristic of Lakoff and Johnson in the process of establishing CL is that it involves more philosophical content than any previous linguistic theories have discussed, and that is because Johnson himself is a famous American philosopher. They have criticized the traditional metaphysics severely, and absorbed many new ideas in modern philosophy, philosophy of linguistics, mental philosophy, and postmodern philosophy (Lakoff and Johnson, 1999: 597–601), pushing CL to the forefront of language research worldwide. It is particularly commendable that they have also spent a lot of efforts to construct the philosophical foundation of

1. This internalist approach for language research maybe called in folk Chinese as "to shut the door and beat the dog".

the discipline, that is, the Embodied Philosophy. Therefore, scholars engaged in CL will struggle without philosophical foundation. In the first chapter of the work, they have pointed out three basic principles of Embodied Philosophy:

- (1) The mind is inherently embodied,
- (2) Thought is mostly unconscious,
- (3) Abstract concepts are largely metaphorical²;

Then they have discussed the basic ideas and research methods of CL (Wang, 2001, 2002, 2007).

If the Structural Linguistics raised by Saussure and the Transformational Generative Linguistics raised by Chomsky are regarded as two revolutions in the linguistics field of the 20th century, CL based on Embodied Philosophy, which is strongly against the theories of Saussure and Chomsky, can be regarded as the third one, leading a new direction of today's linguistics research, and promoting linguistics once again to a new stage which becomes a forefront of current linguistic theory.

3. The shortcomings of CL

However, many scholars have recently reflected upon the shortcomings of CL and have put forward many beneficial suggestions, which are in full compliance with the basic law of “negation of negation” followed by the development of the discipline. We have also found some flaws in CL over the years, but it will not be as “deadly sins” as Dabrowska has said. After years of rethinking, we believe that the Embodied Philosophy and CL mainly have the following problems, which are briefly described below for reference by scholars.

(1) Although Lakoff and Johnson have referred to a lot of philosophical contents and discussed the Embodied Philosophy which is the foundation of CL and have emphasized the embodiment of mind, so as to separate from the popular idealism of Western philosophy. But unfortunately, their philosophical vision is still not broad enough to mention the materialism of Marxism-Leninism, and they only pay attention to the deconstruction in the trend of postmodern philosophy, and are completely unaware of the “constructive postmodernism”, let alone discussing the cognitive style of language from the height of embodied humanism. The philosophical standpoints of “materialism, humanism, and sociality” that should be involved in the Embodied Philosophy are still absent in their works.

(2) Humanism is a very important content of Western philosophy, and it is rarely mentioned in their works. They have explored several cognitive strategies of real humans to explain the cognitive mechanism of language effectively, including interactive experience, categorization, conceptualization, image schema, cognitive model, conceptual blending, metaphor and metonymy, construal, salience, relevance, etc. However, they simply opposed to Chomsky's concept of the ideal

2. If we separate these three principles, some Western scholars have already discussed it. For example, the first one is materialism in philosophy, which has existed since ancient Greece; the second is Freud's discovery; and the third is discussed by Western scholars such as Aristotle, Locke, Rousseau, Kant, Hegel, Richards, Black, Derrida, etc. (Wang, 2011). But the integration of these three into a whole and the designation of “Embodied Philosophy” is the contribution of Lakoff and Johnson. They have followed Marx's research method of constructing dialectical materialism by combining Feuerbach's materialism and Hegel's dialectics.

human based on which they have strongly criticized the shortcomings of the previous linguistic theories. The shortcoming is that they have never been able to rise to the height of the post-modernist philosophy of embodied humanism.

(3) They claim to give a thorough rethinking of Anglo-American analytic philosophy, but it is unclear that what they exactly rethink. The difference between Embodied Philosophy and analytical philosophy has not been clearly stated. One of the basic principles of analytical philosophy is the isomorphism of language, but the interaction between humans and the world has not been well analyzed. This part of the discussion is obviously inadequate. The method of solving the relationship between existence and thinking in philosophy through linguistic analysis which is advocated by analytical philosophy is very clever. They don't know much about it, so how can they carry out profound reflection?

(4) They also claim to have a profound reflection on the Postmodernist Philosophy, which, the same as the last mistake, is so obscure as to explain what they are rethinking about and what different views they have. They have sometimes made mistakes of mixing the Western traditional philosophy with Postmodern Philosophy. According to the latter, the "Embodied Philosophy" they have proposed is a challenge to the entire Western philosophy which has completely changed the traditional creed, then the Embodied Philosophy should completely belong to the category of Postmodernist Philosophy, such as "unconsciousness thought", "metaphorical concept" and so on all having distinct characteristics of post-modernity, but they have failed to realize this.

(5) They (Lakoff and Johnson, 1999: 343) have mentioned the need for rational reconstruction, which is a guilty of "embodied rationality as the only right way", misleading from time to time to reveal the Embodied Philosophy and the CL can deal with everything and solve all the problems. This view is obviously not in line with the basic spirit of dialectics, which is contrary to what we have proposed "the view of elephant and leopard" (Wang, 2019c), and has therefore been criticized by academics. Human beings can only go along the road of "negation of negation" forever, which is a long road of continuous exploration of truth, far from the absolute truth. To strive while there is life to live.

(6) There are many synonymous terms used in CL, such as "framework, model, schema, prototype, script, stereotype", etc., whose connotation and extension are often overlapping and the boundaries among them are blurred. What is worse is that, only "cognition" is highlighted in the subject name "CL", which fails to distinguish it from the Chomsky's research on language cognition. Their favorite but also the most distinctive "embodied mind" is not reflected in the name of the subject, which is inevitably a pity! Their interpretations of cognition in their works are inconsistent, and they sometimes suggest that it is all-encompassing, and anything that has been worked through mental operation can be regarded as "cognition", which seems to imply that it is acceptable for Chomsky to consider himself a cognitive linguist. On the other hand, they have emphasized the cognition of "embodied, unconscious and metaphorical" in the Embodied Philosophy.

(7) Lakoff and Johnson have accepted Merleau-Ponty's "phenomenology of perception", emphasizing the fundamental role of "body experience" in human mind, thinking, and language in the discussion of the Embodied Philosophy, according to which they have severely criticized the philosophical position of Objectivism, which is acceptable. We believe that it should be based not

only on the inside of the “body”, but also on the “real world” which is outside the body. According to the principle of

“惟人参之”

“wéi rén cān zhī”

“only human being makes it”

we build the philosophical theories and analyze the causes of language. We should both reflect the principles of materialism and the Embodied Philosophy, and adapt to the embodied humanism in postmodern philosophy, but they have failed to realize this principle well.

Therefore, Wang (2014) revises the title of CL to ECL which attempts to construct our own linguistic theory in China. It is expected to effectively distinguish the broad CL camp (including Chomsky, computer Software designers and some psychologists, etc.). It can not only save so much efforts and words from Lakoff and Johnson to distinguish “the first-generation cognitive science” from “the second modern cognitive science”, but also can highlight the research achievements of embodied cognition in the field of linguistics.

Lakoff and Johnson (1980, 1999) have summarized all the past philosophical theories as Objectivism and have conducted in-depth criticism. On this basis, they have put forward “non-objectivism”, and they have pointed out that if the conceptual metaphor is true, all objectivist views on meaning and knowledge are false (Lakoff and Johnson, 1980: 273). Lakoff (1987: 158) also says that all the doctrines of objectivism about human thought and language are problematic if they are not completely wrong. This clearly shows that all the previous theories are wrong, and naturally it concludes that their theory is the only correct conclusion which is obviously inconsistent with the pluralism emphasized by postmodernist philosophy. If there is no part or most of the objective factors in our knowledge (especially in the natural sciences), and the non-objectivism is used to completely deny this foundation, how can we talk about “embodiment”? How can one gain the true knowledge of the world?

4. Unclear extension of “Cognition”

Lakoff and Johnson (1999: 11) have mentioned that “cognition” refers to the mental operations or structures that can be studied in precise terms, most of which are unconscious. This point of view is obviously influenced by the research contributions of postmodern philosopher Freud, thus the “conscious cognition” focused on the research of traditional philosophy is extended to “unconscious cognition”, which makes the Embodied Philosophy have the characteristics of postmodern trend.

After they (Lakoff and Johnson, 1999: 10) have analyzed two simple dialogues, they can list dozens of mental processing steps which can be all completed instantly. They are processed automatically and spontaneously so that people could barely be aware of their existence.

If we follow Lakoff and Johnson’s macroscopic thought on “cognition”, all researches in language must be processed by the mind, and the term “CL” can also include all academic schools, which means there is no revolution in the study of Chomsky’s language cognition. Such an overly broad terminology is not conducive to the orientation of the discipline, and it confuses its own

distinctive linguistic school with all other cognitive studies of language.

Some scholars will say that macro-cognitive linguistics uses lower case letters, cognitive linguistics, which includes cognitive theories proposed by many schools of scholars in language research, however, Lakoff and Johnson's language theories can be expressed by capitalizing the letters as 'Cognitive Linguistics'. Then we have to ask, how does this capitalized CL differ from other cognitive theories? What are the typical features? Now that we have such a wealthy of words, why bother with this one term instead of finding another term?

The underlined phrase "precise term" in the quotation in the last sentence also seems difficult to understand. What is "precise"? This reminds people of precise calculation of mathematics. Cognitive psychologists of the first generation of cognitive science have advocated mental operation as "mental arithmetic" which means the precise method of mathematical calculation can be used to explain the laws of mental operation. It is obviously inconsistent with postmodern philosophy and the second-generation cognitive science, and is easy to associate with Chomsky, the leader of the formalist school, together with his disciples. The word "precise" is also accompanied by the influence of formalist school.

The so-called "precise" is actually a mess in the eyes of postmodern philosophers, which may still be influenced by traditional metaphysics. We also clearly remember that Lakoff's famous paper *A Note on Vagueness and Ambiguity* which was published 50 years ago in 1970, stating that the language has a feature of vagueness. He went on to publish papers in 1972 and 1973 to illustrate this point. In this sense, the "precise" used here does not coincide with the "ambiguity and pluralism" discussed by Lakoff and postmodern philosophy.

On the other hand, Lakoff and Johnson confines "cognition" to "embodied cognition" in their work. They (Lakoff and Johnson, 1999: 5) have pointed out clearly in the famous book *Philosophy in the Flesh: The mind is inherently embodied, reason is shaped by the body*. On page 343 of the work it says: ... *our analyses are constrained by empirical studies of the nature of cognition*. The view of embodied cognition is of epoch-making significance. It's claimed that they have launched the third revolution of the 20th century in linguistics, thus subverting the first revolution of Saussure's structural revolution based on apriorism and the second revolution of Chomsky's transformational generative revolution based on Nativism. This extraordinary revolution ultimately has split language research off the dominance of idealism, and has brought the philosophical camp of materialism back to the linguistic field. This is particularly significant for the guidance of Chinese scholars, because our country tends to adhere to the dialectical materialism. It is a pity that they know very little or even ignore Marxism-Leninist materialism and they have not mentioned materialism³ in their works because their philosophical horizon is not broad enough.

If we follow Lakoff and Johnson's thinking to understand, the theory of language cognition they have put forward and the cognitive research that Chomsky and others are engaged in are totally different in many basic theoretical assumptions. It is really a pity that such a distinction is not reflected in its academic terminology, and the most essential view of embodied is drowned in the misnomer.

3. In 2003, Lakoff was invited to China to give lectures. He was asked that if he had ever read the works of materialism, and he responded with a 'no' answer.

As we know, Chomsky (1957, 1965, 1968) pioneered the study of language from a mental perspective, so he also called himself cognitive linguist. There are many scholars engaged in artificial intelligence, software design, and computer experiments at home and abroad who call themselves cognitive scientists. This has brought many uncertain factors for the academic circle to correctly understand “cognition” and clearly define the CL advocated by Lakoff and Johnson. We have already found that this phenomenon of misnomer, and it seems to be biased to only mention cognition in the name of the subject without mentioning embodied.

5. The revision of ECL to CL

5.1. What is Embodied Cognition?

Although the Embodied Philosophy and CL have initiated a revolution criticizing the Saussurean and Chomskyan revolutions, they have failed to clarify the philosophical position of materialism, humanism, and sociality. Wang (2002) has discussed the philosophy foundation of CL as Embodied Philosophy and has translated it into *tìyànzhéxué*, which proposes the brand-new design feature of “embodiment of language” to criticize Saussure’s Linguistic Apriorism and Chomsky’s view of Nativism. Later, he has felt that the word “embodiment” mostly contains the meaning of objectivist physical experience, however, the subjective meaning of “cognitive processing” is not highlighted enough, so the “embodied cognition” is to revise “embodiment of language”, also reasonably has changed the “CL” from abroad to “ECL”, which is intended to use “embodiment” to highlight the perception of language, so that the materialism in philosophy can return to the field of language research. We also retain the “cognitive” in the original name, using interactions, image schema, categorization, conceptualization, conceptual blending, metaphor and metonymy, cognitive model (CM (cognitive model), ICM (idealized cognitive model), ECM (event domain cognitive model), frame, stereotype, construal, salience, relevance, and other terms to reveal the causes of language. The concept of “cognitive” puts more emphasis on the humanism in language research, and the new humanistic view of postmodern philosophy can be used to restore the true nature of language, fully reflecting the basic position of linguistics as “humanology” (Li, 2002, 2005, 2011; Pan, 2006). This also indicates that ECL and CL have a homologous relationship, both in origin and in length.

ECL also integrates many unique research achievements of the embodied cognitive team of Sichuan International Studies University, such as refining the core principles of the discipline, applying super disciplinary research methods, constructing and improving the branch discipline systems, and closely integrating with language teaching. Wang (2014) has discussed the reason from ten aspects why the name of the discipline of CL should be revised, which is encouraged and supported by more and more scholars. In recent years, dozens of papers have been published for deeper analysis. Wang (2019a) has further discussed the theoretical orientation, main content, basic ideas, research methods and significance of ECL. In the same year in November, the National Association of ECL was established in Sichuan International Studies University, and the first International ECL Seminar was held which saw more than 200 scholars from home and abroad to attend. Scholars gathered to talk about the research experience in these years and made this theory develop gradually.

It is quite interesting that there is a ready-made word “*Tǐ rèn* (embodiment)” in Chinese, which has been added into the *Modern Chinese Dictionary (Fifth Edition)* two days before its

publication in 2005 (also the word “Yuànjǐng” has been added), because this word appeared in the announcement of the press communique in April of that year during General Secretary Jintao Hu’s meeting with the Chinese Kuomintang Chairman Chan Lien in the mainland of China. Some scholars believe that the word “Tǐ rèn (embodiment)” is popular in Hong Kong and Taiwan of China, but this statement is quickly questioned by many scholars who have found that the word appeared in the Chinese during the Song Dynasty and continued to be used until the Republic of China period. This shows that “Tǐ rèn (embodiment)” has always been a common word used by the mainland and Taiwan.

The interpretation of “Tǐ rèn (embodiment)” in *Modern Chinese Dictionary (Fifth Edition)* is: to perceive and know. This is perhaps the most basic way for human beings to acquire knowledge, which can be regarded as the basic starting point and methodology of all sciences. People’s life is to know the world through perception, to master the language, and to integrate themselves into the society. So it is now perfectly reasonable to use it in the name of linguistic theory.

5.2. Materialist standpoint

The struggle between “materialism vs. idealism” has been running through the western philosophy for more than 2,000 years. Materialism believes that material determines consciousness. The former is the cognitive basis of the latter, and the latter is the sublimation of the former. The cognition of human beings cannot be separated from concrete objective things, and “category, concept, meaning” all depend on the “objective world”. Idealism, on the other hand, holds that consciousness determines material, and only the things recognized by people are the real existence. The idea, “There is nothing outside the heart” proposed by Chinese scholars, belongs to this camp.

Chinese scholars have received the ideological education of materialism since childhood. This standpoint is well known to everyone, and is the philosophical basis that we cannot be too familiar with. It is a great pity that few people in the linguistic field at home and abroad know that Saussure and Chomsky’s linguistic theories belong to the camp of idealism.

Saussure (1916) has taken the lead in criticizing the theory of language tools proposed by Socrates in ancient Greece, vigorously advocating Linguistic Apriorism, which takes the attitude that language is a transcendental formal system beyond the individual, and people are put into a language system after birth, controlled and manipulated by it. Both the ancient Greek philosophers and Descartes of modern times have discussed Linguistic Nativism, and have also proposed “speculative grammar” and “universal grammar”. Chomsky has inherited this theory, making it once again prevalent in the academic circle for decades. He believes that people were born with a “universal grammar” or “language acquisition device” embedded in their minds. With limited stimulation, people can acquire language, and he also attempts to explain the syntax generated in the mind by using formal calculus process. On one hand, he has made great contributions to lead the language research to the direction of “mind” and “cognition”, on the other hand, he has also misled the direction of linguistic research in the world for decades, which should be reversed.

The first principle in the Embodied Philosophy created by Lakoff and Johnson is “The mind is inherently embodied”, which is the most contrary to Saussurean and Chomkyean philosophy theories and has extremely important historical significance in the linguistic field. In recent years, we have proposed ECL on this basis, and highlighted the position of materialism in linguistics, in

order to reverse the situation in which Saussure, Chomsky and others have dominated the linguistics stage based on idealism for nearly a century. Wang (2007: 288) further thinks about the materialist view of language to solve the questions of “what is the basis of the embodiment?”, “what mainly should be embodied?” and “how to embody?”, trying to illustrate the process of how matter determines the consciousness, which is also a kind of supplement to materialism.

5.3. Humanism

The ancient Greek philosophers, for the purpose of “seeking the truth and loving wisdom”, kept questioning the nature of the world and established the metaphysical philosophy of objectivism, ignoring people’s subjective imagination. The long Middle Ages were an age of the “divine throne”, in which decent people were subject to the enslavement of the God. During the Renaissance of the 15th and the 16th centuries in Europe, although humanism was revived to a certain extent, under the majesty of traditional philosophical views, most scholars believed that people’s feelings were unreliable and often biased which would produce value pollution. Humanism was once again ignored by Western philosophers for various reasons. From the end of the 19th century to 1950s the early ideal language school of western philosophy of language established the philosophical view of “The language and the world are isomorphic” to criticize the illusory pseudo-propositions which metaphysics tried to prove, however the humanistic spirit was still not in their visions. Since the 1950s and 1960s, the ordinary language school in the philosophy of language and the European humanist philosophy gradually became prominent, and humanism was going out of the low tide and has gained its name by the hands of German philosophers.

Whether philosophical and linguistic studies should be based on “humanist factors” is also a watershed between postmodernist philosophy (including embodied philosophy, post-philosophy of language in China, etc.) along with ECL and the past traditional theories.

It is known to all that philosophy is mainly concerned with the relationship between “thought vs. existence (human vs. nature)” and it is obvious that both of them are closely related to human. In more than 2,000 years of exploration in the Western philosophy, traditional philosophy believes that people have subjective imagination, value faith, and prejudice, etc, but they are not conducive to obtain absolute objective truth. Therefore, people are often excluded and eventually are ruthlessly abandoned to a marginalized ending by Western philosophers, such as the Cartesian Paradigm which blatantly excludes living people.

Saussure and Chomsky’s, strictly following this way, pursue the objective nature of language as the guideline, so that the factor of the human is relentlessly driven out of the field of language research. Especially Chomsky has forcefully used “ $1 + 1 = 2$ ” which is the formalist method of describing and interpreting the language, ignoring humanist factors and deeply falling into the quagmire of traditional objectivist philosophy.

Each of the three principles of the Embodied Philosophy mentioned above involves humans as a subjective part. “Mind, thought and concept” are the results of “only human being makes it” which is said by Xie Liu, a famous Chinese philosopher of Southern Liang Dynasty. There is no direct connection between language and the outside world, during which there must be participation of human, and traditional viewpoints of referential theory, objectivist philosophy, logical positivism, truth value theory, picture theory, scientism, and formalization are all questioned because of the

neglect or abandonment of the humanistic spirit, and are criticized by postmodern philosophers.

Since the Renaissance, most modern scholars in the West believe in the doctrine of “rational human” and “scientism”, which has made the academic circle often abandon the realistic people, which has formed the opposition of “human vs. nature”. As we all know, it is precisely because of people that we have language and linguistics. This kind of theory which has discarded the humanism in the research must have inherent problems, and lack further explanation because it finally kicks people who have created the language originally out of the field of language research, which is far from the “three adequacies” advocated by Chomsky!

Western scholars have sometimes shifted to another extreme, proposing “radical humanism” and excessively promoting human subjectivity. Under the misleading of the slogan of “anthropocentrism”, people get complacent, arrogant, and infinitely demanding from nature, making the environment destroyed and an ecological imbalance has appeared, which has been severely criticized by today’s academic circles. We also disagree with the “radical humanism” or “pessimistic humanism” proposed by some foreign postmodernists, indiscriminately criticizing the “human subject” (Wang, 2006: 124), deconstructing Sartre’s “human precedence” and abandoning the human subject is also inappropriate. Foucault’s (1966) proposition that “man is dead” also seems difficult to stand on its own.

Constructive postmodernists vigorously advocate that people and nature should live in harmony, which is the right choice of the times. And harmony between human and nature must be achieved by humans and nothing can help. What will happen to the world without its enforcer? Sartre’s Existentialism of “man has precedence in his existential” is still reasonable. There is no need for the academic circle to pursue novelty blindly by opposing everything.

From this analysis, we deeply realize the profound meaning of the sentence which is “postmodernism inherited from modernism”. Modernism advocates that humanism has its own merits, but it is inappropriate to change it into “anthropocentrism”. And the postmodernists advocate “radical humanism” for a while, and then appeal “pessimistic humanism” for a while, and chant the slogan of “deconstructing the human subject”. These are all wrong. What we oppose is “anthropocentrism”, but we cannot abandon human subjects. The traditional Chinese philosophical view of “extremity makes opposition” is still very reasonable, according to which we do not accept the overstatement of postmodernists and should treat “humanism” correctly!

We have conformed to this humanistic thought, based on the main ideas of Embodied Philosophy and CL, and also on the views of materialism and humanism, we have summarized the core principles of ECL as: “Reality-Cognition-Language”, which is entitled “embodied principle”. We firmly believe that language is formed in the process of “embodied interaction” (embodied) and “cognitive processing” (cognition) with the real world, emphasizing that only under the effect of human cognition, language is possible to be connected with reality, which is also consistent with “the universalism of embodied cognitivity” and “subject-object-subject multiple interaction understanding model (SOS for short)” proposed by Wang (2009). Based on this argument, Wang (2008) have also demonstrated why the 40 English translations of *Night Mooring by Maple Bridge* have similarities and differences, which can be illustrated by cognitive construal. Yang and Wu (2015, 2017, 2019, 2020) have shown the intersubjectivity’s significant role in language production such as *ziji*, verb doubling cleft construction in Chinese and Chinese passive construction. Zhao (2019a,

2019b) has illustrated the establishment of intersubjectivity both in the evolution of first pronouns in Chinese and English pronouns. It not only can better explain the basic situation of the language both is English and Chinese, but also applies to human understanding and information dissemination.

6. The view of “Elephant and Leopard” and Pluralism in linguistics research

6.1. The view of “Elephant and Leopard” based on postmodern philosophy

The fourth turn of Western philosophy formed under the impetus of the French legions of postmodern philosophy, namely “postmodern philosophy” (Wang, 2019a: §3), spreads all over the world like a ghost. On the one hand, humanistic spirit has been truly publicized and attracted much attention. On the other hand, the trend of “deconstruction, subversion, destruction and criticism” is at its peak. Deconstruction of foundation, criticism of tradition, reflection of rationality, resistance to metaphysics, opposition to duality and subversion of center have also turned into a new trend in the academic world. Subsequently, “constructive” postmodern thoughts have emerged in the United States and other places, practicing the thought of “not only to destroy the old world, but also build a new world”, bringing the study of social humanities into a new era, and making the two fields of literature and translation have undergone earth-shaking changes.

Postmodern philosophers oppose monism as well as dualism, simultaneously advocating the pluralism. The so-called Perspectivism also holds this position which denies absolute truth and emphasizes that people will have different feelings if they observe the same thing from different angles. And everyone can draw their own unique insights from its own unique position, insisting to redress the wrong idea to “prejudice”. Feyerabend (1975), a famous postmodern philosopher, summed up this view in the simple saying as “Anything goes.” Deleuze (1994) once compared thought to “the dice”. “Thought is a roll of a dice”, he said, in order to emphasize diversity and contingency.

ECL accepted the influence of anti-foundationalism, decentralism, and pluralism, and put forward the “Elephant and Leopard”, which holds that there is no objective ultimate truth or absolute unity essence in the world. Language research is no exception. It can have multiple essences and perspectives, so it doesn’t have to be one and the same. “Let all flowers in bloom and all thoughts in argument” is the essence of scholarship.

There are two common idioms in Chinese: “the blind men and the elephant” and “seeing a leopard only by a glimpse of few dots”. The former idioms tell a story that six blind men touched different parts of an elephant from different angles, thus telling the whole elephant what it looked like. The latter means to recognize a leopard by a glimpse of a spot. Both of the idioms are intended to criticize the one-sided view of “overgeneralization”. But postmodern philosophers argue these two idioms are reasonable because it is impossible for us to touch or see the whole object all at once. It is inevitable to know the whole through parts, because people can never see the six sides of a cube at the same time. According to this idea, man is always on the way searching for truth, and it is impossible to recognize the whole truth of the world. Perhaps the metonymy mechanism as “part for whole”, which is discussed in detail by CL, is an inescapable human destiny.

Linguistic schools are often established by different linguists based on a certain theory from a certain angle. For example, Saussure, the father of modern linguistics, established the structuralism

theory by “closing the door to research language” based on the “empiricism”. Chomsky constructed the transformational generative linguistics by “closing the door to research syntax” based on the “nativism”. CL discusses the embodiment and cognitive aspects of language from the perspective of criticizing Saussure and Chomsky. Based on the “dialectical materialism” of Marxism-Leninism, “embodied philosophy” of Lakoff and Johnson and “postmodern philosophy” of the fourth turn of western philosophy, ECL emphasizes the embodied cognitive principle of “reality-cognition-language”, which can make up for the shortcomings of previous theories. It is clear from the above that there exists no linguistic theory which can solve all the problems of language, and there exists no method that can cover the entire world. The road of language exploration is endless.

In a word, it is impossible for people to recognize the whole nature of language on the basis of existing knowledge at that time. We are still far from this goal, so we can only make a partial understanding from a certain perspective, always walking on the way of metonymy of “part for whole”, and practicing the dialectical principle of “negation of negation”. This is the conclusion pointed out by Hu (2012) that “Sometimes truth is not in one theory, but among multiple theories”. Accordingly, the scholar must bear in mind that “to take a longer view”, must not again make the mistake of “cannot see the wood for the trees”. Of course, when you are trying to redress the misunderstanding of two idioms of “elephant and leopard”, you don’t have to keep to one opinion. You should try to touch as many different parts of the elephant as possible, see as many spots on the leopard as possible, and examine the problem from as many angles as possible. This is the “pluralism” proposed by postmodern philosophy, which advocates tolerance, inclusiveness, integration through win-win path, and realizes the organic combination of “selfness” and “otherness”.

6.2. Language is pluralistic

The various properties of language described in the current linguistic works or textbooks at home and abroad also fully prove the correctness of the view of “the Elephant and the Leopard”. So far, scholars’ views on the nature of language mainly involve: sociality, universality, nationality, communicativeness, systematicness, semioticalness, mentality, arbitrariness, generativeness, etc. And we also notice that different linguistic schools tend to emphasize different natures of language. Structural Linguistics emphasizes the systematicness, semioticalness and arbitrariness of language; Systemic Functional Linguistics emphasizes the sociality, communicativeness and function of language; Transformational Generative Linguistics emphasizes the nativism, mentality and generativeness of language; ECL emphasizes the embodiment, integration and iconicity of language.

What we have discussed is “language has the nature of embodied cognition”, which is a new understanding of the nature of language and the simplest and most general expression to explain the causes of language at all levels.

This new understanding of language has been mentioned sporadically by foreign scholars so far, but no paper or work has been published to formally explain this new understanding of language. Based on the above ideas, we have published dozens of articles in this century to formally propose and preliminarily discuss the recognition of language, which is a new understanding of the nature of language. It has also attracted extensive attention from scholars at home and abroad and won their strong support. These articles, reprinted by Reprinted in Information Center for Social Science of Renmin University of China, are widely cited by peer scholars. But this does not mean that ECL can solve all problems.

In the course of the three linguistic revolutions of the 20th century, each theory flourished over about 50 to 60 years. We believe that ECL appearing after CL has thrived for half a century, and there must be newer and more explanatory theories proposed after ECL.

7. Conclusion

Since we have proposed embodiment perspective on language more than ten years ago, we now have received many scholars' responses. In particular, its core principle of Reality-Cognition-Language has great explanatory power and is applicable to all levels of language. Our team has published dozens of articles around this core principle, and officially published the book *Embodied-Cognitive Linguistics* by the Commercial Press (Wang, 2020), which will play a positive role in promoting the popularization and development of this discipline.

The basic theory advocated by ECL is also consistent with the philosophical concept of "perceptual knowledge vs. rational knowledge". Materialists believe that human knowledge originates from sensibility, but it must be sublimated to become rational knowledge, and such knowledge is more reliable. Therefore, we have both sensibility and rationality in the study. ECL uses the word "embodied" to represent the former Tǐ, and the word "cognitive" to represent the latter Rèn. Two mental processes are closely combined, which better reflects this philosophical position. Not only does language originate from embodiment (sensibility and rationality), but all human knowledge originates from embodiment. Human life is about embodiment, and the history of human development is a continuous embodiment processing. Scholars of philosophy of language believe that all human knowledge is stored in language, so it is reasonable of Wang (2013, 2015) to position ECL as a continuation of philosophy of language.

The academic community has always advocated the close combination of theory and practice, and ECL is also making efforts to practice this basic spirit, such as Liu (2020) using ECL to explain the Chinese rhetoric devices. It has not only achieved some development in theory, but also has great significance in practice. Teaching under the guidance of "embodied and cognitive" will surely get better results (Wang and Wang, 2019b).

ECL is the inheritance and development of CL which is the current mainstream school of linguistics (Wang, 2019d). It is regarded as an inheritance because ECL has accepted CL' theoretical basis—"Embodied Philosophy" and several cognitive strategies; it is referred to a development because Embodied Philosophy and CL have failed to clarify their materialist philosophical standpoint. The humanistic and social understanding in language research is also unclear. Based on this, we have reflected on Saussurean and Chomskyeian idealist standpoints and corrected their errors of ignoring individual differences and neglecting social aspect in language research. At the same time, Lakoff and Johnson's descriptions on "cognition" is vague. Its scope could be sometimes too broad or simply limited to embodied cognition, and both of the two scopes have failed to justify themselves. Therefore, we propose ECL in order to make a little development of CL.

Conflict of interest

No conflict of interest was reported by the author.

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ORIGINAL ARTICLE

Semantic relations and prosodic features of *ranhou* in spontaneous Mandarin conversation

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Abstract: *Ranhou* ‘then’ is traditionally defined as a conjunction, indicating succession of two events. Adopting the methodology of Interactional Linguistics, this study explores semantic relations of *ranhou* in Mandarin face-to-face and telephone conversations. An examination of the data shows that besides succession, *ranhou* can express other nine semantic relations, including causality, progression relation, coordinating relation, adversative relation, additive relation, enumeration, hypothesis, alternative relation, concession and be no practical meaning as well. Meanwhile, prosodic features of *ranhou* are explored with the help of software Praat and Audacity. It is suggested that eleven semantic relations vary in mean pitch range and mean length. Although each token of *ranhou* differs from each other in prosody, with respect to loudness, *ranhou* can be stressed on *ran*, or *hou* and also be articulated without loudness. But in a whole, loudness of *ranhou* is mostly put on *hou*.

Keywords: *ranhou*; semantic relation; prosodic feature; spontaneous Mandarin conversation; Interactional Linguistics

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1. Introduction

Ranhou is traditionally defined as a conjunction, indicating succession of two events in terms of the seventh edition of Chinese Dictionary (2016: 1092). For instance:

学	然后	知	不足
xué	ránhòu	zhī	bùzú
learn	RANHO	know	shortcoming
‘Learn and know the shortcoming.’			

Previous studies on *ranhou* have mainly focused on its multifunctionality. For example, it is

argued that *ranhou* can be a discourse marker to continue turn in interaction (Fang, 2000), to mark successive relationship, enumeration and start new topics in conversations (Xu, 2009), to play a transitional role in switching the discourse from conversation setting to narrative setting in narration (Zhu, 2017) and to be a topic-shifting and trail-off marker (Wang, 2018).

Instead of predefining some functional categories, the present study first thoroughly investigates each token of *ranhou* in the data and focuses on semantic relations of *ranhou*, which refers to meanings expressed by *ranhou* when it is used to connect turn construction units (TCUs) before and after it in one turn. And two methods, substitution and deletion, are used to confirm the semantic relation reflected by the word *ranhou* in the data. Second, the paper examines prosodic features of *ranhou* to verify whether different semantic relations match different prosodic features.

Thus, the article examines *ranhou* in naturally occurring conversations, mainly revolving around the question: what semantic properties does *ranhou* present in talk-in-interaction. Specifically, 1) what kind of semantic relations does it present in interaction? 2) what prosodic features does it reflect with relation to its semantic relations? 3) what prosodic features does it display?

To clearly present features of *ranhou* in conversations, the article is organized in the following manner. First, data and methods are explained to address the need for further exploration of *ranhou* in spontaneous conversations. Next, core concepts are displayed to pave the way for the analysis. Then, a formal analysis is conducted to give an in-depth and comprehensive discussion of *ranhou* on the basis of the established integrated theory. The concluding section includes the summary and discussion of its findings.

Data

The present study has been carried out with theoretical orientation of Interactional Linguistics. It takes a twofold empirical stance—it advocates empirical data from natural interaction as its object of study, and it seeks empirical evidence from the same data for the validation of its analyses. It uses naturally occurring data, conducts context-sensitive analyses in an online perspective, and strives to ground its categories empirically as well as to warrant its claims through participant observation.

Hence, the data, a total of 6.77 hours, come from sixteen audiotaped telephone and face-to-face interaction among native speakers of Mandarin collected through participant-observation by the recording tool. The topics involved are rich, mainly including education, job hunting, the experience of being volunteers, visiting Chengdu, work, and scholarship. The details of data and participants are described in the table below. The part of the collected data that involves the privacy of others has been deleted or processed by other ways. The names are replaced by English symbols. The letter M and F denote male and female respectively. In a bid not to affect analysis, tokens of *ranhou* expressed by the author have been excluded from the totality. Eventually, 530 tokens of *ranhou* have been found.

And data were intermediately transcribed following Du Bois transcription and a Chinese character-based three tier designed based on Du Bois transcription (Tao, 2001; Lu et al., 2014) to better show non-English data. The data are transcribed by the intonation unit (IU) and each line is numbered to describe data easily. The intonation unit (IU) is defined as a stretch of utterance produced under a single coherent intonation contour (Du Bois et al., 1993: 47; Tao, 1996: 35). To transcribe effectively, Praat and Audacity were adopted in that the technical tools can reflect a series

Table 1. Basic information of data

No.	File Name	Duration	Number of speakers	Gender	Age range	Type	Relationship
1	WL	13m	2	M F	24-35	face-to-face	teacher & student
2	BHPL	38m20s	4	F F F F	22-25	face-to-face	alumnae
3	PWWL	17m17s	4	F F F F	19-24	face-to-face	classmates
4	YL	9m40s	2	F F	24-25	telephone	classmates
5	ZL	10m54s	2	M F	19-24	face-to-face	alumnae
6	LL	9m15s	2	M F	24-40	face-to-face	teacher & student
7	ZS	7m50s	2	F F	19-20	face-to-face	friends
8	GYZL	41m44s	4	F F F F	24-40	face-to-face	teacher & student
9	ZYL	6m29s	3	F F F	24-25	face-to-face	classmates
10	LL	7m43s	2	M F	24-25	telephone	friends
11	GZXLZYL	30m40s	7	F F F F F F F	24-40	face-to-face	teacher & student
12	HZL	56m04s	3	F F F	24-25	face-to-face	classmates
13	ZL	20m04s	2	F F	24-25	face-to-face	friends
14	SL	48m29s	2	F F	24-30	face-to-face	strangers
15	CL	1h10m53s	2	F F	23-25	face-to-face	alumnae
16	YL	8m25s	2	F F	24-25	face-to-face	Friends

of prosodic features and pause respectively. The data have been transcribed in pinyin Mandarin, then translated into English, first literally and then into a natural form. Therefore, each excerpt consists of three lines, though in some cases the more idiomatic translation is not shown line-by-line but rather at the end of that turn.

2. Theoretical perspective: turn and online perspective

The analysis of *ranhou* is closely associated with interaction and is context-dependent. To clearly clarify, the definition, component and classification of turn should be mentioned, since the analysis of *ranhou* closely attaches to them. Although the concept of turn was proposed by Sacks et al. (1974), the definition was not crystal clear. In Edmondson's eye, turn means the opportunity to become a speaker at some point in the conversation and what a person says when he/she is the speaker (Edmondson, 1981). However, there is no clear standard, so some disagreements have occurred in distinguishing the turn from the non-turn. To solve disagreements, Liu defined turn as the words that the speaker continually addresses at any time during the conversation, and the end is marked by the interchange of the role of the speaker and the listener or the silence of the parties (Liu, 2004: 46). This definition includes two criteria for measuring turn. First, whether the speaker's words are continuous, that is, whether there is silence at the end of a sequence of grammatical semantic completions. If there is a silence, usually lasting over two seconds, then the speaker's words will be more than one turn. The second is whether there has been a change in the role of the speaker and the listener. If it does, it marks the end of a turn and the beginning of the next turn.

And turn could be composed of interactionally achieved, flexible, and adaptable units at talk that are oriented to as relevant by the participants, called as turn construction units (TCUs) (Selting, 2000). Turn can be classified into full turn, feedback items and half turns (Liu, 2004). The feedback item is the form of the listener's reaction to what the speaker said. According to Liu, the feedback project has six basic characteristics: 1) issued by the listener; 2) objectively not interrupting the

speaker's turn; 3) subjectively not asking for the intention of the turn, but encouraging the speaker to keep the turn: 4) with the relatively short form; 5) not providing new information and 6) not a trigger for the answer structure. In Chinese talk-in-interaction, words, such as en (em), a (em), dui ('right') are common feedback items that can be frequently found in the data. Half turn contains subsidiary turn, unfinished turn and the overlap when the hearer completes the speaker's turn.

The analysis of *ranhou* relies on turn as well as an online perspective. The online perspective refers to a progression in the analysis that follows the real-time production and processing of talk by the participants (Couper-Kuhlen and Selting, 2018: 58). Originally, it refers to turn alternation or turn by turn, or TCU by TCU. Yet as the current research is showing, there are smaller stretches of talk that are also interactively relevant, so that an online perspective requires considerations below the level of TCU (Iwasaki, 2009, 2013). Analyzing data from an online perspective means reconstructing structures both as emergent in real time and as interactional achievements. The analysis of *ranhou* depends on what is going on in the interaction: under certain circumstances and sensitivity.

3. Semantic relations of *ranhou*

The part aims to give an in-depth and comprehensive discussion of *ranhou* on the basis of the established integrated theory. It mainly explores semantic relations of *ranhou* as well as prosodic features of semantic relations. The semantic relation represented by *ranhou* refers to the relation between TCUs before and after *ranhou* in one turn. According to Xing, the semantic relation can be classified into three categories, that is, generalized parallel relation, generalized causality, and generalized adversative relation (Xing, 2001). In generalized parallel relation, there are successive, coordinating, progressive, and alternative relations since all of them reflect the list of several things. Generalized causality means the relation of cause and effect, including causality, hypothetical relation, conditional relation, inference relation and goal relation. The last category implies opposition and contrast, including adversative relation and concession.

In terms of the seventh edition of the Chinese Dictionary (2016), the word *ranhou* represents successive relation of two events (2016: 1090). However, the meaning of the word *ranhou* is extended with the semantic relation featuring diversity. Not only the successive relation can it represent, but also other relations it can reflect such as causality, coordinating relation. Two methods, substitution and deletion, are used to confirm the semantic relation reflected by the word *ranhou* in the data. In order to clearly present the semantic relation represented by *ranhou*, each category is listed in the **Table 2**.

Table 2. The semantic relations represented by *ranhou* in the data

Semantic relation	Number	Proportion
succession	190	≈35.85%
causality	100	≈18.87%
progressive relation	61	≈11.51%
coordinating relation	50	≈9.43%
adversative relation	34	≈6.42%
additive relation	9	≈1.70%

Table 2 (continued)

Semantic relation	Number	Proportion
enumeration	7	≈1.32%
hypothesis	5	≈0.94%
alternative relation	3	≈0.57%
concession	1	≈0.19%
no practical meaning	70	≈13.21%
Total	530	100

From the above table, there are eleven semantic relations represented by the word *ranhou*, and one of them is no practical meaning. Among them, the top three are succession, causality and no practical meaning, accounting for about 35.85%, 18.87% and 13.21% respectively. It reflects that *ranhou* keeps its original meaning and extends the meaning in the interaction as well.

3.1. Successive relation

By successive relation, it means actions occur continuously, or several things that happen one after another in turns. If *ranhou* represents the successive relation, it can be replaced by *jiezhe* ('and').

Excerpt 1. ZL—The conversation between a teaching assistant and a male student 05

1	L: 哦	你们	有	这样	的	一	个 .
	o	nǐmēn	yǒu	zhèyàng	de	yī	gè
	PRT	you	have	in this way	CSC	one	CL
	'Oh, you can (get the place in postgraduate recommendation) by this way.'						
2	Z: 对 ,						
	duì						
	right						
3	.. 但是	它	好像	是 ,			
	dànshì	tā	hǎoxiàng	shì			
	but	it	seem	is			
4	.. 但是	你	要	先 ,			
	dànshì	nǐ	yào	xiān			
	but	you	need	first			
5	.. 要	面试 ,					
	yào	miànshì					
	need	interview					
6 →	.. 然后	要	去	获得 ,			
	ránhòu	yào	qù	huòde			
	RANHO	need	go	get			
7	.. 那个	支教		保研			的
	nàgè	zhījiào		bǎoyán			de
	that	voluntary teaching		postgraduate recommendation			CSC
	名额 .						
	míng'e.						
	place.						
	'But it needs you to be interviewed first. RANHO, (you) need to get the place of postgraduate recommendation of voluntary teaching.'						

Excerpt 1 is mainly about one way of the postgraduate recommendation, that is to say, being a volunteer teacher in a rural area. The speaker described the procedure of getting the place in postgraduate recommendation (line 3–7), in which the applicant firstly needed to take an interview. If he/she performed well in the interview, the applicant would be graduate candidate. In the example, there appears xian...*ranhou* (*‘first...and then’*), which marks being a graduate candidate takes place after the interview.

3.2. Coordinating relation

Although coordinating and successive relation can be classified into generalized coordinating relation based on Xing (2001), the former does not emphasize the sequence of event as the latter does. It states several things or aspects of one thing. For example,

Excerpt 2. BHPL—Chat in the dormitory 01

1	B: 哦	是	的	是	的 .			
	o	shì	de	shì	de			
	INT	be	ASSC	be	ASSC			
'Oh, yes, yes.'								
2	.. 现在	就	我	还	有	Hh	然后 ,	
	xiànzài	jiù	wǒ	hái	yǒu	name	ránhòu	
	now	just	I	still	have	NAME	RANHOU	
'Now, there are me and Honghong, RANHOU'								
3	.. 还	有	另外	一	个	同学	他们	
	hái	yǒu	lìngwài	yī	gè	tóngxué	tāmēn	
	still	have	other	one	CL	classmate	they	
→	要	去	嘛	然后		不	知道	
	yào	qù	ma	ránhòu		bù	zhīdào	
	want	go	PRT	RANHOU		NEG	know	
	有	没	有	五	个	人	要	不
	yǒu	méi	yǒu	wǔ	gè	rén	yào	bú
	have	NEG	have	five	CL	person	need	NEG
	要	开	课 ,					
	yào	kāi	kè					
	need	offer	class					
'and another classmate wants to go. They will go. RANHOU, it is unknown whether the number of students selecting the course is up to five and whether (the teacher) offers the course.'								
4	.. 所以	我	的	学分	都	还	没	有
	suǒyǐ	wǒ	de	xuéfēn	dōu	hái	méi	yǒu
	so	I	POSS	credit	even	still	NEG	have
	够	就	很	愁	因为	当时	我	计划
	gòu	jiù	hěn	chóu	yīnwéi	dāngshí	wǒ	jìhuà
	enough	just	very	sad	because	then	I	plan
	的	时候	我	是	把	这个	计划	进去
	de	shíhòu	wǒ	shì	bǎ	zhègè	jìhuà	jìnqù
	CSC	time	I	be	BA	this	plan	into
								PRT
'So, my credit doesn't reach the standard of graduation. I am worried, because the course is included in my course plan when I made it.'								
'Now, there are me, Hh and another classmate who select the course. So, I don't know whether there are five persons selecting the course and whether the teacher offer the course. So, my credit will not reach the standard and I am worried since the course is in my course plan.'								

Excerpt 2 is about one of courses of the speaker. She told that there were only three students who selected the course (line 2). Whether the total number of students selecting the course was up to five was uncertain and hence, whether the teacher offered a course was also not sure (line 3). Therefore, the speaker worried that she could not get enough credits since the course was in her plan (line 4). In the excerpt, the focus is on the first token of *ranhou* that is the demonstration of the coordinating relation, since it lists those who have selected the course.

3.3. Progressive relation

The progressive relation also belongs to the generalized parallel relation, but it further illuminates the event happened before.

Excerpt 3. WL—Online education 01

1 →	W: 然后	他	自己,				
	ránhòu	tā	zìjǐ				
	RANHO	3SG	(him)self				
2 →	... 就	是	结	了	婚	然后	又,
	jiù	shì	jié	le	hūn	ránhòu	yòu
	just	be	get	PFV	marry	RANHO	again
3	... 查	出来	好像,				
	chá	chūlái	hǎoxiàng				
	find	out	seem				
4	... 是	不	能	要	小孩.		
	shì	bú	néng	yào	xiǎohái		
	be	NEG	able	have	baby		
‘And he got married, and was found out something wrong, that is, he cannot have a family.’							

Excerpt 3 is the part reason why one student in W’s class was in a bad mood, which led him to curse one teacher in QQ group (QQ is an Internet-based instant messaging (IM) software) after he did not get the answer of the final exam from the teacher. Before the line 1, the speaker told the part reason that the student’s mother was likely to catch a cancer. And the focus in line 1 to 2 is on the student himself. The line 3–4 further described the student’s condition.

3.4. Alternative relation

Although the proportion of alternative relation registers about 0.57%, the number reflects the existence of alternative relation. Xing (2001) said it could also be classified into the generalized parallel relation. The alternative relation is disjunctive, which differs from the first three subcategories mentioned before. The instance is displayed below.

Excerpt 4. BHPL—Chat in the dormitory 03

1	H: 我	给	你	讲	你	要,
	wǒ	gěi	nǐ	jiǎng	nǐ	yào
	I	give	you	tell	you	have
‘I tell you that you want,’						
2	.. 读	语音	的	话,		
	dú	yǔyīn	de	huà		
	study	phonetics	ASSC	if		
‘If you want to study Phonetics,’						
3	.. 你	至少	就	说,		

Excerpt 4 (continued)

	nǐ	zhìshǎo	jiù	shuō		
	you	least	just	say		
4	.. 呃 =	那	个	什么 ,		
	e =	nà	gè	shénme		
	PRT	that	CL	what		
5	.. 呃 =	那	个	什么 ,		
	e =	nà	gè	shénme		
	PRT	that	CL	what		
6	.. 什么	上外 .				
	shénme	shàngwài				
	what	Shanghai International Studies University				
		'At least, you should choose Shanghai International Studies University.'				
7	B: 嗯 .					
	en					
	INT					
8 → H:	然后	暨 ,				
	ránhòu	jì,				
	RANHOU	Jinan University				
9	.. 不	是	什么	什么	什么 ,	
	bù	shì	shénme	shénme	shénme	
	NEG	is	what	what	what	
10	.. 那	个	叫	什么	来	着 ,
	nà	gè	jiào	shénme	lái	zhe,
	that	PRT	call	what	come	PRT
11	.. 复旦 .					
	fùdān					
	Fudan University					
		'RANHOU, Fudan University.'				
12	B: 嗯 .					
	en					
	INT					
13 → H:	然后	这个	南开 ,			
	ránhòu	zhègè	nánkāi			
	RANHOU	this	Nankai (University)			
14	.. 这些	做	的	比较	好 ,	
	zhèxiē	zuò	de	bǐjiào	hǎo	
	these	do	CSC	comparatively	good	
15	.. 或者	是	暨南大学	也	可以 .	
	huòzhě	shì	jìnnándàxué	yě	kěyǐ	
	or	be	Jinan University	also	ok	
		'Nankai University is good on Phonetics and Jinan University is also ok.'				
		'I tell you that if you want to study Phonetics further, you'd better choose Shanghai International Studies University or Fudan University. RANHOU, Nankai University is good on Phonetics and Jinan University as well.'				
16	B: 哦					
	o					
	PRT					

Here, the speaker H recommended B universities that were good at phonetic studies. Although four patterns of *nageshenme* ('emmm') were used to help her remind of names of universities in her telling, the speaker mentioned four universities in all, which were connected by the word *ranhou*, forming the pattern *shangwai, ranhou fudan, ranhou nankai, huozheshi jinandaxue*. Actually, both of *ranhou* here can be replaced by *huozhe* ('or'), providing the choice for the hearer.

3.5. Enumeration

Besides four subcategories in generalized parallel relation, the word *ranhou* can also represent the enumeration in the data, which can be proved by the following example.

Excerpt 5. BHPL—Chat in the dormitory 11

1	B: 他们	有	那	种	健身房	里面	有	配套
	tāmēn	yǒu	nà	zhǒng	jiànshēnfáng	lǐmiàn	yǒu	pèitào
	they	have	that	CL	gymnasium	in	have	match
'There are corresponding courses in the gym.'								
	的	像	我		之前	那		种,
	de	xiàng	wǒ		zhīqián	nà		zhǒng
	ASSC	like	I		before	that		CL
'Like me. (the gym) I went to before.'								
2	.. 就	是	它		什么	都		有,
	jiù	shì	tā		shénme	dōu		yǒu
	just	be	3SG		what	all		have
'It offers various courses.'								
3	.. 有	舞蹈,						
	yǒu	wǔdǎo						
	have	dance						
4	.. 健身	舞蹈,						
	jiànshēn	wǔdǎo						
	fitness	dance						
5 →	.. 然后	也	有		瑜伽,			
	ránhòu	yě	yǒu		yújiā			
	RANHOU	also	have		yoga			
6 →	.. 然后	也	有		器材	等等.		
	ránhòu	yě	yǒu		qìcái	děngděng.		
	RANHOU	also	have		equipment	etc.		
'(There are) fitness dance, yoga, fitness equipment etc.'								
7	H: 嗯.							
	en							
	PRT							

The interlocutor chiefly talked what she could enjoy in the gym. According to her, there were fitness dance, yogurt, and fitness equipment in the gym (line 4–6). The speaker enumerated them with two tokens of *ranhou*. Although the other two words *yeyou* ('also') follow the word *ranhou*, the deletion of them does not affect *ranhou* to express the enumeration.

3.6. Causality

The frequency of causality existing in the data is relatively high. Causality refers to the relation of cause and effect. In the conversation, *ranhou* can represent cause and effect as well.

Excerpt 6. ML—The dialogue between two strangers 04

1	L: 你	为什么	要	去	遂宁	办?
	nǐ	wèishénme	yào	qù	Suining	bàn
	you	why	need	go	toponym	handle
'Why do you handle affairs in Suining?'						
2	M: 我们	那	边	有	分	公司.
	wǒmēn	nà	biān	yǒu	fēn	gōngsī
	we	that	side	you	branch	office
'Our branch office is over there.'						
3	L: 哦					
	o					
	INT					
4	M: 公司	在	那	边,		
	gōngsī	zài	nà	biān		
	office	at	that	side		
'The (branch) office is over there.'						
5 →	.. 然后	那	边	有	一	个
	ránhòu	nà	biān	yǒu	yī	gè
	RANHOU	that	side	you	one	CL
	的	人,				
	de	rén				
	CSC	person				
'RANHOU, an unreliable person is over there.'						
6 →	.. 然后,					
	ránhòu					
	RANHOU					
7	.. 没	办法,				
	méi	bànfǎ				
	NEG	method				
'(That person) can do nothing about it.'						
8	.. 解决	不	了	了,		
	jiějué	bù	liǎo	le		
	solve	NEG	PRT	PFV		
'cannot solve (the problem).'						
9 →	.. 然后	就	自己	过去.		
	ránhòu	jiù	zìjǐ	guòqù		
	RANHOU	just	self	go		
'RANHOU, I have to handle affairs by myself.'						

The case involved two strangers who talked about M's short business trip. The workplace of M is usually in Chengdu. But she had to go to the branch office in Suining since an officer was unreliable and could not handle a thorny problem (line 5–9). There are three tokens of *ranhou*. The first is used to express cause of the business trip and can be replaced by *yinwei* ('because'); the second is to further describe the reason of the business trip but cannot be replaced by *yinwei* ('because') since it represents progressive relation and the last reflects the effect brought by the officer unreliability.

3.7. Hypothetical relation

According to Xing (2001), the hypothetical relation also belongs to generalized causality, since it

reflects the cause and effect in logic. *Ranhòu* in the hypothetical relation can be replaced by *ruguo* ('if') and *name* ('then'), which can be presented by the case below.

Excerpt 7. ML—The dialogue between two strangers 14

1	M: 要是	那	个	你	审	的	审计	报告	里面,
	yàoshì	nà	gè	nǐ	shěn	de	shěnjì	bàogào	lǐmiàn
	if	that	CL	you	audit	ASSC	audit	report	in
'If the report you audit,									
2	... 被	稽核到,							
	bèi	jīhédao							
	PFV	check							
'is checked,'									
3 → ..	然后	有	问题,						
	ránhòu	yǒu	wèntí						
	RANHO	have	problem						
'RANHO, there is a problem,'									
4 → ..	然后	你	就		惨		了.		
	ránhòu	nǐ	jiù		cǎn		le		
	RANHO	you	just		terrible		PRT		
'RANHO, you are in trouble.'									
'If the report you audit is checked to have a problem, you will be in trouble.'									

The example involves the accountant who talked about the audit report. She mentioned the person would be punished if there existed mistakes in the report that she/he was responsible for. In her narration, two tokens of *ranhòu* were used to express hypothesis. The first can be replaced by the token *ruguo* ('if'), and the second equals to *name* ('then'). Meanings of the line 3 and 4 actually are "if there are mistakes in the report, then the person will be in trouble".

3.8. Adversative relation

Now, the attention is on the adversative relation that implies the opposite or contrast. The case is presented below to illustrate the adversative relation.

Excerpt 8. GZYL—An interaction between one teacher and her three students 14

1	Z: 因为	他	是,						
	yīnwéi	tā	shì						
	because	3SG	be						
'because he is,'									
2	.. 因为	我们	财务处		事	也	很	多	嘛,
	yīnwéi	wǒmēn	cáiwùchù		shì	yě	hě	duō	ma
	because	we	finance section		thing	also	so	many	PRT
'because there are a lot of rules in the finance section of our school,'									
3	.. 然后	银行	啊	也	是,				
	ránhòu	yínháng	a	yě	shì				
	RANHO	bank	PRT	also	be				
'RANHO, so does the bank,'									
4 →	.. 然后,								
	ránhòu,								
	RANHO								
5	.. 他	就	说	没	什么	我们	南非	那	边,
	tā	jiù	shuō	méi	shénme	wǒmēn	nánfēi	nà	biān

Excerpt 8 (continued)

	3SG	just	say	NEG	what	we	South Africa	there	over
'He said it's ok since South Africa is similar to (China),'									
6	.. 也	是	这	样	.				
	yě	shì	zhè	yàng					
	also	be	this	like					
'like this, too.'									

The speaker narrated the reaction of foreign teacher when he faced changeable requirements of financial office and bank in school in the example. Here, the word *ranhou* can be replaced by *danshi* ('but') to express the adversative relation, for foreign teachers usually complain about changeable requirement. However, the foreign teacher mentioned by the speaker did not grumble since he always encounters the same situation in South Africa.

3.9. Concession

Concession is also the subcategory of generalized adversative relation, in which the word *ranhou* can be replaced by the word *suiran* ('although'). The case below is to illustrate the point.

Excerpt 9. GZYL—An interaction between one teacher and her three students 03

1	G: 其实	这个	无所谓	因为	包括	他	在	
	qíshí	zhègè	wúsuǒwèi	yīnwéi	bāokuò	tā	zài	
	actually	this	not to matter	because	including	3SG	at	
	各自	的	学院	它,				
	gèzì	de	xuéyuàn	tā				
	own	POSS	college	it				
'Actually, this doesn't matter. Because he is in own college,'								
2	.. 其实	现在	很	多	年轻	老师	的	加入
	qíshí	xiànzài	hěn	duō	niánqīng	lǎoshī	de	jiārù
	actually	now	so	many	young	teacher	ASSC	join
	那些	海归	呀	他	也	是,		
	nàxiē	hǎiguī	ya	tā	yě	shì		
	those	returnee	PRT	3SG	also	is		
'Actually now, so many young teachers join in and these returnees are also,'								
3	.. 全	英文	的,					
	quán	yīngwén	de					
	all	English	PRT					
'(teach) in English'								
4 →	.. 然后	有	些	全	英	当然	并	不是
	ránhòu	yǒu	xiē	quán	yīng	dāngrán	bìng	búshì
	RANHO	have	some	all	English	sure	and	NEG
	那	种	很					
	nà	zhǒng	hěn,					
	that	sort	very					
'RANHO, some English teaching is certainly not like that,'								
5	.. 真的	很	精	课	的	那	种	全
	zhēnde	hěn	jīng	kè	de	nà	zhǒng	quán
	real	very	perfect	class	CSC	that	sort	all
	英文	真的	是	有点	水	的	那	种
	yīngwén	zhēnde	shì	yǒudiǎn	shuǐ	de	nà	zhǒng
	English	real	is	a bit	not good	CSC	that	sort

Excerpt 9 (continued)

全	英文	哈 .					
quán	yīngwén	ha					
all	English	PRT					
‘...is really perfect. (Some English) are really not good.’							
‘Actually, teaching in English is not a matter. Although some English teaching is not very good, there are plenty of young teachers in their own colleges who teach in English and those returnees also teach in English.’							

The speaker in the **Excerpt 9** primarily discussed the English teaching is not a matter. Although the English teaching in some courses is not qualified, the pattern of English teaching has been formed as a whole since novice teachers employed by each college can teach students in English. The *ranhou* here is used to express concession and can be replaced by the word *suiran* (‘although’).

3.10. Additive relation

Besides, *ranhou* can also express additive relation, which means it can be used to ask for more information. The point is illustrated by the following case.

Excerpt 10. BHPL—Chat in the dormitory 03

1	H: 那	你	一	周	上	几	结	课 ?
	nà	nǐ	yī	zhōu	shàng	jǐ	jié	kè?
	that	you	one	week	have	several	CL	class
‘How many (yoga) classes do you have in a week?’								
2	L: 它	也	是	那种	卡 .			
	tā	yě	shì	nàzhǒng	kǎ.			
	3SG	also	be	that	card			
‘It’s also that card.’								
3	H: 也	是	一	周	去	三	次 .	
	yě	shì	yī	zhōu	qù	sān	cì	
	also	be	one	week	go	three	time	
‘(You) also attend (a yoga class) three times a week.’								
4	L: 嗯	嗯	对 .					
	en	en	duì					
	PRT	PRT	right					
5 →	H: 然后	可以	去	几	个	月 ?		
	ránhòu	kěyǐ	qù	jǐ	gè	yuè?		
	RANHO	able	go	several	CL	month		
‘RANHO, how many months can you go? ’								
6	L: 一	个	多	月	吧	但是	那	
	yī	gè	duō	yuè	ba	dànshì	nà	
	one	CL	over	month	PT	but	that	
	是	学姐	转	的 ,				
	shì	xuéjiě	zhuǎn	de				
	is	senior	resale	CSC				
‘Over one month. But that (the membership card) is resoled by a senior.’								
7	.. 到	时候	我	自己	办	一	个 .	
	dào	shíhòu	wǒ	zìjǐ	bàn	yī	gè.	
	at	time	I	self	get	one	CL	
‘When the card is due, I will buy new one.’								

The case involves two speakers and is about the yoga course. The person L has signed up for a yoga class and the person H is willing to take one. The latter asked L how many lessons she could take a week (line 1). Having gotten the answer, H continued to ask how many months L could go (line 6). In the second question, the speaker H adopted one token of *ranhou* at the beginning of the turn to help herself to get more information of the yoga class.

3.11. No practical meaning

Besides the semantic relations represented by *ranhou* mentioned above, the word can also be used as a pause or reminder with no practical meaning to help the speaker keep the turn continuous. And the deletion of them would not influence the utterance meaning, which is showed by the **Excerpt 11**.

Excerpt 11. ML—The dialogue between two strangers 12

1	L: 那	那	也	挺	贵	的	呀,
	nà	nà	yě	tǐng	guì	de	ya
	that	that	also	pretty	expensive	ASSC	PRT
'That is also pretty expensive.'							
2	.. 在	外面	吃	一	日	三	餐
	zài	wàimiàn	chī	yī	rì	sān	cān
	at	outside	eat	one	day	three	meal
	天	至少	要	三十,			
	tiān	zhìshǎo	yào	sānshí,			
	day	least	need	thirty			
'It takes at least thirty yuan to eat out three meals a day.'							
3	M: 嗯 ==						
	en==						
	PRT						
4	.. 早饭	吃	不	了	那么	多,	
	zǎofàn	chī	bù	liǎo	nàme	duō	
	breakfast	eat	NEG	PRT	so	many	
'It doesn't take so much money to have breakfast.'							
5	.. 早饭	一般	随便,				
	zǎofàn	yībān	suíbiàn,				
	breakfast	usually	casual				
'(I) usually have a simple breakfast.'							
6	.. 有时候	我	一般	喜欢	自己	在	家
	yǒushíhòu	wǒ	yībān	xǐhuān	zìjǐ	zài	jiā
	sometimes	I	usually	like	self	at	home
							inside
							make
'Sometimes, I like to make breakfast on my own at home.'							
7	.. 因为	比较	近,				
	yīnwéi	bǐjiào	jìn				
	because	comparatively	close				
'because the home is close to (the company).'							
8	.. 然后	上班	我	就	起来	自己	做
	ránhòu	shàngbān	wǒ	jiù	qǐlái	zìjǐ	zuò
	RANHO	work	I	just	get up	self	cook
							PRT
							eat
'RANHO, I make breakfast by myself at weekdays.'							
9 →	.. 然后	然后	或者	是	去	去	外边
	ránhòu	ránhòu	huòzhě	shì	qù	qù	wàibiān
	RANHO	RANHO	or	be	go	go	outside

Excerpt 11 (continued)

买	的	话，				
mǎi	de	huà				
buy	CSC	if				
10 .. 包子		豆浆		啊 .		
bāozǐ		dòujiāng		a		
dumpling		soybean milk		PRT		
'RANHOU, I will go out to take a steamed stuffed bun and a soybean milk as my breakfast.'						

The excerpt is chiefly about how M dealt with her breakfast. After L said it would cost at least 30 yuan to eat three meals a day out (line 2), M responded that the cost of breakfast was not high (line 5). Sometimes, she liked to prepare it at home since it was not far away from the workplace (line 6–7). If she eats breakfast out, the speaker will buy dumplings and a cup of soy milk (line 8–9). There are two tokens of *ranhou* successively used in the line 8 but they can be deleted since they possess no practical meaning. Here, they are just used as pauses to take the turn.

In the section, the semantic relation of *ranhou* is examined. It is suggested that *ranhou* can present eleven semantic relations in spontaneous conversations. The next section aims to manifest the existence of these semantic relations from the perspective of prosody.

4. Prosodic features of *ranhou*

In fact, for every task that interactants face, there are not only verbal but also prosodic and phonetic resources at participants' disposal (Couper-Kuhlen and Selting, 2018). In other words, although we always articulate sound segments and execute syllables with, e.g., some pitch, loudness and timing when we speak, as participants in talk-in-interaction, we specifically mobilize certain of these features at given moments in time for interactional purposes. Moreover, prosodic phenomena can be analyzed acoustically with computer programs such as Praat, which runs on algorithms that are much more sensitive to the air-pressure variation created by sound waves.

The section explores whether there are differences in prosodic features of *ranhou* when the meaning it expresses varies. The analysis involves the latest version Praat 6.1.02, Audacity and Excel. Praat is designed by Paul Boersma and David Weenink and used to do phonetics by computer, reflecting the information such as pitch, intensity, spectrum, and waveform. Audacity is the software used to edit and denoise the audio. Excel is employed to record prosodic features of each *ranhou*.

Prosodic features mentioned here mainly involve pitch, length and loudness, since they are most consistently used for linguistic purposes and reflected in Praat. Pitch concerns the varying height of the pitch of the voice over one syllable or over a number of successive syllables; length concerns the relative duration of a number of successive syllables, or the duration of a given syllable in one environment relative to the duration of the same syllable in another environment; loudness concerns change of loudness within one syllable or the relative loudness of a number of successive syllables (Cruttenden, 1997: 2).

As mentioned before, 530 tokens *ranhou* are involved in the analysis. But 193 tokens are excluded in this section, for it is necessary to ensure the sound quality of *ranhou* when they are

put into Praat. And *ranhou* is composed of two syllables—*ran* and *hou*. One token of *ranhou* is discarded, if one of them sounds unclear, due to overlap, background noise, or other issues. At last, 337 tokens are involved in this section. To ensure the sound quality of *ranhou*, each audio is denoised through the software Audacity. The pitch of *ranhou* is the varying height over two syllables *ran* and *hou*, mainly presented pitch range; its length is about the relative duration of these two syllables; and its loudness is about relative loudness of two syllables and the position of the maximum can show where the stress is placed. The position of the maximum intensity can be place on *ran*, or *hou*. And *ranhou* may be stressed as well.

When each denoised utterance including the token of *ranhou* is imported in Praat, *ranhou* can be identified through voice, waveform, and spectrum. Praat presents the information of *ranhou*, such as pitch contour represented by blue curve, intensity shown by yellow curve and duration, as shown in the **Figure 1**.

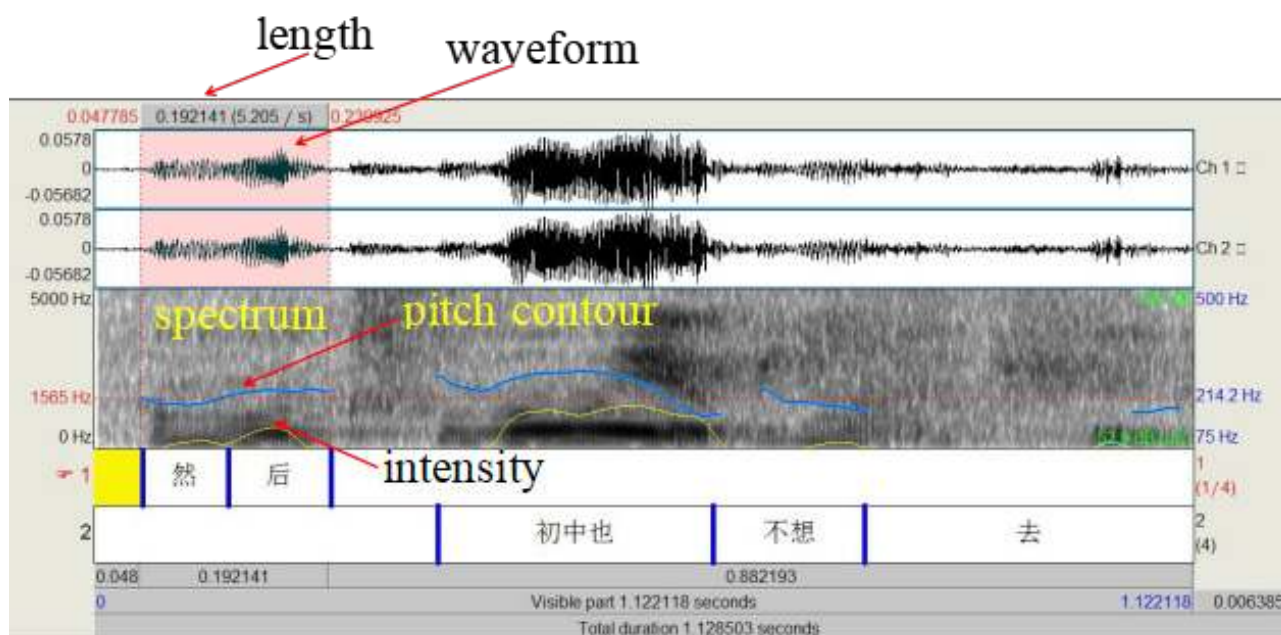


Figure 1. Information of *ranhou* in Praat.

Each denoised utterance is imported into Pratt, its information is clearly presented like Figure 1. According to the information of *ranhou* in Pratt, prosodic features of *ranhou* are obtained and recorded like **Table 3**. Actually, 337 tokens of **ranhou** are imported into Praat and their prosodic features are recorded in the Excel. Since the scope is limited, a part of the Excel is presented in the section to show what the information are recorded.

Table 3. Prosodic features of *ranhou* in WL

File name	Number (semantic relation)	Mean pitch	Pitch maximum	Pitch minimum	Pitch range	Duration	Intensity
WL	2 (P)	103.2382364	110.3550321	95.81848135	14.53655071	0.294305	<i>hou</i>
	3 (C)	107.1307922	108.8756185	103.952333	4.923285431	0.129993	<i>hou</i>
	5 (C)	101.3432565	111.1936931	95.83229991	15.36139314	0.166993	<i>ran</i>
	6 (P)	143.2304135	161.8537316	123.6218317	38.23189994	0.210258	<i>ran</i>
	7 (P)	137.2639265	145.5276841	121.7460957	23.78158844	0.142303	<i>hou</i>
	10 (P)	135.222568	157.407119	111.6733829	45.73373605	0.270526	<i>hou</i>
	11 (P)	95.29002567	102.6466659	87.40085191	15.24581403	0.292809	<i>hou</i>

Table 3 presents prosodic features of seven tokens of *ranhou* with the high quality. All of them are expressed by the speaker W in the dialogue WL. Number in the table refers to the serial number of *ranhou* used by the speaker. And letter P and C mean progressive relation and causality respectively. From the table above, it is found that every token differs from each other with respect to pitch range, duration and intensity. Although each token enjoys different features, the information of them paves the way for observing prosodic features of each semantic relation from the mean pitch range, mean length and the position of intensity, which is showed in **Table 4**.

Table 4. Prosodic features of semantic relations

Semantic relation	Number	Mean pitch range (Hz)	Mean length (metric: second)	Number of the position of maximum intensity (<i>ran-hou-unaccented</i>)
succession	121	≈83.112	≈0.275	38- 71-12
causality	64	≈73.690	≈0.223	17-34-13
progression	41	≈52.250	≈0.238	10-24-7
coordination	33	≈54.155	≈0.257	11-21-1
adversative	25	≈75.824	≈0.242	7-16-2
addition	8	≈122.312	≈0.267	3-3-2
enumeration	3	≈76.381	≈0.218	<i>hou</i> (3)
hypothesis	2	≈90.873	≈0.261	<i>hou</i> (2)
alternation	2	≈58.000	≈0.229	<i>ran</i> (1); <i>ranhou</i> (1)
concession	1	≈66.732	≈0.168	<i>ranhou</i> (1)
no practical meaning	37	≈107.884	≈0.332	9-22-2-4
Total	337	/	/	337

As the Table 4 shows, the number of enumeration, hypothesis, alternation and concession is not over 5, so they are excluded from comparison. From the statistics left, there exist differences in mean pitch range, mean length and the number of the position of maximum intensity among other semantic relations. Specially, the top three of mean pitch range are addition, no practical meaning and succession, about 122.312, 107.884 and 83.112 respectively, while that of progression is the narrowest. The mean pitch range of causality (about 73.690) is close to that of adversative (about 75.824). The mean pitch range of progression (about 52.250) is close to that of coordination (about 54.155).

In terms of mean length, no practical meaning, succession and addition rank the top three. The mean length of causality is the shortest. In addition, the length of *ranhou* without practical meaning is longer than that of *ranhou* with meanings. And the mean length of succession is longer than that of the rest semantic relations. There exist three categories based on the position of maximum intensity which reflects the stress of *ranhou*. In other words, *ranhou* in the conversation can be stressed on *ran* or *hou*. And *ranhou* can also be unaccented. But from the table, the position of maximum of intensity is mainly placed on the syllable *hou*. This indicated that the stress of *ranhou* is mostly on the syllable *hou*.

In a nutshell, the prosodic features of each semantic relation confirm that *ranhou* can express various meanings in naturally occurring conversations. And the production of semantic relation is relevant to context.

5. Discussion and conclusion

Across the data of Chinese interactions collected by the author, it is suggested that semantic relation is closely related to context. Among the semantic relations, succession and causality rank first and second in the list and no practical meaning is the third, which shows *ranhou* keeps its original meaning and develops new meanings in the conversation and being the discourse marker as well. Besides, prosodic features of *ranhou* are investigated from perspectives of length, pitch and loudness, 337 tokens of *ranhou* involved in the analysis. At the same time, prosodic features are associated with semantic relations of *ranhou*. Actually, each sound has its own prosodic features but when they are associated with semantic relations, the scene varies. As shown in Table 4, eleven semantic relations differ from each other in mean pitch range and mean length. Additive relation enjoys the widest mean pitch range, and no practical meaning takes the longest time. Loudness of *ranhou* can be placed on *ran*, or *hou*. *Ranhou* can also be articulated without loudness. But in a whole, loudness of *ranhou* is mostly put on *hou*. These findings are partly consistent with a few previous studies, which argue that *ranhou* has undergone semantic reduction and become a discourse marker in natural occurring conversations (e.g. Fang, 2000; Xu, 2009; Wang, 2018). The other part is a supplement to some previous studies (Su, 1998; Wang, 1998; Xu, 2009), since, besides successive relationship, enumeration, this study finds more semantic relations of *ranhou*, such as causality, hypothetical relation, adversative relation and verifies that each semantic relation enjoys different prosodic features.

There still exist limitations in breadth and depth of this study, which should be admitted. In terms of participants, all of them have received higher education and the number of men and women is not equal. And most data are collected on campus. Therefore, the source and richness of data are influenced, which affects, to some extent, the results of paper. Researchers of further studies on same questions should sample persons from all walks of life and all ages as participants and the number of each gender could be equal so that a clearer picture of *ranhou* can be got. For discourse, Mandarin Chinese is explored. Actually, further studies can put their attention on dialects to investigate *ranhou* in different discourse. In addition, researchers can examine the use of *ranhou* by foreign learners, finding their problems in using *ranhou*, which can further help them to learn Chinese. According to the object of study, *ranhou* is analyzed synchronically, but the grammaticalization of *ranhou* is not examined. It is worth exploring in further studies. In further studies, *ranhou* can be compared with other conjunctions to get deeper knowledge of conjunctions in talk-in-interaction.

In conclusion, it is a tentative try on exploring *ranhou* in spoken discourse from Interactional Linguistics, the findings of the paper may offer some references for other studies in spoken discourse, inspiring researchers to conduct similar studies on other discourse and fill the gap in this field. It may guide the daily oral communication of foreign learners of Chinese, enhancing their fluency and clarity in communicating with native speakers. And it may promote the development of machine translation, for the operating mechanism of *ranhou* can be redesigned in the computer in terms of the findings of the paper.

Conflict of interest

No conflict of interest was reported by all authors.

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Appendix A. Transcription conventions

(.)	A final intonation
(ˊ)	A continuing intonation
(?)	Indicates an appeal intonation
[]	Indicates the point where the current talk is overlapped by the talk of another
(..)	Indicates a longer pause. The more dots, the longer the pause.
=	Indicates a noticeable stretching of a sound. The more colons, the longer the stretching.
@@	Indicates laughter. The length of laughter is proportional to the number of “@”. Words between two “@” symbols indicate that the stretch of talk is produced with a laughing voice.
→	Points to the lines relevant to the point being made in the text.
--	Indicates a sudden cut-off of the current sound or self-interruption.
<XX>	Indicates the unclear voice.
<XXX >	Indicates the voice utterly not to be discerned.

Appendix B. Glossing conventions

3SG	third person singular
ASP	aspectual marker
ASSC	associative (<i>de</i>)
BA	a pretransitive marker (<i>ba</i>)
CL	classifier
CRS	currently relevant state (<i>le</i>)
CSC	complex stative construction (<i>de</i>)
DUR	durative aspect (<i>zhe, zai</i>)
INT	interjections in speech
NEG	negatives (<i>bu</i>)
ONOMA	onomatopoeia
PASS	a passive marker (<i>bei, gei</i>)
PFV	perfective aspect (<i>le</i>)
POSS	possessive (<i>de</i>)
PROG	progressive (<i>zai</i>)
PRT	particle
Q	question marker (<i>ma</i>)

REVIEW ARTICLE

The interpreter advantage in executive functions—A systematic review and meta-analysis

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Abstract: Given the heavy cognitive load inherent in language interpreting, interpreters may develop cognitive advantages from managing frequent switching of linguistic codes and working modes. Based on a systematic review of executive functions of inhibiting, shifting and working memory (WM) updating by Nour et al. (2020) and meta-analysis of working memory by Wen and Dong (2019) and Mellinger and Hanson (2019), this research follows the PICOS framework and the PRISMA guideline to synthesize findings from 98 tasks of 29 original studies from International and Chinese databases with a cut-off date of 1st October, 2020. Substantial evidence for an interpreter advantage in shifting was found, but not for inhibition or updating. The meta-analysis showed 1) a moderate to high effect in shifting ($g = 0.68$, seven WCST effects; $g = -0.32$, eight switching cost effects); 2) no effect in inhibiting ($g = 0.13$, six Stroop effects); 3) mixed effects in WM updating. Subgroup analysis on WM updating revealed significant training effects from within-group comparisons ($g = 0.58$, five 2-back effects; $g = 0.71$, two L2 listening span effects), but insignificant difference from between-group comparisons ($g = -0.03$, five 2-back effects; $g = 0.18$, five L2 listening span effects). More reproducible behavioral research with scientific and consistent designs is needed for a clearer understanding of the relationship between interpreting experience and EFs.

Keywords: interpreting experience; interpreter advantage; executive functions; inhibition; shifting; working memory updating

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1. Introduction

Interpreting is a concurrent process that involves listening and comprehension of speech segments in the source language (SL), attention and retention of the incoming segments and (re) production of equivalents in the target language (TL) with little time lag (Gerver, 1975; Liu et al., 2004). Therefore, interpreting is effortful (Christoffels et al., 2006; Babcock and Vallesi, 2017) and filled with “problem triggers”, such as those caused by dense information, strong accent, thick

terminology and asymmetrical SL-TL structures (Gile, 2009: 161–178). It relies on systematic training of interpreting strategies (Li, 2013; Dong et al., 2019) and use of interpreting technologies to reduce cognitive saturation (Gile, 2008; 2011; Fantinuoli, 2018). Given the high cognitive load from frequent switching of codes and modes (Pöchhacker, 2016; Chen, 2017; Stachowiak-Szymczak, 2019), interpreters may face more competitions for their cognitive resources than general bilinguals or non-bilinguals, giving rise to an advantage in cognitive control (García, 2014).

Executive functions (also EFs; cognitive control, executive control) cover a set of mental capacities to formulate goals, execute plans and monitor performances (Lezak, 1982). These functions include inhibiting irrelevant information, storing and updating information in distraction status, or working memory, switching between mental sets, as well as self-initiation, strategy application, multitasking, planning and monitoring (Gilbert and Burgess, 2008; Diamon, 2013; Friedman and Miyake, 2017;). In addition, executive functioning is effortful and trainable (Diamond, 2013: 154).

Working Memory (WM) is a closely related concept. While EFs are top-down goal-oriented mental capacities to coordinate behavior by keeping information active while restraining interferences (Baddeley, 1996; 2012; Kane and Engle, 2002; Friedman and Miyake, 2017), WM is a limited-capacity system supporting cognitive processes by simultaneously storing and processing information (Kane and Engle, 2002; Conway et al., 2005; Baddeley, 2012; Stachowiak-Szymczak, 2019). The central executive in Baddeley's multi-component model of working memory (Baddeley, 1996) supervises, manages and coordinates slave systems, rather than simply maintains information (Baddeley, 2012), which work similarly to EFs. Nevertheless, most cognitive psychologists consider WM (updating) to be one of the EFs (e.g., Miyake et al., 2000; Diamond, 2013; Dong et al., 2018; Lehtonen et al., 2018).

From perception to articulation and from rendition to correction, language interpreting is a complex operation that triggers the activation, manipulation and inhibition of mental representations (Stachowiak-Szymczak, 2019). Memory systems are needed to store (Long-term memory, LTM; Short-term memory, STM) and process (WM) these mental representations (Pöchhacker, 2016: 113–117). Given the high cognitive load (Seeber, 2011), researchers posit that interpreters may develop transferable advantages on behavioral tasks (e.g. García, 2014; Rosiers et al., 2019).

However, such transferable advantages in executive functions have not been consistently reported over the years. For instance, while the interpreter advantage in inhibition was not found in most studies (e.g. Yudes et al., 2011; Dong and Xie, 2014; Dong and Liu, 2016; Aparicio et al., 2017; Babcock and Vallesi, 2017; Van der Linden et al., 2018), others revealed some interpreter superiority, at least for some interpreter groups and tasks (e.g. Köpke and Nespoulous, 2006; Timarová et al., 2014; Woumans et al., 2015; Henrard and Van Daele, 2017). This is also the case for shifting, with supporting evidence from some researchers (e.g. Yudes et al., 2011; Macnamara and Conway, 2014; Dong and Liu, 2016; Liu and Dong, 2017) and mixed evidence from others (e.g. Babcock and Vallesi, 2017; Zhao and Dong, 2020). While the interpreter advantage in updating was revealed in multiple studies (e.g. Timarová et al., 2014; Morales et al., 2015; Dong and Liu, 2016; Dong et al., 2018), others had null findings (e.g. Liu and Dong, 2017; Van der Linden et al., 2018; Rosiers et al., 2019; Liu and Dong, 2020).

Nour et al. (2020) adopted the unity and diversity model of executive functions proposed in

Miyake et al. (2000) for a systematic review of seventeen studies of the interpreter advantage before December 1, 2016. The framework included shifting or switching between tasks, and mental sets (henceforth “Shifting”), updating and monitoring of working memory representations (“Updating”) and inhibition of prepotent responses (“Inhibition”). (Diamond, 2013; Gilbert and Burgess, 2008; Miyake et al., 2000). Nour et al. (2020) found evidence for the interpreter advantage in shifting and updating, but not in inhibition. In the mean times, the meta-analysis by Wen and Dong (2019, cut-off before Oct.30, 2018) and Mellinger and Hanson (2019, cut-off before Dec. 2016) revealed significant effects for the interpreter advantage in STM and WM.

Given that prior findings are far from consistent on the presumed interpreter advantage in EFs, important patterns and moderators may be revealed in the systematic review and meta-analysis. Therefore, this research aims to synthesize existing evidence on the impact of interpreting training and/or experience on EFs, expanding on the systematic review by Nour et al. (2020) and the meta-analysis by Wen and Dong (2019) and Mellinger and Hanson (2019).

2. Methods

2.1. PICOS and PRISMA

This study assumes an interpreter advantage in executive functions due to interpreting training or experience by replicating the only published and latest systematic review by Nour et al. and meta-analysis in working memory by Wen and Dong, and conducting research under the “unity and diversity” model of executive functions by Miyake et al. The research is set within the PICOS (*Participants, Intervention, Controls, Outcome and Study Design*) framework (Higgins and Green, 2008; Liberati et al., 2009), with the *Participants* being (more advanced) interpreters, *Intervention* being interpreting training or experience, *Controls* being non- (or less advanced) interpreters, *Outcome* being an interpreter advantage, and *Study Design* being cross-sectional or longitudinal.

This systematic and meta-analytic review follows the *Preferred Reporting Items for Systematic reviews and Meta-Analysis* (PRISMA). Specifically, this systematic and meta-analytic review aims to answer the following three questions:

- (1) Do interpreters exhibit EF advantages over non-interpreters or professional interpreters over novice interpreters? This question will be answered by reviewing cross-sectional correlational or between-group comparisons;
- (2) Do interpreters enhance EFs with interpreting training? This question will be answered by reviewing longitudinal studies;
- (3) Do interpreters exhibit EF advantages on specific tasks? This question will be answered by meta-analysis of five replicable tasks.

2.2. Search strategy

To be as inclusive as possible, both published peer-reviewed studies and unpublished data in grey literature are hand searched in domestic and foreign electronic database (Google Scholar, ResearchGate, ScienceDirect, CNKI, Wanfang Data and Baidu Scholar) with subject heading and key words, i.e., “interpret (er) (ing) experience (training)”, “interpreter advantage”, “(working)

memory”, “executive function (s) (ing)”, “cognitive control”. These keywords are combined using Boolean operators, mainly AND because the operator AND narrows the scopes of search with all concepts searched together (Atkinson and Cipriani, 2018). Besides, the present study also scans bibliographies or references, and conducts backward and forward searches (Card, 2012: 42–52).

2.3. Inclusion criteria

The present systematic review specifies eligibility criteria as follows:

- (1) Data Information: Study included must be empirical with statistical analysis.
- (2) Study Design: Published and unpublished original articles, including doctoral and master dissertations, both cross-sectional or longitudinal designs.
- (3) Sample Characteristics: At least one group of professional interpreters or interpreter trainees should be compared with controls, and at least one EF task be contained; Language of the study should be either English or Chinese; Study included must take interpreting training or experience as the intervention.
- (4) Task Inclusion: An EF task by its nature rather than its label.
- (5) Definitions of Constructs of Interest: EF components and interpreting should be clearly defined in the included study.

2.4. Extraction criteria

Those excluded are: 1) duplicates; 2) theoretical research, reviews or articles that are unable to trace full-text; 3) not mentioning the moderating factor, i.e. interpreting training or experience; 4) studies with EF tasks unable to be classified under Miyake et al.’s model or simple span tasks tapping only short-term memory capacity.

2.5. Data collection process

First, studies are collected based on the classification of cross-sectional and longitudinal designs. There are three cross-sectional comparisons: 1) interpreters vs non-interpreters (e.g. balanced or unbalanced bilinguals, monolinguals, multilinguals and translators); 2) professional interpreters vs novices; and 3) advanced trainees vs beginners. In addition, there are also cross-sectional correlational studies where the relationship of interpreting experience and EFs are investigated within the group. Longitudinal studies compare interpreter trainees’ performance at the start and end of training.

Second the present study classifies data on tasks for Updating, Shifting or Inhibition based on the “unity and diversity” model of Miyake et al. (2000). Each task is categorized as verbal, number, letter or (visual-) spatial (Dong and Zhong, 2019). Tasks measuring each EF are collected and presented in **Table 1**.

2.6. Data analysis

The systematic review was conducted through synthesizing the T, F, or P values as well as group means, standard deviation (SD), standard error (SE), effect size, eta-squared (η^2) and other statistical measures in the original articles, be it longitudinal or cross-sectional comparative or correlational.

The meta-analysis was performed in the Review Manager software (RevMan 5.4). RevMan was also used to assess bias and check heterogeneity in systematic review.

Hedges' g was computed as a standardized mean difference (SMD) (Higgins and Green, 2008; Borenstein et al., 2011; Card, 2012). With $g = 0.20$ representing a small effect, $g = 0.50$ representing a medium effect, and $g = 0.80$ representing a large effect (Card, 2012). Chi-squared (χ^2 , or Chi^2), tau-squared (Tau^2 , or τ^2) and I^2 were the statistical indicators for heterogeneity. The larger the I^2 is, the more considerable heterogeneity is detected, ranging from 0% to 100% (Higgins and Green, 2008). In continuous variables, Z represents p-value results. The results of bias risk are presented as risk of bias graphs, and the results of meta-analyses as forest plots.

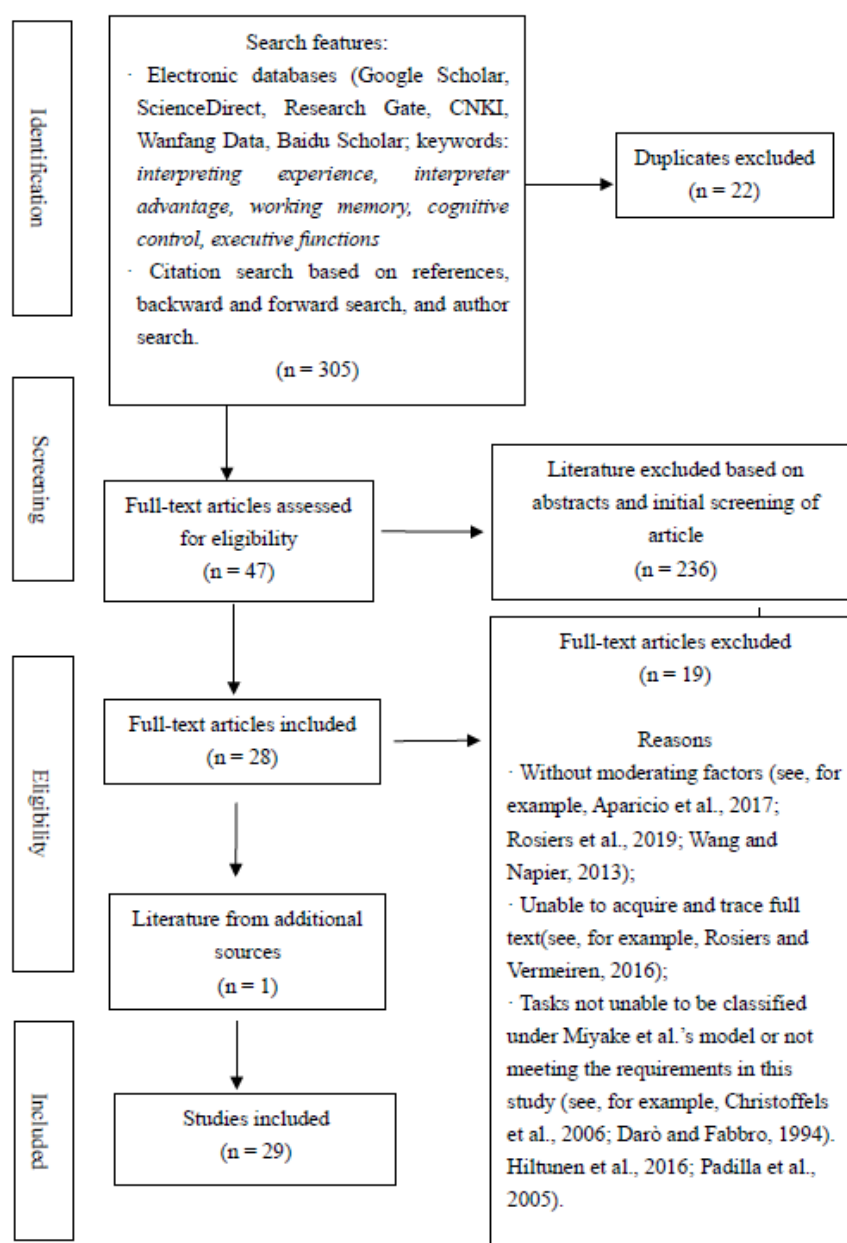


Figure 1. PRISMA flow diagram of selecting studies.

Table 1. EF tasks under the “unity and diversity” framework

EFs	EF Tasks	Task Types	Study ID.
Inhibition	Flanker	Spatial	Dong and Xie, 2014
		Spatial	Van der Linden et al., 2018
	Advanced flanker	Spatial	Van der Linden et al., 2018
	Arrow flanker	Spatial	Timarová et al., 2014
		Spatial	De Smedt, 2016
	Simon	Non-verbal; Spatial	Van der Linden et al., 2018
		Non-verbal; Spatial	Woumans et al., 2015
		Non-verbal; Spatial	Yudes et al., 2011
	ANT	Spatial	Babcock et al., 2017
		Spatial	Babcock and Vallesi, 2017
		Spatial	De Smedt, 2016
		Spatial	Woumans et al., 2015
	ANTI-V	Spatial	Morales et al., 2015
	Number Stroop	Number	Dong and Liu, 2016
		Number	Liu and Dong, 2017
		Number	Zou, 2016
	Color-word Stroop	Verbal	Babcock and Vallesi, 2017
		Verbal	Köpke and Nespoulous, 2006
		Verbal	Tian, 2016
	Antisaccade task	Spatial	Henrard and Van Daele, 2017
Spatial		Timarová et al., 2014	
Brown-Peterson	Non-verbal	Henrard and Van Daele, 2017	
Task-switching	Non-verbal; Spatial	Babcock et al., 2017	
	Non-verbal; Spatial	Babcock and Vallesi, 2017	
	Non-verbal	Zou, 2016	
Number-letter task	Number/letter	Timarová et al., 2014	
	Number/letter	Macnamara and Conway, 2014	
	Number/letter	Macnamara and Conway, 2015	
Shifting	Color-shape switch task	Spatial	De Smedt, 2016
		Spatial	Dong and Liu, 2016
	WCST	Spatial	Liu, 2018
		Spatial	Dong and Xie, 2014
WCST	Spatial	Liu and Dong, 2017	
	Spatial	Macnamara and Conway, 2014	
	Spatial	Liu, 2018	
WCST	Spatial	Macnamara et al., 2011	
	Non-verbal; Spatial	Wei, 2017	

Table 1 (continued)

EFs	EF Tasks	Task Types	Study ID.
		Non-verbal; Spatial	Macnamara and Conway, 2015
		Non-verbal; Spatial	Yudes et al., 2011
	Plus-minus	Non-verbal	Henrard and Van Daele, 2017
	Semantic fluency	Verbal	Woumans et al., 2015
Updating	Complex span (listening span)	Verbal	Liu and Dong, 2020
		Verbal	Attanak et al., 2019
		Verbal	Chmiel, 2018
		Verbal	Dong et al., 2018
		Verbal	Liu et al., 2004
		Verbal	Stavarakaki et al., 2012
		Verbal	Tian, 2016
	Complex span (reading span)	Verbal	Chmiel, 2018
		Verbal	Zou, 2016
	Complex span (the automated operation, reading and automated symmetry span)	Spatial	Babcock et al., 2017
		Spatial	Babcock and Vallesi, 2017
		Spatial	Macnamara and Conway, 2014
		Non-verbal	Macnamara et al., 2011
		Non-verbal	Stead and Tripier, 2016
Updating	Span task with articulatory suppression	Verbal	Injoque-Ricle et al., 2015
	N-back	Spatial	Van der Linden et al., 2018
		Spatial	Timarová et al., 2014
	Single and dual n-back	Spatial	Morales et al., 2015
		Spatial	Liu and Dong, 2020
	Visuo-spatial 2-back	Spatial	De Smedt, 2016
		Spatial	Dong and Liu, 2016
		Spatial	Dong et al., 2018
		Spatial	Dong and Liu, 2017
	Dual n-back	Spatial	Attanak et al., 2019
		Spatial	Stead and Tripier, 2016
	Letter-memory	Letter	Henrard and Van Daele, 2017
		Number	Zou, 2016
Free call with suppression	Verbal	Köpke and Nespoulous, 2006	
Category/rhyme probe	Verbal	Köpke and Nespoulous, 2006	
Cued recall	Verbal	Signorelli et al., 2012	

3. Results of the systematic review

3.1. Data extraction

A total of 305 studies was included based on relevance with the present systematic review, of which 215 was sourced from Google Scholar, 75 from Baidu Scholar and 15 from ScienceDirect. Then, 22 duplicates were removed. After initial screening of the abstracts and full texts, those not meeting the inclusion criteria were excluded, leaving 47 full texts for in-depth comprehensive reading. In the end, a total of 28 studies were included in the abovementioned snowballing procedure, which were conducted and completed in May-August 2020, covering the years from 1980 to 2020. Then, a second round of literature search was conducted with a cut-off date of October 1, 2020. One additional study by Liu and Dong in 2020 was added to the literature, bringing the total number of reviewed studies to 29 (see **Figure 1**).

3.2. Research design of reviewed studies

Among these 29 studies, 10 was longitudinal, 17 cross-sectional and 2 correlational. In addition, 8 additional post-test comparisons from longitudinal studies were extracted between the interpreter group and the controls, as presented in **Table 2**.

Table 2. Research designs of included studies

Number of time points	Group characteristics	Study number
One: Cross-sectional design	Between-group comparisons containing one group of interpreters	19
	Between-group comparisons containing more than one interpreter groups	6
	Correlational analysis	2
Two or more: Longitudinal design		10

3.3. Included EF tasks

Among these 29 studies, a total of 2, 034 subjects participated in 129 reported tasks, from which only 75 were included for analysis under the “unity and diversity” model (Miyake et al., 2000). Tasks were counted more than once when between-group comparison results were provided in longitudinal studies, bringing the total number of tasks to 87, as presented in **Table 3**.

Table 3. Included tasks taxing different EF components

Executive Functions	Tasks Included	Frequency of Use
Response-Distractor	ANT; ANTI-V; Antisaccade; Brown-Peterson; Flanker; Simon; Stroop	26
Shifting	Color-shape switch; Number-letter; Plus-minus; Task-switching (in switching cost); WCST	24
Updating	Category and rhyme probe task; Complex-span (listening span; automated operation, symmetry, or reading span; free call; cued recall); letter-memory; number switch; N-back	48

3.4. Results of the included studies

The present study used an effect below 0.05 in p value or above 0.5 in Cohen's d value as the "advantage" criteria for interpreters over bilinguals, multilinguals, translators or monolinguals, or for interpreters with more experience or training compared to those with less or no training or experience. The authors' analysis and conclusion were also checked to confirm the results.

3.5. Response-distractor inhibition

Cross-sectional or correlational studies investigating interpreters' possible inhibitory advantage were conducted on 21 tasks. Among them, five tasks (24%) exhibited the interpreter advantage, while fourteen tasks (76%) didn't.

Among the five longitudinal tasks included, three (60%) didn't reveal an advantage from interpreting training and experience, while the other two (40%) indicated minimal training effects. Specifically, De Smedt (2016) hinted a minimal improvement on the Simon incongruent trials and significant enhancement on the ANT incongruent trials. Detailed information of the included inhibition tasks is presented in **Table 4**. The histogram in **Figure 2** is a visualized presentation of the included results.

Table 4. Results of the included inhibition tasks

Article	Research design	Reason	Task(s)	Results
Babcock and Vallesi, 2017	Cros. 1 group I.	experience	Stroop	ns.
	Cros. 1 group I.	experience	ANT	ns.
Babcock et al., 2017	Longitudinal IT.	training	ANT	ns.
	Cros. Design 1 group IT.	training	ANT	ns.
De Smedt, 2016	Longitudinal IT.	training	Simon	TE
	Longitudinal IT.	training	ANT	TE
Dong and Liu, 2016	Longitudinal IT.	training	Stroop	ns.
	Cros. Design 1 group IT.	training	Stroop	ns.
Dong and Xie, 2014	Cros. 1 group IT.	training	Flanker	ns.
	Cros. >1 group IT.	training	Flanker	ns.
Dong and Liu, 2017	Longitudinal IT.	training	Stroop	ns.
	Cros. Design 1 group IT.	training	Stroop	ns.
Henrard and Van Daele, 2017	Cros. 1 group I.	experience	Antisaccade	I+
	Cros. 1 group I.	experience	Brown-Peterson	I+
Köpke and Nespoulous, 2006	Cros. >1 group I.	experience	Stroop	ns.
	Cros. >1 group I.	experience	Stroop	ns.
Morales et al., 2015	Cros. 1 group I.	experience	ANTI-V	ns.
Tian, 2016	Cros. 1 group I.	experience	Stroop	ns.
Van der Linden et al., 2018	Cros. 1 group I.	experience	Flanker	ns.
			Simon	ns.
	Cros. 1 group I.	experience	Advanced flanker	ns.
Woumans et al., 2015	Cros. 1 group IT.	training	Simon	I+
	Cros. 1 group IT.	training	ANT	I+
Yudes et al., 2011	Cros. 1 group I.	experience	Simon	ns.
Timarová et al., 2014	Corre. 1 group I.	experience	Flanker	I+
			Antisaccade	ns.

Note: Cros. = Cross-sectional study. Cros. Design = Cross-sectional design in longitudinal study. 1 group I. = There is merely one group of interpreters included in a certain task. >1 group I./IT. = There are more than one group of interpreters or interpreter trainees. 1 group IT. = There is only one group of interpreter trainees included in a task. TE = Training effect due to minimal improvement, but no significant difference is reached (usually in the longitudinal study). I+ = interpreter advantage. ns. = no significant difference or correlation.

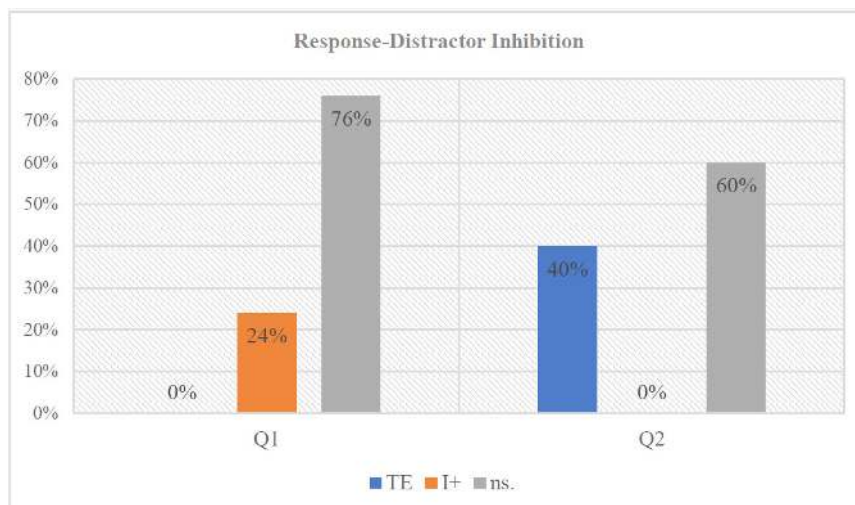


Figure 2. Results of inhibition advantages among interpreters.

Note: Q1: Do interpreters exhibit inhibitory advantages over non-interpreters? Q2: Do interpreters enhance inhibition with more training or accumulated experience?

3.6. Shifting

In the 18 cross-sectional studies on the shifting function, four (22%) reported no significant advantage for interpreters over non-interpreters or significant correlation between interpreting training or experience and shifting response. Two (11%) found only minimal advantages. However, twelve (67%) discovered significant advantages. Among the six longitudinal studies included, all (100%) found supporting evidence for the training or practice effect. See **Table 5** for the detailed results of the shifting tasks included. See a more visual presentation in the bar chart of **Figure 3**.

Table 5. Results of the included shifting tasks

Article	Research design	Reason	Task (s)	Results
Babcock and Vallesi, 2017	Cros. 1 group I.	Experience	Task-switching	ns.
Babcock et al., 2017	Longitudinal IT.	training	Task-switching	TE+
	Cros. Design 1 group IT.	training	Task-switching	ns.
De Smedt, 2016	Longitudinal IT.	training	Color-shape switch	TE
Dong and Liu, 2016	Longitudinal IT.	training	Color-shape switch	TE+
	Cros. Design 1 group IT.	training	Color-shape switch	I+
Dong and Xie, 2014	Cros. 1 group IT.	training	WCST	I+
	Cros. >1 group IT.	training	WCST	MI
Dong and Liu, 2017	Longitudinal IT.	training	WCST	TE+
	Cros. Design 1 group IT.	training	WCST	I+
Henrard and Van Daele, 2017	Cros. 1 group I.	experience	Plus-minus	ns.
	Cros. 1 group I.	experience	Plus-minus	I+
Macnamara and Conway, 2014	Cros. >1 group IT.	training	Task-switching	I+
	Cros. >1 group IT.	training	WCST	I+

Table 5 (continued)

Article	Research design	Reason	Task (s)	Results
Liu, 2020	Cros. 1 group IT.	training	WCST	I+
	Cros. 1 group IT.	training	Color-shape switch	I+
Macnamara et al., 2011	Cros. >1 group I.	experience	WCST	MI
Timarová et al., 2014	Corre. 1 group I.	experience	Number-letter	ns.
Wei, 2017	Cros. 1 group IT.	training	WCST	I+
	Cros. > 1 group IT.	training	WCST	I+
Macnamara and Conway, 2015	Longitudinal IT.	training	WCST	TE+
	Longitudinal IT.	training	Task-switching	TE+
Woumans et al., 2015	Cros. 1 group IT.	training	Semantic verbal fluency	I+
Yudes et al., 2011	Cros. 1 group I.	experience	WCST	I+

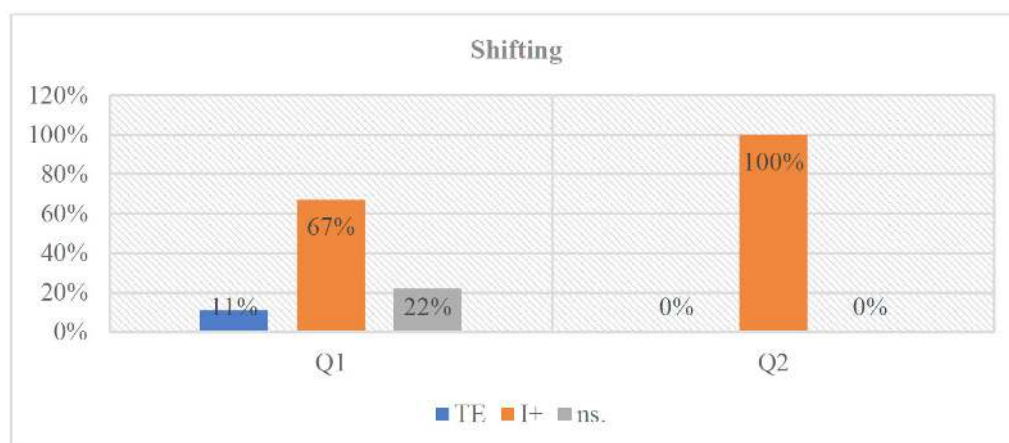


Figure 3. Results of shifting advantages among interpreters.

Note: Q1: Do interpreters exhibit shifting advantages over non-interpreters? Q2: Do interpreters enhance shifting with more training or accumulated experience?

3.7. Updating

On the 34 cross-sectional tasks, 23 (68%) revealed no significant group difference in updating between interpreters and controls or between experts and novices, while 11 (32%) did. On the 14 longitudinal tasks, seven studies (50%) didn't report a significant training effect, while six tasks (43%) did, with one more study (7%) revealing minimal improvement. See Table 6 for the detailed results of the shifting tasks included. See a more visual presentation in the bar chart of Figure 4.

Table 6. Results of the included updating tasks

Article	Research design	Reason	Task (s)	Results
Liu and Dong, 2020	Longitudinal IT.	training	Complex span	ns.
	Cros. Design 1 group IT.	training	Complex span	ns.
	Longitudinal IT.	training	N-back	ns.
	Cros. Design 1 group IT.	training	N-back	ns.

Table 6 (continued)

Article	Research design	Reason	Task (s)	Results
Attanak et al., 2019	Longitudinal IT.	training	Complex span	TE+
	Cros. Design 1 group IT.	training	Complex span	I+
	Longitudinal IT.	training	N-back	TE+
	Cros. Design 1 group IT.	training	N-back	I+
Babcock and Vallesi, 2017	Cros. 1 group I.	experience	Complex span	I+
Babcock et al., 2017	Longitudinal IT.	training	Complex span	ns.
	Cros. Design 1 group IT.	training	Complex span	ns.
Chmiel, 2018	Longitudinal IT.	training	Complex span	TE+
	Cros. Design >1 group I.	experience	Complex span	I+
	Cros. Design 1 group I.	experience	Complex span	I+
De Smedt, 2016	Longitudinal IT.	training	N-back	TE+
Dong and Liu, 2016	Longitudinal IT.	training	N-back	TE+
	Cros. Design 1 group IT.	training	N-back	I+
Dong et al., 2018	Longitudinal IT.	training	N-back	TE+
	Longitudinal IT.	training	Complex span	TE
	Cros. Design 1 group IT.	training	N-back	IT+
	Cros. Design 1 group IT.	training	Complex span	ns.
Dong and Liu, 2017	Longitudinal IT.	training	N-back	ns.
	Cros. Design 1 group IT.	training	N-back	ns.
Henrard and Van Daele, 2017	Cros. 1 group I.	experience	Letter-memory	I+
	Cros. 1 group I.	experience	Letter-memory	I+
Macnamara and Conway, 2014	Cros. >1 group IT.	training	Complex span	ns.
Injoque-Ricle et al., 2015	Corre. 1 group I.	experience	Complex span	ns.
	Corre. 1 group I.	experience	Span with articulatory suppression	ns.
Köpke and Nespoulous, 2006	Cros. >1 group I.	experience	Free recall	I+
	Cros. >1 group I.	experience	Category and rhyme probe task	ns.
	Cros. >1 group I.	experience	Free recall	ns.
	Cros. >1 group I.	experience	Category and rhyme probe task	ns.
Liu et al., 2004	Cros. >1 group I.	experience	Complex span	ns.
	Cros. >1 group IT.	training	Complex span	ns.
Macnamara et al., 2011	Cros. >1 group I.	experience	Complex span	ns.
Morales et al., 2015	Cros. 1 group I.	experience	N-back	I+

Table 6 (continued)

Article	Research design	Reason	Results	Results
Macnamara and Conway, 2015	Longitudinal IT.	training	Complex span	ns.
Signorelli et al., 2012	Cros. >1 group I.	experience	Complex span	ns.
Stavrakaki et al., 2012	Cros. 1 group I.	experience	Complex span	ns.
Stead and Tripier, 2016	Longitudinal IT.	training	Complex span	ns.
	Cros. Design 1 group IT.	training	Complex span	ns.
	Longitudinal IT.	training	N-back	ns.
	Cros. Design 1 group IT.	training	N-back	ns.
Tian, 2016	Cros. >1 group I.	experience	Complex span	ns.
Timarová et al., 2014	Corre. 1 group I.	experience	N-back	ns.
Van der Linden et al., 2018	Cros. 1 group I.	experience	N-back	ns.
Zou, 2016	Cros. >1 group IT.	training	Complex span	ns.
	Cros. >1 group IT.	training	Number switch	ns.

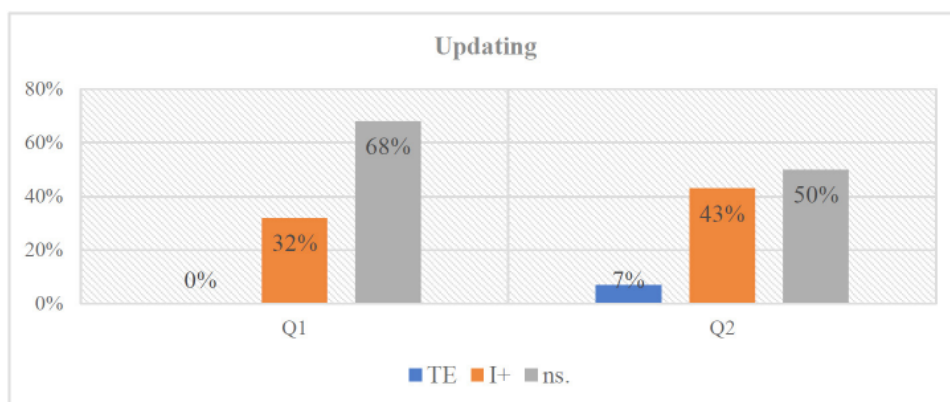


Figure 4. Results of updating advantages among interpreters.

Note: Q1: Do interpreters exhibit updating advantages over non-interpreters? Q2: Do interpreters enhance updating with more training or accumulated experience?

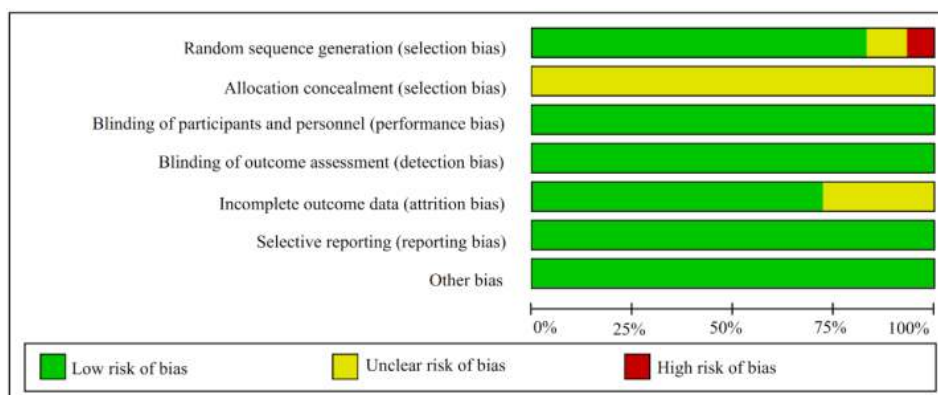


Figure 5. Risk of bias diagram: percentages of reviewers' decisions on each risk of bias item across all the 29 studies included.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Attanak et al., 2019	+	?	+	+	?	+	+
Babcock and Vallesi, 2017	+	?	+	+	+	+	+
Babcock et al., 2017	+	?	+	+	+	+	+
Chmiel, 2018	+	?	+	+	+	+	+
De Smedt, 2016	+	?	+	+	?	+	+
Dong and Liu, 2016	+	?	+	+	+	+	+
Dong and Xie, 2014	+	?	+	+	+	+	+
Dong et al., 2018	+	?	+	+	+	+	+
Henrard and Van Daele, 2017	+	?	+	+	+	+	+
Injoque-Riclé et al., 2015	+	?	+	+	?	+	+
Köpke and Nespoulous, 2006	+	?	+	+	?	+	+
Liu, 2018	+	?	+	+	+	+	+
Liu and Dong, 2017	+	?	+	+	+	+	+
Liu and Dong, 2020	+	?	+	+	+	+	+
Liu et al., 2004	+	?	+	+	?	+	+
Macnamara and Conway, 2014	?	?	+	+	+	+	+
Macnamara and Conway, 2015	?	?	+	+	+	+	+
Macnamara et al., 2011	?	?	+	+	+	+	+
Morales et al., 2015	+	?	+	+	+	+	+
Signorelli et al., 2012	+	?	+	+	+	+	+
Stavrakaki et al., 2012	+	?	+	+	?	+	+
Stead and Tripiier, 2016	+	?	+	+	?	+	+
Tian, 2016	+	?	+	+	+	+	+
Timarová et al., 2014	+	?	+	+	+	+	+
Van der Linden et al., 2018	+	?	+	+	+	+	+
Wei, 2017	+	?	+	+	?	+	+
Woumans et al., 2015	+	?	+	+	+	+	+
Yudes et al., 2011	+	?	+	+	+	+	+
Zou, 2015	+	?	+	+	+	+	+

Figure 6. Bias risk summary: review authors' assessments on each type of risk of bias for each included study.

Table 7. Detailed information of 29 studies

Study ID.	Author	Country of the author	Department	Project	Journal Titles	Journal Level
Attanak et al., 2019	Attapol Attanak	Thailand	Khon Kaen University Language Institute	/	Journal of Community Development Research (Humanities and Social Sciences)	
	Sirikran Juntapremjit	Thailand	Center of Excellence in Cognitive Science, Burapha University	/		
	Arnon Chaisuriya	Thailand	Language Institute, Chulalongkorn University	/		
Babcock et al., 2017	Laura Babcock	Sweden	Department of Neuroscience	Hemispheric Asymmetries for Executive Functions	Journal of Cognitive Enhancement	
	Mariagrazia Capizzi	Italy	Department of Neuroscience			
	Sandra Arbula	Italy	Cognitive Neuroscience Group, Scuola Internazionale Superiore di Studi Avanzati di Trieste			
	Antonino Vallesi	Italy	Department of Neuroscience			
Babcock and Vallesi, 2017	Laura Babcock	Sweden	Department of Neuroscience, Karolinska Institutet	The neurobiology of musical expertise; Hemispheric Asymmetries for Executive Functions	Bilingualism: Language and Cognition	SSCI
	Antonino Vallesi	Italy	Department of Neuroscience, University of Padova	Hemispheric Asymmetries for Executive Functions		
Chmiel, 2018	Agnieszka Chmiel	Poland	Department of Translation Studies, Adam Mickiewicz University	Respeaking - process, competences, quality; (PINC) Extreme language control: activation and inhibition as bilingual control mechanisms in conference interpreting; ADLAB PRO	International Journal of Bilingualism	A&HCI; SSCI
De Smedt, 2016	Sarah De Smedt	Belgium	University Gent	/	/	
Dong and Liu, 2016	Dong Yanping	China	School of International Studies, Zhejiang University	Neurocognitive Studies of Interpreter Training; Working memory in second language acquisition and processing	Frontiers in Psychology	SSCI
	Liu Yuhua	China	College of Foreign Studies, South China Agricultural University	Bilingual advantage		
Dong et al., 2018	Dong Yanping	China	School of International Studies, Zhejiang University	Neurocognitive Studies of Interpreter Training; Working memory in second language acquisition and processing	Frontiers in Psychology	SSCI
	Liu Yuhua	China	College of Foreign Studies, South China Agricultural University	Bilingual advantage		
	Cai Rendong	China	Bilingual Cognition and Education Lab, Guangdong University of Foreign Studies	The effect of using a foreign language on decision-making; Phonetic convergence in nonnative speech; Working memory in second language acquisition and processing		

Table 7 (continued)

Dong and Xie, 2014	Dong Yanping	China	School of International Studies, Zhejiang University	Neurocognitive Studies of Interpreter Training; Working memory in second language acquisition and processing	Journal of Cognitive Psychology	SSCI
	Xie Zhilong	China	Foreign Languages College, Jiangxi Normal University	Different bilingual experiences and cognitive control		
Henrard and Van Daele, 2017	Sébastien Henrard	Belgium	Department of Occupational Psychology, Université de Mons	Cognitive characteristics of work activities	Frontiers in Psychology	SSCI
	Agnès Van Daele	Belgium	Department of Occupational Psychology, Université de Mons	PROJET EXPERT'CRISE		
Injoque-Ricle et al., 2015	Irene Injoque-Ricle	Argentina	Department of Cognitive Processes, Psychology Research Institute, Universidad de Buenos Aires	Procesos cognitivos en niños; Procesos cognitivos en adultos; Memoria de trabajo e interpretación simultánea	Advances in Cognitive Psychology	SSCI
	Juan Pablo Barreyro	Argentina	Faculty of Psychology, UBA			
	Jesica Formoso	Argentina	Department of Research in Basic Cognitive Processes, National Scientific and Technical Research Council			
	Virginia I. Jaichenco	Argentina	Institute of Linguistics, UBA			
Köpke and Nespoulous, 2006	Barbara Köpke	France	University of Toulouse, Toulouse, France	COGNIPROS. Linguistic and cognitive evaluation of prosodic production and	Interpreting	A&HCI; SSCI
	Jean-Luc Nespoulous	France	University of Toulouse			
Liu and Dong, 2017	Liu Yuhua	China	College of Foreign Studies, South China Agricultural University	Bilingual advantage	Foreign Language Research	Chinese Core Journals
	Dong Yanping	China	School of International Studies, Zhejiang University	Neurocognitive Studies of Interpreter Training; Working memory in second language		
Liu and Dong, 2020	Liu Yuhua	China	College of Foreign Studies, South China Agricultural University	Bilingual advantage	Journal of Foreign Languages	CSSCI
	Dong Yanping	China	School of International Studies, Zhejiang University	Neurocognitive Studies of Interpreter Training; Working memory in second language acquisition and processing		
Liu et al., 2004	Liu Minhua	Hong Kong, China	Centre for Translation, Hong Kong Baptist University	/	Interpreting	A&HCI; SSCI
	Diane L. Schallert	U.S.	Department of Educational Psychology, University of Texas at Austin	Written and oral language; Constructive Criticism Team		
	Patrick J. Carroll	/	/	/		
Liu, 2018	Liu Yuhua	China	College of Foreign Studies, South China Agricultural University	Bilingual advantage	Translation Research and Teaching	
Macnamara and Conway, 2014	Brooke N. Macnamara	U.S.	Department of Psychological Sciences, Case Western Reserve University	/	Psychonomic Bulletin & Review	SSCI
	Andrew R. A. Conway	U.S.	Department of Applied Cognitive Psychology, Claremont Graduate University	Virtues in Communities of Trust		
Macnamara and Conway, 2015	Brooke N. Macnamara	U.S.	Department of Psychological Sciences, Case Western Reserve University	/	Journal of Applied Research in Memory and Cognition	SSCI
	Andrew R. A. Conway	U.S.	Department of Applied Cognitive Psychology, Claremont Graduate University	Virtues in Communities of Trust		

Table 7 (continued)

Macnamara et al., 2011	Brooke N. Macnamara	U.S.	Department of Psychological Sciences, Case Western Reserve University	/	Interpreting	A&HCI; SSCI
	Adam B. Moore	/	/	/		
	Judy Kegl	U.S.	Department of Linguistics, University of Southern Maine	ASL Linguistics Project		
	Andrew R. A. Conway	U.S.	Department of Applied Cognitive Psychology, Claremont Graduate University	Virtues in Communities of Trust		
Morales et al., 2015	Julia Morales	Spain	Universidad Loyola Andalucia	Modulating cognition with tDCS	Acta Psychologica	SSCI
	Francisca Padilla	Spain	Department of Experimental Psychology and Physiology of Behaviour, University of Granada	Cognitive processes in translation or interpreting; Working memory and executive functions		
	Carlos J. Gomez-Ariza	Spain	Department of Psychology, Universidad de Jaén	Executive Control Training; Inhibitory control as a mechanism of memory regulation		
	Maria Teresa Bajo	Spain	University of Granada			
Signorelli et al., 2011	Teresa Signorelli Pisano	U.S.	Program in Speech–Language–Hearing Sciences, CUNY Graduate Center	Semantic working memory	International Journal of Bilingualism	A&HCI; SSCI
	Henk J Haarmann	U.S.	Center for Advanced Study of Language (CASL), University of Maryland, College Park	Semantic working memory; Creative cognition		
	Loraine K Obler	U.S.	Program in Speech–Language–Hearing Sciences, CUNY Graduate Center	The influence of second-language grammar on native language sentence comprehension; Semantic working memory		
Stavrakaki et al., 2012	Stavroula Stavrakaki	Greece	School of Italian Language and Literature, Aristotle University of Thessaloniki	Relationship between Developmental Language Disorder and Developmental Dyslexia	Journal of Clinical and Experimental Neuropsychology	SCIE; SSCI
	Kalliopi Megari	Greece	Department of Cardiothoracic Surgery I, Aristotle University of Thessaloniki	Call for papers for "American Journal of Psychiatry and Neuroscience"		
	Mary Helen Kosmidis	Greece	School of Psychology, Aristotle University of Thessaloniki	Neuropsychological Assessment of Greek Australian Migrants		
	Maria Apostolidou	/	/	/		
	Eleni Takou	/	/	/		
Stead and Tripier, 2016	Andrew Stead Coralie Triper	Switzerland	University of Geneva	/	/	
Tian, 2016	Tian Jia	China	Guangdong University of Foreign Studies	/	/	
Timarová et al., 2014	Šárka Timarová	/	KU Leuven	/	Interpreting	A&HCI; SSCI
	Ivana Čeňková	Czechia	Institute of Translation Studies, Charles University in Prague	ImPLI (Improving police and legal interpreting) 2011-2012 translation policy		
	Reine Meylaerts Erik Hertog	Belgium	Faculty of the Arts, KU Leuven	/		
	Arnaud Szmalec	Belgium	Psychological Sciences Research Institute, Université Catholique de Louvain - UCLouvain	Assessing Content and Language Integrated Learning (CLIL): Linguistic, cognitive and educational perspectives		
	Wouter Duyck	Belgium	Department of Experimental Psychology, Ghent University	LEMMA project		
Van der Linden et al., 2018	Lize Van der Linden	Belgium	Psychological Sciences Research Institute, Université Catholique de Louvain - UCLouvain	Cognitive control of language in the bilingual brain: Behavioral and brain correlates in (atypical) populations	Frontiers in Psychology	SSCI
	Eowyn Van de putte Evy Woumans	Belgium	Department of Experimental Psychology, Ghent University	/		
	Wouter Duyck	Belgium	Department of Experimental Psychology, Ghent University	LEMMA project		
	Arnaud Szmalec	Belgium	Psychological Sciences Research Institute, Université Catholique de Louvain - UCLouvain	Assessing Content and Language Integrated Learning (CLIL): Linguistic, cognitive and educational perspectives		

Table 7 (continued)

Wei, 2017	Wei Yue	China	University of Electronic Science and Technology of China	/	/	
Woumans et al., 2015	Evy Woumans	Belgium	Department of Experimental Psychology, Ghent University	LEMMA project	Journal of Experimental Psychology: Learning, Memory, and Cognition	
	Evy Ceuleers	/	/	/		
	Lize Van der Linden	Belgium	Psychological Sciences Research Institute, Université Catholique de Louvain - UCLouvain	Cognitive control of language in the bilingual brain: Behavioral and brain correlates in (a)typical populations		
	Arnaud Szmalec	Belgium		Assessing Content and Language Integrated Learning (CLIL): Linguistic, cognitive and educational perspectives		
	Wouter Duyck	Belgium	Department of Experimental Psychology, Ghent University	LEMMA project		
Yudes et al., 2011	Carolina Yudes	Spain	Departamento de Psicología Evolutiva y de la Educación, University of Malaga	/	Frontiers in psychology	SSCI
	Pedro Macizo	Spain	Department of Experimental Psychology and Physiology of Behaviour, University of Granada	Second language learning		
	Maria Teresa Bajo	Spain	University of Granada	Executive Control Training; Inhibitory control as a mechanism of memory regulation		
Zou, 2015	Zou Deyan	China	Shanghai International Studies University	/	/	

3.8. Assessing risk of bias

Risk of bias was assessed in RevMan (see **Figure 5** and **Figure 6**). There was a 17% risk of a selection bias and a 28 % chance of incomplete data bias after ignoring concealment- and blinding-caused biases. Taken together, the bias risk was relatively low for the present systematic review, thus confirming validity of the included literature.

Table 7 shows author names, countries, departments and projects and journal titles. Nine out of the 29 included studies are from China, mainly led by Dong Yanping and Liu Yuhua. Other studies are led by authors from Thailand, Sweden, Italy, Poland, Argentina, France, U.S., Spain, Greece, Czechia, and Belgium. In addition to peer-reviewed journal articles, there are three Chinese dissertations downloaded from CNKI and Baidu Scholar and two international dissertations downloaded from school libraries. Journal ranking was checked according to the Shang Jiao Tong University Core Journal Finding System (<http://corejournal.lib.sjtu.edu.cn/findcoreej.htm>) and ISSN of the journal both on the article and the website to avoid mistakes. A total of 20 studies included are of high quality as they were published by SSCI, A & HCI, SCIE, CSSCI or Chinese Core Journals.

4. Meta-analyses

4.1. Reproducibility and replicability

One of the ways by which the scientific community confirms the validity of scientific discovery is by repeating the research that produces it. Popper stresses the importance of repeatedly testing and reproducing results before acknowledging the conclusions and their empirical validity (Popper, 2005: 23). In our case, executive functions are not a single mechanism measured by a singular task.

In fact, different EFs (even the same EF) are measured by different tasks under a variety of cross-sectional and longitudinal designs. However, we managed to synthesize data on some commonly used EF tasks for meta-analysis to see if the interpreter advantages can be replicated. These tasks included WCST, task-switching, Stroop, 2-back and some of the complex span tasks. To ensure validity, replicated evidence must be available from at least two primary studies for a task to be included for meta-analysis in RevMan (Card, 2012).

4.2. Results of meta-analyses

4.2.1 Inhibition: Stroop

For a Stroop study to be included, it must meet the following requirements: 1) The moderating factor should be interpreting training or experience; 3) The Stroop effect of the original study should be provided; 3) The comparison should be made between groups with (more) interpreting training and those with (less) or no training; 4) Task moderations are accepted, meaning it can be number Stroop or color-word Stroop. Six publications included the Stroop task. However, only three met all the inclusion criteria, with seven datasets. But only three met all the inclusion criteria. **Figure 7** showed no interpreter advantage on the Stroop task ($g = 0.13$; 95% CI, -0.07, 0.33; $Z = 1.27$, $p = .20$; $I^2 = 0\%$).

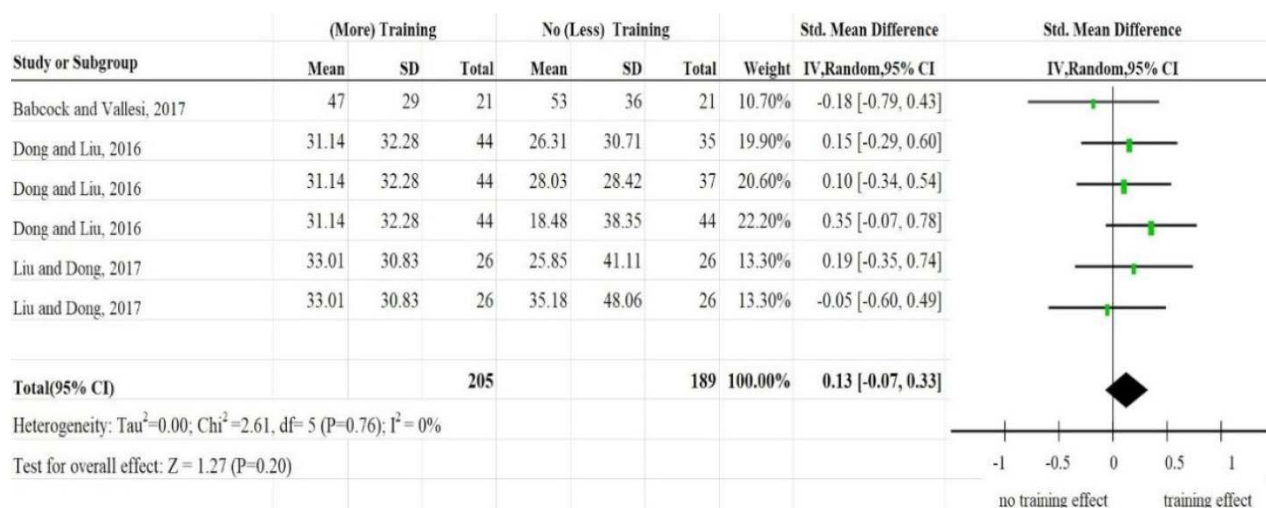


Figure 7. Forest plot on Stroop task, comparing Stroop effect between interpreters and non-interpreters or advanced trainees or less skilled trainees.

4.2.2 Updating: 2-back

The inclusion criteria for the 2-back task were similar to those for the Stroop task, except for the dependent variable being the 2-back mean accuracy score rather than the Stroop effect. Accuracy measured in other manners was converted according to De Smedt (2016). Ten studies included the 2-back task. However, only five studies with ten datasets met all the inclusion criteria.

Forest plot results in **Figure 8** showed a small effect size in favor of interpreter advantage on 2-back ($g = 0.23$; 95%CI, -0.02, 0.48; $Z = 1.82$, $P = 0.07$; $I^2 = 61\%$). Due to the substantial heterogeneity, a sub-group analysis was conducted to identify the cause.



Figure 8. Forest plot of training effect on 2-back task, comparing 2-back accuracy rate between interpreters and controls or trainees’ pre-post performance.

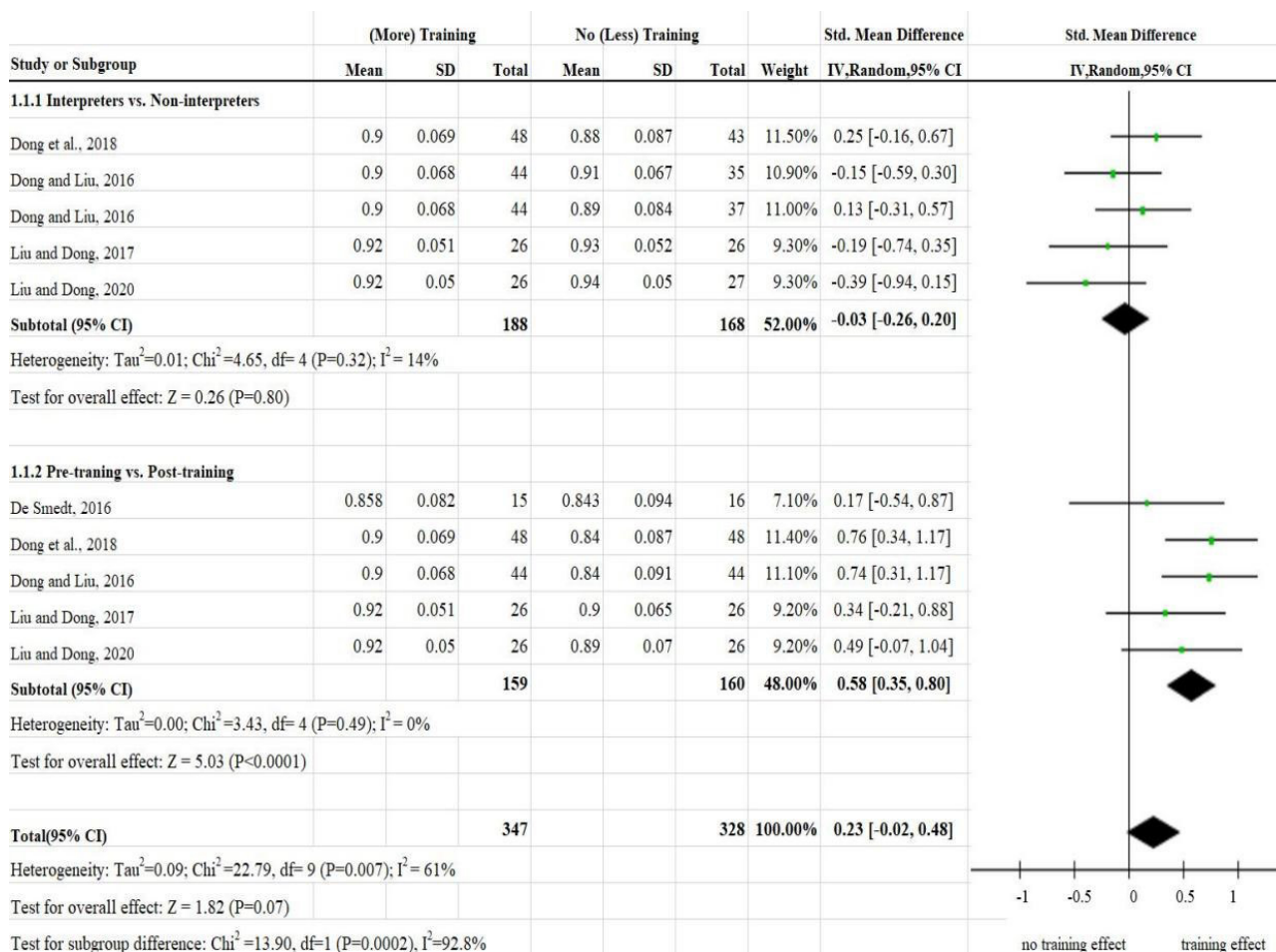


Figure 9. Forest plot of sub-group analysis on 2-back training effect.

In **Figure 9**, the interpreter vs non-interpreter subgroup showed no interpreter advantage on

2-back ($g = -0.03$; 95% CI from -0.26 to 0.20 ; $Z = 0.26$, $p = 0.80$; $I^2 = 14\%$). However, the pre-training vs post-training subgroup exhibited significant interpreter advantage on 2-back ($g = 0.58$, 95% CI from 0.35 to 0.80 ; $Z = 5.03$, $p < 0.00001$; $I^2 = 0\%$). The sub-group analysis indicated that that heterogeneity could arise when between- and within-group results were synthesized.

4.2.3 Updating: L2 listening span

L2 listening span is complex span task that requires the participants to recall the last word of a set of each sentence after listening in their second language (L2) and judging if the sentences make sense. The inclusion criteria are the same except for the scoring method, which can be the total number of correctly recalled words (Nour et al., 2020) or the highest number of recalled words for more than two out of five sentence set (truncated span) (Liu et al., 2004). Six studies included the L2 listen span task, but only four met all the selection criteria, with seven datasets. In Liu et al. (2004: 32), the means and standard deviations of the L2 listening span results are provided for professional interpreters, advanced students and beginning students. However, results of the whole student groups are not clearly provided. Equations (1) and (2) presented below are used to calculate the separate means and SDs of the advanced (x) and beginning students (y). After calculation, the mean of the whole student group is 3.295, with SD being 1.597.

$$\bar{Z} = \frac{n\bar{x} + m\bar{y}}{m+n} \tag{1}$$

$$\sigma = \sqrt{\frac{n\sigma_x^2 + m\sigma_y^2 + \frac{mn(\bar{x}-\bar{y})^2}{m+n}}{m+n}} \tag{2}$$

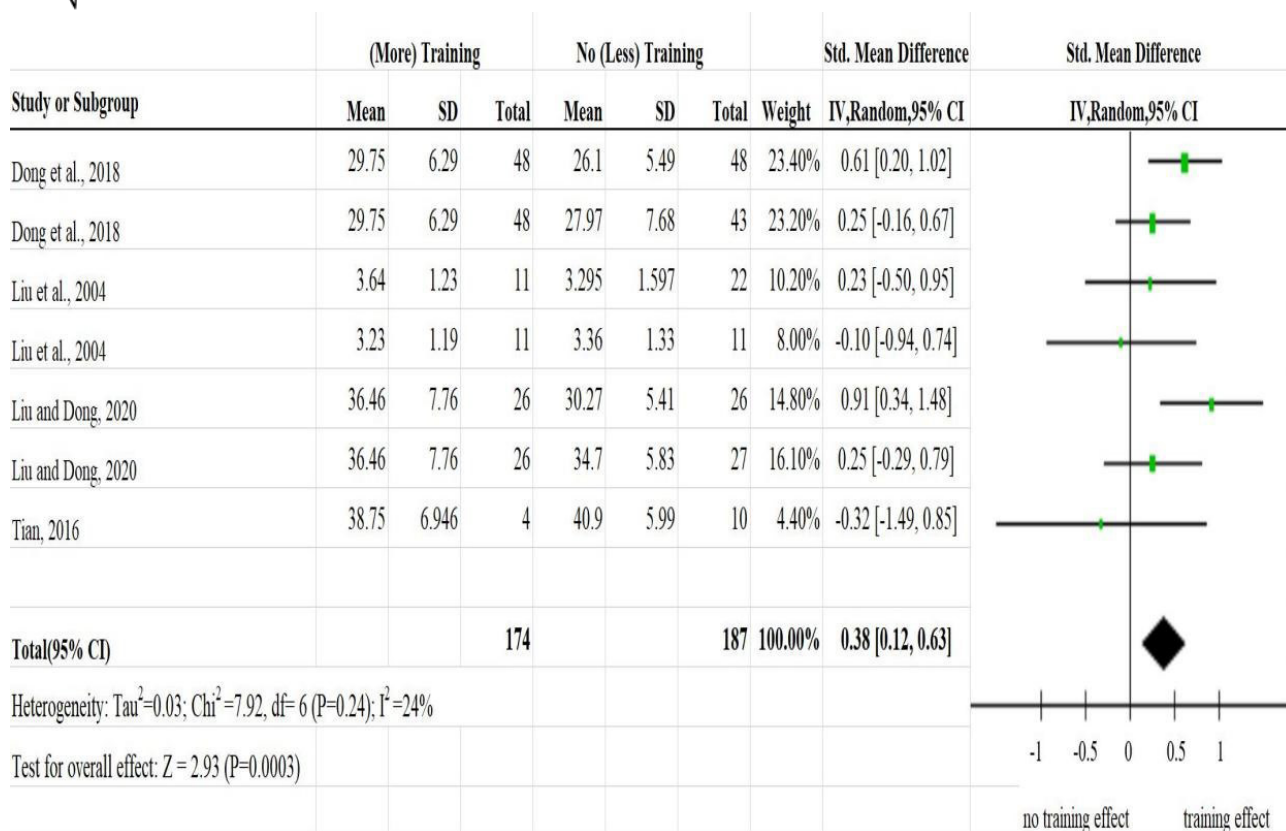


Figure 10. Forest plot of L2 listening span.

The results in **Figure 10** showed that more interpreting training or experience significantly enhanced L2 listening span ($g = 0.38$; 95% CI, 0.12, 0.63; $Z = 2.93$, $p = 0.0003$; $I^2 = 24\%$). Although there was only a small heterogeneity in the datasets (Higgins and Green 2008: 278), we conducted a sub-group analysis to address it.

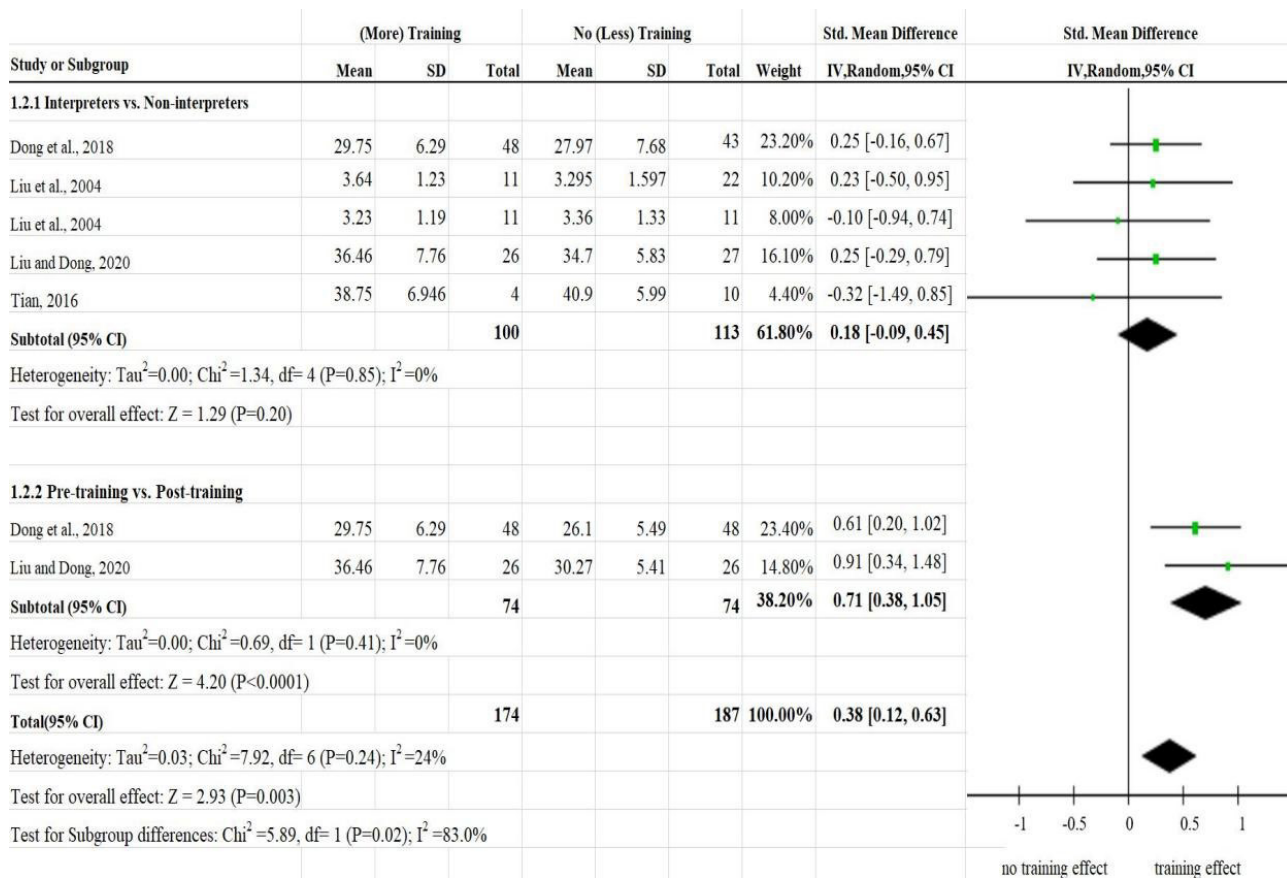


Figure 11. Forest plot of sub-group analysis on L2 listening span.

As presented in **Figure 11**, the 24% heterogeneity was due to the combination of between-group and within-group data. The sub-group analysis showed that interpreters possessed no advantage over non-interpreters in L2 listening span ($g = 0.18$; 95% CI, -0.09, 0.45; $Z = 1.29$, $p = 0.20$; $I^2 = 0\%$). However, post-training interpreters performed significantly better in L2 listening span than before training, with a high effect size ($g = 0.71$, 95%CI, 0.38, 1.05; $Z = 4.20$, $p < 0.0001$; $I^2 = 0\%$).

4.2.4 Shifting: WCST

The inclusion criteria for WCST are the same except for the dependent variable, which is the number of completed categories. Eight studies included WCST, but only four met all the selection criteria, with seven datasets. In Dong and Xie (2014) there are two groups of interpreters and two groups of non-interpreters. Equations (1) and (2) are used again to convert the means and SDs of the separate groups into those of the whole group.

The results in **Figure 12** showed a highly significant interpreter advantage with a medium-to-high effect size and no heterogeneity in the datasets ($g = 0.68$; 95%CI, 0.48, 0.87; $Z = 6.86$, $p <$

0.00001; $I^2 = 0\%$)

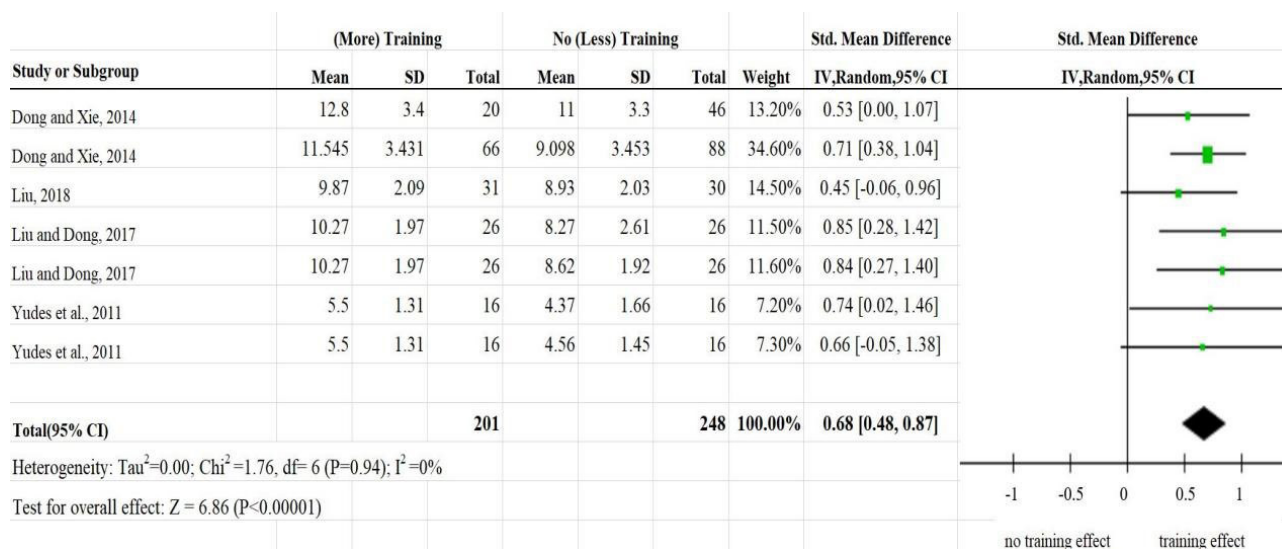


Figure 12. Forest plot on WCST.

4.2.5 Shifting: Task-switching

Five out of the eight task-switching studies meet the inclusion criteria, with nine data sets. The included dependent variable is the switching cost, i.e. difference in response time between repeat trials and switch trials. The higher the switching cost is, the weaker the shifting ability is (Liu, 2018). Results presented in Figure 13 showed that more interpreting training or experience significantly reduced switching cost ($g = -0.23$; 95%CI, 0.03, 0.43; $Z = 2.22$; $P = 0.03$; $I^2 = 32\%$).

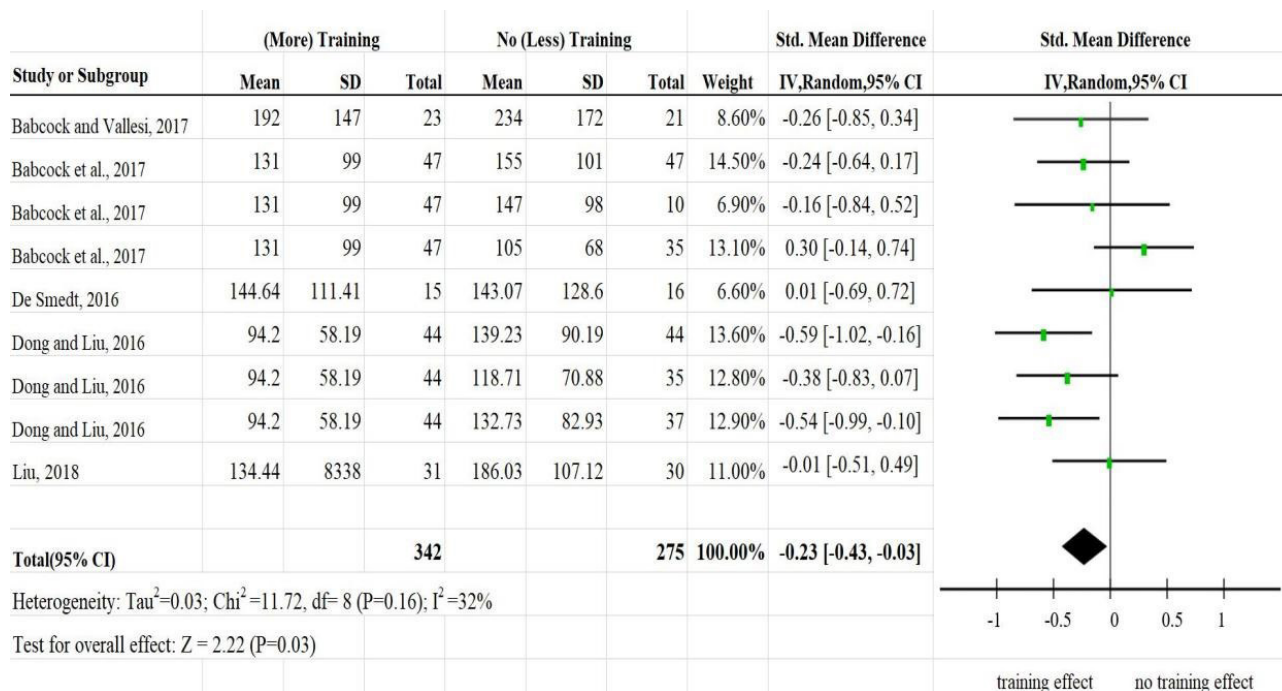


Figure 13. Forest plot on switching cost.

Although the 32% heterogeneity was not too significant to affect the results, a sensitivity analysis was conducted. It was found that the third dataset extracted from Babcock et al. (2017) included interpreters and non-language controls while the other eight datasets compared interpreters with controls with language training. After excluding the heterogeneity, a new forest plot in **Figure 14** showed a bigger effect estimate, with more interpreting training or experience significantly lowering switching cost ($g = -0.32$; 95% CI, 0.14, 0.49; $Z = 3.56$, $P = 0.0004$; $I^2 = 0\%$).

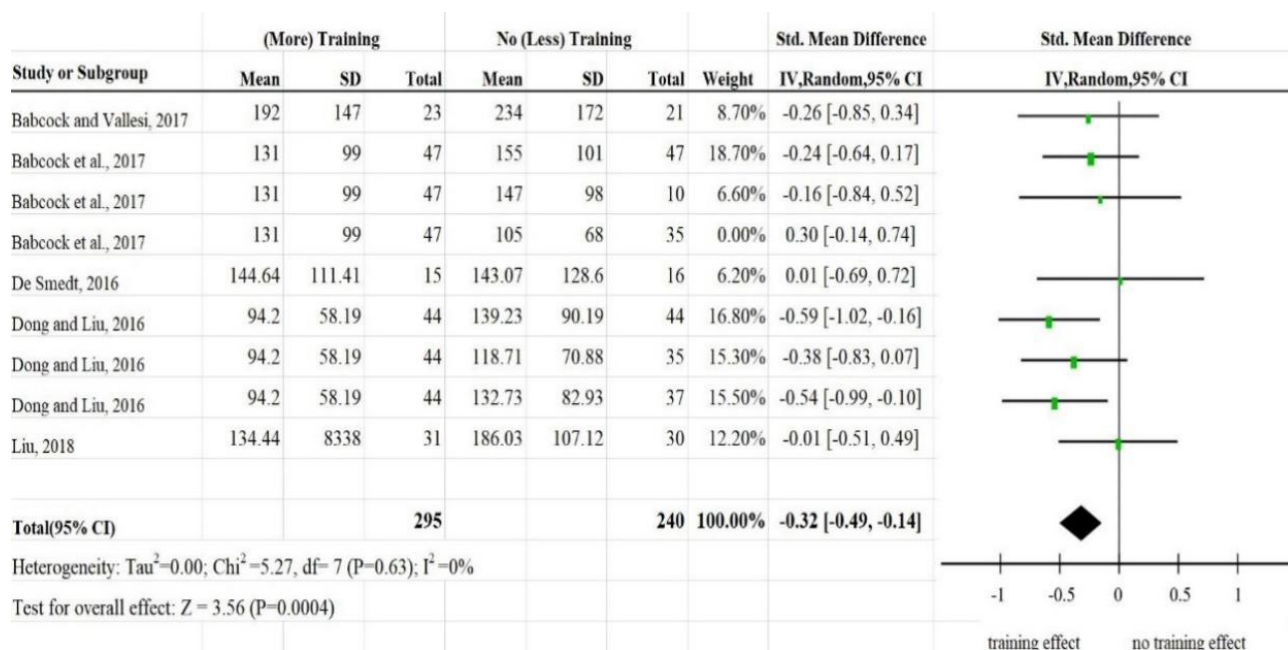


Figure 14. Forest plot on switching cost after sensitivity analysis.

5. Discussion

5.1. Summary of major findings

Despite growing interest in the cognitive processes of interpreters, prior research on the presumed interpreter advantage in executive functions has produced inconsistent results. To find patterns in these mixed results, the systematic review and meta-analysis synthesized data from 98 tasks of 29 highly relevant studies. As shown in **Table 8**, a shifting advantage was confirmed whereas an inhibitory advantage was rejected. For updating, findings were mixed in the systematic review and the meta-analysis.

Table 8. Summary of results

	EFs	Q1: Cross-sectional	Q2: Longitudinal
Systematic Review	Inhibition	×	×
	Shifting	√	√
	Updating	×	mixed
Meta-analyses	Inhibition (Stroop)	×	×
	Shifting (WCST; Task-switching)	√	√
	Updating (2-back; L2 Listening span)	×	√

5.1.1 Shifting

In cross-sectional between-group comparisons, 69% of publications on shifting supported an interpreter advantage, while all longitudinal studies (100%) presented positive evidence. The results aligned with the conclusion in Nour et al. (2020). Besides, the interpreter advantage in shifting was also shown in the meta-analysis of two shifting tasks (SMD = 0.68 for WCST and SMD = -0.32 for Task-switching). According to the Adaptive Control Hypothesis (Green and Abutalebi, 2013: 17–518), cognitive advantages are modulated by the interactional context being the dual-language, single-language or dense code-switching. As interpreters routinely switch between two languages at work or during training (Aparicio et al., 2017; Babcock and Vallesi, 2017), their abilities in shifting might be significantly enhanced, as proven by most existing literature.

5.1.2 Inhibition

Only five out of the 21 (24%) cross-sectional or correlational tasks supported an inhibitory advantage for interpreters (Timarová et al., 2014; Woumans et al., 2015; Henrard and Van Daele, 2017). Three of the five (60%) longitudinal tasks did not report significant improvement after the training (Babcock et al., 2017; Dong and Liu, 2016; Liu and Dong, 2017). These accord with the review results of Nour et al. (2020). Besides, the meta-analysis of Stroop (SMD = 0.13) exhibited no inhibition advantage of interpreters.

5.1.3 Updating

On the 34 cross-sectional tasks of updating, 23 (68%) revealed no significant difference between interpreters and controls or between experts and novices. On the 14 longitudinal tasks, 50% didn't report a significant training effect. The pooled effect estimates only suggested significant impact of interpreting training on 2-back (SMD = 0.58) and L2 listening span (SMD = 0.71), but not in cross-sectional comparisons. This is consistent with findings of Wen and Dong (2019), but at variance with those of Nour et al. (2020). The discrepancy mainly comes from the 29 (this review: 48 vs Nour et al. 2020: 19) newly-added effects.

5.2. Moderating factors: PICOS

5.2.1 Participant

Participant differences affect the results. Difference in demographics (age, social economic status etc.), language experience and expertise, interactional context (dual, single, or dense code-switching) are crucial variables in the development of executive control in bilinguals (Yudes et al., 2011; Green and Abutalebi, 2013; Verreyt et al., 2017; Kidd et al., 2018).

There is a trade-off between age and EFs. With more years, interpreters get to build more cognitive reserves. However, growing older means decline in working memory and executive functioning. (Zhang et al., 2020). For inhibition, Henrard and Van Daele (2017) found superior inhibitory performance of interpreters over translators. while Dong and Liu (2016) didn't reveal such superiority. The much older participants in Henrard and Van Daele (2017) than those in Dong and Liu (2016) (M = 19.85) and (M = 44.98) could be the explanation, meaning an interpreter's inhibitory advantage may emerge in older age. For shifting, Babcock and Vallesi (2017), Macnamara et al. (2011) and Timarová et al. (2014) failed to prove the interpreter advantage in shifting with mean participant ages of 34.1, 42 and 37.1, older than those of other studies. Could this mean that

an interpreter's shifting advantage is likely to emerge at a younger age? In the same vein, supporting evidence for an updating advantage mostly came from student interpreters between 19 and 22 years old. With older students at 26.68 and 28.87, Macnamara and Conway (2014; 2015) and Stead and Tripier (2016) did not find an interpreting training effect.

Not only age, but L2 proficiency and switching frequency have also been shown to moderate EFs (e.g. Woumans et al., 2015; Verreyt et al., 2016). In Woumans et al. (2015), student interpreters exhibited higher inhibition accuracy over unbalanced bilinguals but not the balanced bilinguals, possibly due to the moderating effect of L2 proficiency. On the other hand, Verreyt et al. (2016) found inhibitory advantages in balanced switching bilinguals over unbalanced and balanced non-switching bilinguals, indicating that language switching might be a key determinant.

5.2.2 Intervention

Interpreting experience is not categorical but continuous, like bilingualism (Luk and Bialystok, 2013). At different levels of expertise, the interpreting experience or training intervenes differently. According to Chein and Schneider (2012), during the three stages of skill acquisition, *formation, controlled execution and automatic execution*, there is a shift from metacognition to cognitive control to representation. As the cognitive control network is heavily recruited during the stage of controlled execution, the most likely period to see superior cognitive control could be during intense training. When interpreters start training, the metacognitive system plays a dominant role, with participants not engaging in the necessary code-switching practice and being insufficiently exposed to the cognitive processes of interpreting. On the other hand, professional interpreters can find interpreting effortless if they have automated language and processing control (Dong and Li, 2020). In Hervais-Adelman et al. (2015) recruitment of the right caudate nucleus was reduced in simultaneous interpreting after 15 months of intense training. Hervais-Adelman et al. (2017) revealed that cortical thickness increased after simultaneous interpreting training. Such structural change decreases demand on cognitive control as the task becomes more automatized. This is in line with the adaptive control hypothesis (Green and Abutalebi, 2013)

So far, the exact amount of training that brings on the EF advantages has not been confirmed. In Dong and Liu (2016), and Liu and Dong (2017; 2020), with other factors being similar, results diverged due to different duration of training (2016: 1 semester and 32 class hours; 2017: 1 year and 144 class hours; 2020: 1 year and 144 class hours) and students being English or non-English majors. Dong and Liu (2020) believed that participants at the beginning stage or at lower levels endure more interpreting pressure and therefore may need WM and EF more.

5.2.3 Control

The lack of differences between interpreters and other well-matched linguistic groups may be attributable to the fact that learning is such a fundamental human behavior that it is constantly pursued in multiple ways. The control group may not engage in the heavy code-switching necessary for developing interpreting skill, but they may pursue a myriad of other goals and interests intensely. Other acquired skills, such as being a professional musician (Bialystok and DePape, 2009), playing American football (Wylie et al., 2018) and aerobic exercise (see a review by Heijnen et al., 2016), have all been shown to produce discernible effects on cognition.

5.2.4 Outcome

Task impurity has a negative impact on the outcome. Since EFs are three independently single mechanism but unitary to some degree (Miyake et al., 2000), one task could test more than one aspect of EFs. For example, task switching requires inhibition as well as the shifting function, which explains why the color-shape switching in Dong and Liu (2016) and the color-word switching Babcock and Vallesi (2017) and Babcock et al. (2017) produced different results. With more complex stimuli, the latter two studies did not show an interpreter advantage in shifting. For complex span (e.g. operation span; listening span), tasks requiring only the ability to understand and judge plausibility led to positive findings (Chmiel, 2018; Attanak et al., 2019). However, if the task requires more focus on information details, or conducting an arithmetic calculation, researchers don't find the advantage (Stead and Tripier, 2016; Babcock et al., 2017; Liu and Dong, 2020).

5.2.5 Study design

Most study designs in the existing literature were cross-sectional, correlational or longitudinal with a control group. Only a few studies followed the pre/post and experimental/control longitudinal design to explain the causal relationship between interpreting training/experience and EFs (e.g. Dong and Liu, 2016, Liu and Dong, 2017, 2020; Dong et al., 2018). More studies focused on how interpreting experience enhanced EFs, not how bigger a role EFs play in shaping interpreting performance, with a few exceptions (e.g. Liu et al., 2004; Dong and Xie, 2014; Timarová et al., 2014).

6. Conclusion

This systematic review and meta-analysis found significant evidence for the interpreter advantage in shifting, mixed findings in updating and little support in terms of inhibition. Inconsistency in previous studies is mainly caused by the heterogeneity of the demographic background, second language and interpreting experience, the universality of executive functioning, the diversity of experimental tasks and indicators used, and the mismatch between interpreting experience and experimental tasks. The findings of the present study can be replicated and extended. In decades ahead, increasing research on the role of executive functions in interpreting practice and vice versa will expand current knowledge of this growing field.

Conflict of interest

No conflict of interest was reported by all authors.

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ORIGINAL ARTICLE

A study on machine translation of resultative constructions

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Abstract: Based on an empirical investigation on data collected from four popular machine translation systems, this paper explores the current problems machine translation is confronted with in translating Chinese resultative constructions into English. The paper analyzes their syntactic and semantic differences in construction and in verbal pattern. The paper then further elaborates on the problems and reveals a truth that Chinese resultative construction poses a great challenge to machine translation for being very productive and flexible. Its productivity is credited to the fact that the main verbs in Chinese are mostly implied-fulfillment verbs. Its flexibility could be attributed to the hypothesis that there are fewer constraints on the co-occurrence of the main verb and the resultative in Chinese resultative construction. Finally, possible solutions are proposed in an attempt to solve the problems.

Keywords: resultative construction; machine translation; implied-fulfillment verb

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1. Introduction

The term ‘resultative’ was first coined by Halliday (1967: 62–66) to distinguish two types of attributes, namely the resultative and the depictive. The corresponding Chinese term was first adopted by Lv (1980) to distinguish two types of complements, one indicating a result and the other a direction. Just as Thepkanjana and Uehara (2009) put it, there is indeed no single cross-linguistically accepted definition of the term ‘resultative’; it can be semantically defined in a broad way as a term referring to linguistic forms that express a state and a previous event. The resultative state may be linguistically realized by many types of linguistic forms across languages. For instance, in Mandarin Chinese resultative constructions consist of a main verb and an adjective or a verb indicating a result (Lv, 1980: 11), which are also known in the literature as V-V compounds (Y. Li, 1990; Zou, 1994; Chang, 1997; etc.), resultative verb compounds (Thompson, 1973; Ross, 1990; C. Li, 2007, 2013; etc.), or verb-resultative constructions (Xia and Li, 2016; etc.). Unlike English resultative constructions, the main verb and the resultative predicate of a Chinese resultative construction are syntactically stuck together, allowing no elements between them. Chinese

resultative constructions are characteristic and known as a concise structure with rich meaning (L. Li, 1986: 198), which are pervasive in Chinese. In essence, their syntactic functions are not substantially different from those of a single verb, yet their semantics is much more complicated than the latter. In a word, Chinese resultative constructions have simple syntactic structures but complicated semantic relations, which hence poses a great challenge to machine translation.

Machine translation has come a long way in the past half century since the first public demonstration of its feasibility, a collaboration by IBM and Georgetown University, in 1954. With the introduction of corpora, rule-based machine translation has been developed into statistical machine translation. The latter takes advantage of the language model trained on monolingual data in the target language and there is no need to write rules manually. By directly training parallel corpora, a machine translation system can be built, which becomes the core technology of many online machine translation systems developed by companies such as Google, Baidu and the rest. But there still exist some problems in statistical machine translation, for it still relies on human experts for designing features to represent all kinds of translation knowledge. The advent of artificial intelligence fosters the development of deep learning and neural network, in which case companies such as Google and Baidu have successively developed neural machine translation systems based on big data, giving rise to superior translation accuracy. Although the current neural machine translation systems have achieved good results in daily conversation, news and other fields, machine translation is far from mature (Feng, 2018). Chinese resultative constructions are too difficult for machine translation to handle owing to their unique syntactic and semantic characteristics.

The rest of the article is organized as follows: Section 2 of this article will examine the problems machine translation is confronted with in translating Chinese resultative constructions into English based on a certain amount of data. In Section 3, a contrast between Chinese and English resultative constructions will be made. In Section 4, the previous problems will be accounted for in linguistic terms; what's more, possible solutions to these problems will be proposed. Section 5 concludes the article.

2. Data collection and discrepancies revealed in machine translation

This article selects about 200 common Chinese resultative constructions and collects all their English translations generated through four machine translation systems, namely Youdao, Baidu, Mr. Translator of Tencent (hereafter referred to as Tencent) and Google, and makes a preliminary statistical analysis of these data. According to the current data, the first three translation systems are probably based on similar parallel corpora, for they present similar or even the same translations for many Chinese resultative constructions while Google provides quite different translations. As far as the collected data are concerned, Google translation gets the lowest accuracy of the four translation systems with just around 16%, 11% lowering than the average.

A close examination and analysis of the available data shows that there exist many problems in the machine translation of Chinese resultative constructions into English, which can be roughly summarized as follows:

1) Only the result of the resultative construction is translated while the main verb is omitted, hence some semantic information is lost. For instance:

(1) *wo zou lei le*

I walk tired PERF

‘I became tired as a result of walking (e.g. a long distance/for a long time).’

The translation of (1) presented by Google is “*I am tired*”, without any semantic information of the verb “*walk*”. The other three give the same translation, “*I’m tired of walking*”, the meaning of which is totally different from that of the original sentence.

Take another instance for example:

(2) *ta chi pang le*

he eat fat PERF

‘He has put on some weight as a result of eating (too much).’

The translations given by the four translation systems are as follows:

(3) a. He put on weight. (Tencent)

b. He has put on weight. (Youdao)

c. He is fat. (Google)

d. He’s overweight. (Baidu)

Likewise, the translations fail to convey the semantic information of the main verb or the action verb.

The above-mentioned examples of Chinese resultative constructions are intransitive. The problem also occurs when it comes to some transitive resultative constructions, for example:

(4) *wo ting dong le zhe ju hua*

I listen understand PERF this CL sentence

‘I listened to this sentence and understood it.’

All the four versions are almost the same except for their different tenses, “*I understand/understood this sentence,*” in which only the resultative predicate is translated. The machine translation systems fail to distinguish between (4) and (5) by giving the exact same translations, without conveying the semantic meaning of the main verbs.

(5) *wo du dong le zhe ju hua*

I read understand PERF this CL sentence

‘I read this sentence and understand it.’

It is widely believed in the literature that the action verb of a Chinese resultative construction is the syntactic head of the sentence while the resultative predicate is its semantic head. Thus, it is somehow reasonable to focus more on the meaning of the resultative predicate than the action

predicate, yet there is a semantic loss when the latter is totally omitted or ignored in translation.

2) The resultative meaning and the change of state are not translated accurately, hence there is a semantic discrepancy between the translated sentence and the original one. For example:

(6) *feng gua meng le*

wind blow hard PERF

‘The wind is blowing harder (than before).’

Sentence (6) actually means that the gentle wind is now blowing more strongly than before and becomes fierce. It indicates the change of the scale of wind. However, the two different translations given by the four machine translation systems, “*The wind is blowing hard*” and “*The wind blew hard*”, fail to accurately convey the change of state as well as the resultative meaning. This subtle difference between the translation and the original Chinese sentence is a big challenge to machine translation, which is also difficult for foreign language learners to grasp. The above translations are fine for another sentence, “*feng gua de meng* (wind blow fiercely)”.

3) When it comes to cases where an instrument serves as the object of a resultative construction, all the four translation systems fail to present accurate translations. For instance:

(7) *wo ca zang le liang kuai ma-bu*

I wipe dirty PERF two pieces rag

‘I wiped something with two rags and as a result the two rags became dirty.’

The translations produced by the four translation systems are as follows:

(8) a. I wiped two rags. (Tencent)

b. I soiled two rags. (Youdao)

c. I rubbed two rags. (Google)

d. I rubbed two rags dirty. (Baidu)

Sentence (7) aims to emphasize the change of state of the two rags instead of the object wiped by the agent ‘I’. The two rags undergo the change of state from being clean to being dirty as a result of the activity of the agent’s wiping something. Yet the translations are far from being accurate and felicitous.

4) Some sentence patterns with Chinese resultative constructions are quite difficult for machine translation. Take the following as an example:

(9) *sheng-chan dui bing si le yi tou niu*

production team sick die PERF one CL cow

‘A cow of the production team died of illness.’

The translations of this sentence given by the translation systems are as follows:

- (10) a. The production team died of a cow. (Tencent; Google; Baidu)
 b. The production team died of illness. (Youdao)

This sentence pattern of resultative construction is unique to Chinese and is very special, hence extremely demanding for machine to translate. Some existing studies regard this pattern as inverted resultative construction, arguing that it is the object of the sentence that is the experiencer of the causative predicate and the resultative predicate. The subject of the sentence pattern ranges from a patient of the main verb to a location. In (9), the subject of the sentence is actually the owner of the object while the object ‘*niu* (cow)’ is the experiencer of the verbs ‘*bing* (fall ill) and ‘*si* (die)’. The two versions indicate that it is impossible for machine to felicitously process this kind of sentence.

Another example:

- (11) *cun li bing si le yi ge ren*
 village inside fall ill die PERF one CL man
 ‘In the village a man died of illness.’

Surprisingly, the translation systems do a much better job concerning (11). Tencent and Youdao give the same translation “*A man died of illness in the village*” while a similar translation is given by Baidu “*One man died of illness in the village*”. However, the one produced by Google is not as good as the previous ones, “*A person died in the village*.” Obviously, Google only presents the result, missing the semantic information of the main verb, or rather the cause of the result.

Some complex sentences with resultative constructions are also very challenging for machine translation to deal with. For example:

- (12) *ta ping-pang ji ba-zhang jiu ba hai-zi da ku le*
 he bang-bang a few palm at once OBJ child beat cry PERF
 ‘As soon as he gave the child a few slaps the child cried (because of being beaten).’

The following translations presented by the translation systems are far from good.

- (13) a. He slapped the child with a few slaps. (Tencent)
 b. He slapped the child at the table tennis and it began to cry. (Youdao)
 c. He slapped a few pats and cries his child. (Google)
 d. He gave the child a few slaps at table tennis and cried. (Baidu)

Tencent fails to present the result. Both Youdao and Baidu identify ‘*ping-pang*’ as ‘*table tennis*’, a noun instead of an onomatopoeic word, which is hereby a simulation of the sound produced by beating somebody with one’s palm. Thus, both (13b) and (13d) are misinterpretations of (12). The translation given by Google is unreadable and unacceptable.

When it comes to patient subjective sentences with resultative constructions, whose subject is not the agent of the verb, the accuracy of machine translation is also low. For instance:

(14) *jian-bang tai zhong le*

shoulder lift swollen PERF

‘The shoulder(s) became swollen as a result of carrying (something heavy).’

The translations are only focused on the resultative predicate without any information of the causative predicate. There is no reflection of the semantic relation between the causative predicate and the resultative predicate in the translations, as illustrated in (15).

(15) a. My shoulders are swollen. (Tencent)

b. The shoulder is swollen. (Youdao)

c. The shoulders are swollen. (Google)

d. The shoulders were swollen. (Baidu)

5) In some Chinese resultative constructions, the resultative predicates are virtually evaluative rather than resultative. Some scholars argue that evaluation is also one type of result. In the existing literature, those structures are widely regarded as resultative constructions. Typologically speaking, it is more economical to classify them into the category of resultative construction, yet some studies point out their particularities and label them as atypical resultative constructions. They are different from typical ones especially in that the secondary predicate is an adjective serving as a certain evaluation. It can be some evaluation on the subject or the action. Take (16) for example:

(16) *quan'er hua xiao le*

circle draw small PERF

‘The circle has been drawn, yet it is too small.’

The translations given by machine are as follows:

(17) a. The circle is small. (Tencent; Google)

b. The circles are getting smaller. (Youdao)

c. The circle is smaller. (Baidu)

All the above translations fail to present the semantic meaning of the action verb. Nor do they reflect the evaluation. The original sentence means that the drawn circle is too small, not big enough, or smaller than expected or required.

Another instance:

(18) *xiao li lai zao le*

Xiao Li come early PERF

‘Xiao Li came too early.’

Google and Baidu translate (18) into “*Xiao Li came early*” while the other two present the translation as “*Xiao Li is early*”. The former translation is better than the latter, for the semantic

meaning of the action verb ‘*lai* (come)’ is given. However, it only conveys that Xiao Li came early rather than Xiao Li coming too early (than necessary). The evaluative meaning of the resultative is lost in the translation.

Another example:

(19) *zhe shi'er ni you ban chi le*

this matter you again handle/deal with late PERF

‘Again you are too late for dealing with this matter.’

(20) a. You’re late for this again. (Tencent; Youdao; Baidu)

b. You’re too late to do this. (Google)

(20a) focuses on the resultative without mentioning the action verb. There is no reflection of evaluation indicated in the original sentence. Google gives a better translation as in (20b).

To sum up, Chinese resultative constructions have brought many difficulties to machine translation due to their unique syntactic and semantic characteristics. There are still quite a few problems even for the big-data-based neural machine translation to solve.

3. Differences between Chinese and English resultative constructions

In order to solve the problems machine translation encounters, it is not enough to base on the current parallel corpora. It is necessary to build a supplementary and specialized corpus of Chinese resultative constructions so that it is feasible to carry out more effectively and accurately machine translation of Chinese resultative constructions into any other language, say, English. For most Chinese resultative constructions, there are no equivalent English resultative constructions available. Chinese resultative constructions differ greatly from those in English both syntactically and semantically.

3.1. Types of resultative construction in Chinese and English

Based on the previous studies (Guo, 1995; Wang, 1996; Song, 2007; Shi, 2008; etc.), Chinese resultative constructions can be roughly classified into the following types:

(21) a. *zhang san da shang le li si*

Zhang San beat injured PERF Li Si

‘Zhang San beat Li Si and as a result Li Si was injured.’

b. *zhang san ku shi le shou-pa*

Zhang San cry wet PERF handkerchief

‘Zhang San cried and (his tears) wetted his handkerchief.’

c. *zhang san han ya le sang-zi*

Zhang San shout hoarse PERF throat

‘Zhang San shouted himself hoarse.’

d. *zhang san zou lei le*

Zhang San walk tired PERF

‘Zhang San got tired because of walking (too much).’

e. *zhang san qi si le li si*

Zhang San irritate die PERF Li Si

‘Zhang San irritated Li Si so much so that Li Si died (from anger).’

f. *ping-guo chi huai le du-zi*

apple eat wrong PERF stomach

‘I ate the apple and it spoiled my stomach.’

g. *zhe jian shi qi si le li si*

this CL matter irritate die PERF Li Si

‘This matter irritated Li Si so much so that Li Si died.’

(21a)–(21d) are the four basic forms of resultative constructions in Chinese. In (21a), the action verb is a transitive verb and its patient serves as the object of the sentence, which is also the experiencer of the resultative predicate. Thus, the object of the construction has a semantic relation with both the action verb and the resultative. In (21b), the action verb is intransitive, hence the object of the construction only has a semantic relation with the resultative predicate, being the agent argument of the resultative. In (21c), the action verb is transitive, yet what serves as the object of the resultative construction is not its direct argument or patient argument, but one of its obliques, which functions as the agent argument of the resultative predicate. In (21d), both the action verb and the resultative predicate are intransitive (most adjectives in Chinese may fall into verbs). The agent argument of the resultative construction is also the agent argument of both the action verb and the resultative. The resultative of the construction is subject-oriented, and that is why the resultative construction can no longer take an object.

(21e)–(21g) are three types of causative resultative construction classified according to source of the causer. In (21e), the agent of the main verb serves as the causer. In (21f), the patient of the action verb serves as the causer and hence becomes the subject of the resultative construction. In (21g), some other independent component rather than the agent or patient of the action verb serves as the causer and hence the subject of the resultative construction.

In addition to the above types, there are some resultative constructions which are classified as atypical ones by some researchers, such as:

(22) a. *wan-fan chi zao le*

dinner eat early PERF

‘It was too early for having the dinner.’

b. *gou wa qian le*

ditch dig shallow PERF

‘The ditch dug is too shallow.’

The resultative adjective in (22a) is a comment on the activity, or rather the time when the event took place while the one in (22b) is on the depth of the ditch that has been dug. Whether these constructions fall into the (21f) or they are just variants of that type remains controversial.

Beavers (2012: 908) defines English resultative constructions as those clauses in which, in addition to the main verb (V), there is an additional, secondary predicate (the result XP), predicating some state that comes about for some participant in the event as a result of the action described by the clause. In general, result XPs are Adjective Phrases (APs) or Prepositional Phrases (PPs); Determiner Phrases (DPs) are not common; but XPs cannot be Verb Phrases (VPs). Various types of resultatives are hereby outlined.

(23) a. OBJECT-ORIENTED TRANSITIVE ACTIVE

i. John hammered the metal flat.

ii. John swept the floor clean.

b. BARE XP

i. The lake froze solid.

ii. The vase broke open.

c. UNERGATIVE + FAKE REFLEXIVE/NON-SUBCATEGORIZED OBJECT

i. We searched the woods and cliffs, yelled ourselves hoarse and imagined you drowned ...

ii. The jogger ran his Nikes threadbare.

d. OBJECT DROP + NON-SUBCATEGORIZED OBJECT

i. The bankers drank the pub dry.

ii. Sudsy cooked them all into a premature death with her wild food.

e. SUBJECT-ORIENTED TRANSITIVE ACTIVE

i. The wise men followed the star out of Bethlehem.

ii. John swam laps to exhaustion.

Resultatives of (23a) are the most oft-cited resultatives which have transitive Vs, with the XP predicating of the object. In (23b), resultatives occur with intransitives that take a single patient

argument; the matrix subject is the subject of the XP and there is no object. In (23c), unergatives generally only take XPs if a fake reflexive or a non-subcategorized object is added and the objects are obligatory. In (23d), non-categorized objects take place of the default objects of some transitive verbs. In (23e), although the verbs are transitive the XPs skip the objects to predicate of the subjects. (Beavers, 2012: 909–914)

Machine translation does a much better job when translating English resultative constructions into Chinese. Most resultative constructions of type (23a) and type (23b) can be translated into corresponding Chinese resultative constructions while a lot of resultative constructions of type (23c) can also be matched with Chinese resultative constructions. When it comes to type (23d), it is hard to translate resultatives of this type into Chinese counterparts. English resultative constructions of (23ei) indicate change-of-location instead of change-of-state, which do not fall into resultative construction in Chinese. Although there might be no equivalent Chinese resultative construction for each English resultative construction, the accuracy of translation turns out to be much higher than that of machine translation of Chinese resultative constructions into English.

3.2. Semantic differences in the main verb of resultative construction

In addition to the syntactic differences between Chinese resultative constructions and English ones, another key issue is the main verb in the construction. Talmy (2000: 261–263) postulates four verbal patterns, exhibiting varying degrees of realization of the Agent’s intention. Each type can enter construction with a different type of semantically complementary satellite: 1) intrinsic-fulfillment verbs co-occur with a further event satellite; 2) moot-fulfillment verbs co-occur with a fulfillment satellite; 3) implied-fulfillment verbs co-occur with a confirmation satellite; and 4) attained-fulfillment verbs tend to disfavor even a semantically pleonastic satellite.

Thepkanjana and Uehara (2009) argue that “the result of the causing action, rather than the agent’s intention, is a semantic property which is intrinsic in the semantics of the causing verb and that the degree of its intrinsicness varies from verb to verb.” Leaving aside the realization of an agent’s intention as claimed by Talmy, this article also focuses on the semantics of verb.

English is not rich in implied-fulfillment verbs and has only scattered examples, yet this verbal pattern is a major type in Mandarin Chinese. Talmy (2000: 272) points out that “Mandarin is a strongly satellite-framed language, regularly using its satellites to specify path, aspect, state change, some action correlation, and much realization.” In other words, Chinese is rich in implied-fulfillment verbs which require a satellite for their realization. That’s why resultative constructions are very common and frequently used in Chinese. Resultative predicates are required for confirmation or realization, indicating a change of state caused by a previous event and making the action telic and bounded.

On the other hand, Chinese resultative constructions are more productive than English ones, since their main verbs are mostly implied-fulfillment verbs. Teng (1972) points out the difference between the English verb *kill* and the corresponding verb ‘*sha*’ in Mandarin Chinese. The former consists of a causing action and a resulting state while the latter has only the causing action although it may imply the resulting state of death. Tai and Chou (1975) present further evidence and arguments and claim that English verbs, such as *kill*, *find*, and *learn*, imply an attainment of a certain goal, which must be expressed by means of verb compounds in Chinese, generally resultative constructions,

namely ‘*sha si*’, ‘*zhao dao*’, ‘*xue hui*’ respectively. They also claim that “they have so far found no Chinese action verbs which imply the attainment of goal.” There are almost no attained-fulfillment verbs in Chinese while English is rich in this verbal pattern. Attained-fulfillment verbs tend to disfavor even a semantically pleonastic satellite. For instance, the English verb *drown* does not allow the addition of *dead* or *to death*, as in *I drowned him *dead/ *to death* (Talmy, 2000: 267). Thus, attained-fulfillment verbs in English do not occur in resultative constructions.

It is noted that implied-fulfillment verbs are a major type of the main verb in Chinese resultative constructions, requiring the co-occurrence of a resultative predicate for confirmation. As Talmy (2000: 266) puts it, the meaning of the confirmation satellite is not independent of the verb’s meaning, but is sensitive to its internal semantic structure and complements the structure. Yet what implied by the verb might turn out to have many possibilities. Take the verb ‘*za* (pound)’ for example. The verb means ‘pound; tamp; thump against something using a heavy thing; (of a heavy object) drop on another object’. It implies that the affected object might be damaged, yet the resulting state must be confirmed by a resultative predicate. The verb can be followed by different resultative predicates, such as ‘*si* (die)’, ‘*shang* (injure)’, ‘*yun* (dizzy/faint)’, ‘*hui* (be destroyed)’, ‘*sui* (be in pieces)’, ‘*lan* (broken)’, ‘*huai* (destroyed/break)’, ‘*duan* (break)’, ‘*po* (broken/damaged)’, ‘*bian* (flat)’. It is argued that Chinese resultative constructions are very productive since a single verb may form quite a few constructions with different resultatives while a resultative can be the result of various actions and hence form different constructions with different action verbs. However, there are some constraints on the co-occurrence of the main verb and the resultative predicate of a typical Chinese resultative construction. First, there is a causative relation between the verb and the result. Second, the causative relation between them is reasonable and convincing according to world knowledge.

4. An account of the previous problems and proposed solutions

The problems machine translation encounters in translating Chinese resultative constructions into English can be attributed to the syntactic and semantic differences between Chinese resultative constructions and English resultative constructions, especially the special syntactic and semantic relations of resultative constructions in Chinese.

4.1. An account of the problems

As Talmy (2000: 268) mentions, “The implicature associated with the implied-fulfillment type of verb apparently behaves not as a discrete factor that is either present or absent, but as on a cline with different degrees of strength.” Talmy takes *choke-stab-strangle-drown* as a set of examples. The verb *choke* has no or has a slight implicature of killing while the verb *drown* is determinate and clearly precludes denial. There is an increasing degree of implicature of fulfillment across the four example verbs. Unlike English verbs, the implicature associated with the implied-fulfillment type of verb in Chinese is fuzzy in itself and the strength of force varies from resultative construction to resultative construction depending on the resultative the verb co-occurs with. The verb ‘*za* (pound)’, for example, can co-occur with a variety of resultatives. When the affected object is an animate being, the effect or harm caused by the action might vary in degree, such as ‘*yun* (dizzy/faint)’, ‘*shang* (injure)’ or ‘*si* (die)’. Thus, the strength of force is confirmed and determined by the resultative predicate. The resultative constructions formed by the action verb co-occurring with

different resultative predicates form a cline. When the affected object is something, say, an artifact, the damage caused by the action verb might be ‘*bian* (flat)’, ‘*huai* (destroyed/broke)’, ‘*sui* (be in pieces)’, ‘*hui* (be destroyed)’, etc. Most of the resultative predicates co-occurring with the verb ‘*za*’ are verbs. Indeed, two events are involved in each resultative construction: the causing event and the resulting event.

Two resultative constructions occur in the following example:

(24) *you tong bu-dan za shang le ta-de tui,*

oil barrel/drum not only pound injured PERF her leg,

hai za bian le ta-de san-lun-che

but also pound flat PERF her tricycle

- a. The barrel not only hurt her leg, but also crushed her tricycle. (Youdao)
- b. The oil bucket not only hurt her leg, but also flattened her tricycle. (Baidu; Tencent)
- c. The oil drum not only injured her leg, but also squashed her tricycle. (Google)

The main verb of the Chinese sentence gives a very specific description of how her leg was injured and how her tricycle became flat, yet the above translations do not give equivalent semantic information of the first half of the sentence. The translations of the second half are much better, since both the meaning of the main verb and that of the resultative of this Chinese resultative construction are somehow implied in the English verbs *crush* and *squash*, although there are still subtle differences between them. According to Collins dictionary, if someone or something is squashed, they are pressed or crushed with such force that make them injured or lose their shape. The English verb *squash* may co-occur with a confirmation satellite or a resultative, as in (25). The verb *flatten* in (24b) seems less good, for it mainly focuses on the resultative.

(25) ... and boot, the youth noted with interest, had been squashed flat as a potato pancake.
(Corpus of Contemporary American English)

Although English is relatively rich in attained-fulfillment verbs, they do not really correspond in meaning with Chinese resultative constructions. It is necessary that machine translation systems should be designed to identify the causing event and the resulting event.

Take another Chinese verb for example, ‘*da* (beat/strike)’. ‘*da po* (break)’, ‘*da sui* (break into pieces)’, ‘*da si* (beat die)’, ‘*da shang* (beat injured)’, ‘*da yun* (beat faint)’, ‘*da duan* (beat break)’, ‘*da ku* (beat cry)’, just to name a few. ‘*da* (beat/strike)’ may fall into the verbal pattern of intrinsic-fulfillment verb termed by Talmy. “With this verbal pattern, the addition of a satellite adds a semantic increment that is wholly extrinsic to the referential content of the verb.” (Talmy, 2000: 263) In ‘*da ku* (beat cry)’, ‘*ku* (cry)’ adds some meaning to the verb, thus the act of beating is understood to cause a further event, crying. When someone is beaten, they might be knocked out, or injured, or even die. The English verb *stun* is an attainment-fulfillment verb, making someone unconscious is attained as in *The blow he got on the head stunned him*. But in Chinese a further-event satellite is generally added to express a result caused by the act, that is, the resultative predicate in the construction. For a verb of this pattern, the resultative adds an additional meaning

which is wholly extrinsic to the verb. There is usually a causative relation between the main verb and the resultative, or the further event is caused by a previous one. It is noted that ‘*da po* (break)’ is widely believed to be lexicalized in many cases, where it functions more like a compound verb, for ‘*da* (beat) and ‘*po* (break/broken)’ are unlikely to be taken as two separate events, especially in the cases involving abstract nouns such as in ‘*da po chang-gui* (break the routine)’, ‘*da po jiang-ju* (break the deadlock)’, ‘*da po ji-lu* (break the record)’.

The reasons why Chinese resultative constructions are so difficult for machine translation to process are that they are very productive and flexible and that there are much fewer constraints on the co-occurrence of the main verb with the resultative in contrast to English.

As Talmy (2000: 275) points out, “Mandarin conative verbs can enter into construction not only with satellites expressing fulfillment or confirmation, but also with ones that express ‘underfulfillment’, ‘over-fulfillment’, ‘antifulfillment’, and ‘other-event’.” For example, the verb ‘*zhe*’ is an implied-fulfillment verb with the implicature that something, especially a linear object, gets broken. Thus, the verb can take a resultative to confirm the implicature, as in ‘*zhe she/duan* (break broken/snapped)’. However, it can also take another resultative ‘*wan* (bent)’, indicating a bent state rather than a broken state. Such a resultative is an underfulfillment satellite in Talmy’s term. Meanwhile, the verb ‘*wan* (bend)’ with the implicature of getting bent can also take what Talmy calls an overfulfillment satellite, such as ‘*she* (broken)’, which marks an access. (Talmy, 2000: 275–276)

Chinese also allows a verb to take a resultative that indicates the reverse of the implied result by the verb. In (26), the implied-fulfillment verb ‘*xi* (wash)’ means ‘immerse and agitate with the goal of cleansing thereby’, yet it can also take the resultative ‘*zang* (dirty)’, a reverse of the implied result ‘*gan-jing* (clean)’. A resultative for this semantic effect on the verb falls into what Talmy terms as antifulfillment satellite.

(26) *wo ba chen-yi xi zang le*

I OBJ shirt wash dirty PERF

‘I washed the shirt dirty.’

‘I washed the shirt (e.g., in the river), but it came out dirtier than before.’

(Talmy, 2000: 276)

In addition, a resultative in Chinese can also express a state that results from the action verb but that does not lie on the conceptual axis leading to the verb’s represented goal. For example, the verb ‘*xi* (wash)’ could take a resultative ‘*po*’ with the meaning ‘torn’, as illustrated in (27). This sentence means that the agent performed the action with the implied meaning of getting it clean, but this action unexpectedly led to the shirt’s becoming torn. In Talmy’s term such a resultative is an other-event satellite.

(27) *wo xi po le chen-yi*

I wash torn PERF shirt

‘I washed the shirt torn.’

“I washed the shirt, and it got torn in the process.”

(Talmy, 2000: 277)

It is noted that the problems machine translation encounters could be boiled down to the semantic relation between the verb and the resultative. For most cases, there is a causative relation between the action and the result. Even when the change of state does not fall along the conceptual axis leading to what implied by the action verb, it still is a state caused by the action.

4.2. Solutions proposed

The first thing is that the machine translation systems should be able to identify the causing event and the result event based on the main verb and the resultative predicate. When there is a sufficiently conceptual and causative relation between two events, it is possible to combine the two events into a complex one and to create a novel resultative construction thereby. For example, Haisong Jiang, who studied in the United States, slipped through the security barrier at Newark Airport to kiss his girlfriend goodbye when he saw her off at the airport. His trespass led to the six-hour shutdown of one of the airport’s terminals, grounding more than 100 flights and forcing thousands of passengers to go through security again. “A goodbye kiss of a Chinese overseas student paralyzed an American airport” became the headline in Chinese newspapers in the US, as illustrated in (28).

(28) *zhong-guo liu-xue-sheng yi ge wen bie,*

China overseas student one CL kiss goodbye

wen tan le yi ge mei-guo ji-chang

kiss paralyzed PERF one CL America airport

‘A goodbye kiss of a Chinese overseas student paralyzed an American airport.’

(29) a. Chinese students kiss goodbye and crash at an American airport. (Youdao)

b. Chinese students kiss goodbye and paralyze an American airport. (Baidu; Tencent)

c. A Chinese student kissed goodbye, and the kiss paralyzed an American airport. (Google)

Although “*wen tan* (kiss paralyze)’ is a very novel and occasional resultative construction, it is very vivid and makes good sense. For machine translation, only when it can identify the two events and their causative relation, can it do a pretty good job, as shown by Google in (29c).

However, the processing of machine translation is quite unsatisfactory when it comes to resultative constructions such as “*kan sha*”, the main verb with the meaning ‘look’ while the resultative predicate with the most common meaning ‘silly’, yet in (30) and (31) the resultative does not mean ‘silly’, but ‘dumbfounded’.

(30) *na bang ren kan sha le*

that group people look dumbfounded PERF

‘That group of people became dumbfounded when they looked (at something amazing).’

(31) *na fu hua'er ba ta kan sha le*

that CL picture OBJ him look dumbfounded PERF

‘That picture left him dumbfounded when he looked at it.’

The translations given by the systems for the above two sentences are as follows:

(32) a. Those people look stupid. (Tencent)

b. Those people look silly. (Youdao)

c. The guys are stupid. (Google)

d. Those guys look silly. (Baidu)

(33) a. The picture made a fool of him. (Tencent)

b. That painting made a fool of him. (Youdao)

c. The picture made him look silly. (Google)

d. The picture made him look foolish. (Baidu)

None of the translations can accurately translate the meaning of the original Chinese sentence, with the failure of identifying the two events and their causative relation. The event expressed by the main verb is that somebody looks at something and the result event is that they become ‘silly’. Identifying the two events is still not enough to produce a right and good translation, especially when the word has more than one meaning. When the semantic relation between the two events turns out to be unreasonable according to encyclopedic knowledge, other meanings should be taken into consideration. For (30) and (31), another meaning of the resultative ‘*sha*’, which can be glossed as ‘dumbfounded’, could render the semantic relation more reasonable. In order to achieve this, a knowledge base is advisable.

To sum up, Chinese resultative constructions are highly productive and flexible. Moreover, there are a wide variety of possibilities of the co-occurrence between the main verb and the resultative when it comes to Chinese resultative construction. It is almost impossible to build a corpus to include all possible resultative constructions in Chinese. Thus, it is advisable to base on corpora as large as possible. In order to improve efficiency and accuracy of machine translation, it is feasible to add more related rules. Considering peculiarities of Chinese resultative construction, more specialized rules should be manually written and added to the current systems. Meanwhile a knowledge base would be a great helper in telling the semantic relation between the two events when it is against common senses or violates encyclopedic knowledge; the system could be able to make an adjustment and search for a better and more reasonable translation.

5. Conclusion

This paper explores and analyses the problems machine translation encounters in translating Chinese resultative constructions into English. Those problems could be linguistically attributed to syntactic differences in construction structure and semantic differences in verb pattern between

Chinese and English. Above all, Chinese resultative constructions are difficult for machine translation for being productive and flexible. On the one hand, resultative constructions are very productive in Chinese due to the abundance of implied-fulfillment verbs in Mandarin Chinese, which require a confirmation satellite for realization. Meanwhile, the resultatives add a confirmation meaning to the verb and make the event telic and bounded. On the other hand, Chinese resultative constructions are flexible since there are few constraints on the co-occurrence of the main verb and the resultative.

The paper proposes that there are several ways to improve efficiency and accuracy of machine translation of resultative constructions. First, a larger parallel corpus is advisably used to train machine translation systems. Second, more specialized rules should be manually written and added to the current systems. Third, a knowledge base could be built and serves as an assistant to identify and encode complex semantic relations. Machine translation of resultative constructions, especially that of Chinese ones, requires more further research.

Author contributions

Xiaoxia Pan is the only author and did all the work involved in this study.

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ORIGINAL ARTICLE

“Fu” and “Zhou”—A preliminary study on “language worship” and its symbolization

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Abstract: The article aims to, based on the study of “Spells” (or “Fuzhou”, 符咒, including the magic figures and incantations), find out the relationship of “Fu” (符, talisman¹), “Zhou” (咒, incantations)” and “language worship” (including written language and oral language). There is an in-depth probe into “language worship”, and the clarification of the term “Fu” and “Fushu” (the use of Fu), “Zhou” and “Zhoushu” (the use of Zhou), no matter in a narrow sense or a broad one. In addition, the differentiation of language, “language worship” and “Spells” has been achieved via symbols and their symbolization. The final conclusion of such study shows that language worship is the process of language symbolization, and spells, in essence, is the symbol of language.

Keywords: language worship; language; Fu; Zhou; symbolization

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Throughout the world, the “language worship” occurs as a common phenomenon in all kinds of cultures. This kind of worship is firstly based on the receivers’ belief that “language has power”. People express their reverence for the special semantics under special circumstances through the so called worship of pronunciation and writing.

There are many researchers working on the study of language worship: Wang Xiangyuan (Wang, 2017), Guo Xiaomin (X Guo, 2007), Liu Ping (Liu, 2006) and so on.

One of the best representation of “language worships” is the “spells” (符咒, Fuzhou). “Fu” (符, talisman) and “Zhou” (咒, incantations), collectively known as the “spells”, have existed in traditional cultures, in different forms, all over the world since ancient times. However, their basic worshiped object is the same, the “sanctity”: the worship of “Fu” comes from the sanctity of words, while that of “zhou” comes from the sanctity of language. Throughout China, although “spells”

1. “Fu” always means “A kind of authenticating object which belonged to military governors and was used to convey an order or to transfer troops” (Xu and Duan, 2010) in ancient China. But nowadays, this word has many other meanings.

seem to be more and more scarce nowadays, in fact, they exist in everyone's life in a broader sense, such as Spring Festival couplets, Shigandang (a kind of stele used to drive out evil spirits), swearwords, homonyms and other writing, and speech acts.

The relationship of "language", "language worship" and "spells" should also be fully discussed and analyzed through the research of symbolization. Among them, "language" is regarded as a symbol system relative to nature, while "language worship" and "spells" are respectively regarded as the process and result of "language symbolization".

1. The origin of the "spells": Language worship

1.1. "Language worship"

As for language, Ferdinand de Saussure, the most important linguist in the 20th century, regarded language as the general model and a set of abstract rules of speech activities of a speech group, and defined it as follows:

"But what is language[langue]? It is not to be confused with human speech[langage], of which it is only a definite part, though certainly an essential one. It is both a social product of the faculty of speech and a collection of necessary conventions that have been adopted by a social body to permit individuals to exercise that faculty." (Saussure, 1959)

For Sapir, the importance of language lies in its instrumental and artificial nature. And language is a symbol system uniquely created by human beings, a non-instinctive way to communicate ideas, feelings, and desires, and a socialized symbol system. (Sapir, 1964)

Different linguists have generally defined language in terms of its different properties. Generally speaking, language is regarded as a tool for speaking and expressing ideas. Based on these definitions of "language", we can discuss the problem of "language worship".

Language worship is a kind of cultural phenomenon Shared by all nationalities at home and abroad. This kind of phenomenon is not directly to Saussure and others described the "language" of worship, but not solely limited to the narrow sense of the worship of normal express (known as "natural language")—the term "language worship" as an expression of aggregation of later scholars to a similar phenomenon, including the language itself and its extension and its symbol of worship (such as text, voice, etc.).

In ancient times, humans have already begun to worship speech and writing. In chapter 22 of *The Golden Bough*, Frazer gives the example of "Personal Names Tabooed", which we can use here to illustrate the origin of language worship:

"Unable to discriminate clearly between words and things, the savage commonly fancies that the link between a name and the person or thing denominated by it is not a mere arbitrary and ideal association, but a real and substantial bond which unites the two in such a way that magic may be wrought on a man just as easily through his name as through his hair, his nails, or any other material part of his person. In fact, primitive man regards his name as a vital portion of himself and takes care of it accordingly." (Frazer, 2017)

In Frazer’s view, this kind of “worship” can be classified as the result of “homeopathic magic” (or “imitative magic”), based on “the belief that words or language are identical with ‘influence’ (or ‘divine power’)”; At the same time, on the other hand, it is also based on the “objective condition of human beings’ lack of scientific cognition of language”, that is, human beings believe that speech or writing has “divine power”. The most critical aspect of language worship is the belief in the assumption that language affects people.

1.2. Different phenomena of language worship: Verbal language worship and written language worship

In this section, we take the different material shells and expression symbols of language in the society as the standard, and divide the different “language worship” phenomena in the world into “the verbal worship” and “the written worship”, and discuss them respectively.

1.2.1 The verbal worship

It is believed that verbal voice is an act of divine, while the “power” in oral words can either have the power to achieve the desire and communicate the commitment by just words or have the power comes from gods- according to the source of power in verbal worship, in this article we will be divided into the “oracle worships” (with which people will worship the gods who release oracle) and the worship of “spirit of speech” (with which people will worship words they speak out).

1.2.1.1 Oracle worship

Oracle worship is characterized by the phonetic worship generated in this kind of worship, which, in essence, is the worship of the originator of the “divine power”. According to the originator of “divine power”, we can be divided into two categories: “divine power comes from scriptures” and “divine power comes from God”.

(1) Divine power comes from scriptures: Buddhism, Hinduism, and Brahmanism

Before there were words, the scriptures of the various Indian religions (Buddhism, Hinduism, and so on) such as *the Vedas*, were taught orally and passed down from generation to generation, and gathered together over the years. *The Ramayana* and *The Mahabharata*, two of the great Epics of India, have also been passed down through early oral instruction.

The traditional learning method of Indian religions, such as Buddhism and Hinduism, is “oral instruction”. Monks teach scriptures by oral teaching. This is also reflected in the “mantra” (Om Mani Padme Hum). It is usually considered in Buddhism to be able to receive all the bodhisattvas’ blessing and compassion by reading the “mantra”. Its contents are extremely rich, mysterious and supreme, and it is also regarded as the crystallization of the great energy, great wisdom and great compassion contained in the universe. Through the recitation of the “mantra”, the monks belong to Buddhism achieve their aspiration to achieve perfection, enlightenment and eventually Buddhahood.

Indian society has maintained a tradition of valuing oral transmission up to the present day. Many people recite *the Ramayana* in their homes, and some temples broadcast the book through loudspeakers to achieve their desires or achieve their fulfillment in merit.

From objectively, this kind of situation has certain historical and cultural reasons, such as:

the low literacy rates of the ancient monks—the sixth inheritor of Chinese Zen Buddhism, Huineng, who was living in the Tang dynasty, is illiterate, so his teacher, the fifth inheritor Hongren passed on knowledge to him by orally speaking. And the disciple of him, Fahai, also sets his teacher’s thoughts into the book called *The Sixth Patriarch’s Dharma Jewel Platform Sutra* by using dictation record. So, it means that maybe there used to have much fewer Buddhists who can read than we thought. This kind of tradition, which is produced for historical and cultural reasons, has gradually come into being as the classics of various religions are handed down from generation to generation.

But in the cultural sense, in oral and chanting scriptures lecture, this habit has been handed down from generation to generation in the process, because the Indian classical on religion, the importance of culture, and also to avoid the transmission process of classic misreading and cause unnecessary religious in the sense of “evil consequences”, India culture regards the correctness of the voice as a significant thing. As Pedersen put it:

“The fact that Indians are often careful to maintain the correctness of their sacred words may explain this: they are meticulous in the slightest articulations, believing that if they do not do so, religious sacrifices will not produce good results or even cause trouble.” (Pedersen, 2010)

Turn in general, the “divine power” of the Indian classical literature was moved from the text to the “voice”. Indians by way of the sanctity of transfer text, will read the voice of the classic when given the same divinity, as a result, the process of chanting becomes sanctified, and when they were chanting, they showed the worship of the process and the voice.

(2) Divine Power Comes from gods: Examples of Christianity, Ancient Greek Mythology and Polytheisms

In this phenomenon of “divine power comes from gods”, oral speech mainly serves as a kind of “reporting to god and making known to people” function, which can either convey their demands to God or represent the oral message received from gods.

For Europe, mythologies in both *the Bible* and various cultures are always inseparable from the myth of the “Oracle”, that is, “the language of God”. Oracles played an essential role in European cultures:

Some oracles, according to the record, come directly from “god himself”: in *The Book of Genesis*, the deity God sends out a series of commands (such as “let there be light!”), thus creating the world; Some oracles come from god’s agents: in *King Oedipus*, the sibylline oracle that means “kill the father and marry the mother” is spoken by the priest.

Moreover, all oracles carry a high status:

“The oracle is intimately connected with the mode of democracy peculiar to Greece. Whenever a colony is to be established, whenever the worship of a foreign god is proposed, or whenever a general is to be prepared for a decisive battle, they will consult with an oracle.” (Hegel, 2001)

Just as Hegel said, in the context of European Christian culture and ancient Greek mythology and polytheism, all the oracles were venerated: god’s words are still regarded as the standard by Christians, Catholics and other believers and the oracle that “kill the father and marry the mother”

was trusted and caused a series of tragedies. (Hegel, 2001)

Even though according to the European religious texts, the originator of oracles is different, but the origin of the divine power is the same, that is “god”, thus we can still draw similar views with India: the oracle is as a voice of worship, its divine power comes not from the language, speech itself, but from “god”.

In addition, there are also distributed in Eurasia and North America in the northern regions of ethnic shamanism. “Shaman” is not only the special name of shamanist but also understood as the agent and incarnation of shaman god in the clan. Shamans make the gods adhere to the body of the shaman in the so-called “possession” way, and through the body of the shaman to complete the communication with the mortal, in which the “oracle” is worshiped, also because of god.

1.2.1.2 The worship of “spirit of speech” (P Li, 2013)

In this kind of worship, one of the most representative examples took place in Japan, belonging to its original Shinto belief system.

As its name suggests, the worship of “spirit of speech” worships “the spirit of speech” and “the god of speech”, that is, they believe that language itself has a kind of magic power. This worship takes speech itself as an objective existence of the gods, strictly monitoring the people who speak, even if the gods offend the spirit of the speech, will still be punished.

In traditional Japanese mythology, there are often similar stories. In the story named *Hairohiko and Yamanohiko* (《海幸彦と山幸彦》) recorded in the book called *The Ancient Records (Kojiki, 《古事記》)*, Yamanohiko (山幸彦) used the Kotodama (means “the spirit of speech (言霊)” in Japanese) “The trouble hook, the hurry hook, the poverty hook, the dull hook! (此鉤者、淤煩鉤、須須鉤、貧鉤、宇流鉤)” to punish his brother Hairohiko (海幸彦), and the Kotodama achieved the request of Yamanohiko, Hairohiko was punished at last. (Oonoyasumaro, 2018)

And the writer of Waka literature, Hatta Tomonori (八田知紀), also gave the following explanation for “Kotodama”: “...We in Japan have beautiful scenery, clean food, and a clear voice to connect with the gods. It is our good fortune to believe in it, and it is called ‘Kotodama’. By the spirit of the voice into a tune, is a Waka literature.” (Wang, 2017)

Compared with the above two situations, the worships of “the spirit of speech” occurs in more everyday situations, such as blessing and curse, etc., and are mostly delivered in the form of face-to-face interaction, which is a kind of Verbal worships because of the divine nature of the language itself.

1.3. The character worship

In Chinese society, the worship of written language, or “character worship”, has always been an important part of traditional culture.

First of all, this worship of characters is closely related to the tradition of ancient Chinese society to attach importance to culture. From the study of Confucius and Mencius (孔孟之学) and Jixia Academy (稷下学宫) to the imperial examinations in Sui and Tang dynasties (隋唐科举取士), the Song dynasty’s emphasis on literature over military force (宋朝重文轻武), and the Ming and

Qing Dynasties' way to select scholars for public office (明清八股取士), the emphasis on the cultural tradition has never stopped.

1.3.1 The "divinity" of the "character worship"

It is because of the continuity of the culture, from the origin of the wordage, the importance of it has not been ignored: *Huai Nan Tzu* (《淮南子》) recorded in "Long time ago, Cang Jie (仓颉) created the wordage, and therefore the sky rains millet and ghosts cried all night long." This recordation reflects a form of "character worship". Through the legend that Cang Jie created the wordage, people deified the process of the invention of the wordage. And through this kind of apotheosis, words became sacred and showed by "startle the universe and move the gods". So that, as a result, the status of words in traditional Chinese culture became more and more significant.

Besides the addition to the source of the "divine", the "divine" of words also reflected in many all kinds of aspects: such as the ancient Chinese literati cherish wastepaper with characters written, even though the Chinese traditional culture is always "the different places have different customs (十里不同音, 百里不同俗)", but "cherishing written paper (敬惜字纸)" is also a kind of nationwide and legitimate folk beliefs. People through a variety of established rules, such as *Precepts of Yan Family* (《颜氏家训·治家》) have the opinion that "When I read the book of Confucius, I respect the book and feel solemn. This book has the meaning of the Five Classics and all the sages' names, so I will never use the paper of this book to do something foul and filthy. (吾每读圣人之书, 未尝不肃敬对之; 其故纸有《五经》词义, 及贤达姓名, 不敢秽用也。)" And Shi Daoxuan, a famous monk who lived in the Tang dynasty, wrote a book named *Teach the New Learning Bhikkhu to Protect the Law of Buddhism* (《教诫新学比丘行护律仪》) and the book said: "We have to prepare wood chips in the toilet and never use the wastepaper with characters written! (常具厕筹, 不得失阙……不得用文字故纸)" (Yang, 2007). All of these rules constitute a new type of folk belief system.

1.3.2 The phenomenon of "taboo words"

Based on "character worship", the emergence of "character taboo" appears.

"Literary inquisition" is a kind of embodiment of "character taboo". *The Chinese Dictionary* (《汉语大词典》) defines "Literary inquisition" as "in the old days, it was said that the rulers deliberately took words and sentences from their works to persecute intellectuals and made them into crimes".² For example, In the event named "the case of Huang Pei's poems", the poem belonging to Huang Pei which said "no sun or moon is shining on the Sea of Shandong province (一自蕉符纷海上, 更无日月照山东。)" was considered having the thought of anti-Qing dynasty, because the Chinese character "sun (日)" and "moon (月)" can combine into the character "Ming (明)", which is the name of the former dynasty of the Qing dynasty. In addition to such superficial reasons as "deliberate political persecution" and "sarcasm", this seemingly overly sensitive behavior is also motivated by the belief that others (agents) can exert some influence on people and things (recipients) of reality through the written word.

Until now, the "golden chain letters" that were widely circulated in the past, as well as the threatening talk that is circulated in the QQ zone "forward it within 10 seconds", are also such "taboo

2. "Chinese Dictionary" version 2.0, The Commercial Press (Hong Kong) Limited, Chinese Dictionary Press.

words” phenomenon. Because of its similarity with the expression form of “character worship”, it can be incorporated into the discussion of “Fu (符 , talisman) and “Zhou (咒 , incantations)” later.

2. “Spells (符咒)” and their forms of expression

“Fu (符 , talisman)” and “Zhou (咒 , incantations)” are often regarded as derivations of language worship. There are two definitions in a broad sense and a narrow sense.

The term “Spells (符咒)”, in the narrow sense, include “Fu (符 , talisman)” and “Zhou (咒 , incantations)”. “Fu (符 , talisman)” and “Zhou (咒 , incantations)”, not only appear in Taoist spells but also have a great influence all over the world, including Tibetan Buddhists, Tantric spells, Voodoo and so on.

2.1. “Fu” and “Fushu” (the use of Fu)

“Fu”, which originally means an object used by the ancient imperial court to convey an order or to transfer troops, with each party holding half of the object to verify the truth or fallibility. It also means a mark or sign that represents something. In witchcraft activities of an official or folk nature (private or local worship), this meaning is extended and is widely known as a magic appliance for the mobilization of supernatural spirits, gods, or other non-human elements by writings a “Fu”.

2.1.1 “Fu” and “Fushu (the use of Fu)” in the narrow sense

In the narrow sense of “Fu”, we define them as follows: in witchcraft activities, people write words with different purposes which are recorded on such writable objects as paper or cloth, and supernatural spirits, gods or other non-human elements are mobilized, to achieve their purpose. Fushu, on the other hand, refers to the methods of making and using Fu.

Even in the narrow sense, Fu and Fushu are widely distributed around the world, such as the “amulet (お守り , 護身符)” and “Ema (えま , 繪馬)” in Shinto shrines of Japan, as well as the notes with names which are written on the “voodoo doll” mentioned above. Some of them are confined to organized religion, while others are the practice of witchcraft within private or relatively small local worships.

The most familiar example of this term is the Taoist “Fu-lu (符箓)”. For Daoists, the “Fu-lu” is one of the primary and fundamental aspects of its sorcery system. The “Fu-lu” is derived from the ancient wizard. One of the books named Weishu (纬书 , divination studies) in the Han Dynasty, *The Chart of Dragon, Bass and Galaxy* (《龙鱼河图》, 汉代讖纬书) contains the legend of the Yellow Emperor (黄帝) being conferred by the Queen Mother of the West (西王母):

“The Sky sent the fairy to assist the Yellow Emperor, who believed in the divine “Fu” and wanted to subdue Chi You. The Yellow Emperor went to the chariot and said: “Chi You was tyrannical.” The Yellow Emperor started to attack Chi You and the Queen Mother of the West gave him a “Fu” in his dream. When the emperor waked up, he set up an altar and prayed in it. A black tortoise emerged from the water and put the “Fu” which appeared in his dream on the altar. And since then, the Chinese start to use “Fu-lu”. (Sun, 1999)

As *The Chart of Dragon, Bass and Galaxy* is one of the divinatory books of the Han Dynasty, the recordation that the “Fu-lu” was used in the Yellow Emperor period is not entirely credible, but it is

speculated that the “Fu-lu” had been used by wizards as early as the Han Dynasty (earlier than *The Chart of Dragon, Bass and Galaxy*).

In the early years of Daoism, the “Fu-lu” was included in the Taoist sorcery system and was divided into “Fu” and “Lu”. Among them, “Fu” is known as “words of phoenix” and “words of jade”, etc. According to the records of Li Yuanguo, “it is constituted by something like words but not words and some pictures with words.”

And the “Lu”, which known as “Fa-Lu (法篆)”, was recorded in *A Preliminary Study of Taoist Fu-lu and Incantations* by Li Yuanguo:

“It usually refers to the notes about the official of gods, the name of the ten gods, the summoning of god officials and the execution of magic, which mainly include the names, shapes and charms of gods. Daoism believes that the Taoist ‘Lu’ is derived from innate Aura... The Taoist practice and use magic which relies mainly on the gods in the ‘Lu’ to save the suffering and evils. A Taoist master must be familiar with the ‘Lu’.” (Y Li, 1991)

The Taoist believes that both “Fu” and “Lu” are information channels between gods and humans and a carrier of ideas and spirits - the Taoist also believes that the “Fu-lu” has the function of bringing Numen, dispelling evil spirits and making themselves become gods.

Examples of the medical use of the “Fu-lu” are familiar to Daoist and even Buddhist practitioners: in the early years of Emperor Guangxu period, a mad monk who lived in The Zhuming Temple in Suzhou treated people by burning a prescription to ashes and drinking it. At the end of the Eastern Han Dynasty, Zhang Jiao, the founder of the Taipingdao sect (太平道), and his disciples also recorded that “‘Fushui(the water which ‘Fu’ burned in it)’ was used to cure the sick, and the people believed in it.” In this way, the function of the prescription and the written name of the medicine are equal, so that “Fushui” can also have the function of medicine.

2.1.1.2 Witchcraft activities of “sorcery by all the people”

In private or relatively small groups or non-religious or local worship, the users of “Fu” and “Fushu” are wizards. As for the literature meaning of wizards, *Chinese Dictionary* (《汉语大词典》) explains it as follows:” The people who engaged in prayer, augury, astrology and cure” (Chinese Dictionary. And “witchcraft” refers to “make one’s dream come true by using some supernatural power.” And as Zhan Yinxin records, we can be seen as” in the original thinking to control things produced under the guidance of the results of the occurrence, development and change of behavior” (Zhan, 2001).

It is not difficult to imagine that in ancient societies, where primitive thinking was so strong, there must have been a time when every family had wizards and everyone could “resort to magic arts”—that is, everyone can be a wizard. For example, in *the Book of the Later Han Dynasty* (《后汉书·方术传下·徐登》), the unusual person Xu Deng is recorded:” Xu Deng comes from Fujian province and changes his sex from female to male, also he is good at witchcraft.” Xu Deng was not a religious man, but he could perform his activities by using witchcraft. (Fan, 2012)

In addition, earlier inscriptions are also a type of “Fu”. They represent the roles of mediator between heaven and human.

When the oracle bone scripts are written on the bones of animals, the inscriptions with the meanings of blessing or divination have the meaning of sorcery, such as the inscriptions recorded in Chen Mengjia’s book named *the Summary of the Divination of Yin Dynasty’s Ruins* (陈梦家《殷虚卜辞综述》):

- “(1) 庚子卜争贞羽辛丑旯?”
- “(2) 贞羽辛丑不其旯?”
- “(3) 王囙曰：今夕其雨？羽辛丑旯?”
- “(4) 之夕允雨，辛丑旯。”

(Chen, 1998)

On the day of Gengzi (庚子), it was revealed whether the next day would be fine or not—in the process of ancient sorcery, the ancients regarded the oracle bone inscriptions and the cracks generated when they were burned as the will of heaven and therefore “sacred”.

For some bronzes, it can also be regarded as another kind of “symbol”, which is the “sacredness” given by the “solemnness” of the act of “making the tripod”, that is, based on the “sacredness” of the characters and the tripod itself, and produces the effect of stipulation or blessing. For example, the inscription “Mao Gong Ding (Duke Mao Tripod, 毛公鼎)” has such a meaning.

2.1.2 “Fu” and “Fu” in the broad sense: The extension of “Universal sorcery”

The term notation and notation, in the broader sense, is not limited to religions and wizardry. However, the use of the terms notation and notation is no longer limited to the formal functions of witchcraft.

By extension, it can be regarded as the broad sense of “character” and “character”, the most familiar is the “character(it is also called ‘Fu’ in Chinese)” in the verse “thousands of doors, every household is new peach for the old character (千门万户曈曈日，总把新桃换旧符)”—Spring Festival couplets. The content and form of the couplets are consistent with the above definition of “fu”: people write blessings on peach wood or rice paper in the hope that the wishes in their words will come true.

In modern times, in addition to the “Spring Festival couplets”, the folk “Fu” and “Fu shu” still exist in many areas, embodied in some inscriptions and inscriptions. Such as standing in Hunan province and other provinces of the rural intersection or family.

On the stele in front of the door, there would always be the words “General’s Arrow”, which was said to drive away evil spirits; For example, the words “Jiang Taigong is here (no taboos)” (姜太公在此(百无禁忌)) written on the walls of pigsty in Jiangxi and other provinces should be written for high yield. In recent years, there will be people going from street to street selling the god of wealth like plastic stickers, which are believed to be put on the wall to bless wealth; More regardless of the wide reach of the national “Taishan Stone Tablets” (泰山石敢当) culture.

These “expect to realize” ceremony is a “blessing or blessing words and pictures” and “the act

of writing or engraved” interact with each other and be able to finish the whole process, namely between “rune” and “operator” and the role of consistent, but because of it is not made by the professional wizard, and widely spread in the folk, what we call it as generalized “character”.

2.2. “Zhou (咒, incantations)” and “Zhoushu (咒术)”

The original meaning of “Zhou (咒, incantations)” is “a kind of pray or blessing”, while “Zhoushu (咒术)” refers to the methods to cast “Zhou”. “Zhou” is originally from the blessing given by witches and wizards when offering sacrifices to the gods. It is recorded as follows in *the Book of the Later Han dynasty* (《后汉书·独行传·谅辅》):

“When the summer drought, too keep out of prayer mountains and rivers, for days no drop. He came out of the court and said generously: ‘The auxiliary is humeral... Dare to pray, if the sun does not rain, begging the body plug no shape.’ (时夏大旱, 太守自出祈祷山川, 连日无所降。辅乃自暴庭中, 慷慨咒曰: ‘辅为股肱……敢自祈请, 若至日中不雨, 乞以身塞无状。’)” (Fan, 2012)

The sentence the person said in this context is “Zhou”, a kind of verbal sorcery.

With the expansion of Chinese semantics, besides the meaning of prayer, “Zhou” gradually took on a negative meaning, that is, “Zhou” and other oral witchcraft that would bring negative effects to others.

This paper defines “Zhou” as oral witchcraft which has no positive or negative meanings and holds that “Zhou (咒)” and its applied technology “Zhoushu (咒术)” have two categories of limits, narrow and broad.

2.2.1. “Zhou” and “Zhoushu” in the narrow sense: Confined to witchcraft activities

In the narrow sense of “Zhou”, we define them as follows: in witchcraft activities, the language with different purposes (curses or blessings) is spoken, and the contractual language with the divine sound or language is used to mobilize supernatural spirits, gods, or other non-human elements, to achieve one’s purpose. And “Zhoushu” are methods used to create and use “Zhou”.

They are more widely distributed than “Fu”, including the “oral speech worship” (including the external source of “oracle worship” and the internal source of “speech worship”), Taoism, the “Ode (《颂》)” in *The Book of Songs* (《诗经》), and so on.

In Taoism, “Zhou” are commonly known as “incantations”. Taoist incantations are usually used in the time of practice magic. According to Li Yuanguo’s description, “Fu is the induction of the combination of internal and external air, and Zhou is the new sound of sincerity” (Y Li, 1991). As the words recited when practicing magic, the purpose of the “spells” is to praise the gods and ask for wishes; When it comes to healing and exorcising evil spirits, they use “spells” to calm the mind and refine the spirit—there are corresponding “incantations” for different situations, and almost everyone ends with the phrase “obey orders presto! (急急如律令)”

Similar to the incantations in religion, there is the “Ode (《颂》)” part in *The Book of Songs* (《诗经》). The Ode Part consists of 31 chapters in *Zhousong* (= *The Ode of the Zhou*, 《周颂》), 4 chapters in *Lusong* (= *The Ode of the Lu*, 《鲁颂》) and 5 chapters in *Shangsong* (= *The Ode of*

the Shang, 《商颂》), a total of 40 chapters, collectively called “Three Odes”. In *Mao Shi Xu* (《毛诗序》), it is said that “the description of beauty and virtue is praised to the gods for its success.” (Anonymity, 8–7th century BC) (Anonymity, 2015)—The purpose of the poems in the “Ode (《颂》)” Part of *The Book of Songs* is to “upload” their contribution to the gods or ancestors with language during the sacrificial ceremony to the ancestral temples so that the gods can understand the virtues of the monarch and achieve the purpose of “blessing”.

2.2.2 General “Zhou” and “Zhoushu”

In a broad sense, “Zhou” and “Zhoushu” are not limited to the scope of religion and witchcraft, that is, their use is no longer limited to the so-called “formal witchcraft activities”.

One of its representatives is “abusive language (詈骂)”, which is a kind of abuse of others. When people have bad relations, they will make personal attacks on each other, which is a kind of “Zhou” in a broad sense. Such “Zhou” is a malicious attack based on the words themselves, and such mutual attacks are based on the situation that confuses the words with the facts.

For example, “Death is a kind of curse commonly feared, loathed and negated by human beings. Therefore, using ‘death’ to curse people has become one of the most common abusive languages.”—“Abusive language” is based on the assumption of “belief” that “language can affect people”. (S Guo, 2002) Through language, it introduces death and other horrible, disgusting and undefined disasters to all people. In addition, there are also language taboos represented by “homophony”, many of which are still circulating in society and interpersonal communication. Such is the tradition of giving clocks as gifts; On the contrary, there are also homophonic blessings, such as the reverse (倒) “fu (福)” character has the meaning of “the good luck has arrived (福到)”, just because of the same pronunciation of “reverse (倒)” and “arrive (到)” in Chinese.³

In the past, people believed that a good word or a bad word would convey the same meaning to the recipient through a verbal reading, while nowadays, although people have a certain amount of scientific knowledge and are not overly superstitious, they still have some vague feeling of “believe it or not” for this kind of behavior.

3. “Spells(符咒)”: The language worship and the phenomenon of symbolization

“Spells (符咒)”, we can think of it as a derivative of language worship, but more precisely, they are special kinds of language witchcraft symbols.

3.1. Symbol

In his book *C.S.Pierce: On Signs*, Peirce defined Semiotics as “a doctrine that studies the essential properties of possible symbolic processes and their basic kinds.” (Peirce, 2014) Saussure’s definition of “Semiotics is the Study of Signs” is used by western works as the general definition of “Semiotics”. (Saussure, 1959)

However, for the definition of “symbol”, there have been many opinions, many semioticians even think that “symbol cannot be defined”. Zhao Yiheng gives a relatively clear definition of symbols

3. “福倒” is read as “dao” and means “reverse”, and is equal to “福到”, read as “dao” and means “something has arrived”.

as the starting point of the discussion: Symbols are perceptions that are thought to carry meaning (Zhao, 2013). Meaning must be expressed in symbols, and symbols are used to express meaning. In short, “Symbols are used to express, transmit and explain the meaning. Any meaning can only be expressed by symbols, and no meaning can be expressed without symbols.” (Zhao, 2013)

Language is a complex symbolic system composed of words according to a certain grammar, including the phonetic system, the lexical system and the grammatical system. Language, as a symbolic system, has the function of giving meaning to everything. We can think that people give meaning to the world through language, or it can be seen as a process of preliminary cognition, classification and meaning assigning to all natural things through language. This process of classification is arbitrary, but once a fixed name, a fixed expression, and a fixed meaning are given to a fixed thing, the relationship cannot be changed at will.

3.2. “Spells(符咒)”: The product of “secondary symbolization” of language as a symbol

3.2.1 *Natural phenomena, primitive symptom sense and “symbolization” and “secondary symbolization” phenomenon*

In the view of modern semiotics, primitive omen sense has a great connection with signs: “primitive omen sense is the initial symbolic behavior of human beings, which confirms the comprehensibility of the world and belongs to non-verbal signs.” (Lei,1998)

Tradition of Zuo (《左传·昭公十七年》) has a record of “Heaven and gods always show themselves up as ‘Xiang’(天事恒象)” (Zuo Qiuming, 4th century BC). In Lei Hanqing’s view, the sense of omens treats the world as a symbol, transforms the cosmic phenomena into cosmic symbols, and establishes a world that can be understood by people. That is to say, “Xiang (象)” here are natural phenomena such as wind, rain, thunder and lightning. By endowing them with meanings, the ancients made them no longer pure natural phenomena, but gestures or signs of Gods giving orders—that is, natural phenomena were “symbolized” and became a kind of “signs” and “images”.

In Lei Hanqing’s opinion, “Bagua (八卦 , the Eight Diagrams)” is the secondary symbolic processing based on the “Xiang” above. In *I-Ching* (《易·系辞下》), there is a record of Fu Xi “looking up at the celestial phenomena and looking down at the geography”. Lei Hanqing pointed out in his article:

“Fuxi regarded the images (象 , Xiang) and rules of heaven and earth, and all the creatures as the object of Bagua, and got all the information from macroscopic to microcosmic between heaven and earth through his eyes, hands and brain. Then, he set up qian (乾), kun (坤), kan (坎), li (离), zhen (震), gen (艮), xun (巽) and dui (兑) to represent heaven, earth, water, wind, fire, thunder, mountain and bottomland—eight kinds of natural phenomena. On this basis, through a change formula of ‘Xiang(images and things)’, number (action, movement) and principle (nature), we have confirmed the universal connection of all things and even the pervasions and mutual transformation of opposite things, to depress or predict the principle of the cause and effect of good or evil among the proposers.” (Lei,1998)

As can be seen from this, the three forms a relationship as follows:

Natural Phenomenon—“Xiang” (Human beings give meaning to natural phenomena through

language, and natural phenomena are deified and symbolized for the first time)—Bagua (through the interpretation of the divine “Xiang”, symbolized for the second time)

In other words, Bagua is the second symbolization of the natural phenomenon with meaning (the symbol of pure natural phenomena).

3.2.2 “Fu Zhou”, “Language worship” and the symbolization of language

Language is a complex symbol system composed of words according to a certain grammar, including the phonetic system, the lexical system and the grammatical system. As a symbolic system, language has the function of endow everything with meaning. As Zhao Yiheng said, “Symbols are perceived to carry meaning”. We can think that people endow the world with meaning through language. as constant as the analysis of “Xiang” above, can also be regarded as a process in which human beings initially recognize, classify and give meaning to all-natural things through language. Such a classification process is arbitrary, but once fixed names and expressions are given meaning to fixed things, the relationship cannot be changed at will.

“Language worship” is the process of language symbolization, and “language worship phenomenon” represented by “Spells (符咒)” is essentially a symbolic language.

As for the relationship between “language worship” and language, we can follow the thought of Lei Hanqing above and make it an extension. We can think that “language worship” is a process of symbolization of “pure” languages.

“Death” in the objective description and “abusive language (詈骂)” were respectively as “ordinary words” and “Zhou”, and “ordinary words” and “Zhou” to the person’s influence is also different. “Language worship” phenomenon is affected by the different context and different populations, let the language in a specific time, specific people, has a special significance; let the language have other meanings once again. This kind of “meanings” are not attached on language represents the objective things, but to adhere to the language, be made as “Spells (符咒)”. At this time, the language (such as “the wind can’t read, why go through the book (清风不识字, 何必乱翻书)”⁴, etc.) on the logical meaning will be different changes.

Therefore, it can be considered that “language worship” is a kind of abstract symbolization process of language, and the result of this process is the symbol represented by “Spells (符咒)”, just as the “Bagua (八卦 , Eight Diagrams)” in the above article is the symbolization result of the “Xiang” as the symbol of natural phenomenon.

4. Conclusion

The charm of Language is infinite, giving the meaning of objective existence and therefore making itself has the function of classification, discrimination and cognition. Meanwhile, “language worship”, attached to it, plays an important role in social changes, and because of the diversity and persistence of the language (words, speech, semantic, etc.), this worship will continue to function, unnecessarily represented in the symbolic form of traditional Wicca, the narrow sense of “charms”—such as “homophones”, “Spring Festival couplets”, etc.—the contemporary form of this worship

4. This is a famous poem whose author was punished in the literary inquisition of the Qing dynasty.

still presents an active situation, and does not seem to be declining.

Conflict of interest

No conflict of interest was reported by all authors.

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ORIGINAL ARTICLE

Local pragmatics: Issues and reflection

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Abstract: Pragmatic effects triggered by embedded structure have caused problems to Grice's Theory of Conversational Implicature. This long-standing view is challenged by local pragmatics proposed by Mandy Simons. As to the theoretical development, Robyn Carston, Francois Recanati, and Emma Borg respectively raise their comments, while Simons positively responds to these commentaries and further elaborates her stance. In this article, the argumentation among these scholars is presented first, and much attention is paid to the value and influence of the argumentation, which would shed light on the current debate between semantics and pragmatics.

Keywords: semantics and pragmatics; local pragmatics; embedded pragmatic effects; what is said and what is implicated

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1. Introduction

Grice's Theory of Conversational Implicature (hereinafter referred to as TCI) in *Logic and Conversation* explains how a speaker can express additional meaning that is different from the compositional meaning of a sentence. This model requires the hearer to figure out the literal meaning first, and then infer the speaker's meaning based on pragmatic factors such as context and intention.

However, it is difficult for TCI to explain the embedded structure. Pragmatic factors can intrude into the embedded components of sentences, thus producing what Simons (2017a) calls "embedded/local pragmatic effects"¹: at a certain stage of interpretation, the propositional content within the scope of linguistic operators contains the output content of pragmatic inference.

1. Simons (2017a) uses "embedded pragmatic effects" and "local pragmatic effects" alternately in the text. Although the emphasis is different, they are equivalent and interchangeable. It should be mentioned that Simons (2014: 22) called the added content "embedded implicature", but it was questioned by reviewers. Therefore, Simons (2017a, b) uses the term embedded/local pragmatic effects. Carston (2017: 518) believes that the change in terminology used by Simons reflects her loyalty to Grice's framework. Besides, Huang (2017: 657) calls this content "neo-Gricean, pre-semantic conversational implicature"

(1) If the old king has died of a heart attack and a republic has been declared, then Tom will be quite content.

Cohen (1971: 58) suggests that the sentence's truth is compatible with the claim that Tom will not be quite content if a republic has been declared and the old king has died of a heart attack. Thus, Cohen maintains that the meaning of *and* is not that of logical conjunction, and its meaning of expressing "temporal ordering" is deduced from the antecedent of (1), so TCI cannot be applied to the interpretation of conditional sentences. In addition, examples such as disjunctive sentences, comparative structures, and complement sentences of propositional attitude verbs also bother TCI (Sperber and Wilson, 1986; Levinson, 2000; Carston, 2002; Recanati, 2003).

Simons (2017a) thinks that TCI can explain embedded pragmatic effects only by making some modifications. Borg (2017), Recanati (2017), and Carston (2017) evaluate Simons' arguments and raise their doubts respectively. Simons (2017b) responds to these challenges and further clarifies her stance. The structure of the paper is as follows. Section 1 is the introduction. Section 2 is a summary of Simons' (2017a) contribution, and section 3 briefly combs the critical opinions from these scholars. Section 4 reflects on the essence and value of this debate and discusses its influence on the existing theories, aiming at accurately grasping the late progress of Grice's theory of conversational implicature. Section 5 concludes.

2. Simons' insight: Local pragmatics

Simons (2017a) holds that embedded pragmatic effects are the results of the global (speech level) pragmatic requirement and are the measures taken by acting locally to solve the potentially global pragmatic violation. The interpretation assumes that the hearer can identify the embedded part of the sentence. As long as this assumption is guaranteed, a modified TCI with more substantial explanatory power emerges.

Consider a framework for relevance implicature: the speaker says *p*; if the speaker says *p* and only means *p*, the speaker violates the maxim of relevance, then that the speaker says *p* is initially determined not to cooperate; however, there is no reason to believe that the speaker is uncooperative. Therefore, the speaker wants to express something that could be inferred from *p*, making conversational contribution relevant in the present. Based on further deduction, it is concluded that the speaker means *q* instead of *p*, or means *q* in addition to *p*.

This reasoning process can be divided into two parts: 1) Gricean reasoning, i.e., to identify a blatant violation of the principle of cooperation, and to conceive the conclusion that the speaker does not mean the (literal) meaning of the sentence (but other meanings) as Grice's conclusion; 2) interpretative step, i.e., starting from Grice's conclusion, the hearer continues to infer and find the best explanation to answer the question of what meaning the speaker is most likely to express.

It should be noted that this is the reasoning process for simple sentences (excluding embedded structures). Simons believes that this process can also explain pragmatic effects embedded in clauses, which is driven by the requirement of making the speech as a whole cooperative (Simons, 2017a: 472–473).

(2) A: What will you do for your mother's birthday?

B: Either I'll buy flowers or I'll cook a nice dinner.

Speaker A asks a question and speaker B replies with a disjunctive sentence. At the same time, any part of the disjunctive sentence is not the answer to the question under the complete literal interpretation. The hearer may naturally enrich and interpret this disjunctive sentence, i.e., buy flowers and give them to her mother or cook for her mother to eat. In this way, embedded pragmatic effects surface.

Assuming that the first part of the disjunctive sentence does not appear in the embedded clause but in a simple sentence, then the enrichment of the simple sentence is the same as that of the disjunctive sentence. The enrichment of the simple sentence can be interpreted by the traditionally conceived TCI. Speaker A asks a question, and assumes that speaker B is cooperative and rational. Then, speaker A hopes that B's answer is the answer to the question. Therefore, B's saying "buy flowers" actually wants A to speculate that B's meaning is to buy flowers and give them to his mother. Let us turn to the answer embedded in the clause. First of all, A judges that the whole content of the disjunctive sentence is compositional; second, A realize that the first part of the disjunctive sentence is not the answer to the question, because buying flowers is not the way to celebrate a birthday, and only those who buy flowers and give them to specific people are; then, the disjunctive sentence as a whole does not answer the question. However, there is no reason to think that the disjunctive sentence uttered by B is not cooperative, so the first part of the disjunctive sentence is not what B means. Based on this, with relevant contextual conditions, A deduces what the first part of B's disjunctive sentence really means².

The focus of this analysis is that the reasoning process of the disjunctive sentence is the same as that of the simple sentence. The difference lies in that the former is used to determine the content of the disjunctive sentence, and the result is embedded pragmatic effects. The inference of the embedded clause is triggered by the fact that the disjunctive sentence as a whole fails to meet the maxim of relevance, specifically, it fails to be relevant to the question raised (Simons, 2017a: 474–478). In short, through a rational reconstruction of Grice's reasoning, the hearer obtains intuitive and correct interpretation based on the compositional meaning of words with syntactic rules, which requires pragmatic enrichment of embedded clauses. However, the trouble with this interpretation is that if the intuitively correct interpretation is regarded as *what is said*, then the concept of what is said will be complicated and full of contradictions³. Therefore, Simons introduces another interpretation, taking the disjunctive sentence just mentioned as an example.

(3) A: What will you do for your mother's birthday?

B: Either I'll buy flowers or I'll cook a nice dinner.

Suppose we want to avoid the interpretation of embedded pragmatic effects that contribute to the truth-condition. In that case, the hearer can regard the intuitively correct interpretation as the result of global pragmatic inference, i.e., B says he wants to buy flowers or cook (absolutely/completely), and implies that B wants to buy flowers and give them to mother or cook for his mother. This is the same as the reasoning process for the disjunctive sentence above. At the same time, the only

2. Simons (2017a) does not mention whether the second part of the disjunctive sentence can play the same role. Carston (2017: 523) thinks that this is not a problem, and the same reasoning process can solve this problem.

3. At this point, pragmatic factors really intrude on what is said. For further discussion, see Saul (2002).

difference is the theoretical analysis of the conclusion: in the global interpretation, the conclusion consists of meanings independent of what is said (Simons, 2017a: 479–480).

Although both local and global methods can explain the pragmatic enrichment of embedded clauses, Simons believes that the choice is a theoretical issue rather than an empirical observation of whether there is evidence to make a choice. She points out that the key is the interpretation of reasoning itself. What resources does the interpreter need to provide for the reconstruction of partially enriched cases? The answer is to allow the interpreter to identify the content of the embedded clause. Let us turn to the complement sentence of a propositional attitude verb (there are changes to the original example).

- (4) Where did Jane go last week?
- (5) (a) Henry believes she spent the week with Frances.
 (b) Henry said she spent the week with Frances.
- (6) But she can't have. I had lunch with Frances on Wednesday.

Simons (2007, 2010, 2011) has demonstrated that embedded verb clauses can be used as objects of pragmatic inference, and these clauses form the main part of speech content. Therefore, (6) is the natural response of any answer in (5), which requires that the hearer should recognize the content of the clause as the possible answer to the question. This shows that the speaker can respond to or question the content of the embedded clause independently of the full content of the sentence in which the clause is located (Simons, 2017a: 480–483). As long as each part of the disjunctive sentence can be identified as the contribution to the overall speech act and the antecedent and the conclusion of a conditional sentence can be distinguished, the interpreter can apply TCI to the interpretation of embedded pragmatic effects. Further, assuming that all the information about the sub-sentential constituents is available, the contents of these constituents can be used as the input of the Gricean operation.

In summary, Simons (2017a) clarifies why Grice's framework can explain embedded pragmatic effects. It is the violation of cooperation on the global level that triggers the interpreter to infer what a particular embedded clause conveys. Although this is different from the starting point and conclusion of Grice's TCI, the reasoning mechanism is the same. Some people may doubt that this is not really Gricean, but Simons believes that it is not her goal to prove that Grice is correct in every respect. She thinks that her analysis is consistent with the core content of Grice's concept of communication (Simons, 2017a: 469). In other words, interlocutors need to think globally and act locally.

3. Doubts on local pragmatics

Simons (2017a) has aroused heated discussions. Carston (2017), Recanati (2017), and Borg (2017) have expressed their doubts. This section will sort out the comments of three commentators on Simons (2017a) first, aiming at accurately describing the essence of the debate⁴. Furthermore, there

4. Limited to space, Simons' (2017b) feedback would not be discussed in this section, but in the next section, most of the views from Simons (2017b) and three commentators would be evaluated thoroughly.

are some common interests as well as their unique views.

3.1. The key lies in the distinction between what is said and what is implicated and the conception of what is said

Carston stresses that there is no evidence to show that Grice's worry about the examples of meaning placed in the range of logical operators is a worry about the derivability of Grice's model and the one about rationally reconstructing inference based on conversational maxims. Of course, Grice's TCI can be applied to the unconventional content of utterance meaning⁵. Carston believes that pragmatic principles can be applied to embedded speech content as long as the aim is to restore the interpretation of speech as a whole, whether Grice-like or not (Carston, 2017: 521–523). Considering Simons' defense of the "staunch holism", Carston thinks that pragmatic intrusion can be avoided by doing so.

(7) A: What's making noise up in the attic?

B: I'm not sure, but if there's a nest up there, we're going to have a big mess to clean up.

(8) What is said: If there's a nest up there, we're going to have a big mess to clean up.

What is implicated: If there's a nest occupied by birds up there, we're going to have a big mess to clean up.

Speaker B's answer in (7) leads to the result of (8). What is said by semantics does not seem to be within speaker meaning, because an old or abandoned nest does not cause great confusion. However, the holistic explanation is still feasible because Grice's concept of "make as if to say" can be used to derive conversational implicature, which constitutes speaker meaning (Simons, 2017a: 479–481). Carston thinks Simons has confused Grice's Group A and Group C⁶. Although the literal meaning happens to be wrong, it is only the function of a specific embedded operator, not the speaker's blatant violation of quality or any other maxim. If there is no embedded structure to answer, the literal meaning will be implied by the implicature, thus becoming a part of speaker meaning. There will be no discussion about "make as if to say" or violating maxims. The immediate consequence is that the content of "said and meant" is essentially an idle wheel, since it belongs to and is expanded by what is implicated.

The trouble brought to Grice's TCI by the examples given by Simons (2017a) lies not in the computability, but in how these examples can be adapted to Grice's distinction of what is said and what is implicated, precisely his conception of what is said (Carston, 2017: 527–529). Carston has already found that Grice inserted two incompatible restrictions into the concept of what is said: (a) on the one hand, the pragmatic requirements implied by the speaker; (b) on the other hand, the semantic requirement to keep close enough to the conventional compositional meaning of the

5. See Walker (1975: 156–157), Geurts and Rubio-Fernández (2015: 448) in the discussion of determining the reference of demonstratives and indexicals and selecting the lexical meaning of ambiguous words.

6. In fact, both (7) and "there's a garage around the corner" belong to Group A, where there are no examples of violation of the maxim, or at least it is not clear which maxim has been violated. This is different from Group C, which includes "examples that involve exploitation, that is, a procedure by which a maxim is flouted for the purpose of getting in a conversational implicature by means of something of the nature of a figure of speech" (Grice, 1989: 32–33). The examples Grice gave in Group C involved a "real, as distinct from apparent, violation of the maxim of Relation", which he thought were very rare. This example is B's bland statement about the weather in response to A's statement, "Mrs. X is an old bag" (Grice, 1989: 35). In this way, B openly refused to make his statement relevant to A's statement. Examples like this do not appear in Simons (2017a).

sentence (Carston, 2002, 2004; Carston and Hall, 2012). Therefore, Simons needs to further explain on the following questions: What is the effect of local pragmatic effects in Grice's sense? What is the relationship between "make as if to say" and what is said? How does "make as if to say" inspire the distinction between what is said and what is implicated?

3.2. The two-stage model cannot explain indexical resolution and pragmatic modulation

Recanati points out that Grice's TCI is a two-stage analysis: the interpreter first calculates the propositional content (semantic level) of utterance, and then infers what the speaker actually means (pragmatic level) according to the context. Therefore, conversational implicature is post-propositional because its calculation presupposes the prior identification of what is said.

As is known, the contextual assignment of indexical is managed by language rules (for example, the rule that "I" refers to the speaker of the utterance where "I" occurs). However, the assignment of demonstrative pronouns and free variables in the context depends on the speaker's intention, and the recognition of the latter is based on the assumption that the speaker abides by the principle of cooperation, which is an instance of Gricean pragmatic inference in a broad sense. However, Recanati does not regard the assignment of indexical as a two-stage model like Grice's derived conversational implicature, because indexical resolution and conversational implicature have different positions in pragmatic inference.

In detail, indexical resolution affects truth-conditions, conversational implicature does not affect truth-conditions, so it is inappropriate to exclude pragmatic inference that is both pragmatically triggered and pre-propositional.

(9) He is late.

The hearer does not know what is said until he determines the reference of the indexical word, so the fact that the speaker has already said *p* is not a prerequisite for reasoning. In fact, the relevant premise is that the speaker has already used the pronoun *he* in a referential way, so there must be a certain male in the brain, and the speaker wants to state the characteristics of the male that the verb phrase represents. Therefore, if the premise as input is not that the speaker has already said the fact of *p*, but some other fact, pragmatically triggered inference can similarly affect truth-conditions. For example, when the speaker uses an expression, its literal meaning produces a verbal interpretation that conflicts with the speaker's assumption of observing the principle of cooperation.

(10) There is a lion in the middle of the piazza.

The example can mean that there is a lion statue in the middle of the piazza. The premise of the sentence as input is not the fact of saying the sentence, because its literal meaning conflicts with the assumption that the speaker abides by the principle of cooperation. The interpretation of the lion's pragmatic modulation can affect intuitive truth-conditions (Recanati, 2004). Therefore, Recanati provides a pragmatic modulation analysis that reverses the order specified by the two-stage model: he advocates a local reasoning process that contributes to the determination of content by modulating the compositional meaning of the sentence, rather than an overall reasoning process that occurs based on the determination of the compositional content. He argues that due to the locality of pragmatic inference, absurd propositions in the literal expression of a sentence do not need to be worked out in the interpretation of speech (Recanati, 1993: 263–266). In actual processing, even if

the literal proposition does not need to be calculated, its role in the rational reconstruction is still admitted. All in all, that pragmatic effects generated by pragmatic modulation can be embedded proves that they are local and pre-propositional, which shows that the two-stage model explaining post-propositional effects cannot be applied to indexical resolution and pragmatic modulation (Recanati, 2017: 494–499).

3.3. Is the rational reconstruction really sound?

To some degree, what Simons (2017a) advocates in her local pragmatics is a rational reconstruction of the mechanism in communication between the speaker and the hearer. Although there is a divergence from Grice's TCI, local pragmatics is Gricean in a broad sense. However, the project that seems to be theoretically plausible has not gained much support from practice, and Borg (2017) and Carston (2017) respectively exhibit their concerns.

Borg (2017) does not deny Simons' contribution, while she maintains that local pragmatics lacks for cognitive reality. There is no doubt that explaining the actual process of restoring language meaning by modeling both sides of communication is very attractive. Besides, Borg (2017: 510–511) discusses the role of the speaker's intention in rational reconstruction, and she believes that the speaker may usually have vague and uncertain intentions, so successful communication might only be a matter of degree.

In comparison, Carston attempts to replace the rational reconstruction with a relevance-based process. She (2017: 534–536) seeks a more cognitively experienced process of interpretation. She thinks that Relevance Theory is based on the general view of human cognition, i.e., cognitive systems tend to maximize cognitive effects derived from input information and at the same time make the least effort possible. Therefore, speech interpretation is not a rational reconstruction of inference, but is related to the hearer's actual inference process and how cognitive factors limit these interpretations.

(11) A: What's making noise up in the attic?

B: Oh, there's a nest up there.

Assuming that the hearer has the best-related expectation, A can expect B to provide an answer to her question. However, B's answer is indirect. She implies that birds make noise in the attic. Linguistic decoding provides the atomic concept NEST that is associated with a series of encyclopedic knowledge about the nest, whose accessibility is regarded as the context premise. Together with the decoded propositional content, implicature can be inferred. Therefore, there is a "backwards inference" from relevance-based speculation to the expressed proposition that affects this enrichment. This is an example of a general pragmatic mechanism in which the explicitness of the speech hypothesis and the meaning of the hypothesis are adjusted in parallel with each other. The process does not stop until the reasonable inference satisfying the hearer's expectation of relevance is reached.

4. Reflection on the debate: Local pragmatics and beyond

Generally, the framework put forward by Simons has gained much praise for her demonstrating the rationality of using the Gricean model to explain embedded pragmatic effects. Of course, it

remains to be a question of whether the approach could be widely accepted. The three commentators have expressed their own opinions, and Simons (2017b) also replies positively, promoting in-depth thinking on the issue. This section intends to further clarify and discuss some of the viewpoints in the article in an attempt to understand the essence and value of this debate more accurately and deeply. It is known that the debate between semantics and pragmatics, which is now more often conceived as that between semantic minimalism and contextualism, has lasted for over 60 years, and there is still no way out. Thus, when local pragmatics is involved in the debate, how does it inspire the current debate?

First, a new conception, i.e., what is expressed, appears in local pragmatics. At present, the source of the dispute between semantic minimalism and contextualism is the distinction between what is said and what is implicated. Simons believes that if the weak concept of what is said is admitted, what is said needs not be psychologically real, and what is said at this time can usually be downgraded to “make as if to say” (Simons, 2017a: 481), which later becomes what is expressed (Simons, 2017b: 543). In this way, what is expressed is not what the speaker must promise, and this is the development of standard Grice’s model. Meantime, it also raises a problem. Such treatment is equivalent to abandoning the quality maxim in the traditional framework, which is bound to result in disputes. Therefore, Simons’ approach still needs further verification. In addition to the concept of what is said, Simons modifies the maxim of quantity and claims that the maxim of relation could also be modified (Simons, 2017a: 488–489). It can be predicted that Simons may reshape Grice’s model on the basis of revising various maxims. It is precisely because Grice does not discuss the origin of the maxims or the relationship between maxims that scholars can make a big fuss here. On the other hand, if Grice has made clear the maxims, what is said, what is implicated, and other issues, perhaps the current theoretical research in pragmatics would not have been so lively.

Second, Carston’s focus on the role of what is said and its relationship with what is implicated is of great value. The trouble brought about by Simons (2017a) to Grice’s framework lies in how it can be adapted to the distinction between what is said and what is implicated, specifically his concept of what is said (Carston, 2017: 527–529). Simons’ (2017b) strategy is to modify the starting point of Grice’s reasoning to what is expressed so as to maintain the explanatory power of the Grice framework in a broad sense. The proposition expressed is not only encoded by the uttered sentence, but also includes the determination of the object to which the indicative component refers and the contextual assignment of temporal words. Besides, what is expressed is a proposition that is closely related to the conventional meaning of the uttered sentence and is truth-evaluative (Simons, 2017b: 545–546). However, Simons (2017b) does not further explore the relationship between what is expressed and what is said, and the influence of what is expressed on the traditional distinction between what is said and what is implicated. The article is going to explain this.

In Grice’s model, what is said precedes what is implicated, but what is said does not precede any Gricean reasoning (Simons, 2017a: 486). This explains that the determination of what the speaker has said “is only the output of pragmatic inference, not the input” (Simons, 2017b: 544). It is worth attention that Simons (2017a) does not give a clear explanation of what is said. And she explains: “I am not committed to a Gricean view of what is said...Gricean pragmatics can get along...without reliance on this notion (i.e., what is said)” (Simons, 2017b: 541).

Though Simmons is not satisfied with Grice’s what is said, she does not clearly state that she

totally rejects the concept of what is said. Given the current debate, both semantic minimalism and contextualism define the concept of what is said. In order to present their different views more vividly, we try to arrange a place for what is said in Simons' framework. Based on her discussion, we can infer that from the encoded content, the pronominal elements and tense markers are determined through context, and what is expressed is obtained through composition. From what is expressed to what is said, there may be ellipsis unpacking or generality narrowing. Then, starting from what is said, we can infer what is implicated in combination with contextual information⁷.

It should be noted that Simons argues that there is no conceptual difference between the pragmatic reasoning in indexical resolution and that in inferring implicature from propositional content (Simons, 2017b: 548). This article holds that there is also no conceptual difference between the pragmatic reasoning from what is expressed to what is said and that from what is said to what is implicated. These two processes have different starting points for pragmatic reasoning, but the underlying assumption is that the cooperative principle is observed. Therefore, although Simons (2017a, 2017b) does not clearly explain the relationship between what is expressed and what is said, our interpretation of Simons' views is consistent with her theory.

- (12) a. I have had breakfast.
b. I have had breakfast this morning.
c. I don't want to eat anything more.

For semantic minimalists, these three sentences are what is said, explicature⁸, what is implicated; for relevance theorists, they are what is said, explicature, what is implicated; for Simons, they are what is expressed, what is said, and what is implicated.

Simons' model is also divided into three parts, with the difference that relevance theory adds a level (explicature) between what is said and what is implicated, while Simons adds what is expressed before what is said. At the same time, relevance theory holds that what is said contains pragmatic factors, but Simons' concept of what is expressed is not committed to pragmatics. Therefore, Simons' model cannot be regarded as a copy of the relevance theory. It is not a model with different terms but essentially the same. Besides, although the reason why Simons adopts what is expressed instead of what is said is to evade the speaker's commitment, she also stipulates that what is expressed should not contain pragmatic elements. It seems that Simons' what is expressed can be equated with Borg's what is said. Compared with Borg's framework, Simons' is more specific and precise in explaining examples. In this sense, we can think of Simons' framework as a further development of Borg's.

Third, Simons' position in the debate between semantic minimalism and contextualism can also be seen from the debate on the interpretation of embedded pragmatic effects. Carston (2017) adopts a lexical pragmatic approach to explain embedded pragmatic effects, forcing Simons (2017b) to

7. Following this, the Grice's circle proposed by Levinson (2000: 186) can be eliminated by Simons' framework. Due to space constraints, we will not go into details here.

8. Borg (2016) believes that the formal and functional definitions of the concept of explicature are flawed, and she believes that explicature does not need psychological reality in the process of processing. In addition, the theoretical purport of semantic minimalism is to minimize the influence of pragmatic factors on literal meaning, so semantic minimalists would not accept the concept of explicature. Here, "explicature" is used neutrally for convenience of discussion, and it is enough to remember that Borg is not in line with relevance theory.

explore further which interpretation approach is reasonable. She thinks that the enrichment is best understood as local enrichment (Simons, 2017b: 555). Although Simons insists that this substantial content is partial, it is not truth-conditional and is not part of what is said (Simons, 2017b: 557). For Carston, being local is being literal, and local pragmatic effects must be truth-conditional. Borg (2017a: 512) points out that “The local view, then, is a variety of Contextualist”. As is known, semantic minimalists try to strictly distinguish the propositional meaning of a sentence from speaker meaning. Borg thinks that this may be possible, but at the same time, we need to accept the local view that pragmatics includes more than Gricean pragmatics (Simons, 2017b: 513). Their views on embedded pragmatic effects could be illustrated as follows.

Table 1. Different views on embedded pragmatic effects

	Carston	Borg	Simons
Embedded pragmatic effects are local?	Yes	No	Yes
Embedded pragmatic effects are literal?	Yes	No	No
Embedded pragmatic effects are truth-conditional?	Yes	No	No
Embedded pragmatic effects are parts of what is said?	Yes	No	No

In **Table 1**, it can be seen that Simons seems to bend with the wind. On the one hand, Simons accepts local interpretation; on the other hand, she does not regard it as literal content. Her viewpoint is a mix of semantic minimalism and contextualism. The source of the debate between the two camps lies in the different answers to what is said. The core concern of semantic minimalism is to minimize the influence of pragmatic factors on semantic contents and try to limit the difference between the conventional meaning and what is said of sentences to a minimum. And Simons makes it clear that the starting point of Grice’s reasoning should be what is expressed without pragmatic commitment (Simons, 2017a: 466; Simons, 2017b: 539). Although Simons disagree with the view that what is said is the starting point of reasoning, the use of what is expressed without pragmatic commitment precisely indicates her inclination towards semantic minimalism⁹.

Meantime, Simons believes that as long as local pragmatic effects enrich a complete proposition, local pragmatic effects do not need to be regarded as part of the truth-conditional content. Therefore, in order to maintain the position, it is crucial to identify the complete proposition first. However, the problem lies in the completeness of proposition itself is a highly controversial topic: semantic minimalists insist on propositionalism, that is, the semantic content of a sentence is the minimal proposition determined by the lexical meaning with syntactic rules, while contextualists advocate that linguistic meaning is not fully determinative in language communication activities, and they propose unarticulated constituents to illustrate the incompleteness of semantic minimalism. Simons points out that what is expressed is a proposition that is closely related to the conventional meaning of the sentence (Simons, 2017b: 546). This confirms her preference for semantic minimalism from another aspect.

Fourth, it is necessary to discuss the mechanism of language communication. Simons (2017a, 2017b) states: the purpose of linguistic interpretation is to identify the speaker’s intention. Borg suggests “an account which seeks to model how interlocutors actually do recover linguistic

9. Also, there is another evidence to show that Simons is inclined to semantic minimalism. She says that “If we take that intuitively correct interpretation to count as ‘what is said’ (a loaded and difficult term about which there is much controversy) ... (that) appear problematic not only for Grice’s model of pragmatic inference, but also, according to many theorists, for his notion of ‘what is said’” (2017a: 479).

meaning” (Borg, 2017a: 510), and Carston would like to “move beyond normative rational reconstructions of the logic of speaker-hearer interactions, towards a more empirically cognitively based account of communication and the processes of pragmatic interpretation” (Carston, 2017: 519). We think that these two opinions are worthy of attention, but we intend to make a preliminary explanation of the issues they have discussed in a broader perspective.

In fact, it is almost impossible to achieve fidelity transmission of meaning from the speaker to the hearer in daily communication unless the speaker clearly clarifies the compositional meaning of sentences before speaking. Concept is the basis of word meaning, so the discussion of meaning cannot be separated from the consideration of concept. Psychologists have pointed out that words can activate the matching concepts, and this connection is not a single linear connection but a selective connection of overall activation. A word can activate a conceptual network, with cultural specificity, individual specificity, and temporal and spatial dynamics. Then, the concept inspired by the same word for different individuals is likely to vary, but at a basic level, the word must have a public and shareable concept; otherwise, the words used by both parties in communication will become their private language, the speaker and the hearer will speak for themselves, and it is impossible to communicate successfully. Following this, natural questions emerge: what is this public and shareable concept? What is the relationship between the public concept and the overall concept of words? What contribution does the public concept make to successful communication?

These questions are not trivial, yet they are still in hot dispute. Looking at the criticism of Simons’ (2017a) approach of interpretation from Borg (2017) and Carston (2017), they focus on the superficial phenomenon of linguistic interpretation, namely, the description of experience and meaning, ignoring the conceptual dimension hidden behind, which provides a starting point for further research. Of course, this article only preliminarily discusses the relationship between concept and communication, among which the complicated relationship needs in-depth study.

5. Conclusion

Simons (2017a, 2017b) demonstrates the rationality of adopting the Gricean model to explain embedded/local pragmatic effects. She believes that this results from a global (speech level) pragmatic requirement and is the measure taken by local actions to solve potential pragmatic violations. Her framework has triggered heated discussions among Borg (2017), Recanati (2017), and Carston (2017), and prompts Simons (2017b) to further clarify her position.

The debate revolves around the issue of the existence or abolition of the concept of what is said, the explanatory power of Grice’s two-stage model, the approach of analyzing embedded pragmatic effects, and the mechanism of linguistic communication, which deepen our understanding of relevant issues. The article has discussed several of these arguments in depth, aiming to add some new thoughts on the basis of accurately grasping the essence of this debate.

Future research work can be carried out around the following aspects: first, research methods can be enriched. The academia is in a heated debate on what is said and what is implicated, and semantics and pragmatics, may not be solved by theoretical reasoning alone. Therefore, researchers can learn from the research methods of the experimental philosophy of language and understand the aforementioned classic topics from the empirical aspect (Noveck, 2018). Second, research contents

can be broadened. Almost all the examples that Simons (2017a, 2017b) offers are based on the relevance implicature, so can embedded pragmatic effects based on other maxims be explained in the same way? In particular, there is a great deal of controversy about the explanation of embedded scalar effects (Geurts, 2010; Chierchia, 2017). Can Simons' framework be successfully applied? This is worth further exploration.

Conflict of interest

No conflict of interest was reported by the author.

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REVIEW ARTICLE

A cognitive-functional approach to utterance pairs: A critical review of dialogic construction grammar

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Abstract: The combination of construction grammar and dialogic syntax in cognitive linguistics facilitates a novel cognitive-functional approach to investigating dialogues, which highlights the engagement of interlocutors and aims to examine the cognitive motivation and mechanism underlying the resonances and temporary constructions in utterance pairs. Nevertheless, studies on dialogic construction grammar are scarce and unsystematic, some of which concern theoretical explanation instead of practical application with sufficient data. As a result, it is demanding to testify its explanatory force in diverse types of utterance pairs in natural language. Basically grounded on the monograph *Dialogic Construction Grammar: A Theoretical Framework and Its Application*, this review sorts out the development of dialogic construction grammar, and manages to present how the Event domain-based Schema-Instance model is constructed to explore the cognitive mechanism of common types of utterance pairs, particularly, wh-question and answer pairs, namely wh-dialogues, with the intention to explain how dialogic construction grammar theory is applied to investigate the cognitive-functional properties of common utterance pairs in linguistic communication, at the same time pointing out the future work that might be done in the studies on construction grammar.

Keywords: dialogic construction grammar; utterance pairs; wh-dialogue; resonance; cognitive mechanism

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1. Introduction

The conventional aspects of dialogue analysis mainly center around forms and meanings of single utterances, as well as the influence of culture and discourse function on utterance meanings (Zeng, 2017). It is the advent of dialogic syntax that shifts the research focus of cognitive-functional approaches to language to the paired utterances, to the relation of utterance and utterance, along with the relation of language and speakers, namely the process that how language makes language (Du Bois, 2014). Inspired by the philosophical view of postmodernism, cognitive linguists are

encouraged to scrutinize dialogical utterances from distinct perspectives, one of which is from the perspective of the integration of construction grammar and dialogic syntax, or dialogic construction grammar. According to the theoretical assumptions of dialogic construction grammar, engagement of speakers in constructing dialogues has been significantly neglected in dialogic analysis. Essentially, engagement is the basis for dialogic resonance (cf. Wang and Zeng, 2016) produced in conversation. According to Brône and Zima (2014), dialogic constructions are ad hoc constructions that are different from the form-meaning pairings traditionally defined in construction grammar in that the later are acknowledged as conventionalized structures, whereas the former cover temporarily routinized paired constructions conceptually shared between interlocutors in consecutive turn-takings. In this sense, the ultimate intention of dialogic construction grammar studies is to figure out how interpersonal interaction contributes to the reasoning of utterance meaning, how cognitive motivation fosters the interaction between speakers and the objective world, and how interlocutors perceive structural parallelism in dialogue (Zeng, 2019b). In reality, as a new theory, dialogic construction grammar has not yet been fully probed into in different languages, and the motivation of this review is to introduce one of the very recent research findings in this field.

2. A brief review of the application of dialogic construction grammar theory

The past few years have witnessed increasing studies on dialogues and interaction (e.g. Verhagen, 2005; Nikiforidou et al., 2014; Linell, 2017; Couper-Kuhlen and Selting, 2018; Hsieh et al., 2019). Among others, the work entitled *Dialogic Construction Grammar: A Theoretical Framework and Its Application* (Zeng, 2019a), is a study mainly on wh-question and answer pairs, exemplifying one of the applications of dialogic construction grammar theory. This monograph not only clarifies the research findings in previous works and a state-of-the-art of dialogic analysis, but makes substantiate contributions, spanning the theoretical innovation, to broaden the realm of construction grammar in cognitive linguistics. Strikingly, with the Event domain-based Schema-Instance model (short for ESI), the cognitive features and mechanisms of utterance pairs inherently grounded on the construction of interactional meaning are investigated in detail, supposed to shed some lights on the further studies on natural languages from a dialogic view.

For this book, there is a beginning with the introduction to the dialogic turn in cognitive linguistic studies, discussed in chapter 1. As a term originating from “interactional turn” intending to yield dynamic perspectives in examining discourse and interactional language, ‘*dialogic turn*’ unveils the view that intersubjectivity in interpersonal interaction among humans ought to be probed in the construction of paired utterances (Zima and Brône, 2015; Zeng, 2018).

In chapter 2, this monograph provides a detailed overview of work on grammatical constructions, which reviews the works on the constructions at the single sentence level, constructions in dialogue and dialogic construction in discourse, as well as their essential distinctions. Technically speaking, a ‘*dialogic construction*’ refers to the schematic construction abstracted in paired utterances, and what the dialogic construction grammar postulates is that meaning is an interactive result between interlocutors and the interaction between speakers and the objective world. Such an assumption incorporates the philosophical view of embodied-cognitive linguistics rooted in usage-based linguistic theories. The highlight of the interaction and dialogicality in meaning construction and meaning understanding renovates the research idea of dialogic philosophy in the context of

postmodernism.

In the next chapter, a theoretical framework for the dialogic studies from the view of dialogic construction grammar, namely the ESI model, is proposed. This model is in fact the integration of Event-domain Cognitive Model and Schema-Instance principle. According to ESI model, a typical “dialogic construction” involves a “priming utterance” and a “newly-built utterance”, where the priming utterance uttered by speaker A activates an event schema, with the utterance itself being an instance of the schema, and the utterance of speaker B (the hearer at the same time) functions as the new instance of the event schema, simultaneously indicating that speaker B produces newly-built utterance. In a single local dialogue, if speaker B follows the structure of the utterance uttered by speaker A, dialogic resonances are accordingly formed, which means the emergence of a dialogic construction. At the end of this chapter, four properties of dialogic construction in linguistic communication are discussed, including the property of being temporary, conventional, productive or dynamic. Based on the analyses of dialogic resonance, in the process of dialoguing, the symmetrical structures at the syntactic level, semantic inheritances, and pragmatic inferences are interpreted. In comparison, the leading argument in this chapter is that the ESI model can be interpreted from a dialogic view, which lies in the analyses of the negotiation of speakers, the dynamic features of ongoing interaction, and the emergence of meaning.

As for chapter 4, it authenticates the explanatory power of the ESI model via analyzing the cognitive features of English wh-dialogues, which involves a wh-question and an answer. According to the author of this book, the communicative meaning of a wh-dialogue is to gauge unknown information and verify known information from the respect of utterance pairs, which complies with the essence of form-meaning pairings in construction. In this chapter, previous findings on wh-question-and-answer dialogues are expertly scrutinized from the perspectives of structural linguistics, formal linguistics, functional linguistics, and cognitive linguistics. The shortcomings of existing research, as summarized in this chapter, are mainly the exclusion of interlocutors’ cognitive engagement and the lack of large corpus-based investigation on dialogue. In contrast, the author argues that the ESI model functions well to make amends to some extent, based on the cognitive theory of grounding, which refers to the process that the speaker leads the focus of the hearer to something specific in order to generate mutual mental contact. The question and answer in a wh-question respectively in fact are a priming utterance and a newly-built utterance, and accordingly represent an ECM-question and an ECM-answer. In an ECM-question, the wh-word is the focus being salient, while the auxiliary and remainder are the background of construing the focus, then constituting the alignment of figure and ground. In specific, a wh-word represents a Schema-1, and an ECM-question represents a larger unit, or Schema-2. It is therefore concluded that the relation between a wh-question and an answer is a Schema-Instance relation, in accordance with which, different types of wh-dialogue constructions are classified, covering the cases of the direct instances of dialogic focus, the cases of indirect instances of dialogic focus, and the examples of the zero instances of dialogic focus. The first type depicts that a wh-question is directly paired with its answer, with the realization of Schema-Instance relation. The second type occurs when the information of the answer fails to directly present the information corresponding to the wh-question but through reasoning, while zero instances of dialogic focus cover the cases of dialogic interactions with focal transferring, negative answers, non-complete answers, and pragmatic marker-based answers. As for the cognitive features of wh-dialogue constructions, this chapter gives an excellent

investigation combining varied and rich data from COCA. Syntactic resonance, a key term in this chapter, is the syntactic feature of wh-dialogue construction, including cases of focal resonance, frame resonance, focal and frame resonance together with non-resonance, with the reliance on the parallelism between a wh-question and its answer. Due to the conceptual abstraction of an ECM-question, what the wh-answer represents is then a particular event or its elements decided by the specific dialogic situation, during which the semantic grounding of the dialogic focus is elaborated. The categories of semantic grounding mainly encompass focal grounding, frame grounding, focal and frame grounding, and non-grounding, each category elucidating a distinct degree of semantic specificity and prototypicality. Cooperation patterns between interlocutors, in line with coupling degrees of events, are also scrutinized in terms of pragmatic features of wh-dialogue construction. In the context of the ESI model, event coupling is defined to be the matching process of the ECM-Q and the ECM-A, suggesting whether the ECM-A is a valid instance of ECM-Q, and then work together to construct a new and integral ECM. The author eventually sheds light on wh-dialogue constructions in discourse in that they play a crucial role in achieving cohesion and expanding the size of a local dialogic discourse, where dynamic meaning construction and agent negotiation process are analyzed.

While, wh-dialogues with negative answers are particularly discussed in chapter 5, on account that this kind of question-and-answer pairs unveils special strategies that interlocutors use when construing events. It is argued that negation has been the research priority in numerous domains, such as philosophy, logic, psychology, linguistics, etc., but what is concerned is merely at the single sentence level instead of at the level of utterance pairs, to which this book makes supplements. At the end of this chapter, the author draws a conclusion on three ways by which wh-dialogues with negative answers are formed, containing the cases of a negative answer providing detailed instance, a negative answer negating the appropriateness of ECM-question and its focus, along with a negative answer negating the Schema-Instance relation between the question and the answer. With regard to the semantic features distinct from the analysis in chapter 4, the author concretizes the features of a wh-question and the features of a negative wh-answer. The author argues that, there are several factors decisive in interpreting a negative answer, encompassing the location of negative markers, the frequency of negation in a single wh-answer, and a cluster of structural types. Structural affinity has its place in wh-dialogue with negative answers as well, which is the source of syntactic resonance. When it comes to the focal part in this type of wh-dialogue, the author pays much emphasis on the discussion of the categories of semantic grounding of the focus of wh-questions, with the finding that, frame resonance and event frame grounding are more universal in wh-dialogue with negative answers. In terms of the pragmatic features, wh-dialogues with negative answers are productive in a dialogue in that such dialogues are the motivation of the novel message in conversation. Multi-interactive relations are also dealt with based on the relation between utterance and utterance, speakers and language, speaker and speaker. It is interesting to note that partial interpersonal cooperation is prominent in wh-dialogue with negative answers.

Chapter 6 makes preliminary contribution to the study on ellipsis phenomena in Mandarin-speaking children's dialogues under the same theoretical framework for dialogic construction grammar analysis, which is an innovative perspective in this realm, intended to make an explicit explanation on the development of children's linguistic and cognitive capacity. Grounded also in the ESI model, for children, the acquisition of language is essentially the acquisition of the network of

dialogic constructions, and the elliptical utterance is fundamentally an implicit instance of the event schema.

3. Dialogic construction grammar: Looking forward

In general, one of the notable merits of dialogic construction grammar is that this approach to language develops further what Du Bois (2014) has done for dialogic syntax. Although Du Bois endeavors to lay out the foundations of a theory related to dialogic syntax and plays emphasis on social interactions, viz. the subscribe to usage-based linguistics, he does not work at length out the cases of how and to what extent the theory could be applied (Brône and Zima, 2014). What Du Bois (2014) gives center stage to is the language phenomena of dialogic resonance, parallelism, analogy, priming, in paired utterances. According to Du Bois (2014), dialogic syntax is particularly concerned with dialogic resonance, with a claim that dialogic resonance reflects a common but not constant feature of language use. Nevertheless, Du Bois does not make efforts on exploring those in detail, to which the author makes striking contributions. Du Bois (2014) appeals for three detailed investigation, namely being a development of quantitative measures of dialogic resonance and the implementation of a precise operationalization of the concepts in dialogic syntax, the clarification of the role of priming, and the extension of the scope of investigation to a broader sample of the world's languages. Strictly speaking, to certain degree, this book has made achievements in the first issue. Strongly supported by the sufficient analyses of data from COCA, the author polishes up the resonance concept Du Bois (2014) defines as the catalytic activation of affinities across utterances but without elaborate description just with a general explanation of affinity, engagement, and coordination between two interlocutors. By contrast, the author adopts a strongly empirical perspective from studies on syntax, semantics, and pragmatics by virtue of ESI model, summarizing the kinds of resonance covering focal resonance, frame resonance, focal and frame resonances, non-resonances, and semantic resonances. Moreover, the author builds connections between event coupling and speakers' cooperation modes to discuss the implications of resonance and manages to explore the response strategies with cognition mediated in question-and-answer pairs.

In addition to what Du Bois (2014) appeals for, this book enriches Du Bois's existent findings. Firstly, the author introduces the grounding theory that is used in cognitive grammar to indicate the speech event, its participants (speaker and hearer), participants' interaction, and the immediate circumstances, which is in compliance with the process of instance in ESI analysis (Langacker, 2008). Since meaning and dialogic interaction go hand in hand so often that the semantic function of grounding theory furnishes better opportunities for cognitive linguists to make better explanation on how human language works. Secondly, the author undertakes a more detailed examination of contrast analysis on dialogue with negative answers to which Du Bois pays less attention. The author makes it clear that a negative answer might in fact be a concrete instance to the wh-question schema. On certain conditions it functions to be the negation of the existence of an ECM-question or a refusal to answer the question.

Besides the merits mentioned above, this contribution has other general strengths as well. For instance, as the author puts it in chapter 1, analyzing the meaning of dialogue at the level of utterance pair is the research frontier of cognitive researches, meanwhile, the integration of dialogic syntax and construction grammar is another research frontier in cognitive analysis of dialogue.

What the author has done is the combination of those research frontiers to accomplish an excellently demanding and innovative work. Moreover, this monograph not only adheres to Goldberg's perspective but also helps answer Goldberg's question, namely, what children acquire when they are engaged with language (Goldberg, 1995). The answer is that for children, the acquisition of language is equal to the process of acquiring the network of dialogic constructions.

What is more, this book is a user-friendly work for novices. In the beginning, the author lists the branches of dialogic studies in recent years with a purpose to arouse readers' interest and desire in reading. Then, the author takes a systematic inquiry into the evolution of construction to assist readers in laying foundations for reading this monograph.

However, this work still has certain room to get somewhere. As for language, the author spares no efforts to uncover the repertoire of English wh-dialogue with the help of the ESI model, but in accordance with what Du Bois (2014) puts forward, researchers ought to expand the scope of investigation to a broader sample of the world's languages, which means the author is bound to take a step in other languages, such as Chinese, to make comparison and contrast between English and Chinese. With regard to the studies on wh-dialogues, the finding suggests that there exist nine kinds of universal wh-words in COCA oral subcorpus, among which *what* represents *Being* element in ECM, while *when*, *how*, *why* stand for *Action* element in ECM. The question is, why does the author determine to do research on wh-dialogue instead of yes-no dialogue? Is the situation of yes-no dialogue easier or more difficult than that of wh-dialogue? Is the ESI model still powerful for explaining yes-no dialogue? One more puzzle is supposed to come in the classification of wh-dialogues, since what the author has discussed is just the typical form, i.e., a wh-question and a wh-answer. To intensify the persuasion, the focus should turn to other communication modes, such as self-answering, multi-answers to one question, and one answer to multi-questions. Moreover, chances are that speakers with various social identities are inclined to reflect their personal traits when they interact with others, which means features of these kinds of wh-dialogues are worthwhile to explore, especially for the application in language teaching.

Another shortage has something to do with the ESI model, which has thrown much light on events and schema-instance relation, but priming is neglected to some extent. As mentioned above, What Du Bois (2014) holds is that priming is an essential preparation for a more overall examination of the implication of the resonance cycle on cognitive and linguistic processes such as analogy, transfer, learning, and grammaticization. In practice, it seems that the addition of grounding is beneficial for expounding on the issue of priming. However, the correlativity is too subtle to get straight, consideration worthy of taking here. What's more, when the wh-dialogues are illustrated in the discourse, the engaged interlocutors ceaselessly construct new turns in anticipation of achieving the desired message or ending the dialogue as soon as possible. During the whole process, both the speaker and the hearer have their own strategies in cognitive cooperation. Whereas, the author mainly centers on answering strategies, as a result, skating over questioning strategies in the pragmatic features of wh-dialogues. Questioning strategies are such vital skills that are applied to negotiation occasions, interviews, conferences, especially for educational applications. There is evidence suggesting that rational teachers' question strategies are more successfully apt to recall students' understanding, catch students' attention, deepen students' thinking level, and encourage students to engage in class activities (Astrid et al., 2019). Whether the ESI model can be employed to explain questioning strategies in the pragmatic features of wh-dialogues deserves an in-depth

examination.

One more suggestion for this volume after reading might be concerned with a tiny structural adjustment. When the author mentions grounding for the first time in chapter 4, he gives a concise interpretation of what grounding is and its link with the ESI model, while the grounding strategies are not put forward until chapter 5, which causes a little confusion for the readers.

4. Concluding remarks

There being a growing consensus that dialogic construction grammar has a long way to go, as one of the cornerstones of nowadays achievement, this monograph is highly recommended to readers from any level to serve as intensive reading material in spite of a few limitations. As for those new to enter into dialogic construction grammar studies, this work furnishes abundant resources about literature reviews, latest progress in recent years. The most rewarding experience for this category of readers might be sparking points on researchable domain around the corner. As for those having set foot in the domain, this forward-looking contribution with the convincing argument is a genuine delight.

Conflict of interest

No conflict of interest was reported by the author.

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