

Faculty of Education, Language and Communication

Prototypicality and Acquisition of Chinese Resultative Verb Compounds among Learners of Chinese as a Foreign Language

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Prototypicality and Acquisition of Chinese Resultative Verb Compounds among Learners of Chinese as a Foreign Language

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.



……

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In the vicinity of the age of forty, I made a challenging decision to go abroad for the academic pursuit of a doctoral degree. That means I have to make a delicate balance between my teaching job, my family and my endeavour. Looking back, those sights were reminiscent of my learning experience. I must admit that this dissertation would never be possible without the help of many other individuals. First and foremost, I am in greatest debt to my supervisor Dr Ruey-Shing Soo who is both a friend, an elder brother and an insightful scholar in my mind, whose patient guidance, advice and encouragement inspired me and shaped this ultimate product. Without his constructive but challenging comments, my work will seem to stay in the embryonic stage forever. Thanks also go to Professor Dr Amby Pandian, Dr Joseph Ramanair, Professor Dr Soubakeavathi, Professor Dr Ting Su Hie, and all panel members on my proposal and Viva committee in UNIMAS.

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ABSTRACT

Chinese Resultative Verb Compound (RVC) is a frequently-used compound word in Chinese everyday speech and a crucial item prescribed in the curriculum and lexical syllabus of teaching Chinese to speakers of other languages (TCSOL). Nevertheless, there were enormous errors committed by Chinese as a second or foreign language (CSL/CFL) learners and evidence for prototypicality and its consistency in predicting SLA in prior studies. These errors and evidence posed challenges to the agreed-on frequency-based sequencing of RVC in the current lexical syllabus and the presentation of intuition-based illustrative examples in the classroom. Thus, this research was aimed to investigate the inter-dependency of LP, SeP and SyP of Chinese RVC through prototyping the RVC instruction. To this end, a three-phase exploratory mixed-method study was adopted to investigate the lexical prototypicality (LP) and syntactic prototypicality (SyP) of RVC and then to test those findings in quasi-experimental research. Phase I aimed to develop unitary definitions of RVC, including LP, semantic prototypicality (SeP) and SyP by reviewing the relevant literature. Subsequently, in Phase II, adopting a convergent design, prototype-based analyses of component morphemes of RVC and sentences licensed by RVC identified in Phase I were conducted, utilizing Gilquin and McMichael's (2018) "convergence criterion of the prototype" framework. To test the effect of prototype-based RVC instruction translated from the findings in Phase II, a quasi-experiment design was adopted using pretest-post test control group design in Phase III. In the quasi-experiment study, 42 intermediate CFL learners were recruited from two intact classes in a middle school in Sibu, Sarawak. These learners took Chinese Proficiency Test (CPT), Lexical Acceptability Judgment Test (L-AJT) and Syntactic Acceptability Judgement Test (S-AJT) before and after the prototype-based RVC instruction, once for pretest and once for posttest

(only L-AJT and S-AJT). Accordingly, independent sample t-test and multiple linear regression analysis were conducted for both L-AJT and S-AJT. Phase II results have demonstrated that, prototype-based graded membership of V1s, RCs and alternative sentences, as well as the prototype-based syntactic scale were produced. Additionally, in Phase III, the prototypicality of RC, token frequency of RVCs and prototype-based RVC instructions were found to significantly affect CFL learners' performance in L-AJT, except for the insignificant effect of V1. In contrast, SeP (including the prototypicality of polysemous V1(打 *da3 "beat"*) and semantic orientation of RC) and SyP had significant effects on learners' performance in S-AJT, excluding the role of LP and prototype-based RVC instruction. The high residue of the models obtained from L-AJT and S-AJT indicates that further investigation was required. Based on the research findings, the prototype-based Dual Route Processing Modal and Tripartite Framework, as well as the prototype-based approach to vocabulary learning were put forward and suggested to predict the CFL learners' compound identification of RVC and joint role of prototype-based instruction, LP, SeP and SyP in syntactic acceptability of RVC. It can be implicated that for intermediate CFL learners, RVCs should be introduced to the learners of Chinese as a foreign language in the CFL classroom based on the prototype-based sequencing of V1s and RCs: the most prototypical V1s and RCs should come first for beginner level CFL learners. In addition, prototypical syntactic patterns, such as SVO or Ba-C should be given to CSL/CFL learners to facilitate the RVC learning. Noticeably, the choice of prototypical sentence was a function of the semantic orientation of RC, SyP and the transitivity of LP.

Keywords: Lexical prototypicality, semantic prototypicality, syntactic prototypicality, prototype-based RVC instruction, learners of Chinese as a foreign language, Chinese RVC

Prototipikalitas Dan Pengambilalihan Kompaun Verb Hasil Cina Di Kalangan Pelajar Bahasa Cina Sebagai Bahasa Asing

ABSTRAK

Kompaun Verb Hasil Cina (RVC) adalah sebatian yang sering digunakan dalam ucapan sehari-hari Cina dan penting dalam bahasa Cina. em ditetapkan dalam kurikulum dan silabus leksikal pengajaran Cina kepada penutur bahasa lain (TCSOL). Kesilapan besar yang dilakukan oleh orang Cina sebagai pelajar bahasa kedua atau asing (CSL / CFL) dan bukti untuk proto tipikal dan konsisten dalam meramalkan SLA dalam kajian terdahulu menimbulkan cabaran kepada urutan berasaskan frekuensi cing RVC dalam silabus leksikal dan pembentangan contoh ilustratif berasaskan intuisi di dalam bilik darjah. Penyelidikan semasa bertujuan untuk membuat analisis berasaskan prototaip RVC Cina. Kajian kaedah campuran penerokaan tiga fasa diguna pakai untuk menyiasat prototypicality leksikal (LP) dan prototypicality sintaksis (SyP) RVC dan kemudian untuk memberi keterangan penemuan tersebut dalam penyelidikan kuasi eksperimen. Fasa I bertujuan untuk menawarkan definisi kesatuan RVC, termasuk LP, prototaip semantik (SeP) dan SyP. Dalam Fasa II, analisis berasaskan prototaip morfem komponen RVC dan ayat yang dilesenkan oleh RVC dijalankan, menggunakan kriteria penumpuan Gilquin dan McMichael (2018) prototaip sebagai rangka kerja analisis. Dalam Fasa III, reka bentuk kumpulan kawalan pascatest pratest diambil, di mana pelajar asing pertengahan Cina yang diambil dari dua kelas utuh sekolah menengah tempatan di Sibu, Sarawak mengambil bahagian dalam tiga pra-ujian Ujian Kemahiran Cina (CPT), Ujian Penghakiman Kebolehterimaan Leksikal (L-AJT) dan Ujian Penghakiman Kebolehterimaan Sintaksis (S-AJT), dua pasca ujian (L-AJT dan S-AJT) dan intervensi pengajaran berasaskan prototaip. Ujian t sampel bebas dan analisis regresi linear berbilang dijalankan dalam kedua-dua L-AJT dan S-AJT untuk memberi keterangan kesan arahan berasaskan prototaip pada pengenalan RVC, yang dimediasi oleh prototypicality V1 dan RC, serta kekerapan token RVC dan kesan arahan berasaskan prototaip terhadap prestasi pelajar dalam S-AJT, yang dimediasi oleh prototypicality LP (da3-RC), SeP (polysemous V1s dan orientasi semantik RCs) dan SyP. Rangka kerja teori yang digunakan untuk melukis hipotesis dalam Fasa III adalah rangka kerja bersepadu pengenalan

kompaun yang merangkumi Teori Kesan Prototaip (PET), Model Pemprosesan Laluan Dua (DRPM) oleh Pollatseck (2008; 2014) dan peranan positif pengajaran dalam pengambilalihan bahasa kedua yang diarahkan (ISLA) dan rangka kerja bersepadu penerimaan sintaksis di mana PET, Rangka Kerja Tripartit Tatabahasa oleh Larson-Freeman (2001) dan peranan positif pengajaran dalam ISLA disatukan. Dalam fasa kualitatif (Fasa II), keahlian gred berasaskan prototaip V1, RCs dan ayat alternatif dihasilkan, di mana V1 yang paling prototypical harus 拿 na2 "diambil", 坐 zuo4 "duduk", 学 xue2 "belajar" dan RC yang paling prototypical ialah 完 wan2 "selesai",好 hao3 "baiklah",死 si3 "mati", 出 chu1 "keluar", 到 dao4 "tiba" dan lain-lain. Bukti konvergen menunjukkan bahawa skala sintaksis berasaskan prototaip adalah SVO (pembinaan aktif transitif)>Ba-C (pembinaan pelupusan Ba)>Bei-C (pembinaan pasif Bei)>PSC (pembinaan subjek pesakit)>CVC (pembinaan kata kerja salinan). Dalam Fasa III, prototaip RC, kekerapan token RVC dan arahan berasaskan prototaip didapati memberi kesan ketara kepada prestasi pelajar dalam L-AJT, kecuali kesan V1 yang tidak ketara. Sebaliknya, SeP (termasuk prototypicality polysemous V1 (打 da3 "tembak") dan orientasi semantik RC) dan SyP boleh memberi kesan yang signifikan terhadap prestasi pelajar dalam S-AJT, tidak termasuk peranan LP dan arahan berasaskan prototaip. Sisa tinggi model yang diperolehi daripada L-AJT dan S-AJT menunjukkan bahawa siasatan lanjut diperlukan dalam kerja masa depan. Berdasarkan hasil kajian, DRPM berasaskan prototaip dan rangka kerja tripartite, serta pendekatan berasaskan prototaip untuk pembelajaran kosakata dicadangkan. Ia telah dikaitkan bahawa untuk pelajar CSL / CFL pertengahan, RVC perlu diperkenalkan di dalam kelas berdasarkan penjujukan berasaskan prototaip V1 dan RC. Di samping itu, corak sintaks prototaip, seperti SVO atau Ba-C perlu diberikan kepada pelajar CSL / CFL untuk memudahkan pembelajaran RVC. Apa yang perlu diperhatikan ialah pilihan ayat prototaip adalah fungsi orientasi semantik RC, SyP dan transitivity LP.

Kata kunci: *RVC Cina, prototaip leksikal, prototypicality semantik, prototaip sintaksis, arahan berasaskan prototaip, pelajar bahasa Cina sebagai bahasa asing*

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LIST OF ABBREVIATIONS

AP	Adjective Phrase
Ba-C	Ba Construction/Disposal Construction
Bei-C	Bei Passive Construction
CCL	Center for Chinese Linguistics
CDVU	Chinese Dictionary Verb Usage
CG	Control Group
CLPT	Cued Lexical Production Task
CNKI	China National Knowledge Infrastructure
CPT	Chinese Proficiency Test
CSL/CFL	Chinese as Second Language or Foreign Language
CSPT	Cued Syntactic Production Task
CVC	Copy Verb Construction
DOR	Direct Object Restriction
DRPM	Dual Route Processing Model
EG	Experimental Group
F1	First Language
FP	Frequency Principle
HSK	Hanyu Shuiping Kaoshi “Chinese Proficiency Test”
ICM	Idealized Cognitive Model
IP	Interaction Principle
ISLA	Instructed Second Language Acquisition
L1	First Language

L2	Second Language
LAJT	Lexical Acceptability Judgment Test
LP	Lexical Prototypicality
MDH	Markedness Differential Hypothesis
MLR	Multiple Linear Regression
MMD	Mixed Method Design
MP	Morphological Simplicity Principle
NP	Noun Phrase
PET	Prototype Effect Theory
PP	Prepositional Phrase
PSC	Patient Subject Construction
RC	Resultative Complement
RQ	Research Questions
RVC	Resultative Verb Compound
SAJT	Syntactic Acceptability Judgment Test
SeP	Semantic Prototypicality
SLA	Second Language Acquisition
SVO	Transitive Active Construction/Subject Verb Object
SyP	Syntactic Prototypicality
TCSOL	Teach Chinese to Speakers of Other Languages
TP	Transitive Principle
UCTS	University College of Technology Sarawak
V1	Matrix Verb
VP	Verb Phrase

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The teaching and learning of Chinese as a foreign language have garnered significant attention in recent years, as China's global influence continues to expand. With this growing interest comes the challenge of mastering Chinese, a language known for its complex grammatical structures and unique characteristics. Among these complexities are Resultative Verb Compounds (RVCs), a grammatical feature that combines a verb with a resultative complement to express an action and its outcome. RVCs are notoriously difficult for non-native speakers to grasp due to their syntactic and semantic intricacies, as well as the subtleties in their usage, which differ significantly from the grammatical patterns found in many other languages.

Historically, the teaching of Chinese has evolved from traditional rote memorization and grammar-translation methods to more modern, communicative approaches that emphasize practical usage and immersion. Despite these advancements, the challenge of effectively teaching complex grammatical structures like RVCs remains. Previous studies have explored various aspects of Chinese grammar acquisition, but there is a noticeable gap in the literature regarding the role of prototypicality in learning these structures. Prototypicality, a concept rooted in cognitive linguistics, refers to the degree to which a linguistic example represents the most typical or central instance of a category. In language acquisition, prototypical examples are thought to facilitate learning by providing clear and representative cases of language rules.

In the context of Chinese RVCs, understanding which examples are prototypical and how they can be leveraged in teaching could offer valuable insights into improving instructional strategies. However, existing research has primarily focused on prototypicality in the context of lexical categories or simple grammatical structures, with limited attention to complex constructions like RVCs. This study seeks to fill this gap by examining the prototypicality of RVCs in Chinese and its implications for language teaching and learning.

Moreover, the increasing global demand for Chinese language education highlights the practical significance of this research. As more non-native speakers embark on the journey of learning Chinese, there is a pressing need for teaching methods that can effectively address the challenges posed by its unique grammatical features. By investigating the role of prototypicality in the acquisition of RVCs, this study aims to contribute to the development of more effective teaching strategies that can enhance learners' comprehension and usage of these structures. The findings of this research could also have broader implications for the field of cognitive linguistics, particularly in understanding how learners of different linguistic backgrounds process and acquire complex grammatical forms.

In summary, this study addresses a critical gap in the literature by exploring the intersection of prototypicality and Chinese grammar acquisition, with a focus on RVCs. The insights gained from this research have the potential to advance both theoretical understanding and practical approaches to teaching Chinese as a foreign language, ultimately contributing to the success of learners in mastering this increasingly important global language.

1.2 Problem Statement

Chinese as a second/foreign language (CSL/CFL) learners have always experienced enormous difficulties with the RVCs (Ma, 2022; Zhou, 2022). Jiang (2018, 2020) pointed out from Thai and Kazakhstan learners of Chinese that even advanced CSL/CFL learners have encountered learning problems with RVCs and related structures. Nevertheless, they had native-like performance on the most prototypical and less prototypical features. Furthermore, preliminary investigation (e.g., Jia, 2019; Wu, 2012) suggested that CSL/CFL learners were found to commit the following types of errors (asterisk referred to those ungrammatical expressions while the expressions in the brackets were the right corresponding forms):

(1-1) a.*我早都 想 吃 这里的蛋糕, 今天 终于 吃 完 （到）了。 (Wu, 2012, p.36）

I early want eat here cake today eventually eat finish (succeed)

"I want to eat the cakes here for a long time, and today I got it."

b.*你 买 贵了 （这条裙子）。 （Wu, 2012, p.35）

You buy expensive (this skirt).

"You bought this skirt at a higher price."

c.*他 把 我的 情书 （撕）碎了。 （Wu, 2012, p.35）

He disposal marker my love letter (tear) broken

"He tore my love letter into pieces."

d.*我 把 杯子 打（碎）了。 （Jia, 2019, p.28）

I disposal marker vase beat (broken)

" I broke the vase into pieces."

These errors brought to light the difficulties CSL/CFL learners had to overcome in the acquisition of RVC. Firstly, it followed from the misuse of RVC in (1-1a) that 吃完 *chi1wan2 "finish eating"* was easier to acquire than 吃到 *chi1dao4 "succeed in eating";* Secondly, the error in (1-1b) indicated that 买贵 *mai3gui4 "buy-expensive"* was always intransitively rather than transitively used and licensed by PSC rather than SVO. This indicated that transitiveness of RVC may have influence on the choice of sentence patterns. Thirdly, the omission of V1 撕 *si1 "tear"* in (1-1c) and omission of RC 碎 *sui4 "broke into pieces"* in (1-1d) showed that monosyllabic verbs were likely to be easier to acquire than complex verbs. Additionally, the frequent usages of Ba-C in (1-1c） and (1-1d) suggested that Ba-C seemed to be earlier to acquire. All the errors L2 learners in the study committed and the learning difficulties they have to overcome pointed to the fact that RVC posed a challenge to CSL/CFL learners in terms of morphology, transitivity, syntax etc. Those errors and difficulties always brought frustration to CSL/CFL learners and if those problems still remained unsolved, it would have a detrimental effect on terminal status of learners' RVC competence.

Another problem in RVC learning originated from the lexical syllabus and curriculum of TCSOL (Confucius Institute Headquarters, 2014; Hanban, 2010). A lexical syllabus was admittedly an important guidance document for L2 vocabulary acquisition and learning. The agreed-upon criterion for lexical selection in the syllabus was based on the frequency of occurrence in the corpus (Curtis, 2014; Milton, 2009). However, previous literature aroused debate on two issues: (1) the most frequent words did not always

guarantee their ease in acquisition and learning (Xiao, 2002), such as function words in English; (2) frequency information was claimed to be only a necessary but not sufficient factor (Ellis, 2002). In light of the inadequacy of the frequency-based approach to vocabulary learning, Liang (2014) suggested that RVC could be preferably investigated by adopting a prototype-based approach.

As mentioned above, CSL/CFL learners, even those at the advanced level, often made mistakes in the RVCs and related structures. Nevertheless, preliminary research suggested prototype-based instruction was better to predict learning outcomes (e.g., Abbot-Smith & Tomasello, 2010; Chen, 2016; Deng, 2019; Gao, 2001; Hotta & Horie, 2018; Kellerman, 1979; Kiriyama & Yamamoto, 1998; Liang, 2014; Shirai & Andersen, 1995; Tian, 2004; Wu, 2018; Year & Gordon, 2009), in contrast with frequency of occurrence alone prescribed in the existing lexical syllabus.

In line with Liang's (2014) suggestion, RVCs were advised by considerable scholars (e.g., Liu, 2018; Xie, 2013; Zhou, 2013) to select and grade in a prototypical manner in the textbook and classroom instruction. Nevertheless, among the increasing number of studies that investigated vocabulary learning in teaching CSL/CFL, only two particularly looked into verbs from the perspective of the prototype, *i.e.*, Wu (2018) and Jin (2022). Wu (2018) has identified the lexical prototypicality (LP) of RVCs in a single corpus, namely prototypical RVCs and their component morphemes based on the classification of cognitive domain and relevant frequency information. Jin (2022) has graded the Chinese verbs according to their LP. Furthermore, the common practice of compound word instruction in the CSL/CFL classroom was to impart the component information and to provide typical sentences as illustrative examples. However, there were many problems with the prototypicality of the illustrative examples, such as the lack of the

provision of prototypical examples in the L2 classroom and examples which were illustrated according to instructor's experience rather than triangulated data (Wang, 2011; Zhang, 2008).

Due to the interdependence among form, meaning and syntax, mastering a compound meant to remember its lexical form, understand its meaning and usage. It has been highlighted in Larsen-Freeman's (2001) Three-dimensional Framework of Grammar Teaching that a grammatical unit should cover three integral parts, form, meaning and syntactic usage. However, none of the previous studies has satisfactorily provided a fuller picture of the prototypicality of Chinese RVCs in terms of form, meaning and syntactic usage, or put it in another way, LP, semantic prototypicality (SeP) and syntactic prototypicality (SyP).

1.3 Research Aim

Referring to vocabulary acquisition and learning, different aspects of vocabulary knowledge like lexical form, semantics and syntactic usage were interdependent (Curtis, 2014). Extensive prior evidence has indicated that prototypicality could permeate different dimensions of vocabulary knowledge. However, a systematic account of Chinese RVC based on a full-fledged definition of prototype in terms of form, meaning and usage has not been widely reported. Therefore, the current study aimed to investigate the inter-dependency of LP, SeP and SyP of Chinese RVC through prototyping the RVC instruction.

1.4 Research Objectives

The main focus of this study was on conducting prototype-based analyses of RVCs in terms of their lexical forms and syntactic usage. The present study sought to investigate the inter-dependency of LP, SeP and SyP of Chinese RVC through prototyping the RVC instruction. To achieve this, the following research objectives were formulated.

1. To formulate unitary definitions of LP, SeP and SyP by reviewing extant relevant literature.
2. To construct prototype-based sequencing of V1s and RCs by analyzing the target monosyllabic verbs from the *Chinese Dictionary of Verb Usage (CDVU)* regarding their corpus-based information and intuition-based information.
3. To construct the prototype-based sequencing of alternative RVC-related sentence patterns by analyzing their distribution of 打 *da3 "beat"*-RC-related sentence patterns in corpus and learners" production.
4. To measure the validity of prototype-based sequencing of V1s and RCs in the instructed L2 acquisition of Chinese RVC.
5. To map their integrated roles of LP, SeP and SyP in the instructed L2 acquisition of Chinese RVC in a framework.

1.5 Research Questions

Thus, the solution to the general problem for this study entailed finding answers to the following five key research questions (RQs).

RQ1: What factors are included in the operational definitions of LP, SeP and SyP of RVC?

RQ2: What are the suggested prototype-based sequencing of component morphemes, namely V1s and RCs of RVC, by drawing on Gilquin and McMichael's (2018) convergence criterion of the prototype?

RQ3: What are the suggested prototype-based hierarchies among alternative 打 *da3-RC*-related sentence patterns through the convergence of corpus-based data and intuition-based data?

RQ4: How can prototype-based component morphemes of RVC explain CFL learners' performance in the instructed second language (L2) learning of RVC?

RQ5: How do integrated roles of LP, SeP and SyP jointly predict learners' performance in the instructed L2 learning of RVC-related syntax?

1.6 Novelty of the Study

The empirical novelty in this study lied in the prototype-based sequencing of Chinese RVC and related patterns by adopting Gilquin and McMichael's (2018) converging evidence of the prototype. Prototype-based analyses of Chinese RVC were useful in fostering its instructed L2 acquisition since prototypicality could better predict learning outcomes (Chen & Wang, 2020). However, the existing teaching materials of Chinese RVCs and the illustrative examples(including the lexical syllabus, curriculum, dictionary and textbooks etc.) were designed depending on their lexical frequency or word counts with the help of corpus/corpora or designers' intuition (Wang, 2011). A case in point was the learners' dictionary, like Dictionary of Modern Chinese Words in Common Use (Liu et al.,1990) and Frequency Dictionary of Mandarin Chinese: Core vocabulary for learners (Xiao et al., 2009). Thus, Gilquin and McMichael (2018) provided us with convergence evidence to produce the prototype, which could offset the weakness of the frequency-based criterion or intuition-based criterion alone. Furthermore, other than LP, the previously unstudied SeP and SyP of RVC missing in Wu's (2018) research were

investigated. In the wake of the findings in LP, SeP and SyP, empirical evidence was offered to verify their validity in the instructed second language acquisition (ISLA).

The theoretical novelty in this study was to put forward two integrated frameworks to predict and explain the roles of prototypicality of Chinese RVC in RVC learning in the context of CFL. To understand the Prototype Effect in compound learning and related syntactic acquisition, it was crucial to put forward a fine-grained theory to address the problem. The most used theories for investigating the problem varied, like Dual Route Processing Modal (DRPM) (Hyönä & Pollatsek, 1998; Perea & Pollatsek, 1998; Pollatsek et al., 2000), Larsen-Freeman's (2001) Three-dimensional Framework of Grammar Teaching etc., besides the Prototype Effect Theory (PET). Although their predictability has been confirmed by various empirical studies, they overlooked the facilitative role of prototypicality in an integrated manner. Putting it simply, no single theory has fully covered the role of prototypicality of component morphemes in compound learning and the roles of LP, SeP and SyP in the RVC-related syntactic acquisition. Hence by integrating the concept of prototypicality, novel theoretical frameworks were proposed. Particularly, revised prototype-based DRPM was put forward to explain the joint effects of prototypical V1s and RCs on the instructed L2 acquisition of RVC. Afterwards, the prototype-based Tripartite framework was put forward to predict the learning outcome of alternative RVC-related sentence patterns.

1.7 Significance of the Study

Despite the learners' difficulties in the RVC acquisition, fewer attempts have been made to systematically investigate the L2 acquisition of RVC, although its syntax and semantics have been much discussed in the area of theoretical linguistics. The target endeavour in this regard might contribute to a better understanding the prototypicality of

RVC and its facilitative effect on the L2 acquisition of RVC. More specifically, the significance of the present study lied in the following aspects.

First, the present study sought to contribute to a deeper understanding of the role of prototype in second language acquisition. The notion of prototypicality, based on which RVC was examined in this study, was still an under-investigated area in second language acquisition (SLA) and language teaching (Liang, 2014). In previous studies, some conceptions related to prototypicality have been argued for by other scholars, such as Slobin (1997) and Sinclair and Renouf (2014). It has been claimed by Slobin (1997) that semantic basicness and salience were major determining factors in the acquisition process. Sinclair and Renouf (2014) have argued that for any learner of English, the main focus of study should be on: a) the commonest word forms in the language; b) their central patterns of usage; c) the combinations which they typically form. Moreover, Chen and Wang (2020) conducted an empirical study to reveal that "prototypicality significantly predicts the learning outcomes (p.15)". That is why Liang (2014) claimed that it was necessary to introduce "the concept of prototypicality to adult L2 learners in classroom teaching (p.217)".

Second, this study offered supporting evidence for the exploration of a shift from a frequency-based lexical syllabus to a prototype-based lexical syllabus. The choice of RVC as a topic for research was of pedagogical importance. As widely acknowledged in the related literature, the language that learners were expected to understand and produce should be graded in some way and that they were to be exposed to should be carefully selected in the syllabus (Willis, 1990). A lexical syllabus was necessary for vocabulary learning and teaching as well as textbook writing. It did not simply identify the commonest words of language, but focused on the commonest patterns, such as *the graded Chinese*

syllables, characters and words for the application of teaching Chinese to the speakers of other languages (Chinese lexical syllabus, hereafter) (Hanban, 2010). The assumption underlying the lexical syllabus was that frequency played an important role in predicting learners' acquisition (Dang et al., 2020). However, sometimes the role of frequency was overestimated. Numerous scholars expressed their prudent views on the frequency. For example, Larsen-Freeman and Long (1991) stated that previous data are generally supportive of a role for frequency but that causal claims should not be made. Ellis (1994) claimed that the safest conclusion was probably that input frequency served as one of the factors influencing development. Ellis (2002) admitted that "frequency is not a sufficient explanation and there are many determinants of acquisition (p.178)". Those statements possibly could account for the debates over whether L2 acquisition was frequency-based or prototypicality-based (Liang, 2014).

Also, an in-depth investigation of the prototypical lexical form of RVCs and their components, as well as SeP and SyP, were hopefully at the disposal of the CSL/CFL instructors, syllabus designers and textbook writers when introducing prototype into TCSOL. Making word lists in the field of L2 learning and teaching was usually done for the purpose of designing syllabuses. Different word lists have been generated, such as *General Service List* (Browne, 2013), *Academic Word List* (Coxhead, 2000), *BNC high-frequency Lists* (Nation, 2004), and *General Teaching Syllabus for Chinese as Second Language Learners* (Confucius Institute Headquarter/Hanban, 2014), as well as *A dictionary of Chinese verb-resultative complement phrases* (Wang et al., 1987) etc. The basis for sequencing items in the lexical syllabus was frequency and coverage (Robinson, 1998). However, counterexamples were easy to find that knowledge of the most frequent senses of a lexical item did not necessarily imply that the learner would be able to use it

properly (Bogaards & Laufer, 2004). Ellis (1993) acknowledged that the issue of how to sequence units of grammatical instruction was problematic and suggested using intuition-based difficulty and frequency of grammar items as criteria of syllabus design. Mehrdad and Ahghar (2015) analyzed the possibility of applying markedness issue to syllabus design in a second language acquisition context. Jin's (2022) typical hierarchy of verbs provided evidence of the possibility of applying the notion of prototypicality to the design of the Chinese lexical syllabus. The idea of designing textbooks and syllabuses based on the prototype might be validated through this investigation.

The present study contributed to the prototype-based approach to language teaching by examining the role of prototype-based RVC instruction in RVC learning, mediated by LP, Sep and SyP. It has been observed that RVCs were highly frequent items. They have been prescribed in all kinds of syllabuses and are always taught in the classroom. However, the difficulties encountered by CSL/CFL learners suggested that frequency and frequency-based instruction alone could not account for all of the stories of RVC learning. An exploration of the prototypical properties of RVC in terms of lexical form, meaning and usage and their influence on L2 learners' acquisition might help to unravel this teaching mystery. The prototype-based analyses of RVC in terms of lexical form, meaning and syntactic usage could provide us with some hints on the role of prototypicality of categories in the instruction of RVC in TCSOL. When discussing the relationship between Markedness, another term closely related to prototypicality, and instruction, Ellis (1993) suggested marked features should receive explicit instruction while unmarked features did not require explicit attention. However, Robinson (1998) pointed out that the idea that unmarked features did not need focus attention remained a problem. Wu (2018)

categorized the lexical RVCs according to the prototype but it lacked acquisition data to support her findings. Therefore, more work was required to unravel these mysteries.

The methodological significance of this study lied in producing prototypical RVCs by reference to the triangulating data. Prototype was a multi-faceted notion while Prototypicality has been a controversial concept which originated in the mid-1970s with Eleanor Rosch's research into the internal structure of categories. In her studies, prototypicality to non-linguistic categories mostly relies on subjects' intuition. To be exact, elicited data were used by collecting the sort of first item that the subject tended to name when asked to list members of a category in a psychological experiment. Afterwards, linguists began to identify the prototypical item regarding robust corpus-based empirical evidence. Recently, it has become more common to seek converging evidence to establish prototypicality in linguistics, such as Gilquin and McMichael (2018). They adopted a converging approach to make a corpus-based cognitive analysis of polysemous "*through".* Thus arose the question: by adopting the converging evidence of the prototype, what were the prototype-based "semantic basicness" and "the commonest form" of RVC and constituents, as well as "their central patterns of usage"?

1.8 Scope of the Study

Whilst the prototypical properties of Chinese RVC in terms of form, meaning and syntax have been sporadically documented and mono-corpus-based LP has been tentatively examined, the corpora-based triangulating LP and SyP, together with SeP and their roles in Chinese as L2 acquisition were poorly understood. The aim of this study was to make a corpora-based cognitive analyses on LP and SyP and to examine the effect of prototype-based RVC instruction on Chinese as L2 acquisition of Chinese RVC, mediated by LP, SeP and SyP.

The scope of the qualitative phase (Phase II) was limited to recruiting CSL/CFL learners with a variety of F1 languages who were contacted using their Chinese volunteer teachers in the Confucius Institute. This recruitment period lasted for a maximum of 1 month. Each volunteer in the study was asked to complete a cued lexical production task to elicit intuition-based prototypical V1s and RCs. The scope of the quantitative phase (Phase III) was limited to recruiting younger foreign learners of Chinese in Sibu, Malaysia who were contacted using their Chinese teachers from Confucius classroom. This recruitment period lasted for at least 2 months due to the pandemic. Volunteers in the study were from two intact classes. They were required to receive different teaching modals: prototype-based experimental group and control group with readily available textbook. What followed was the completion of the Lexical Acceptability Judgment Test (LAJT) and Syntactic Acceptability Judgment Test (SAJT) to examine the effects of LP, SeP and SyP on the instructed L2 acquisition of Chinese RVC.

1.9 Operational Definitions

1.9.1 Chinese RVC: Lexical Form, Meaning and Syntax

In the current linguistic research, the term "Resultative Verb Compound (RVC)" has been discussed in relation to Resultative Construction, a typologically universal linguistic phenomenon (Dömötöri, 2022; Nedjalkov & Jaxontov, 1988; Pustejovsky, 1991). In Mandarin Chinese, there were two forms of Resultative Construction: V_{erb}-V_{erb} construction or RVC and V-*de* 得 VP resultative phrase (Zhang, 2009), also called -*de* resultative (Sybesma, 1999) or V-*de* construction (Li, 2015; Lin, 2007). Thompson (1973) regarded the V-*de* as the potential form of RVC while Deng (2019) called VV construction as lexical RVC and V-*de* as phrasal RVC. The linguistic phenomenon dealt with in the present study was exclusively on lexical RVC or simply RVC. The reason was that V-*de*,

in most cases, was investigated in a syntactic approach while the derivation of RVC was construed as a lexical process (Deng, 2019). In addition, the targeting endeavour in the current research was vocabulary learning in Teaching Chinese to Speakers of Other Languages (TCSOL).

Different types of RVCs have been classified and discussed in the previous literature. Lǚ Shuxiang was possibly the earliest scholar to discuss Chinese RVCs. In Lǚ's view (Meng et al., 1999), RVC and directional verb compounds were two distinct types of verb compounds. RVC consisted of three sub-types: common RVCs, RVCs with grammaticalized RCs, like 了 *liao3 "finish",* 着 *zhao2 "succeed",* 成 *cheng2 "become",* 动 *dong4 "move",* 好 *hao3 "well",* 得 *de2 "get"* and idiomatic RVCs. However, Li and Thomson (1981) classified directional verb compounds as a sub-type of RVC. Thus, four kinds of RVCs are found, respectively: cause, achievement, direction and phase, which was held by Gao (2001). Deng (2019) classified lexical RVC into three types: result-state, directional, and completive RVC. In addition, as stated in Basciano (2019), Yong (1997) made a distinction between simple change RVC and complex change RVC, which was beyond the scope of the current discussion. Admittedly, it was occasionally difficult for a professional to draw a clear demarcation line between result-state verb compounds and directional verb compounds. For example, 到 *dao4 "arrived"* can function as both a resultative complement and a directional complement (Cui & Sung, 2022). Therefore, in this study, Shi's (2002) suggestion was adopted that resultative can only be understood in a broad sense and the commonly accepted classification of RVC was adopted (Deng, 2019; Li, 2007; Yong, 1997). Thus, in this study, verb compounds with complements of result, such as 大 *da4 "big"*, 湿 *shi1 "wet"*, complements of direction like 上 *shang4 "up",* 下

xia4 "down", 进 *jin4 "into"* and complement of phase like 成 *cheng2 "become",* 完 *wan2 "finish"* were subsumed under the unitary rubric of RVC.

The prototypical example of what was commonly regarded as RVC was presented in (1-2) below.

(1-2) 张亚锋打碎 了 花瓶。

Subject RVC Aspect marker Object

"Zhang Yafeng broke the vase into pieces."

It can be seen from the example in (1-2) that RVC exclusively displayed the following properties:

--1. The first component was typically a monosyllabic transitive verb denoting physical action (V1) while the second one (resultative complement, RC for short) (maybe a monosyllabic intransitive verb or an adjective) indicated result due to the action denoted by the first component (Gao, 2001; Hsu et al., 2019).

--2. RVCs were incompatible with durative aspect marker 着 *zhe2 "succeed"* but compatible with aspectual particle 了 *le0 "finish"*.

--3. RVC could be negated by using 不 *bu4* and 没 *mei2 "negation"*: 不 *bu4 "negation"* is used to deny stative situation while 没 *mei2 "negation"* was used to deny dynamic situation (Li & Thompson, 1981; Li, 2007).

--4. RVC and components V1 and RC were always polysemous (Chen & Wang, 2020; Ho, 2008; Ou, 2012).

Justified by the semantic orientation of RC, RVC can be divided into three sub-types: object-oriented RVC, verb-oriented RVC and subject-oriented RVC. Object-oriented RVC was closely related to Simpson's (1983) *Direct Object Restriction* (DOR) . It has been stated in DOR that in the Resultative Construction, the result phrase can be predicated only on the direct object, as shown in (1-2). To illustrate, in 打碎 *da3sui4 "broke into pieces"*, the RC 碎 *sui4 "broken into pieces"* was predicated on the object 花瓶 *hua1pin2 "vase"* rather than the actor *"*张亚锋". However, different from English RC, there were two so-called counterexamples of RVC in terms of semantic orientation, namely subject orientation and verb orientation. In particular, subject-oriented RVCs were those whose RCs were predicated on the surface subject such as V-惯 *guan4 "V-accustomed",* V-腻 *ni4 "V-bored",* V-累 *lei4 "V-tired"* and V-烦 *fan2 "V-bored"* while verb-oriented RVCs were those on V1s, like V-完 *wan2 "finish Ving"* and V-成 *cheng2 "succeed in Ving"* as shown in (1-3) and (1-4).

(1-3) 李四笑疯　　了。（subject-oriented, Huang, 2009）

Subject RVC Aspect marker

"Li-Si laughed himself crazy."

(1-4) 我　吃完　　了　　一罐酸奶。（verb-oriented, the BCC corpus）

Subject RVC Aspect marker Object

"I finish eating a bottle of yoghurt."

According to the transitivity, RVC can be divided into transitive RVC, intransitive RVC and labile RVC. As noted by Zhang (2019), labile RVCs were RVCs which could be used transitively and intransitively without any overt marking. There were two sub-types

of labile RVCs: Agent-labile RVC and Patient-labile RVC, illustrated in the following examples.

(1-5) a. 中国队 打胜 了 韩国队。

Subject RVC Aspect marker Object

"The Chinese team beat the South Korean team."

b. 中国队 打胜 了。

Subject RVC Aspect marker

"The Chinese team won."

(1-6) a. 中国队 打败 了 韩国队。

Subject RVC Aspect marker Object

"The Chinese team defeated the South Korean team." (The Chinese team won.)

b. 韩国队 打败 了。

Subject RVC Aspect marker

"The South Korean team lost."

(Examples from Zhang, 2019)

Both 打胜 *da3sheng4 "win by playing"* in (1-5a) and 打败 *da3bai4 "defeat"* in (1-6a) were their transitive uses while (1-5b) and (1-6b) were their corresponding intransitive uses. What was different was that (1-5a) and (1-5b) shared the same truth-conditional meaning while (1-6a) and (1-6b) were opposite in meaning: the object in (1-6a) was the subject of

(1-6b). Thus, 打胜 *da3sheng4 "win by playing"* was an agent-labile RVC whereas 打败 *da3bai4 "defeat/lost"* was a patient-labile RVC.

Previous literature suggested that Chinese RVCs could appear in alternative sentence patterns (e.g., Huang, 2005; Huang, 1996; Shi, 2015; Song, 2004; Wang, 2001). Syntactically, they were in a position to license five sentence patterns: transitive active sentence (SVO), patient subject construction (PSC), ba3 把-construction (Ba-C), bei4 被-construction (Bei-C) and copy verb construction (CVC). They were exemplified below (7-11).

(1-7) 我 把 花瓶 打碎 了。 (Ba-C)

Subject Disposal marker Object RVC Aspect marker

"I broke the vase."

(1-8) 我 打碎 了 花瓶。 (SVO)

Subject RVC Aspect marker Object

"I broke the vase."

(1-9) 花瓶 被 我 打碎 了。 (Bei-C)

Patient-Subject Passive marker Agent-object RVC Aspect marker

"Vase is broken into pieces by me."

(1-10) 花瓶 打碎 了。 (PSC)

Patient-subject RVC Aspect marker

"Vase is broken."

(1-11) 他　打　球　打累　　了。　　（CVC）

Subject V1 Object RVC Aspect marker

“He is tired for playing basketball.”

SVO was a predominantly canonical word order sentence in Mandarin Chinese (Cui & Sung, 2022), as illustrated in (1-8), whereas Ba-C and Bei-C have often been brought together as variants of canonical SVO (Huang et al., 2009). In Bei-C, the object in SVO became the subject of the sentence and it was said to carry a pejorative meaning describing an unfortunate event (Shi, 2002), as shown in (1-9). In contrast, in Ba-C, the object of SVO was placed post the disposal marker 把 *ba3 “disposal”*, which was always used in imperative and narrative sentences (Huang et al., 2009). To note, in Mandarin Chinese, not all the Ba-Cs could be converted into SVO. Ba-C was most frequently used with verb compounds with directional complement and resultative complement (Zhang, 2000). PSC, as its name suggested, was a structure in which the syntactic subject was a semantic patient (more precisely, non-agent), as shown in (1-10). It has been argued to be one of the most basic sentence patterns (He, 2019). Finally, CVC with RVCs referred to a construction in which a bare verb was followed by two constituents, an object 球 *qiu2 “ball”*, as indicated in (1-11) and RVC 打累 *da3lei4 “play-tired”*. The bare verb 打 *da3 “play”* was duplicated in CVC (Cheng, 2007; Fang et al., 2007). It has been found that the most frequently used RVCs in the CVC were RVCs with subject-oriented reading (Shi, 2002).

1.9.2 Prototypicality of Grammar

According to Taylor (2008), prototype was an important notion in linguistics, originating from Cognitive Psychology and then quickly was taken up by the Cognitive

Linguistics. It simply referred to the best example to represent a category. Prototype categorization has found many applications in the study of the categories of language itself, including lexical form, polysemy, clause type and syntactic construction etc. Grammar was another important term, a system to organize a language. In the current study, the topic was about vocabulary acquisition. Nevertheless, grammar was discussed due to the fact that different from traditional grammarian, in Corpus Linguistics and Cognitive Linguistics, vocabulary and grammar formed a continuum. According to Tripartite Framework of Grammar Teaching (Larsen-Freeman, 2001, 2003; Larsen-Freeman & Long, 1991; Larsen-Freeman & Celce-Murcia, 2016), three indispensable aspects should be covered: form, meaning and syntactic usage. When the prototype met with grammar, three notions were introduced in the instructed L2 acquisition of Chinese RVC: LP, SeP and SyP. LP referred to the prototypical lexical forms of Chinese RVC which were investigated by mainly analyzing prototypical V1s, RCs and 打 *da3-RCs*. According to previous literature, prototypical V1s were defined as monosyllabic transitive action verbs with highly frequent access to multi-corpora and language learners, together with high productivity. Similarly, prototypical RCs were monosyllabic intransitive stative verbs or adjectives with highly frequent access to multi-corpora and language learners, as well as high productivity. It followed that prototypical RVC ought to be those transitive accomplishment verbs with prototypical V1(打 *da3 "beat"*) and RC.

SeP was the abbreviation of semantic prototypicality which has been discussed from two perspectives: prototypicality of polysemous V1 and semantic orientation of RC. The prototypicality of polysemous V1s was probed by taking 打 *da3 "beat"* as a better example while according to the prior studies, the prototypical semantic orientation of RC was claimed to be object-oriented. Moreover, syntactic prototypicality was understood by

reference to the triangulating data of prototype-based distribution of alternative sentences in the corpus and learners' elicited production.

1.9.3 TCSOL, CSL and CFL

TCSOL, known as "Teaching Chinese to Speakers of Other Languages" referred to the teaching of Chinese to non-Chinese speakers all over the world. Chinese in such a context referred to Mandarin Chinese or official language rather than varieties of Chinese dialects. It focused on non-Chinese speakers' learning or teaching Chinese as a second language(CSL) or a foreign language(CFL). Following the model of TESOL, TCSOL was becoming a worldwide independent discipline (Wang, 2010). Specifically, the target of teaching Chinese as a foreign language was, simply put, Chinese learners who were non-native speakers of Chinese (Zhang, 2024). Besides, second language was acquired in a setting where it was widely spoken by the community whereas foreign language was learned in a context where it was not the community's dominant language. Thus, in current study, CSL exclusively referred to the learning Chinese as a second language in China, including mainland China, Hong Kong, Taiwan and Macau while CFL learners encompassed the learners of Chinese as a foreign language beyond the territory of China, like Malaysia, Singapore, Indonesia etc. In many cases, CSL and CFL were always employed interchangeably if unnecessary in present study.

1.10 Organization of the Thesis

The present study investigated, with mixed methods research, the role of prototype-based RVC instruction in the ISLA of Chinese RVCs, mediated by the prototypicality of RVC in terms of form, meaning and syntactic usage. It presupposed the definitions and the prototype-based analyses of RVCs and related components in terms of form, meaning and

syntactic usage. Therefore, this study was, first of all, an attempt to define the prototypical form, meaning and syntactic usage of Chinese RVCs based on the fragmentary statements in the previous studies. What followed was to figure out the prototypical members and patterns of Chinese RVCs in the qualitative phase (Phase II) by employing Gilquin and McMichael's (2018) "convergence criterion of the prototype" framework. Subsequently, quasi-experimental phase was designed to find the supporting evidence for the prototype-based approach to teaching Chinese RVCs as CFL/CSL. Such an attempt was in accordance with the Prototype Effect in language acquisition to the effect that input in language teaching and learning should start from the most prototypical items as seeds. Beside, as argued by DRPM and Tripartite Framework in language acquisition, component of compounds should be highlighted and vocabulary knowledge in form, meaning and usage, were linked to facilitate compound learning.

The rest of the dissertation was organized in the following way. Chapter two covered nine sections which specifically dealt with the theoretical foundations, including vocabulary knowledge, theories of Corpus Linguistics underpinning the prototypical members and Cognitive Linguistics in which the prototype was a cornerstone concept. What followed was the prototype theory and language-specific properties of prototypical RVC and components as well as the semantic orientation of RC and polysemy of V1 to formulate the definitions of LP, SeP and SyP. Based on their effects involved in the language acquisition, the gap of research, research questions, theoretical framework, and research hypothesis were proposed, respectively.

Adopting the multi-phase mixed methods design in the methodological approach, Chapter 3 described the research design of qualitative research to find the prototypical members of Chinese RVCs. In the wake of findings in the qualitative phase, quasi-

experiment was designed to test the roles of prototypical form, meaning and syntax in the lexical identification and RVC-related syntactic acceptability by integrating Prototype Effect Theory, Double Route Processing Modal and Tripartite Framework of Grammar Teaching.

The triangulating data of the investigation into the LP, SeP and SyP of Chinese RVCs and their joint efforts of three variables, together with prototype-based RVC instruction in RVC learning were dealt with in Chapter 4. The first part in Chapter 4 dealt with LP which included the prototypical V1s, RCs and 打 *da3-RCs*, prototypical syntactic usage with reference to the prototypical meaning of a special case of 打 *da3 "beat"*; The second part presented the results of the quasi-experimental study. It covered the effects of prototype-based RVC instruction, prototypical component morphemes and token frequency of RVC on the RVC identification. Additionally, the effects of prototype-based RVC instruction on learners performance in the alternative RVC-related sentence patterns, mediated by LP, SeP and SyP were presented.

In Chapter 5, the findings reported in Chapter 4 were discussed in light of the theoretical frameworks and extant literature; Chapter 6 concluded the thesis with the major findings, theoretical implications and implications for TCSOL, as well as the limitations and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Chapter Overview

The topic involved in this thesis pertains to the two sides of the vocabulary: learning and teaching for CSL/CFL learners. When it comes to vocabulary learning, what was commonly questioned is what has been learned by L2 learners. A satisfactory answer to the question is vocabulary knowledge, basically including the lexical form, meaning and syntactic usage, as suggested by Larson-Freeman (2001, 2003) and Nation (1994, 2001, 2013). Another side concerning vocabulary is how vocabulary knowledge should be imparted to learners in the classroom. An updated answer to this question is to provide the vocabulary as input in light of the prototypicality, a crucial notion in both Cognitive Linguistics and Corpus Linguistics. When the vocabulary knowledge of Chinese RVCs meets the prototypicality, prototypical morphological morphemes, prototypical meanings and prototypical syntactic usage are initially introduced and analyzed. What follows is a quasi-experimental study to quantitatively examine their effects on the instructed L2 acquisition.

This chapter was organized as follows: Section 2.2 offered a statement on vocabulary knowledge and the relation between vocabulary and corpus in the context of vocabulary acquisition in the TCSOL. It was followed by some basic assumptions in Section 2.3 underlying the background theories involved in the current study. These theoretical underpinning covered tenets in corpus linguistic theory and some basic assumptions of Cognitive Linguistics. In Cognitive Linguistics, the crucial theory centers on the core notion---Prototype Effect Theory, including the defining features of the

prototypicality and the prototype effect in language acquisition. What came next was a review of the relevant theoretical analyses of Chinese RVCs in Section 2.4, as well as their relevant previous acquisition studies. Specifically, analyses were made of the features of the RVCs and component elements, namely V1s and RCs. Additionally, the semantic orientation of RCs and the syntactic contexts where RVC can appear are examined in detail. According to the literature reviewed above, research gaps and research questions were proposed in Sections 2.6 and 2.7. Before the chapter ended up with a summary, the integrative theoretical frameworks and hypotheses were proposed accordingly in Section 2.8.

2.2 Development of Vocabulary Acquisition in TCSOL

Since the topic in the present study is concerned with compound word learning and teaching in TCSOL, it is pressing to sketch out the development of vocabulary acquisition in TCSOL. TCSOL debuted as early as 1950 in China (Ang & Halim, 2019). Since then, Chinese has been increasingly taught and learned as an important foreign or second language both inside and outside China, when China started to continuously exert its global and economic power. Especially, the last fifteen years have witnessed its particularly noteworthy growth (Gong et al., 2020).

CSL/CFL vocabulary studies commenced in the 1980s. It was only after the 1990s that the picture that only a small number of works were devoted to vocabulary changed. According to Gong et al. (2020), lexical acquisition in TCSOL is a traditional problem area concentrated on in the majority of previous studies. Special importance has been greatly attached to it by Chinese researchers to help the CSL/CFL learners develop suitable vocabulary learning strategies. However, it has to be admitted that vocabulary acquisition and teaching were scarcely investigated, compared to other research areas of CSL/CFL

research. CSL/CFL vocabulary has been considered the weakest link in Chinese pedagogy (Romagnoli, 2017).

Nevertheless, though scarce in number, some significant implications and findings have been achieved. For example, Zhang's (2017) study suggested that proficiency levels of learners (beginner vs intermediate vs advanced) should be taken into consideration in the instructional practice of teaching vocabulary. Su's (2015) research indicated that CSL/CFL instructors should pay attention to both word meanings, their pragmatic function and the context of language use. Xiao (2002) pointed out that the most frequent words do not necessarily equate with the most salient words for learners and classroom vocabulary and words relating to everyday life are often not part of frequency lists.

2.2.1 Vocabulary Knowledge

At the outset of this chapter, one point to be made explicit is that for vocabulary learning, acquired by learners in language classrooms is the vocabulary knowledge or phrased in another way, mastering lexicon implies vocabulary knowledge of all aspects. For example, Nation (2001, 2013) came up with a construct of vocabulary knowledge in which three fields are included: *lexical form* which implies the written form and word class, *meaning* and *usage* including syntactic usage, pragmatic usage, collocation etc. What should be noted in this construct is the notion of continuum existing in vocabulary knowledge: lexical learning should begin with the form and meaning of a lexical item and end with free use of the words. According to the construct, CSL/CFL learners might as well follow the acquisitional path: the first focus should be on the pairing of form and meaning, followed by syntactic usage and then pragmatic usage.

Lexical form, meaning and syntactic context are collectively studied for more than one reason. First of all, the prototype is a central concept in Cognitive Linguistics whose basic unit is construction, a form-meaning pairing. Schmitt (2008) stated that the form–meaning link is the first and most essential lexical aspect which must be acquired. Therefore, the first step in the vocabulary acquisition process for a learner is to establish an initial form-meaning link. Learners need to know much more about lexical items, particularly if they are to be used productively. Furthermore, one of the common practices to teach vocabulary in L2 classrooms is to provide one or more sentences as examples to illustrate its usage. However, numerous problems arose with the prototypicality of illustrative sentences in prior studies (Wang, 2011; Zhang, 2008). Thus, investigation of the prototypical sentence patterns in the present study can unravel this mystery.

Second, lexicon and grammar (including morphological and syntactic regularities of a natural language) form a continuum, in agreement with the cognitive view that lexicon is a construction, ranging from morphology to syntactic usage (Langacker, 1987/2004). On the one hand, according to Three-Dimensional Grammar Framework (Celce-Murcia & Larsen-Freeman, 1999; Finneran, 2015; Larsen-Freeman & Celce-Murcia, 2016; Larsen-Freeman, 2001, 2003), it has been argued that lexical form, meaning and syntax are inextricably linked (as shown in Figure 2.1). On the other hand, both cognitive linguists and corpus linguists eschew the distinction between lexis and grammar and argue that there is no meaningful distinction between grammar and lexicon (Liu, 2012; Sinclair et al., 1990).

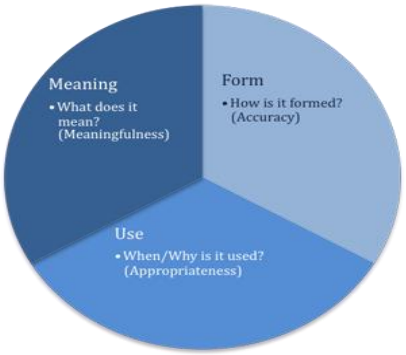


Figure 2.1: Tripartite Framework for Grammar Description (Celc-Murcia & Freeman, 1999)

Given that the indispensability and interdependence of form, meaning and syntax in vocabulary knowledge are well acknowledged, in what follows, the details in each dimension are to be elaborated.

The first aspect involved in lexical form is discussed surrounding word formation or endeavour of morphology. In Nation's (2013) framework, it is concerned with what parts are recognizable in words. Western morphology always defines a lexical word as one or more morphemes, the smallest unit of language that has its meaning and that could stand alone in a language. Thus, verbs that consist of only one independent morpheme are termed simple verbs whereas verbs that are made up of more than one independent morpheme are compound verbs. However, referring to Chinese word formation, syllables play a more important role than in English. In Chinese morphology, the syllable is associated with a Chinese character as well as a meaning. When a syllable is associated with more than one meaning, it is generally the case that each meaning is written with a different character. Modern Mandarin is poly-syllabic and in most cases rich in two syllables, a complex verb consisting of two mono-morphemic syllables, except for some polyphonic words such as "和 *he2 'harmony'*" in 讲和 *jiang3he2 "negotiate"* and "和

huo2/4 'stir'" in 和好 *huo2/4 "stir well"*.

Another important aspect pertaining to lexical form is word class or part of speech. Dichotomy postulated by traditional grammarians claims that action verbs can fall into two categories: transitive and intransitive. An action verb is transitive if it can licence a direct object while intransitive if it only has a subject. Nevertheless, Hopper and Thompson (1980) have argued, when discussing the prototypicality of transitivity, that transitivity is a scalar notion and it is the result of the combination of numerous criteria. The more features it is endowed with, the more prototypical it is. In that regard, Huang et al. (2009) and Gao (2001) have claimed that the typical V1 is a transitive action verb.

In Mandarin Chinese, there are far more transitive action verbs than intransitive ones. Intransitive action verbs are those indicating posture like 站 *zhan4 "stand"* and 坐 *zuo4 "sit"*, body movement, like 跳 *tiao4 "jump"* and 爬 *pa2 "crawl"*, emotion verbs like 笑 *xiao4 "smile"* and 哭 *ku1 "cry"* and physical or chemical changes such as 变 *bian4 "turn"* (Yip & Don, 2004). As regards those intransitive verbs, Permultter (1978, 1983) divided them into unergative or unaccusative in his Unaccusative Hypothesis. According to Levin and Rapport (1995), unaccusative verbs can be verbs of change of state (e.g., 碎 *sui4 "broken"* and 开 *kai1 "open"* in Chinese RVC) or verbs of change of location (e.g., directional verb 来 *lai2 "come"* and 到 *dao4 "arrive"*). To illustrate, a pair of sentences with RVC *跳下 tiao4xia4 "jump down"* are presented in (2-1a and 2-1b):

2-1a.从床上跳下几个孩子(unaccusative verb in Chinese)

"Several children jumped down from the bed."

2-1b.几个孩子从床上跳下 (unergative verb in Chinese)

"A few children jumped on top of the bed."

In (2-1a-b), it is found that Chinese intransitive verbs exhibit an unaccusative-unergative distinction in terms of syntax and semantics. Therefore, it is safe to say that noun phrase movement from the object to the subject position is obligatory in English but optional in Chinese (Kong, 2018).

Verbal classification has been examined by a great number of linguists and philosophers (e.g., Halle, 2018; Smith, 1991,1994; Soh & Nomoto, 2014; Van Gelderen, 2018). Apart from verbal classification based on transitivity, verbs can be classified according to their situation aspects. Aspect can be defined as the internal temporal structure of a verb (Bussmann, 1996/2000) while situation aspect refers to the internal structure of the situation (Soh & Nomoto, 2014). The seminal situation aspect class is Vendler classes (Soh & Nomoto, 2014) in which four classes are identified: activity, accomplishment, achievement and state. Such a classification seems to be available in Chinese (Soh & Nomoto, 2014). What is different is that at the simple verb or mono-morphemic level, only stative verb and activity verb can be found (Lin, 2004; Sybesma, 1997) and at the complex verb or RVC level, both achievement verb and accomplishment verb are permitted (Soh & Kuo, 2005; Tai,1984, 2003). Achievement verb indicates events of change that are completed instantly while accomplishment verb depicts an event with an inherent endpoint at which the result state is realized. Simple accomplishment verbs, however, were rare in Mandarin Chinese (Huang & Shi, 2016). It follows that matrix verbs in RVC are always activity verbs like 打 *da3 "beat",* 踢 *ti1 "kick",* 听 *ting1 "listen",* 学 *xue2 "learn"* etc. The RCs are the stative verbs, like 好 *hao3 "well",* 碎 *sui4 "broken",* 死 *si3 "die"* etc. RVCs are always achievement verbs or accomplishment verbs, such as 打死 *da3-si3 "beat death",* 踢碎 *ti1-sui4 "kick broken",* 提高 *ti2-gao1 "improve",* 弄坏

nong4-huai4 "damage" etc. Occasionally, some simple verbs can function as both a stative verb and activity verb, such as 累 *lei4 "tired"* in the compound 累死 *lei4si3 "die for being tired"* which can be construed as an activity verb and in 走累 *zou3lei4 "walk-tired"* as a stative verb.

When it comes to lexical semantics, it seems to be more likely that a lexical item (simple or complex) is polysemous or ambiguous. The issue of polysemy and ambiguity has been hotly debated. Polysemy is a linguistic term for a word with two or more meanings, usually multiple or related meanings, which is pervasive in language. According to the Standard Assumption (Rakova, 2003), among several lexical meanings for a polysemous item, the major meaning is called literal meaning or prototypical meaning and all other meanings are metaphorical meanings or non-prototypical meanings usually derived from literal meaning. If there are several literal meanings, only one primary literal meaning is required. In the same vein, in Cognitive Semantics, polysemy has been described under the Prototype Effect Theory. The prototype-based polysemy structure is a radical network. The cluster of different senses is related to the central sense and less prototypical sense in various ways. The less prototypical senses are derived from central meaning through mechanisms of meaning extension like analogy, metaphor etc. In the course of language acquisition, the central meaning is learned earlier than the less prototypical meaning (Geeraerts, 2010).

Lexical ambiguity refers to the property of being ambiguous for a linguistic item, which can be demonstrated in (2-2).

(2-2). 我　追累　他　　了。

Subject RVC　Object　Aspect marker

"I chased him, which made him tired. / I chase him, which made me tired."

In (2-2), RVC 追累 *zhui1-lei4 "chase-tired"* occurring in the SVO is ambiguous for it allows either the subject or the object of the compound to be understood as the one becoming tired from chasing (Huang et al., 2009).

In Cognitive Linguistics, lexicon and syntax are claimed to occupy a continuum (Szczesniak, 2014). The role of syntax in vocabulary learning has been acknowledged by an increasing number of linguists from different theoretical schools. For example, Competition Modal (Bates et al., 1982) emphasized that syntactic patterns are controlled by lexical items and lexical items provide cues for sentence production. Syntactic Bootstrapping Hypothesis in child language acquisition claimed that the syntactic structure in which a verb may appear can facilitate the acquisition of the vocabulary (Lee & Naigles, 2005, 2008). Similar viewpoints are shared by Lexicalist Parsing Models of syntax by Alissa and Christian (2005) and a phenomenon termed *syntactic preference* or *structural preference* (Segaert et al., 2014). The close relationship between syntax and lexicon has been confirmed by a multitude of other researchers (e.g., Melinger & Dobel, 2005; Singleton & Leśniewska, 2021). It might be pedagogically implicated from its close relationship that in a classroom setting, instructors should adhere to typicality principle for the selection of example sentences (Wang, 2011).

2.2.2 Vocabulary and Corpus

When vocabulary knowledge has been well acknowledged, the most useful tool to derive vocabulary knowledge is assuredly all kinds of corpora. Thus, the relationship between vocabulary and corpus is reviewed for the following reasons. First, it seems that corpus-based analysis has been a widely used research method in TCSOL and researchers

can employ statistical data to inform the pedagogical decisions in language education (e.g., Gao et al., 2014). Second, the corpus is the most important instrument to grade the lexicon and prototypicality. It is no exaggeration to argue that corpora and corpus-based studies have revolutionized the study of language and the applications of language over the last few decades (Hunston, 2002).

Corpus can provide us with a basic tool to identify frequent categories based on which lexical syllabus is designed. A case in point is Academic Word List developed by Coxhead (2000) according to the frequency of occurrence in academic texts. Historically, the pioneering impetus for frequency listings in the lexical syllabus in the early decades of the twentieth century is decidedly educational. It has to be admitted that in the lexical syllabus, the vocabulary of a language can be graded according to various criteria: the formation of words (root morpheme and compound), the statistical frequency and use, the pedagogic consideration etc. (Bussmann, 1996/2000).

Prototypical members of a category are, in most cases, extracted from actual usage based on their frequency in the corpus. For example, Brezina et al. (2015) claimed that frequency of use is an important indicator of the typicality of a word association. Researchers in Corpus Linguistics always equate the prototypicality with high frequency though it is somewhat problematic. Gilquin (2006) has explored the prototypical causation by reference to the most frequent types of constructions found in the corpus data. Divjak and Arppe (2013) proposed a methodology to obtain the prototype from usage as is evident in corpora. Ji and Liang (2018) investigated the corpus-based animacy hierarchy within inanimate nouns by taking the prototypical approach.

Corpus can be employed to explore language and uncover aspects of usage or patterns that have previously been under-described or perhaps even misunderstood, as

suggested by Sinclair (1991, 2004). Pattern and lexis are mutually dependent: each pattern occurs with a restricted set of lexical items, and each lexical item occurs with a varied set of patterns. In addition, patterns are closely associated with meaning: 1) in many cases, different senses of words are distinguished by their typical occurrence in different patterns; 2) words which share a given pattern tend to share an aspect of meaning (Hunston & Francis, 2000).

Different types of corpora can complement each other in terms of the validity of lexical syllabuses. For example, historical corpora contain old-fashioned or unfamiliar words and spellings as well as possible characters that no longer exist in a modern language. General corpora are deemed representative of the whole language and generally to be used for a wide variety of different research objectives. In contrast, specific corpora are often only of limited use to the general public, such as learners' corpus. Learners' corpus, as its name suggests, contains text produced by students or learners at different levels and stages of language acquisition, often restricted to L2 learners, like the HSK dynamic writing corpus. Occasionally, the corpus of L1 learners is available at researchers' disposal (Weisser, 2016).

Corpus can provide information about the overall frequency of lexeme and particular contexts in which it occurs (Yilmaz & Soruç, 2015). On the face of it, frequency seems to be one of the most straightforward methods of looking at corpus data. In the case of lexical items, the frequency is obtained with respect to token frequency and type frequency. Token frequency examines raw token counts of individual words. However, token frequency alone is not likely to explain the acquisition, in that it has been argued that the frequency in language acquisition is based on usage patterns or how the compound is patterned in corpus rather than purely based on the token frequency. Thus, regarding the

frequency in language acquisition, researchers should take the construction frequency and type frequency into account. Type frequency or word types can be employed as an indicator of the productivity of verbs (Crossley et al., 2014).

Central to the entire discipline of Corpus Linguistics is the concept of concordance, through which the usage and patterns of lexical items can be discovered and generalized. Sinclair (1991) described it as a way to obtain the listed reference to a word form. It has to be admitted that the quality of evidence about the language which can be provided by concordances is quite superior to any other methods, especially in the past three decades. When great advances have been witnessed in the field of technology and concordance programs, they can provide us with a representative picture of which usages are most typical and to what degree variation occurs both within and across varieties. For example, researchers and instructors always do Regex (blending of regular expression, a kind of complex search in Corpus Linguistics) with concordance to search for the construction frequency.

Corpus can provide us with collocational knowledge of lexical items. Collocation can be defined as the co-occurrence of words or a node-word co-occurring with collocates in a span of words to left and right (Stubbs, 2002). An example RVC 打死 *da3si3 "beat to death"* may illustrate its collocation. If the V1 打 *da3 "beat"* is a node, a technical term in corpus linguistics, 死 *si3 "die"* will be the collocate that can collocate with 打 *da3 "beat"* to form RVC and vice versa. More evidence indicated that collocational error was a common type of error by CSL/CFL learners, as shown in the problem statement in Chapter 1. Meanwhile, collocation is an important dimension of use in Nation's (2013) framework of knowing a word. There is a consensus that collocational knowledge is important for developing L1/L2 language skills (McIntosh et al., 2009; Nesselhauf, 2005).

However, a corpus is not without shortcomings. For example, Cook (2001) made the criticisms that a corpus cannot tell us how speakers process language in the mind or what the intention behind the use of a common pattern may be. It is always the case that no corpus can incorporate the totality of language because of improper and skewed representation of text samples (Dash & Arulmozi, 2018). Nonetheless, these limitations of the corpus can be mitigated by combining multiple methods and data.

The finding derived from corpus data can be validated via methodological triangulation that inspired researchers to triangulate the corpus method with a wide range of other research methods in linguistics, like psycholinguistics, language acquisition etc. For example, it has been suggested by some scholars (e.g., Egbert & Baker, 2020; Ellis & Wuff, 2020) that it is encouraging of further collaborations between corpus linguistics and usage-based language research. This trend is reflected in the following statement:

> The triangulation of corpus methods with other research methodologies will be an important further step in enhancing both the rigour of corpus linguistics and its incorporation into all kinds of research, both linguistics and non-linguistics. To put it another way, the way ahead is methodological pluralism. This kind of methodological triangulation is already happening, to some extent... but we would argue that it needs to be taken further (McEnery & Hardie, 2012, p.47).

To sum up, there are two main reasons to use corpora: 1) Using basic searches like collocation and concordance, corpus data are crucial for comprehending the structure of the archetypal RVC and its constituent parts through type frequency and token frequency. 2) By using a sophisticated search engine like Regex to analyse corpus data, we may obtain the frequency distribution of several alternative constructs that RVC can license to find the archetypal syntactic context. To counteract the corpus's fundamental weakness and obtain

triangulating data for improved validity, multi-corpora and other data strands can be employed.

2.3 Theoretical Assumptions in Cognitive Linguistics

Prototype Effect Theory (PET), the cornerstone theory in Cognitive Linguistics, is the theoretical underpinning under which the prototypical RVCs are analyzed. Therefore, it is necessary to briefly introduce some basic concepts in Cognitive Linguistics in the following section for a better understanding of the parameters of prototypical RVC and the mechanism of learning in Cognitive Linguistics.

2.3.1 Basic Tenets in Cognitive Linguistics

This section is exclusively dealt with six important concepts in relation to the notion of prototype and language learning: construction, entrenchment, idiomaticity, productivity, schematicity and idealized cognitive model (ICM).

Construction refers to the form-meaning pairing which has been highlighted in the vocabulary knowledge. In particular, a grammatical construction is any string of words or morphemes exhibiting a coherent pattern. A construction can demonstrate itself in all levels of grammatical description ranging from a phrase (like a noun phrase or a verb phrase) or a complex lexeme (like a phrasal verb) to an entire sentence or a clause (Geeraerts, 2006; Hoffmann, 2020).

Entrenchment can be defined as the degree to which a construction is established and represented in a speaker's knowledge of grammar or a gradient unit is stored, which arguably went back to Langacker (1987/2004). It is in relation to input frequency in usage-based language acquisition, since Cognitive Linguistics is a usage-based modal of grammar. An analyzable unit may become independently and redundantly entrenched if it

occurs frequently enough. Goldberg (2006) admitted that patterns are stored if they are sufficiently frequent, even when they are fully regular instances of other constructions and thus predictable.

Idiomaticity is the feature of non-compositionality (Chomsky, 1980; Gibbs, 1980; Tabossi et al., 2008; Wang et al., 2023), to the effect that the figurative or non-literal meanings are not functions of the meanings of their part. Cognitive linguists believe that idioms are partially analyzable or non-decomposable. Therefore, the analyzability of an idiom is a matter of degree depending on the salience of their individual parts. The more salient an individual part is within an idiom, the more likely that component or word shares the semantic field as does its idiomatic referent (Gibbs & O'Brien,1990). Besides the frequency, semantic transparency may influence the interpretation of the idiom, which was supported by various scholars (e.g., Gagne & Spalding, 2016; Mok, 2009; Ramonda, 2017 etc.)

Productivity is the degree to which a schematic construction can yield new instantiations. It is a gradient term and determined by the relative type-token frequency of component units and therefore indicative of the lexical organization of those units. High type frequency enhances productivity, while high token frequency inhibits productivity (Clausner & Croft, 1997). The productivity of RVC is shown by the flexibility of the RCs that can occur with a given V1 and of the V1s with a given RC. Bybee (1985) argued that a highly productive morphological schema results when there is a high type frequency of low token frequency lexical items which instantiate the schema.

Schematicity is a relation between a schematic unit and its instantiations or exemplars. A schematic unit represents a generalization over specific instantiations. For example, the unit *Action Verb* generalizes over a great portion of Chinese verbs, such as 打

da3 "beat", 踢 *ti1 "kick",* 跑 *pao3 " run",* 唱 *chang4 "sing"* etc. Complex verbs may also be schematic. The complex verb RVC[RVC－V1+RC] is a general schema for almost all the resultative compounds in Chinese. The relation between a type and its token can be described as one of schematicity, like 打 *da3 "beat" + RC* and 打碎 *da3sui4 "beat broken"*.

In Construction Grammar, the degree of schematicity at which a given construction, such as the RVC in Chinese, is represented is thought to depend on the number and scope of "open slots" it contains. The "open slots" in RVCs are the component elements of RVC, namely, V1 which can function as the matrix verb in RVC and RC which acts as a resultative complement. The scope of a slot is determined by its type frequency (Blumenthal-Dramé, 2012). Schemas of any complexity may exist in schematic hierarchies. For example, the general schema "V1+RC" may instantiate intermediate schemas like 打 *da3 "beat"+ RC,* 踢 *ti1 "kick"+RC* or *V1+*死 *si3 "die", V1+*完 *wan2 "over", V1+*进 *jin4 "enter" etc.* An intermediate schema may in turn instantiate even more specific schemas for particular verbs. For example, in 打 *da3 "beat" +RC*, there are 打碎 *da3sui4 "beat-broken",* 打完 *da3wan2 "finish playing",* 打乱 *da3luan4 "disarrange",* 打死 *da3si4 "beat to death",* 打走 *da3zou3 "beat away",* 打跑 *da3pao3 "beat-run",* 打傻 *da3sha3 "beat-stupid"* etc.

ICM denotes a concept or cluster of related concepts that defines our knowledge of a category. Divjak and Arppe (2013) claimed that Prototype Effect is the by-product of ICM organization and the prototype is the members of a category which best fits the definition of ICM. Idealised across a variety of personal experiences, an ICM is typically arranged according to a specific image schema. Therefore, Zhang (2008) regarded ICM as

a parameter in the criteria of prototypicality. There are five types of ICMs in all: image-schematic, propositional, metaphoric, metonymic and symbolic.

2.3.2 Prototype: Theory and Practice

The notion of prototype in PET started from the theory of categorization. It originated in the mid-1970s with Rosch's series of research (Rosch, 1973a, 1973b; Rosch et al., 1976a, 1976b; Rosch & Mervis, 1975; Rosch, 1975; Rosch & Oliver, 1972) into the internal structure of categories and semantic categories, like focal colour, form etc. When describing categories analytically, most traditions of thought have treated category membership as a digital, all-or-none phenomenon. It is always assumed that categories are logically bounded entities, membership of which is defined by an item's possession of a simple set of criterial features, in which all instances possessing the arterial attributes have a full and equal degree of membership (Rosch & Mervis, 1975). Subsequently, from the fact of the colour terms, it has been found (Rosch,1975; Rosch & Mervis,1975; Rosch et al., 1976a,1976b) that a particular area of the colour spectrum is more salient or typical than others and then it became the cornerstone theory in Cognitive Linguistics. In what follows, relevant research is reviewed to identify the defining properties of prototypical members so that prototypical RVCs are easier to analyze.

2.3.2.1 Defining Features of Prototype

Etymologically, prototype is a Greek-origin word in which two morphemes are included. The *proto-* means "first" while *-typos* means "form, shape and image". The history of the prototype suggests that it for the first time appeared around the early 18th century and then became a hot issue from the second half of the 20th century, reaching its peak at the beginning of the 21st century, as shown in Figure 2.2.

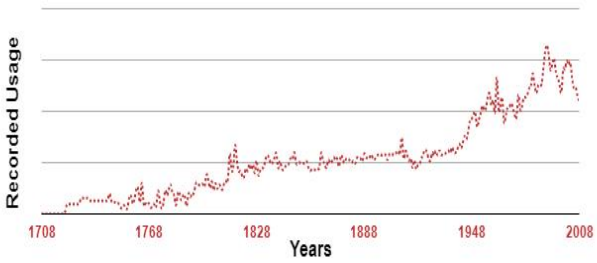


Figure 2.2: Trends of Usage of "Prototype" in All Years (Collins, 2024)

Various definitions of the prototype have been given in history: (a) the modal or proto-image of all representatives of the meaning of a word or of a category. (b) the bundle of typical features of a category. (c) the features themselves can also be more or less typical, *i.e.* they can have a higher or lower "cue validity"- a probabilistic concept related to the frequency of category (Bussmann, 1996/2000; Rosch et al., 1976a,1976b). In Langacker" s (1987/2004) view, a prototype is a unit in a schematic network which is naturally most salient, most often thought of and most likely to be chosen as representative of the category. Taylor (1995) regarded a prototype as the central member or cluster of central members of a category, and a semantic representation of the conceptual core of a category.

The answer varies to the question that which one is more basic or typical among the members of a category. For example, as adduced by Lakoff (1987/2008), the typical meaning of "mother" has been identified based on different models. Their discrepancy in the criteria of prototype seems to indicate that there is no single, generally accepted cognitive model for such a common concept as "mother". However, one point to be sure of is that the prototype effect entails the asymmetry in a category and basic-level effect.

A couple of concepts pertinent to the notion of prototypicality have been discussed in previous studies, such as Basic-level Effect, Markedness Theory etc. For example, according to the Basic-level Hypothesis (Hajibayova, 2013; Jitsumori, Ohkita & Ushitani,

2011; Radchikova, 2003), items at a basic-object level show a greater prototype effect than lexeme subordinate to the basic object level. It follows that the prototype is early in the acquisition and a short, morphologically simple item. It maximizes the number of attributes shared by members of a category and enjoys high overall frequency in actual language.

Another crucial term used by linguists to describe a kind of prototype effect is Markedness (Lakoff, 1987/2008). According to Lehrer (2014), the unmarked member showed more prototype effects than the marked one. Janda (1996) has explained the markedness in terms of prototypicality that markedness correlated with distance from the prototype of a category, with the least marked elements closest to the center, and the most marked member in the peripheral positions.

To sum up, the key characteristics of the prototypical member should be the following: morphologically short and simple, unmarked and basic, the first item that learners can think of, maximally informative and enjoying priority and preference in language acquisition and language use.

2.3.2.2 Lexical Prototypicality, Semantic Prototypicality and Syntactic Prototypicality

As stated in Section 2.1, form, meaning and syntactic usage are three indispensable dimensions involved in vocabulary knowledge. A similar viewpoint is shared by Larsen-Freeman (2001). She came up with Three-dimensional Framework of Grammar Teaching in which a grammatical unit should cover three basic parts: form, meaning and syntactic usage. Thus, when the central notion of prototypicality is introduced to integrate with three aspects of the vocabulary knowledge, three terms are introduced accordingly, *i.e.,* lexical prototypicality (LP), semantic prototypicality (SeP) and syntactic prototypicality (SyP).

LP, SeP and SyP are not brand-new terms and have been discussed in previous studies. For example, Dobrić (2015) evaluated the SeP by embarking on a corpus-based investigation of the verb "*look".* Gries and Wulff (2005) examined the LP and SyP by identifying the prototypical instances of ditransitive verbs and related constructions.

LP can be measured with respect to corpus data like token frequency and type frequency, due to the fact that frequency information and productivity are features of more prototypical morphemes (Wu, 2018; Zhang, 2006). LP of verbs, though fewer in number, in different languages has been analyzed by some researchers, such as English strong verbs (Bybee & Moder, 1983), *TRY* in Russian and *THINK* in Finnish (Divjak & Arppe, 2013), English transitive verb (e.g., García-Miguel, 2010; García-Miguel & María, 2015; Levin, 1999) and Chinese verbs (e.g., Myers, 2016; Van Hoey, 2020; Zhang, 2019; Jin, 2022). In the current research, the prototypicality of whole word and component morphemes of RVC is within the scope of LP of RVC.

SeP is possibly the earliest area to be discussed in Cognitive Linguistics. Hopper and Thompson (1984) have admitted that the prototypical members of a category could be examined in terms of semantic and discourse functions. Three good examples of SeP among different senses of a word have been illustrated in the verb "*take"* (Norvig & Lakoff, 1987*),* the word "*lie"* (Coleman & Kay, 1981) and the preposition "*through"* (Gilquin & McMichael, 2018). SeP of RVC in the present study is investigated from two aspects: the prototypicality of polysemous V1s and the semantic orientation of RCs.

SyP always refers to the prototypicality among alternative syntactic constructions licensed by a given lexical item. For example, Taylor (1995) and Gilquin (2006) have argued that syntactic construction in English shows prototype effects. Thus, the prototype effect in syntactic usage can be exhibited in various syntactic constructions, like

preposition *"by"* and passive structure (Winters,1990), passive and related constructions (Shibatani, 1985), transitive clauses (Rice, 1987), dative alternation (Gries, 2003). Ross (1987) claimed that certain types of sentences and constructions are prototypical. Slobin and Bever (1982) went a further step to assert that simple, active, affirmative, transitive, declarative sentence is canonical or prototypical.

Different criteria have been adopted to examine the SyP. For example, Winters (1990) has listed six features almost universally manifested in Indo-European languages to identify more prototypical constructions. They are high token frequency, high type frequency (productivity), salience in discourse function, transparency in which the ease of production and clarity of perception must be satisfied, autonomy, and naturalness.

2.3.2.3 Criteria of Prototype Identification

Prototype per se is a prototypical concept. Influenced by different theoretical stances and research objectives, it can be measured based on different criteria. That is possibly the reason why the issue of the criteria of the prototype has been a subject matter of constant debate since it was born. According to Gilquin (2006), prototypicality is a multi-faceted concept. However, when all the various facets of prototypicality point in the same direction, they can converge. For example, a three-factor criterion has been proposed by Dobric (2015) to evaluate the levels of SeP: frequency of occurrence, contextual salience and inter-category similarity. In the converging criterion, the role of frequency of occurrence cannot be denied and it is best described as a central factor determining the semantic centre of a polysemous lexeme. Nearly the past half century witnessed the development of prototype identification, from intuition-based account through corpus-based criteria to the convergence evidence of the prototype, which is elaborated as follows.

The earliest criterion of prototype is related to the perceptual sensation and proposed by Rosch et al. (1976a) who claimed that prototypicality of natural categories, like form, colour had a natural basic category. In her psychological experiment, the prototypical members were derived from subjects' intuition or subjective rating, which is called an intuition-based account of the prototype. Rosch et al. (1976b) proposed five criteria for the typicality: subject rating of the typicality of the items, order in which items are learned, verification times for category membership, probability of item output and expectation generated by the category.

Though as the heart of empirical work in Cognitive Linguistics, introspection or intuition, has been widely acknowledged that it truly reflects something about the ways ordinary people think and use language, some researchers cast doubt on the validity of intuition (e.g., Gibbs, 2006). People's introspection about their beliefs, feelings, and the reasons for their actions, is often believed to be inaccurate due to the fact that there is very little that people can reflect on regarding many of the cognitive and affective processes. Therefore, psychologists have been consistently sceptical about linguistic intuitions as the primary basis for creating theories of language and language use.

The second criterion of prototypicality emerged with the boom of Corpus Linguistics, which is called the frequency-based account of the prototype (e.g., Brugman & Lakoff, 1988; Lakoff, 1987/2008; Rice, 1996;Tsohatzidis, 1990; Tyler & Evans, 2004). Rosch (1973a, 1973b) admitted in her research that the prototypical items are the most frequent items and the prototypical items are the most maximally informative, when accounting for the reasons why prototypical items are prone to be learned first. Therefore, frequency of occurrence has been frequently deemed as a strong indicator of the judgement of prototypicality (Dobrić, 2015; Stamenković & Tasić, 2013). It has been pointed out by

Tummers et al. (2005) that all sorts of prototype-theoretical analyses might use frequency as an indication of prototypicality and usage tendencies, in that frequency in text instantiates entrenchment in cognitive system (Schmid, 2010).

The frequency of occurrence, which comprises not only the absolute frequency of occurrence but also construction frequency and type frequency which are often extracted and analyzed based on the different kinds of corpora (Divjak & Arppe, 2013; Gilquin 2006; Glynn, 2016; Gries, 2003, 2008, 2016). This goal can be achieved by means of data triangulation, to the effect that validation of data can be facilitated through more than two sources so that the inadequacy in one approach could be minimized. The process of language acquisition is far more complicated than absolute frequency counts.

Nevertheless, frequency of occurrence is not the only indicator of prototypicality, especially in the absence of context (Gries, 2008, 2016). As quoted in Taylor (1995), Rosch has warned us to be suspicious of frequency as the only explanation of prototypicality. It is likely that L2 learners use a variety of linguistic properties to facilitate word learning such as context, perceptual salience, word distinctiveness and word prototypicality. Also, it is likely that the conditional frequency of the word within a specific construction is a better predictor of lexical acquisition than absolute word frequency (Crossley et al., 2014).

Due to the relative weakness of frequency, more converging evidence has been supplemented as the criterion of the prototypicality, including both language-universal features, like introspection, corpus-based frequency and language-specific features related to a given grammatical item. As cited in Gries (2003), Barsalou (1985) admitted that there seems not to be a single universally valid criterion for the prototypicality of a particular category member. Lakoff (1987/2008) took *motherhood* as an example to illustrate that

prototypicality is a concept that is based on a complex model in which a number of individual models combine, forming a cluster model, or there is more than one criterion.

The multi-faceted criterion of prototypicality pushes scholars to conduct an increasing number of relevant studies. For example, Shibatani (1985) analyzed the language-specific features of prototypical passive construction by referring to the typological characteristics and related constructions. Those language-specific features include de-focusing of agent, semantic property in terms of semantic salience and affected subject, syntactic properties in syntactic encoding and valence of predicate, as well as the morphological properties. Dobric (2015) adopted a corpus-based three-factor approach of prototypicality, namely, frequency of occurrence of a sense, contextual salience and inter-category similarity to examine the highly polysemous verb "*look"*. Frequency of occurrence means that the more frequent a given linguistic structure is, the more prototypical in semantics it will be, as stated in the corpus-to-cognition principles. The contextual salience measures how many contexts a sense appears in. The less contextually constrained a sense is, the more prototypical it will be. Category similarity measures how many contexts a sense shares with other senses of the same lexeme. The less contextually constrained a sense is, the more prototypical it will be. Zhang (2019) explored the prototypicality of Chinese labile verbs (verbs that may be used transitively or intransitively) by using a small corpus and the cognitive analysis under the framework of cognitive construction grammar.

The updated attention might be worthy of being paid to Gilquin and McMichael's (2018) research which has presented us with an empirically converging criterion of prototypicality (as shown in Figure 2.3).

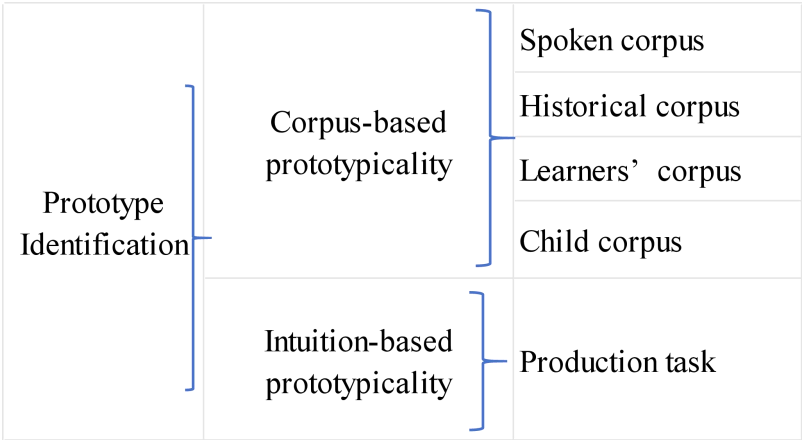


Figure 2.3: Converging Criteria of Prototypicality (Gilquin & McMichael, 2018)

In the construct, four different types of corpora are involved, namely the frequency of use in spoken corpus, historical origin based on etymological dictionary and historical corpus data, pattern through a child language corpus and patterns from a learner corpus. Besides the corpus triangulating data, intuition-based data---ease of elicitation are collected with respect to the production task. For the sake of its high validity, this convergence evidence of prototypicality is adopted in the present study as an analytic framework to examine the LP and SyP of Chinese RVC, respectively.

2.3.2.4 Prototype Effect in Language Acquisition

Prototypicality, as a cornerstone concept in Cognitive Linguistics, has been not only applied in the relevant linguistic analysis but also investigated in a handful of language acquisition in the context of both L1 and L2 (Liang, 2014).

The prototype effect in language acquisition in the context of L1 has been touched on from an earlier age. Since the 1970s, a great number of scholars have carried out empirical research to investigate the prototype effect in child language acquisition (e.g., Bowerman,1976; Ibbotson & Tomasello, 2009; Meints,1995; Rosch, 1973a, 1973b). For example, Anderson and Shirai (1996) presented a prototype-based account for the first language acquisition of tense-aspect morphology by using the data from CHILDES. It was

found that children restricted their use of tense/aspect inflections to the prototype of the category. Langacker (1987/2004) has claimed that the category prototype has developmental priority and cognitive salience. Ibbotson et al. (2013) brought together several lines of cross-linguistic research to demonstrate the role of prototypicality in young children's acquisition of transitive construction. The research finding confirmed that frequency, as one indicator of prototypicality, plays an important role in the acquisition and highly frequent constructions are acquired first by children.

Besides, the prototype effect arouses the attention of numerous scholars in the context of L2. For example, Year and Gordon (2009) examined the acquisition of English ditransitive construction by Korean speakers to investigate whether a prototypical ditransitive verb with high frequency will facilitate the acquisition of English ditransitive construction. The findings support the facilitative effect of high-frequency prototypicality on L2 learning except for their claim that its effect might interact with other factors. Liang (2014) examined the role of prototypicality, together with other factors in the acquisition of polysemous 上 *shang4 "go up"*-phrases in Chinese as a second language.

Apart from those studies mentioned above, the concept of the prototype appears to have something in common with unmarkedness and basic level, as stated by Van Langendonck (1989, 1999, 2007). Therefore, acquisition based on Markedness theory and Basic-level theory might provide indirect evidence of prototype effect in language acquisition.

The notion of basic level meshes in with the prototype effect in language acquisition. As claimed by Lakoff (1987/2008, p.37), "linguistic categories should be of the same type as other categories in our conceptual system. In particular, they should show prototype and basic-level effect (p.58)". Rosch et al. (1976a) argued that knowledge is

primarily organized at the basic level and of the three levels of the hierarchy, the basic level might as well be viewed as the most prototypical.

The basic level can not only be applied to natural objects, but to linguistic items, such as word meaning and sentence, For example, Corrigan (1986) found that people tend consistently to rate sentences with animate actors, typical verbs, and animate patients were most basic. Ross (1987) argued that the basic or most prototypical sentence should be SVO with the form *"agent subject+verb of action+patient Object".* Corrigan (1991) reported a psycho-linguistic experiment to answer the question that whether there is a basic level in the sentence as a category. The findings suggested that the most prototypical or basic level sentences are similar to the simple, active, affirmative, and declarative sentences. The same is true of the basic level of the word meaning. For example, Callanan et al. (1994) conducted three studies to test the basic level constraint hypothesis that a basic level constraint guides preschool children's hypothesis about word meaning. The children are found to interpret novel words at the basic level only for items where they already know a basic level name and only the basic level cannot account for the differences in similarity across the item's types.

Regarding the role of basic-level categorization in L1 acquisition, it has been argued that in the natural contexts, categories at the basic level are the earliest ones to be acquired by children (Johnson & Mervis, 1997; Mervis & Crisafi, 1982). Rosch et al. (1976b) have predicted that children are able to categorize at the basic level before learning to categorize at other levels of abstraction. The basic level category is advantageous possibly because it is more fundamental than the other levels and seems to display a lot of processing advantages, relative to other levels (Collin & Mcmullen, 2005; Rosch et al., 1976b). Furthermore, it is the most cognitively efficient level and the most general level at

which category members have similar overall shapes.

On top of that, studies in the context of L2 acquisition seem to support the basic level effect. For example, Mervis and Crisafi (1982) designed an experiment and confirmed the hypothesis that the degree of differentiation of categories from one another is greatest for basic level, next largest for superordinate level categories, and smallest for subordinate-level categories. Differentiation Hypothesis (Daniali & Kim, 2022**)** accounted for the order of acquisition that "the order of availability (and therefore the order of acquisition) of different categorization schemes for a given set of stimuli is determined by the relative degree of differentiation of each of these categorization schemes (p.5659)". To put it in another way, the more differentiated categories at a given level are, the earlier categorization at that level will be acquired. Xia and Wolf (2010) conducted an experiment with the participation of Chinese adult learners of English. The results seem to favor the hypothesis that basic-level salience affects L2 vocabulary learning and basic-level labels are generally the preferred targets for learning.

However, the basic level theory is not without problems. A closer inspection of the data suggests that there lacks a solid ground for the basic level (e.g., Rosch et al.,1976b; Tversky & Hemenway, 1984) though Belohlavek and Trnecka (2020) tried to put the basic level category on a solid ground by providing the formalized basic level metrics within the framework of formal concept analysis. Two aspects of existing literature made it difficult to evaluate the role of basic-level categories in language acquisition (Mandler & Bauer, 1988): 1) the confounding between the basic level and superordinate comparisons; 2) the difficulty in evaluating the primacy of basic-level categories.

Apart from the Basic-level effect, another crucial theory related to prototypicality is the Markedness Effect Theory, originating from Prague Circle during the 1930s. It is

always used by linguists to describe a kind of prototype effect — an asymmetry in a category, where one member or subcategory is more marked than the others (Lakoff, 1987/2008). Unmarkedness and prototypicality indeed seem to go together in a so-called ICM and both unmarked and prototypical items usually display a greater lexical or text frequency. Janda (1996) has exploited the similarity between both of them to explain markedness in terms of prototypicality: “The position of the prototype in the radical category explains the priority of the unmarked element (p.224)” .

As with prototypicality, markedness permeates various levels of language, like morphology, lexicon, syntax, semantics etc. (Wurzel,1998). The Markedness effects in language acquisition have been supported by a long line of relevant research (e.g., Bardovi-Harlig, 1987; Hawkins, 2018; Mazurkewich, 1985; Rutherford, 1982). When the notion of Markedness was first applied to L1 acquisition (Reimers, 2014), it was claimed that those values which occur more widely in the world's languages are acquired earlier by children. In the field of L2 acquisition, the role of markedness has mainly been discussed in relation to issues such as learnability (e.g., Hyams, 1986; White, 1987), developmental sequences (e.g., Chaudron & Parker, 1990; Mazurkevich, 1985; Rutherford, 1982) and the influence of the mother tongue (e.g., Eckmann, 1977; Gass, 1979; Zobl, 1984). The Markedness effect in language acquisition can be attributed to frequency (e.g., Bañón et al., 2021), learning complexity (e.g., Hawkins, 2018), universal grammar (e.g., Mazurkewich, 1985) etc.

Markedness Differential Hypothesis (MDH) (Eckman, 1977; Mehrdad & Ahghar, 2015) has attempted to explain the degree of difficulty that L2 learners have by reference to the typological markedness of target language structure. In particular, the degree of difficulty involved in SLA is a function of similarity between target language and native

language on the scale of markedness. Based on MDH, several pedagogical implications follow from their assumptions.

1. L2 learners will acquire relatively less complex structures before more complex ones.
2. Similar material is to be presented before more complex material.
3. Less marked TL structure should be presented before more marked.
4. Only the most marked member of a category is taught, while none of the less marked structure is taught.
5. The direction of generalization should proceed from more marked to the less marked and not the opposite.

It is fair to admit that the relative degree of difficulties in MDH, different from the tenets in the Contrastive Analysis Hypothesis that difference means difficulty, does make us have enough room and elasticity to explain the learner error, which has been supported by a number of studies (e.g., Schachter, 1974). However, Kellerman (1979) argued that it is likely that MDH is valid in the area of syntax and phonology and cannot make predictions of second language errors in the areas of morphology and lexicon in SLA.

Basic-level effect and Markedness effect do reflect the asymmetric relationship or unbalanced distribution in the language category. They enable language learners to acquire the form, meaning and usage of words with more efficiency. However, their inherent problems, like the uncertainty and vagueness of the concept of both basic level and markedness and incompetence of making predictions in vocabulary acquisition compel researchers to turn to PET.

2.4 Features of Prototypical Chinese RVC: Form, Meaning and Syntactic Usage

In view of vocabulary knowledge in Section 2.2, this part is devoted to the language-specific properties of prototypical Chinese RVCs in terms of form, meaning and syntactic usage. Noted here is that the form refers to RVCs as a whole and their morphological components. Meaning focuses on the polysemous V1(打 *da3 "beat"*), as well as semantic predication of RC while syntactic usage is concerned with the alternative syntactic context where RVC may occur.

2.4.1 Previous Studies on the Chinese RVC

The 20th century and two decades of the 21st century have witnessed the development of three mainstream linguistics: Descriptive Linguistics, Generative Linguistics and Cognitive Linguistics. Previous studies surrounding RVCs started from efforts on the exact description of the structure in Structural Linguistics and then moved to the generative approach and cognitive approach. Thus, before the features of prototypical RVCs are made explicit in terms of form, meaning and syntactic usage, previous studies in Generative Linguistics and Cognitive Linguistics are necessary to be reviewed first, hoping to have a clearer trajectory of development of RVC research.

2.4.1.1 Generative Account of RVC

The Chinese RVC is earlier to be systematically discussed under the framework of Generative Linguistics, one of the explanatory theories. As summarized by Peng (2011), in Chomskyan approach to the research into RVC, different standards have been employed to classify RVC, such as the reanalysis approach (e.g., Huang, 1988), small clause theory (e.g., Peng & Sybesma, 2010; Sybesma, 1992, 1997, 1999; Sybesma & Shen, 2006), framework of distributional morphology (e.g., Xie & Guo, 2008), as well as theta grid and transitivity of component morphemes (e.g., Wang & He, 2002).

In the current research, the relevant seminal discussions by Huang et al (2009) and Li (1990) are reviewed to acquire a better understanding of the following parts and their profound contributions to generative research into Mandarin Chinese grammar. One point to be noted is that in Generative Linguistics, RVC is placed under the syntactic context rather than lexical features. Compared with the compounded verb, generativists are more concerned with the argument structure of a resultative construction, as illustrated in (2-3).

(2-3). 张钰涵 打碎 了 花瓶.

Subject RVC Aspect marker Object

"Zhang Yuhan broke the vase."

As shown in example (2-3), following the convention in theoretical syntax, the subject and object of a verb are called its ARGUMENTS, like *Zhang Yuhan* that acts as the subject of the transitive sentence and 花瓶 *hua1ping2 "vase"* which is the object of RVC 打碎 *da3sui4 "beat broken".* The semantic relation between a verb and any of its arguments is called a THEMATIC RELATION. Based on the fact that not every detail in the thematic relation between a verb and an argument matters in syntactic computation, thematic relation can be classified into various types or thematic roles (THETA-ROLES): agent, patient, theme, beneficiary, goal, source etc. In thematic relation, an agent is a relation in which the argument is doer or initiator and patient labels the "do-ee" argument. In a typical active sentence, the agent is always assigned to the subject while the patient is to the object.

The lexical entry for any predicate can be found using the theta-grid, which includes the theta-roles that its arguments bear, such as the verb *"cook"*<Agent, Patient>. In its theta-grid, it takes two arguments, an Agent and a Patient (Cook & Newson, 2000). Some linguists have claimed that the theta-grid of a verb is a hierarchically structured list

of theta-roles rather than an unordered one (e.g., Li, 1990, 1995). A structured theta grid is to restrict the pattern in which the theta roles of two components in a compound are identified and assigned(ibid).

Theta-identification is a mechanism proposed by Higginbotham (1985) for reducing the number of theta-roles a resultative compound assigned to its arguments, such as the compound 砸碎 *za2sui4 "pound-broken"* in the sentence 宝玉砸碎了花瓶 *"Baoyu pound broken the vase"*. The theta-grid of 砸 *za2 "pound"* is <Agent<patient>> while the theta-grid of verb 碎 *sui4 "broken"* is <Theme>. The theta-identification of the Patient role from V1 砸 *za2 "pound"* and the Theme role from RC 碎 *sui4 "broken"* is indicated with a hyphen<Agent <patient-theme>>. Once theta-identified, the two theta-roles are assigned together to the object NP. The theta-identification itself is optional in the context of RVC, that is the single theta-role of V2 may be optionally identified with either the Agent role or the Patient role of V1, exemplified in the ambiguous compound 追累 *zhui1lei4 "chase-tired"*.

Theta role: 追 *zhui1 "chase"*: <Agent <Patient>>

Theta role: 累 *lei4 "tired"*: <Experiencer>

Theta identification: 追累 *zhui1-lei4 "chase-tired"*:

<Agent <Patient-Experiencer>> or

<Agent-Experiencer <Patient>>

The compound can be optionally understood as subject or agent predicated or object or patient predicated.

Besides, the issues of semantic orientation and transitive alternatives of RVC have been discussed in generative literature. For example, a parametric approach was taken by Huang et al. (2009) to explain the difference in these properties between Chinese and English. The argument starts with two widely assumed principles: one is the Direction Object Restriction (DOR) proposed by Simpson (1983) who claimed that based on the facts in English, the result RC must be predicted on the object of V1, rather than the subject. The other is about the patterns of transitivity alternation. An unergative may transitivize by adding an internal argument and an unaccusative can causativize by adding an external argument (e.g., PSC: 花瓶打碎了*"The vase is broken."* vs SVO: 张三打碎了花瓶*"Zhang San broke the vase."*). However, an unergative does not causativize. The problem with Chinese resultative is that these principles, different from the facts in English, seem to be grossly violated. It is fair to say that many Chinese resultatives do exhibit a pattern of object predication (see 2-4).

(2-4) 张纳云 踢扁　　了　　我的篮球.

Subject RVC Aspect marker Object

"Zhang Nayun kicked my basketball flat."

However, abundant anti-examples exhibited subject predication (as shown from 2-5 to 2-7). Meanwhile, the third type- phase predication also does exist in Mandarin Chinese (see 2-8).

(2-5). 李四　跳累　了。

Subject RVC Aspect marker

"Li Si becomes tired because of dancing."

(2-6). 王莎 笑疯 了.

Subject RVC Aspect marker

"Wang Sha laughed to become crazy"

(2-7). 张纳云 吃饱 了 饭 了.

Subject RVC Aspect marker Object Aspect marker

"Zhang Nayun ate rice full."

(2-8). 小王 跑到 河边

Subject RVC Object.

"Little wang ran to the bank of the river"

In the above four examples, (2-5), (2-6) and (2-7) are subject predication. In the examples, V1s, like 跳 *tiao4 "dance",* 笑 *xiao4 "smile"* are unergative but not unaccusative, yet the activity 吃 *chi1 "eat"* is a transitive action verb. In contrast, (2-8) is verb or phase predication, which is elaborated in the following section.

Semantic orientation pertains to the nature of RC. For example, the stative verb 腻 *ni4 "bored"* seems to be oriented toward an agent but not a patient or affectee. Therefore, both 追累 *zhui1-ni4 "chase-bored"* and 看腻 *kan4-ni4 "watch-bored"* only have subject-predicated interpretations. Other examples with such *RCs* include 看见 *kan4jian4 "look-see",* 看懂 *kan4-dong3 "look-understand"* and 听懂 *ting1-dong3 "listen-understand".* Therefore, it is possible to conclude that, on occasion, an RC may be predicated on a subject even in the presence of an object. In the absence of an object, an RC can always be predicated on a subject even in the absence of a "fake reflective".

As a response to the fact that DOR ignores the distinctions between Chinese and English, Hovav and Levin (2000) developed the Force Recipient Principle. Later on, Huang (2009) simplified the principle and proposed another integrated theory-Minimal Distance Principle to give a better account for the Chinese resultative patterns.

Force Recipient Principle (Hovav & Levin, 2000)

1. In a resultative construction, the Result is predicated on the argument bearing the role of force recipient of the relevant action or event, if such a recipient exists.

2. If no force recipient exists, the Result is predicated on the subject.

Minimal Distance Principle (Huang, 2009)

In a resultative construction, the Result XP is predicated on the closest prominent argument.

In the past decades, numerous grammarians and scholars in the generative grammar tradition have made multi-dimensional and in-depth analyses and comparisons over the argument structure of resultative construction and the feature of V1. However, it is apparent that the dualism in the philosophical foundation underlying the generative grammar theory is incompatible with the continuum theory embedded in the cognitive approach. Thus, the current study is in a position to adopt the ideological basis of Cognitive Linguistics from which, the notion of prototypicality commenced and thrived. However, it is fair to admit that the analyses by generative linguists provided us with an insightful and inspiring explanation for the research into the SeP and SyP of RVC.

2.4.1.2 Cognitive Account of RVC

Under the framework of Cognitive Linguistics, various theories have been adopted to offer an inspiring description and explanation of both Chinese and English resultative construction, such as event theory, Talmyan theory, PET etc.

Event Theory was mostly employed to explain the RVC, in line with Hovav and Levin's (2000) proposal that an appeal to semantic concepts or events explains the characteristics of the construction. For example, Hovav and Levin (2000) presented an event structure account of English resultative. Song (2007) made a fine-grained event-based classification on Chinese RVC: motion events, change of state events and events of temporal contour. This classification was roughly equivalent to directional RVC, intransitive resultative RVC, prototypical causative RVC, non-prototypical resultative RVC and completive RVC, respectively. Basciano (2019) provided an account of event structure of Chinese simple change resultative compounds and complex change resultative compounds.

Talmyan theory is another widely adopted theory to analyze Chinese RVC in Cognitive Linguistics. Talmyan important work on the lexicalization of motion events decisively plays a significant role and occupies a very special place in linguistic typology, one of the most active research areas (Batoréo & Ferrari, 2016). According to Chen (2008), Chinese RVCs posed a problem for Talmyan well-known typological dichotomy between "verb-framed" and "satellite-framed" languages. She identified six basic semantic elements: Figure, Ground, Motion, Path, Manner and Cause, which can be illustrated with two examples: directional verbs 跑进 *pao3jin4 "rush-enter"* and 推出 *tui1chu1 "push-out".* The first verbs of both RVC, namely 跑 *pao3 "rush"* and 推 *tui1 "push"* are Manner and Cause, respectively. Accordingly, the directional complements, to wit 进 *jin4 "enter"* and

出 *chu1 "out"* are Path which are deemed as satellites for they do not function as full verbs and form a small closed set. According to those analyses, she characterized Chinese as a satellite-framed language, as opposed to verb-frame language. In satellite-framed language, the Manner or Cause is typically encoded in the main verb which also expresses motion. This view is possibly feasible only for directional resultative compounds and is not refuted by many other researchers (e.g., Slobin, 2004; Zhang, 2007). As regards some directional verbs like 进 *jin4 "enter"*, Mandarin Chinese demonstrates the pattern characteristic of verb-pattern: the path component is conflated with the motion component. Therefore, Slobin (2004) proposed a trichotomy by adding a third category "equipollently-framed language". The proposal has been empirically supported by several studies on Mandarin and its acquisition (e.g., Chen & Guo, 2005; Peyraube et al., 2006).

Thus far, the only research on the LP of Chinese RVC was conducted by Wu (2018). She has investigated the prototypical V1s, RCs and compounds by means of the corpus data and classification of the cognitive domain. In particular, from 4958 bi-syllabic RVCs chosen from the modern Chinese segmentation word list for information processing, 218 verbs licensing the RC were sorted out. Among these verbs, 97 verbs whose type frequency was above 5 were selected and classified into 13 categories according to their cognitive domains in the dimension of human and entity. Three parameters were employed, namely, the cognitive domains, the numbers of RVC included in each domain and the ratio to total number of the RVC, to examine the prototypical V2 or RC.

The result in Wu's research showed that the most prototypical RC was the complement of direction followed by the complement of phase. As for the prototypical V1, 1013 verbs were derived from the 4729 compounds and then classified into 18 cognitive domains in terms of force, locative, affiliation and state. When the prototypicality of V1

was concerned, three factors, to wit cognitive domain, the number of V1s which was subsumed under the rubric of a given cognitive and the number of RC which can collocate with a certain cognitive domain. The converging evidence indicated that the verbs in terms of force and locative (which is roughly equivalent to physical action verb and manner verb) were more prototypical than those in terms of affiliation and state, like 盖 *gai4 "cover"* in 盖住 *gai4zhu4 "cover"* and 掀 *xian1 "uncover"* in the compound 掀开 *xian1kai41"uncover open"*. The prototypical RVC was produced by combining the 13 cognitive domains in RC and 18 cognitive domains in V1 and generating 34 prototypical constructions.

2.4.2 Lexical Prototypicality of RVCs

Chinese abounds in compounds. Mandarin Chinese has lexical resultatives in the form of RVC, also known as "verb-complement compound", "verb-complement construction", or "V_{erb}-V_{erb} resultative compound", depending on the theoretical stance of the particular analysis (e.g., Deng, 2019; Gu, 1992; Huang, 2009; Li, 1990; Shi, 1998). RVCs are always used to encode state-change events. They are composed of two components, with the RC indicating the result (either a change of property or an action) of the action or process represented by the V1, as indicated in the following examples.

(2-9) 他 拉开 了 门。

Subject RVC Aspect marker Object

"He opened the door by pulling it."

As illustrated in (2-9), 拉开 *la1-kai1 "pull-open"* describes a state-change event consisting of two sub-events: a causal event of 拉 *la1 "pulling"* and a resultant event of 开

kai1 "being open". Both component verbs can be used alone as full verbs, as shown in (2-10).

(2-10) 他　拉　　了　　门。　　门　开　　了。

Subject Verb Aspect marker Object Subject Verb Aspect marker

"He pulled the door." "The door is opened."

Basic grammatical categories are defined for a particular language according to their morphosyntactic behaviour. The RVCs share the following semantic and morphological defining features: i) a causal relation between the first component and the second component. ii). they can be negated by 没 *mei2 "none"* before RVC and 不 *bu4"not"* inserted in the middle resultative compound (Thompson, 1973).

As stated in Chapter 1, three subtypes of RVCs are within the scope of the current discussion, namely, RVC with complement of state, complement of direction and complement of phase. Lǔ Shuxiang (cf. Meng et al., 1999) in its narrow sense, initially subsumed the *"V1+complement of result"* under the RVC category. However, Liu (1998) carried out a comprehensive investigation of directional complements in modern Chinese and found that directional complements usually expressed three kinds of meaning: direction, result and state. Thus, what used to be called directional complement should be properly seen as a kind of RC (cf. Deng, 2019; Gao, 2001; He, 2019; Packard, 2000). Therefore, in agreement with Deng (2019), Xu et al. (2003) classified RVCs into three major types according to the meaning of RC. They are stative complement or complement of result, directional complement or complement of direction and completive complement or complement of phase or temporal contouring event. Taking these prior statements together, three commonly-used types of RVCs are pooled together in the current thesis.

The lexically prototypical RVCs that follow cover lexical forms of prototypical V1s, prototypical RCs and RVCs whose features have been depicted sporadically in the previous literature. The prototypicality of lexical components in RVCs is justified by compound formation and knowledge of compositionality guiding children to acquire a potentially infinite number of compound words based on a limited number of component morphemes (Deng, 2019). Also, it is supported by a view underlying the well-known character-centred approach to teaching Chinese as a second language and monosyllabic myth (Feng, 2019).

2.4.2.1 Prototypical V1s

Prototypical V1s should be monosyllabic verbs in terms of the syllabicity. The prototypicality of being monosyllabic has been justified by Lakoff's (1987/2008) view that prototypicality in cognition can be reflected in simplicity of form. When it comes to Chinese lexicon, it follows that prototypical V1 should be monosyllabic since the basic unit in Chinese morphology is a syllable. This statement is supported by Yang's (2006) analysis which examined 163 monosyllabic verbs from *Lexical Syllabus for Chinese as Foreign Language Learners* and found that 73 words could function as the V1.

Besides, the preference of verbs in the first slot of RVC is explained by their dominance in the predicate of RVC, though occasionally adjectives are acceptable such as 累 *lei4 "tired"* in 累傻 *lei4-sha3 "tire-silly"* and 饿 *e4 "hungry"* in 饿惨 *e4-can3 "hungry-awfully"*. Results from language analysis and child acquisition also lend credence to this claim. For example, acquisition data suggest that the prototypicality of verbs can be found in Chinese children's early vocabulary in which 70 % of their first 100 words are verbs (Gao, 2001; Tomasello, 1992). Furthermore, Shi (2008) argued that three types of

verbs can occupy the first slot in RVC: concrete action verbs, some verbs with abstract meanings and some adjective verbs or predicative adjectives.

Previous studies indicate that prototypical V1s should be action or activity verbs, which is demonstrated in Tomasello's (2003) argument that ideal circumstances for an activity verb entail noticeable and tangible forms of sensory-motor activity. For example, Y-M.Li (2004) sorted the verbs in Chinese into three sub-classes, according to their aspect in Chinese and found that the majority of verbs as V1 in Chinese can be [+dynamic] verbs which denote verb of action, like 吃 *chi1 "eat"* in 吃饱 *chi1bao3 "eat-full"*. Li (2007) claimed that stative predicates which have an activity component can marginally function as V1 in Mandarin. V1s that always collocate with directional complement include most typically manner of motion verbs (e.g., 跳 *tiao4 "jump"*), verbs indicating the cause of a motion (e.g., 扔 *reng1 "throw"*) and verbs that entail a certain path and manner of motion (e.g., 掉 *diao4"fall"*, which entails downward motion in an uncontrolled manner).

Prototypical V1s tend to be somewhat transitive. According to Chao (1968/2017), traditional grammarians always classified action verbs into two major classes: transitive, such as 看 *kan4 "look"* in 看傻 *kan4sha3 "look-silly"* and intransitive, like 哭 *ku1 "cry"* in the compound 哭湿 *ku1shi1 "cry-wet"*. The prototypicality of transitive verbs as V1 is maintained by a couple of scholars, such as Huang et al. (2009), Li and Thompson (1981), Xie (2013), among others. In Gao's (2001) thesis, she claimed that the prototypical V1s should be the verbs of direct physical contact with various characteristics. One of characteristics is that it should be transitive, to the effect that it contains a minimum of two entities that function as argument — agent and patient. Furthermore, Chinese transitive

verbs also outnumber intransitive verbs in frequency and the great majority of action verbs are transitive in nature (Yip & Don, 2004).

Besides those action verbs, extra importance might be attached to a kind of special verb---phonetically realized Chinese light verbs in Basciano's (2010a, 2010b) term. Chinese light verbs are always called general-purpose verbs or generic verbs which refer to verbs with very general and abstract semantic content. They constitute a virtual schema of the semantics of verbs of their valency. Light verbs' productivity, frequency, and basicness all support their prototypical status. For example, inspired by the term "light verb" from in Chomskyan paradigm (Chomsky, 1995; Grimshaw & Mester, 1988; Hale & Keyser, 1993; Larson, 2014), numerous scholars (e.g., Basciano, 2010a, 2010b; Huang, 1994, 1997; Lin, 2014) argued that Chinese light verbs correspond to basic primitive eventuality predicates like *DO*, *CAUSE*, and *BECOME.* They can be morphologically realized in those causative verbs like 弄 *nong4 "make, handle",* 使 *shi3 "cause"* and 变 *bian4 "become",* 搞 *gao3 "do",* 整 *zheng3 "make"* etc. Light verbs are always highly frequent and productive in the spoken corpus of both adults and children (Tao & Hu, 2019). In previous studies, it has been found that the most typical light verbs are 加以 *jia1yi3 "proceed"*, 从事 *cong2shi4 "inflict"*, 进行 *jin4xing2 "engage"*, 搞 *gao3"do",* 做 *zuo4"do"* for their high frequency (Diao, 2004).

To conclude, prototypical V1s are assumed to be a large number of monosyllabic transitive action verbs, as well as light verbs. However, none has provided a verified prototype-based graded membership of V1s.

2.4.2.2 Prototypical RCs

RC is the abbreviation of resultative complement. Before the formal discussion, it is necessary to make explicit the concept of "complement" in RVCs in Mandarin Chinese, because of its distinction between Chinese grammar and Western grammar.

The term *"complement"* is usually used as a rough English translation of the Chinese grammatical concept of 补语 *bu3yu3 "complement"*. However, Chinese complements differ greatly from those in English and other Indo-European languages regarding their characteristics and behaviors. Three representative definitions in theoretical linguistics are quoted to generalize the common features of complement in the Western tradition: traditional pedagogical grammar, dependent valence grammar and generative grammar, as listed below.

Definition 1: The complement is an adjective group or noun group which comes after the verb and describes or identifies the subject. (Sinclair, 1992)

Definition 2: Complement is also called the argument of a verb or predicative and A constituent X is a complement of a constituent Y, if X is valence-dependent on Y. (Bussmann,1996/2000)

Definition 3: Principle and parameters theory incorporates a particular theory of phrase structure called X-bar syntax. The X-bar structure of the phrase needs to include the level at which the close relationship between the zero-category head and its complement can be captured; complements are sisters of the lexical head and are governed by it. The complement can always come on the right of the head or left of the head (Cook & Newson, 2000), as diagrammed below.

XP → [specifier[head[complement]]]

The notion of complement has been construed differently according to different theoretical paradigms by Western theoreticians. For example, the complement in traditional grammar (see definition 1) or some English textbooks refers to the components of the subject or object respectively. In traditional grammar, the link verb is associated with the complement, because the link verb cannot express an event independently, it must be followed by a complement to complete the sentence structure. These verbs need to be followed by a complement, mainly adjectives, which are syntactic mandatory and different from the optional nature of general modifiers.

In definition 2, the complement is closely related to valence, an ability of lexeme to predetermine its syntactic environment. If Tesniere's classification of verbs is accepted: zero-valence, mono-valent verbs, bivalent verbs and trivalent verbs. It is not difficult to deduce that complement, in its narrow sense, is equal to the object or noun phrase (NP).

In generative account (see definition 3), English is the head-first language in typology and head can be a lexical category corresponding to one of the four major word classes in the lexicon, namely, V_{erb}, $A_{djective}$, N_{oun} and $P_{reposition}$. Complement can refer to any complement following the head. For example, in the PP (prepositional phrase) *"from England"*, *"from"* is head and the noun *"England"* is complement. In the NP *"doctor from England"*, *"doctor"* is head and the PP *"from England"* is the complement. The VP (verb phrase) *"drink milk"* has as its head the V *"drink"* and noun or object *"milk"* as its complement. The Adjective phrase (AP), as in *"jealous of Peter"*, contains an adjective head *"jealous"* and a PP *"of Peter"*.

The differences in the definitions ultimately boiled down to several points in common: i) though the complement can be occupied by various constituents like NP, AP, PP, etc., the NP as object acts as the basic function; ii) the complements are, more often than not, syntactic constituents rather than morphological or lexical parts.

In contrast, the Chinese complement has totally different functions and behaviours. For example, Yip and Don (2004) defined complements as those elements in a sentence which follow the verb (or adjective), rather than the object. They usually signify such semantic categories as direction, location, duration, result, manner, possibility, degree, etc. Lin (2001) asserted that complements in Mandarin follow the predicate verbs or adjectives of a sentence to provide additional information regarding the verbs or adjectives. Specifically, the additional information may be about the result, direction, degree, quantity or possibility of the preceding verb or adjective. It is not difficult to find that RC, as one of the complements, is a complement following the main verb and having the resultative reading. Cognitive Semantics deems RC as a semantic category under co-event which accompanies the main event"s action or state (Tai, 2003). Additionally, RCs with different difficulty levels are prescribed in the *Syllabus of long-term further education for foreign students studying in Chinese higher education institutions* (TCSOL office, 2002).

The slot of RC can be filled by different types of words or phrases. For example, The RC (or V2 in other literature) can be an adjective (also called a stative verb or adjectival verb), such as 坏 *huai4 "bad"* in the compound 打坏 *da3huai4 "beat and broken"*. It also can be occupied by a verb denoting certain kinds of actions such as 碎 *sui4 "broken"* in 砸碎 *za2sui4 "smash",* and adverbs, such as 极 *ji2 "very"* in 好极 *hao3ji2 "very good",* as well as prepositional phrases and clauses. The possible results indicated

by RC can be: (1) a physical state, like 开 *kai1 "open"* in 踢开 *ti1-kai1 "kick-open"*; (2) a mental state, like 懂 *dong3 "understand"* in 听懂 *ting1-dong3 "listen-understand"*; and (3) an action, such as 笑 *xiao4 "laugh"* in 逗笑 *dou4-xiao4"amuse-laugh"* and 哭 *ku1 "cry"* in 骂哭 *ma4-ku1 "scold-cry"*. Chen (2008, 2016) has listed 138 monosyllabic verbs and adjectives which can function as RC in RVC.

The largest number of RCs is found to be monosyllabic adjectives. This position has been backed up by numerous previous studies (e.g., Fu, 2007; Ma & Lu, 1997a, 1997b, 1997c). In particular, as reviewed by Luo (2009), at the earliest stage, Chao (1968/2017) examined the RC from the *Common Word List for Complement* and found that 83 per cent of possible RCs are adjectives (127 in 153). Zhu (1982) pointed out the adjectives are prototypical RC. Ma and Lu (1997a) explored 957 adjectives in the *Usage Dictionary of Adjectives*. It was found that in the 168 monosyllabic adjectives, 153 adjectives can license the Chinese RVC, accounting for 91.07% whereas in the 790 disyllabic adjectives, only 63 can license the Chinese RVC. Liu (2001) and Fu (2007) argued that all the monosyllabic adjectives, in most cases, can be licensed as the RC of RVC.

Apart from adjectives, the stative verb is another category to fill in the slot of RC, though it only occupies a small proportion. For example, Wang (1996) found only a small proportion of verbs (16.8%) can function as RC after investigating 2091 verbs. In addition, Shi (2008) classified verbs which can function as RC as verbs of perception, verbs with resultative reading, verbs with resultative reading and some grammaticalized adjectives with light or aspectual meanings. For example, 怕 *pa4 "afraid"*, 烦 *fan2 "bore"*, 惯 *guan4 "habitual"* etc. are verbs of perception while 开 *kai1 "open"*,死 *si3 "die"* (which function both as a verb of result like 打死 *da3si3 "beat to death"* and a verb of degree 笑死

xiao4si3 "awfully laughable") are verbs with resultative reading. Moreover, telic verbs like 晕 *yun1" faint",* 塌 *ta1 "collapse"* and some grammaticalized adjectives with light or aspectual meanings such as 见 *jian4 "see",* 完 *wan2 "finish",* 好 *hao3 "good",* 住 *zhu4 "stop"* etc. also can illustrate the point.

Verbal RC can fall into three categories: verb of direction, verb of result and verb of phase. For example, Syrokomla-stefanowska and Lee (1991) have listed 16 common RCs and corresponding examples. In the common RCs, there are 5 verbs of phase or completive complement, namely 到 *dao4 "arrive"*, 见 *jian4 "see"*, 好 *hao3 "well"*, 完 *wan2 "finish"*, 住 *zhu4 "stop"*. Two of them are verbs of direction or directional complement:下 *xia4 "down"* and 开 *kai "open"*. What occupies the greatest proportion is the nine verbs of result, like 会 *hui4 "understand",* 错 *cuo4 "wrong",* 倒 *dao3 "overthrow",* 热 *re4 "hot",* 冷 *leng3 "cold",* 饿 *e4 "hungry",* 累 *lei4 "tired",* 死 *si3 "die",* 对 *dui4 "right"*. In Mochizuki"s (2007) paper, 18 common RCs were found. They are 成 *cheng2"become",* 出 *chu1"outward movement",* 到 *dao4"indicating a goal or result",* 掉 *diao4"come off, fall",* 过 *guo4 "across",* 见 *jian4"see",* 进 *jin4"enter",* 上 *shang4"ascend",* 完 *wan2"finish",* 下 *xia4"descend",* 在 *zai4"indicating time, place, or condition",* 着 *zhao2"achieve a goal",* 住 *zhu4"steady",* 起 *qi3"rise"* and 走 *zou3"away"*.

Directional Complement is a verb of directional motion – a small, closed set which is called a directional verb or path verb. Talmy (2001a, 2001b) has listed twenty English path verbs in his typological classification: *exit, enter, ascend, descend, cross, pass, circle, leave, advance, proceed, approach, arrive, depart, return, join, separate, part, rise, near,*

follow. In Mandarin Chinese, the directional set usually consists of nine monosyllabic directional verbs and two deictic path verbs that express the orientation of the motion:来 *lai2 "come"* and 去 *qu4 "go"* (Lin, 2001). The nine monosyllabic directional verbs are 上 *shang4 "ascend",* 下 *xia4 "descend",* 进 *jin4"enter",* 出 *chu1"exit",* 回 *hui2"return",* 过 *guo4"pass",* 开 *kai1"part",* 起 *qi3"rise"* and 到 *dao4"arrive".* They usually can be combined to yield other thirteen complex directional verbs. The nine monosyllabic simple directional verbs will be taken into consideration for the sake of their prototypicality.

The third class is attainment RC or completive RC which has a phase-marker verb. According to Li and Thompson (1981), attainment RC denotes the attainment of termination or the completion of an action. They have a relatively large, but closed class. There are two subtypes within the class. One sub-type indicates completion or termination according to event type with which any action verb can be combined. The other indicates only completion and is compatible only with telic events such as 过 *guo4 "pass*, exceed". In Li and Thompson (1981) and Gao (2001), five complements of phase are enumerated, namely, 完 *wan2"finish",* 着 *zhao2 "to be on the target",* 住 *zhu4"hold on",* 到 *dao4"arrive",* 好 *hao3"good".* However, there are ten completive RCs in Chen"s (2008) list: 完 wan2*"finish",* 着 *zhao2"be on target",* 住 *zhu4 "hold on",* 到 *dao4"reach, achieve",* 好 *hao3 "good, finish",*见 *jian4 "see, perceive",* 掉 *diao4 "fall",* 会 *hui4 "be able to or know",*成 *cheng2 "achieve"* and 惯 *guan4 "be used to".* This list is adopted in this study though it is not difficult to note that some are cross-class, such as 到 *dao4"arrive"* which is both a complement of direction and a complement of phase.

To put it briefly, prior research indicates that among the different types of RC, namely monosyllabic adjectives, verbs of phase, verbs of direction and verbs of result,

monosyllabic adjectives are the most frequent ones while prototypical V1s seem to be monosyllabic transitive action verbs.

2.4.2.3 Prototypical RVCs

RVC in this study is composed of directional RVC, completive RVC and result RVC. Packard (2000) divided RVC into three general classes based on the nature of RC: stative resultative, directional resultative and attainment resultative. In Gao's (2001) research, four kinds of RVC are listed: cause resultative compound, achievement VV compound, direction resultative compound and phase resultative compound. Cause resultative compound indicates that the result usually causes the object to have a change in its quality or state while achievement VV compound signifies that the result does not give the object any change in quality and RC is usually an adjectival verb. There are five verbs to be included in direction resultative compound and phase resultative compound, namely 完 *wan2 "finish"*, 着 *zhao2 "to be on the target"*, 住 *zhu4 "hold on"*, 到 *dao4 "arrive"*, 好 *hao3 "well"*.

Prototypical RVC should be a disyllabic and transitive verb with prototypical V1 and RC. In Wu's (2018) research, she defined the prototypical RVC as compounds with prototypical V1s and RC. The prototypicality of disyllabicity for RVC is corroborated by the prototypicality of mono-syllabicity for prototypical V1s and RCs. As regards transitivity, Zhu (1982) claimed that RVCs in Chinese can be transitive and intransitive. According to Li and Thompson (1981), it has been claimed that a typical RVC should be a transitive verb, consisting of a transitive action verb and adjective or a result intransitive verb, supported by Xie (2013). In addition, the prototypicality of transitive RVCs might be closely interrelated with object-oriented semantic orientation elucidated as follows.

2.4.3 Semantic Prototypicality of RVCs

It is generally assumed that verb meaning is best analyzed in terms of an underlying grammatical level of representation usually referred to as an "event structure" or "event decomposition" (Beavors, 2010). Thus, the prototypical meaning of RVC or SeP is discussed from two aspects: polysemous V1 and semantic orientation of RC.

2.4.3.1 Prototypicality of Polysemous V1s: the case of 打 *da3 "beat"*

Polysemous V1s demonstrate the prototype effect, like the seven senses of 看 *kan4 "look at"* analyzed and identified by Ou (2012). However, there are so many polysemous V1s to address that it would be a demanding task, if not impossible, to examine each of V1s in semantics. Therefore, 打 *da3 "beat"* in this study is specifically selected as a good case to examine the prototypicality of polysemous V1s for the following reasons. First, 打 *da3 "beat"* has been confirmed to be one of the most prototypical V1s for its high frequency in usage (Bei & Zhang, 1988), high productivity, as shown in the examples in Table 2.1 and high polysemy to be elucidated below. Second, 打 *da3 "beat"* provides us with a good example to explore the joint efforts of LP, SeP and SyP in the instructed L2 acquisition of RVC. Chen and Wang"s (2020) longitudinal study of the acquisition of polysemous 打 *da3"beat"* by young children has demonstrated that meaning is derived from the confluence of lexical and syntactic cues in the usage patterns in the input.

Evidence suggests that 打 *da3 "beat"* is a good example of highly polysemous V1. For example, 152 distinct senses of 打 *da3 "beat"* were found by Gao (2001) in 27 semantic domains. Also, 24 senses of 打 *da3 "beat"* are listed in *Contemporary Dictionary of Chinese,* while 23 senses *in Chinese Dictionary of Verb Usage* (as shown in

Table 2.1). Huang et al., (2010) have figured out 121 senses of 打 *da3 "beat"* based on a detailed lexical-semantic analysis in *The Chinese Wordnet*. It has been found that their prototypical meaning reaches a high frequency of occurrence in the corpus data and a large number of other senses are extended naturally and systematically from the semantic representation of its prototypical meaning (Gao, 2001).

Table 2.1: Senses of 打 *da3* and Examples in *CDVU* (Meng et al., 1999)

Senses of 打*da3*	Examples of RVCs
用手或器具撞击 *"knock or hit by hand or using a tool"*	打光 *da3guang1" beat up"*，打坏*da3huai4 "beat-bad"*，打破 *da3po4"beat-broken"*，打掉 *da3diao4"beat-off"*
因撞击而破碎 *"break; smash"*	打光 *da3guang1 "smash up"*，打碎*da3sui4 "smash-broken"*，打破 *da3po4 "smash-broken"*，打裂*da3lie4"smash-split"*
做 *"play(games)"*	打错*da3cuo4 'play-wrong"*，打稳*da3wen3 "play-stable"*，打完*da3wan2 "play-over"*，打着 *da3zhao2" succeed in playing"*
做，从事*"conduct or engage in"*	打完*da3wan2 "finish conducting"*，打成*da3cheng2" conduct and become"*，打开*da3kai1"open"*，打上*da3shang4 "succeed in engating"*
捉 *"catch (the beast)"*	打没*da3mei2 "catch over"*，打完*da3wan2"finish catching"*，打着*da3zhao2"succeed in catching"*，打成*da3cheng2"succeed in catching"*
制造 *"make"*	打坏*da3huai4 "make-bad"*，打齐*da3qi2"make even"*，打全 *da3quan2 "make-complete"*，打完*da3quan2"finish making"*
收集 *"gather in; reap; collect"*	打够*da3gou4 "gather enough"*，打满*da3man3"gather full"*，打累*da3lei4"gather tired"*，打完*da3wan2"finish collecting"*

Table 2.1 continued

舀，买 *"scoop or buy"*	打满*da3man3"scoop-full"*， 打完*da3wan2"finish scooping"*， 打着*da3zhao2"succeed in scooping"*， 打成*da3cheng2"succeed in buying"*
涂抹 *"paint, stamp, print"*	打直*da3zhi2 "print straight"*， 打斜*da3xie2"print slanting"*， 打好*da3hao3"paint well"*， 打出*da3chu1"stamp out"*
殴打，攻打 *"beat, fight, attack"*	打疼 *da3teng2"fight-ache"*， 打破 *da3po4"beat-broken"*， 打折 *da3she2"fight-broken"*， 打哭*da3ku1"fight-cry"*
捆 *"bind"*	打紧*da3jin3"bind tense"*， 打松*da3song1"bind loose"*， 打完*da3wan2"finish binding"*， 打成*da3cheng2"bind into"*
举，提*"lift"*	打歪*da3wai1"lift slanting"*， 打斜*da3xie2"lift slanting"*， 打正*da3zheng4 "lift to the point"*， 打去*da3qu4 "lift off"*
揭，凿 *"open, dig"*	打浅*da3qian3 "dig shallow"*， 打深*da3shen1"dig deep"*， 打歪*da3wai1"open slanting"*， 打通*da3tong1"dig through"*
搅拌 *"stir"*	打稀*da3xi1"stir-thin"*， 打匀*da3yun2"stir-even"*， 打干*da3gan1"stir-dry"*， 打完*da3wan2"finish stiring"*
建造 *"construct or build"*	打牢*da3lao2"build stable"*， 打通*da3tong1"build through"*， 打完*da3wan2"finish building"*， 打成*da3cheng2"build into"*
支付，领取 *"pay or receive"*	打完*da3wan2"pay up"*， 打出*da3chu1"pay out"*， 打回*da3hui2"pay back"*， 打到*da3dao4"pay to"*
发生与人交涉的行为 *"deal with (sb or sth)"*	打够*da3gou4"deal with-enough"*， 打完*da3wan2 "finish dealing with"*， 打赢*da3ying2" win in dealing with"*， 打输*da3shu1"deal with-lose"*
放射 *"set out or emit"*	打光*da3guang1"send over"*， 打完*da3wan2"finish sending"*， 打着*da3zhao2 "succeed in emitting"*， 打成*da3cheng2"emit into"*
计算 *"figure out"*	打定*da3ding4"figure out"*， 打完*da3wan2"finish figuring"*， 打成*da3cheng2 "figure into"*， 打好*da3hao3"figure well"*

Two seminal studies on the analysis of polysemous 打 *da3 "beat"* conducted by Tian (2004) and Gao (2001) were reviewed respectively to generalize the scale of prototypical 打 *da3 "beat"*. In Gao's research, all its semantic uses of 打 *da3 "beat"* were collected from two corpora and grouped into 5 different categories (see Table 2.2) according to the degree of prototypicality.

Table 2.2: Semantic Representation and Senses of 打 *da3 "beat"*

Semantic Representations	Specific Senses
Type 1: Physical action focusing on hand contact	Defeat (play games, battle, fight, kill, attack, break, smash)
	Physical punishment (beat hit, punch, spank, whip, slap, strike)
	Open (turn on, take out, unpack);Fastening (pack up, knot, tie)
Type2: Hand action (mostly with instrument)	Construction (make, build, dig, drill, burrow)
	Launching (shoot, fire, send, report, pump, post, set up, signal)
	Cover (dress *up,* pretend, spray, wax, powder; plaster; clout; drench, label, paint, polish, wrap)
	Insert (inject, nail, hammer; knock)
	Possess (fetch, catch, have, hunt, ladle, hold)
	Mark (type, work out engrave, press, label, print, stamp)
	Sound source (drum, knock, cap, pound, crow flap, ring, tap, whistle)
	Motion (stir; return, move, mix)
	Reflection (flash, reflect)
	Collection (gather, reap, sweep, get in, get)
	Removal (prune, peel, knock out, get rid *of,* rob, thresh)
	Engagement (work)
Type 3: Physical action with physical contact unspecified	Physiological reaction (shiver; yawn, doze off, snore, sneeze, cheer up, hiccup, nod, stupefy) Gymnastic feat (roll, tumble, loop)
	Posture (bare, remain, zazen)
Type 4: Metaphorical uses (hand action traceable)	Social interaction (call, contact with, gesticulate)
	Business deal (discount buy invest)
	Authoritative conduct (issue, score)
	Legal activity (go to court)
Type 5: Metaphorical uses (hand action untraceable)	Mental activity (plan, seek, make, think *of,* calculate, disturb, consider, decide, draw analogy, concern, estimate)
	Verbalization (ask about, greet, bet, draw, interrupt, talk, chat, cry out, discuss, question, speak) Opposition (defend, protest)
	Visual contact (meet, bump into, look at)

The degree of semantic prototypicality of 打 *da3"beat"* based on Gao's (2001) classification (as shown in Figure 2.1) has been empirically confirmed by Chen and Wang (2020) who carried out a longitudinal study to examine the developmental trajectory of different senses of 打 *da3 "beat"* by Mandarin-speaking children.

Semantic types	type 1	type 2	type 3	type 4	type 5
Degree of prototype	prototypical	⟷			non-prototypical

Figure 2.4: Degree of Semantic Prototypicality of 打 *da3 "beat"*

Similar results were yielded by Tian (2004). He first of all proposed six criteria to judge the prototypical sense of 打 *da3 "beat"*.

(i) The distinct senses of a polysemous word should first be identified on the basic concept level in that they are embodied One;

(ii) These senses should be identified by studying their corresponding Cognitive semantic frames respectively;

(iii) Among these senses, one (or more than one in some rare cases) is primary or central, owing to its cognitive importance in acquisition, its frequency in use, and its derivational relationship with other senses;

(iv) The pro-sense, if there exists one, should be identified on the super-ordinate level to capture the invariant meaning components among the distinct senses on the basic level;

(v) A sense on the basic level, under some cases, can further differentiate into or instantiate as several sub-senses on the subordinate level;

(vi) The number of senses a definer can distinguish is indefinite unless sense granularity is set according to factors, such as how closely a definer examines the citations collected, and what knowledge he expects the intended dictionary users to have.

Based on those criteria, Tian (2004) proposed a frame for the proto-sense of 打 *da3 "beat"*, which was diagrammed in Table 2.3.

Table 2.3: Proto-sense of 打 *da3 "beat"* and Specific Senses (Tian, 2004)

The primary senses of da3	Distinct senses on the basic concept level
Type 1: Impact by contact	Strike by hand or with a tool
	(rain, snow, wind, frost, wave) strike (or beat, fall)
	Accidentally cause sth to break
Type 2: Deliberately hit someone, attack	Fight, attack
	Fight against each other, go to war
Type 3: Manual activity in which the strength of impact is highlighted, and objects are usually the end products	Make by means of beating
	Using sharp tools to make something
	Construct; build by ramming
Type 4: Manual activity in which the skill or craft is highlighted, and objects are usually the end products	Mix substances together and stir
	Tie up; weave
	Use, calculate or estimate; figure/work out
	Catch animal by means of a default tool
Type 5: Other	Go and fetch from somewhere; Cover with some material; Hold high; raise; Project; send; write
	Do; engage in; play; Adopt; use; Go through

A general conclusion in common can be made by summarizing both of them that the most prototypical meaning of 打 *da3 "beat"* is the physical action with hand contact. "It bears the semantic features [+hand, +volition, +contact, +force] and [-instrument]" (Chen & Wang, 2020, p.32). In this study, two levels of prototypicality of 打 *da3 "beat"* are chosen, namely, prototypical meaning and non-prototypical meaning for further investigation, as shown in Table 2.4.

Table 2.4: Levels of Prototypicality of 打 *da3 "beat"* in this Study

Levels of prototypicality	Gao's classification	Tian's classification
Literal meaning or prototypical meaning	Type1, type 2, type 3	Type 1, type 2, type 3, type4
Non-literal meaning or non-prototypical meaning	Type 4 and type 5	Type 5

2.4.3.2 Prototypicality in the Semantic Orientation of RC

As with the V1s, the semantic polysemy and prototypicality can be found in the polysemous RCs like 破 *po4 "broken"* (Ho, 2008) and 开 *kai1 "open"* (Wang & Su, 2015). However, in the current research, the semantic orientation of RC was discussed to investigate its semantic prototypicality of RC due to the close affinity between semantic orientation and syntactic preference.

The semantic orientation of RC originated from Simpson's (1983) *DOR*. It claims that in a resultative construction, the RC is always predicated on an object, not the subject, which is called object-oriented or object-predicated, as illustrated in (2-11). RC 红 *hong2 "red"* in RVC 刷红 *shua1hong2 "paint red"* is predicated on the object 墙 *qiang2 "wall"*.

(2-11) 漆工 刷红 了 墙

Subject RVC Aspect marker Object

"*The painter painted the wall red"*

However, many counterexamples were found in Chinese (see 2-12 and 2-13 below).

(2-12) 张三 喝醉 了。

Subject RVC Aspect marker

"Zhang San gets drunken for drinking wine."

(2-13) 他　打完　了　比赛。

Subject　RVC Aspect marker　Object

"He finished playing the match."

The RC 醉 *zui4 "drunk"* in (2-12) is predicated on the agent or subject *Zhang San* while in (2-13) verb-oriented 完 *wan2 "finish"* is predicated on the V1 打 *da3 "play"*. Verb-oriented RCs denote the completion of the action, like 成 *cheng2 "become",* 完 *wan2 "finish",* 好 *hao3 "good",* 了 *liao3 "finish",* 见 *jian4 "see",* 着 *zhao2 "succeed",* 到 *dao4 "arrive"* (Liang, 2006).

Evidence suggests that there exist three types of RVCs in terms of the semantic orientation of RC (e.g., Deng, 2019; Liang, 2006; Shi, 2002), namely object-oriented RVC or RC predicated on the object, completive RVC or RC on the V1 and subject-oriented RVC or RC on the subject. Various evidence has indicated that object-oriented RVC is the most prototypical RVC while subject-oriented RVC is the least prototypical. This argument has been justified by the evidence from historical origin, typological classification and acquisition data.

Evidence of historical origin (e.g., Liang, 2006; Shi, 2002) seems to support the prototypicality of object orientation. For example, Shi (2002) proposed the temporal sequence in light of the degree of fusion (as shown in Figure 2.5) and found that object-oriented RVC is the earliest to be introduced into Mandarin whereas the subject-oriented was the last to arrive in history.

RVC predicate of object	>	RVC predicate of verb	>	RVC predicate of subject
7th century		9th century		14th century

Figure 2.5: Historical Development of RVC (Shi, 2002)

The prototypicality of object-orientedness is supported with respect to typological evidence. For example, Washio (1997, 2002) made a cross-linguistic generalization of RVCs. It claims that strong resultative entails weak resultative, given that the subject-oriented resultatives are strong and marked while object-oriented resultatives are weak and unmarked. His generalization seems to be supported by the resultative of French and Romanian which does not allow resultative with a subject-oriented reading when the causing predicate is unergative or transitive.

Markedness of the subject-oriented reading has been accounted for by a couple of scholars (e.g., Cui, 2022, Li, 2007, Wechsler, 2005). For example, Li (2007) claimed that the verb-complement structures of most languages have not yet formed pseudo-compounds (subject-oriented RVC). In addition, compared with the conventional object-oriented RVC, the subject-oriented reading is marked because of the "theme-object trend" (Wechsler, 2005). In other words, the patient (partite) and the cause (causee) tend to be objects rather than subjects. For this reason, the RCs in transitive RVCs tend to point to the object rather than the subject.

Acquisition data can lend support to the prototypicality of object-oriented RVC. For example, Zhang (2008) found that in the child acquisition order of semantic orientation, the object orientation is the earliest acquired followed by the verb orientation. Jiang (2020) found that the verb orientation and object orientation are easier to accept and understand. Nevertheless, learners tend to reject the subject orientation in their research of L2 acquisition of RVC. The similar findings were also shared by Jin (2018) and Xu (2017).

To conclude, the semantic orientation of RC forms a continuum, declining from the object-oriented RVC through verb-oriented RVC to the subject-oriented RVCs in terms of scale of prototypicality.

2.4.4 Syntactic Prototypicality of RVCs

SyP refers to asymmetry in syntactic distribution or a general preference to use a prototypical sentence structure over a less prototypical one (Van de Velde et al., 2014). One of the reasons why syntactic distribution is investigated is necessary to be restated based on the assumption that in cognitive linguistics, lexicon and syntax form a continuum at varying levels of complexity and abstraction. It has been discussed in previous studies under the rubric of syntactic preference. For example, the Duten verb *tonen "to show"* prefers prepositional object dative. Gries (2003) introduced a corpus-based technique to identify the prototypical construction between the two alternative constructions, namely prepositional object dative construction and double object construction. Gilquin and McMichael (2018) found the top five through-constructions by adopting a prototype-based approach.

All human languages must be able to express complex events in which a preceding or precipitating activity leads to a resulting state. Chinese syntactically provides alternative ways to convey the cause-result event. A handful of researchers have touched on the issue of syntactic distribution of RVCs (e.g., Huang, 2005; Huang,1996; Shi, 2015; Song, 2004). Five alternative constructions have been found to be closely related to RVC: Patient Subject Construction (PSC), Ba-construction (Ba-C), Bei-construction (Bei-C), transitive active construction (SVO) and Verb Copying Construction (CVC). Each of them is elaborated below.

In what follows, the basic features of five alternative types of sentence patterns were briefly introduced so that a sound understanding of the formal and discourse features of those constructions involved could be achieved.

2.4.4.1 Transitive Active Construction (SVO)

As accepted in other languages, SVO which is sometimes called transitive clause is an unmarked structure in Mandarin Chinese. According to Goldberg (1995), basic sentence-level construction designates basic facets of human experience. In Modern Chinese, "Subject+predicate" is the most basic syntactic pattern (He, 2019), which can express itself in two types of sentences： SV and SVO (as shown in 2-14 and 2-15). Typological evidence suggests that SVO is one of two basic word order types (SOV vs. SVO) in the languages of the world (Gerner & Jin, 2023; Tomlin, 1986).

2-14). 你 坐 下。($S+V_{intransitive}$)

Subject RVC

"You sit down."

2-15). 他 打死 了 张三。 ($S+V_{transitive}$ +O)

Subject RVC Aspect marker Object

"He beats zhangsan to death."

Prototypical SVO pertinent to RVC should be "animate agent+ transitive RVC+ patient" exemplified in (2-16). It can be justified with respect to the scalar notion of transitivity and other statements in Cognitive linguistics. According to Hopper and Thompson's (1980) works on transitivity, it was found that transitivity pertinent to SVO is a prototypical category. Membership in the category of transitivity is a matter of gradience,

determined by typical properties in terms of kinesis, participants, agency, animacy etc. (Song, 2014, 2018).

Furthermore, the notion of Subject and Object in SVO are prototypical concepts, as shown in (2-16). For example, Tomlin (1986) asserted that the most animated NP in a basic transitive clause is identified with the subject of that clause and the prototypical object should be an inanimate patient in the semantic role hierarchy. As stated by He (2019), Tao and Thompson (1994) found from the Mandarin speech corpus that among the most frequently occurring sentence types, 58% of them were cases where the subject was an agent.

(2-16) 张纳云　打破　了　花瓶.

Subject　RVC　Aspect marker　Object

"Zhang Nayun broke the vase."

2.4.4.2 Bei-Construction (Bei-C)

Bei-C refers to the passive sentence of Mandarin Chinese with a prototypical passive marker 被 *bei4 "by"*. The subject position of a sentence is occupied by a patient rather than an agent and the prototypical Bei-C with RVC can be diagrammed as follows.

Patient object+被 *bei4 "by"* +(agentive NP) +RVC le0.

There is a wider range of markers to indicate passive meaning, such as 被 *bei4"by",* 让 *"let",* 叫 *jiao4 "call",* 给 *gei3 "give"*, the archaic 为...所 *wei2...suo3 "by"* structure and some lexical verbs like 挨 *ai2 "suffer; endure",* 受 *shou4 "suffer; be subjected to"* and 遭 *zao1"suffer; meet with".* The most prototypical passive construction is the sentence with the passive marker 被 *bei4* "by".

Several reasons might be mentioned to justify the prototypicality of 被 *bei4 "by"* in Chinese passive construction. First, 被 *bei4 "by"* enjoys the highest frequency in total occurrence in the corpora. For example, Xiao et al. (2006) found from a series of corpora that among the total instances of 被 *bei4 "by"*, 87.3% are used as a passive marker, a proportion which is considerably higher than other markers. Second, RVCs studied in this study generally co-occur most frequently with 被 *bei4 "by"* marker in both syntactic passive and lexical passive according to Xiao et al."s (2006) distribution pattern of markers. Third, 被 *bei "by"* is a universal passive marker in Chinese whereas 叫 *jiao4 "call"*, 让 *rang4 "let"* and 给 *gei3 "give"* are colloquial passive markers. Furthermore, 叫 *jiao4 "call"* and 让 *rang4 "let"* are typically used in Northern dialects while 给 *gei3 "give"* typically occurs in Southern dialects. 为…所 *wei2...suo3 "by"* occurs only in formal written genres whereas 被 *bei4 "by"* can be found in all genres.

2.4.4.3 Ba-construction (Ba-C)

Ba-C is another extensively studied structure in Mandarin pertaining to RVC (e.g., Shi, 2023a, Wang, 1987; Zheng, 2000). As one of two closely related patterns serving special functions and variations of the canonical SVO Order in generative tradition, the Ba-C expresses an object being affected, dealt with, or disposed of. Its most noteworthy feature lies in the existence of the element 把 *ba3 "disposal"*, a grammaticalized disposal marker which historically means "take, hold, handle". Noted here is that another marker 将 *jiang1* "disposal" may be used in a less colloquial and more formal style to replace 把 *ba3 "disposal"* (Yip & Don, 2004). As Sybesma (1999) put it, a number of the terms have been used to describe the Ba-C, such as "disposal construction", "executive construction",

“accusative construction and “a highly transitive construction” where transitivity is defined as the carrying over of an activity from an agent to a patient (Thompson,1973; Wang, 1987; Wang, 2015). According to previous studies, there are two subtypes of Ba-C, namely “canonical 把 ba3 sentences” (Sybesma, 1999) or “disposal” (Wang, 1954/2011), as opposed to “causative Ba-C” whose subjects are generally inanimate causers. The most typical pattern of Ba-C, or sentences with transitive verbs is an expressing that an animate agent does something to some inanimate patient, which is shown below.

Animate agent +把 Ba3+ Patient + Transitive RVC

Ba-C and RVC can co-occur on the dimension of the notion of boundedness which has been exemplified by Sybesma (1999) as follows.

(2-17) 他　　把　　狗　　打死　　了。

Subject Disposal marker Object RVC Aspect marker

“He beats the dog to death.”

Ba-Cs are constrained by several factors like boundedness, verbal aspect etc. Verb types affect the acceptability of Ba-C, namely, Ba-Cs require complex verb phrases. Liu (1997) claimed that the most common environment where 把 *ba3 “disposal”* occurs is in a resultative context, which contains an RVC. She argues that a *Ba-C* is essentially a construction expressing a bounded event and suggests that the predicate of a 把 *ba3 “disposal”* sentence must denote a bounded event or situation. The constraints on possible types of VPs in a 把 *ba3 “disposal”* sentence are manifestations of obligatorily expressing a bounded event/situation. The notion of boundedness can be expressed in two ways: situation type or situational aspect and viewpoint aspect (Huang et al., 2009). RVCs in

Chinese contribute to both the situation aspect and viewpoint aspect in that they typically express a telic notion and grammatically mark the completive aspect (Xiao & McEnery, 2004). Therefore, it appears to be correct that in all object-predicated resultatives, the object itself can appear pre-verbally with 把 *ba3 "disposal"*. Conversely, it is mostly the case that a subject-predicated resultative does not allow the object to appear with 把 *ba3 "disposal"* (Huang et al., 2009).

2.4.4.4 Verb-copying Construction (CVC)

CVC is a special structure in Mandarin Chinese, especially in a colloquial context. One of the apparent features of CVC is the reduplication of a verb, namely, the verb is reduplicated in the position between the V-NP sequence and RVC, which can be prototypically schematized as follows (Chang, 1991; Li & Thompson, 1981; Shi, 2023):

$$\text{Subject} + V_i + \text{Direct Object} + RV_iC$$

As in (2-18a/b), when there is no verb copying, there is more than one reading available among the alternative patterns(2-18b) (Li, 1998). However, when the RC is underlyingly the predicate of the subject, the CVC(2-18a) becomes the only means available for Chinese speakers to express an object and a resultative within one sentence (Cheng, 2007). Hence, CVC with RVC is only possible if the resultative predicate is predicated on the matrix subject (Huang, 1984).

(2-18a). 他　骑　马　骑累　了。

Subject　V1 Object　RVC　Aspect marker

"He becomes tired by riding a horse."

b). 他　骑累　了　马。

Subject RVC Aspect marker Object

“He becomes tired by riding a horse/a horse is tired by being rode.”

Besides, the historical data also can provide us with evidence for the close relations between RVC and CVC in two aspects. First, the CVC came into being after the establishment of RVC. The innovation of the CVC is due to the fusion of V1 and RC; Second, the predicate of the CVC must be an RVC (Shi, 2002).

2.4.4.5 Patient-subject Construction (PSC)

In a general sense, as its name suggests, PSC is a structure with the patient object as a syntactic subject, as shown in (2-19). It is an ancient, highly frequent and highly stable construction in Mandarin. Previous studies have suggested that there are many different views about the nature or status of the PSC: a subcategory of SVO (e.g., Huang & Liao, 2017), unmarked or notional passive (He, 2019; Yang , 2022), topicalization structure (Shi, 2002; Shi, 2015). What should be noted here is that in this study the predicates discussed in PSC are always occupied by RVCs (cf. He, 2019). Therefore, the prototypical pattern of this structure may be presented as follows.

Patient +RVC le0

In which, almost all the RVCs with a high degree of action can enter into this structure (see examples from 2-19 to 2-21).

(2-19) 票 打开 了。

Patient-Subject RVC Aspect marker

“Ticket is opened.”

(2-20) 衣服 洗坏 了。

Patient-subject RVC Aspect marker

"Clothes are washed bad."

(2-21). 饭　　吃完　　了。

Patient-subject RVC Aspect marker

"Meal is eaten up."

In (2-19) 票 *piao4 "ticket"* is originally the semantic patient of RVC 打开 *da3kai1 "open"*， and currently is the syntactic subject of the sentence. It is also true of (2-20) and (2-21). In this study the notion of the patient is understood in a narrow view or phrased in another way, the prototypical patient is opposed to the agent and refers to the direct inanimate recipient of an action, excluding other roles like instruments (as suggested in 2-22).

(2-22). 刀子　　砍钝　　了。

Patient-subject RVC Aspect marker

"The knife has been cut blunt."

Previous evidence indicates that syntactic transitivity, verb type, the notion of affectedness and semantic orientation may contribute to the mixed finding on SyP of RVC. For example, He (2019) came up with a transitivity scale of five alternative construction types (as shown in Figure 2.6) based on the degree of syntactic transitivity. Specifically, Ba-C, being the most transitive, can be placed at the high end of the scale, while the CVC, being the least transitive, can be placed towards the low end, with the SVO, Bei-C and PSC sitting somewhere between the two ends.

Degree of prototypical transitivity	most transitive	⟷			least transitive
Sentence Pattern	Ba-C	SVO	Bei-C	PSC	CVC

Figure 2.6: Transitivity Scale of Five Alternative Construction Types (He, 2019)

However, apart from the degrees of transitivity, some scholars attributed the scale of alternative sentence patterns to semantic orientation of RVC. For example, object-oriented RVC always occurs in the more transitive constructions like SVO, Ba-C while subject-oriented RVC is always licensed by the least transitive construction, such as CVC. That is why Huang (1996) claimed that Ba-C and CVC are complimentary distribution.

The degree of syntactic prototypicality may be influenced by verb type. For example, Chu (2016) systematically analyzed different types of RVCs and their capacity to license alternative sentence patterns. Consequently, He found that the prototypicality of sentence pattern pertinent to 8 types of RVC can be ordered as SVO>Ba-C>Bei-C>CVC in terms of frequency (as shown in Table 2.5).

Table 2.5: Types of RVC and Licensing of Alternative Sentence Patterns (Chu, 2016)

RVCs	Ba-C	Bei-C	SVO	CVC
涨红 'turn red in the face	√	×	√	×
喝醉'drink-drunken'	×	×	√	×
洗脏 'wash-dirty'	√	√	√	×
砍断 'cut-broken'	√	√	√	√
学会 'learn-understand'	√	√	√	√
吃剩 'eat-leftover'	×	×	√	√
教哭 'teach-cry'	√	√	√	×
教会 'teach-understand'	√	√	√	×
Aggregation	6	5	9	3

Taking all those statements above together, an eclectic viewpoint was adopted on the SyP of RVCs in three levels: the most prototypical patterns are SVO and Ba-C, followed by Bei-C and PSC while the least prototypical pattern is CVC.

2.5 Acquisition of Prototypical Chinese RVCs

This part is exclusively dealt with the overview of relevant acquisition studies concerning RVC both in the context of L1 and L2. However, before the acquisition of Chinese RVCs is reviewed, it is necessary to summarize the findings of the acquisition of compound words in a general sense for further research design.

2.5.1 Findings in the Acquisition of Compound Words

As regards the acquisition of compound word, the central concern of the representation of a compound word in the mental lexicon was whether compound words were stored as whole-word forms or constructed from their constituent morphemes. However, more evidence (e.g., Koh et al., 2013; Niswander-Klement & Pollatsek, 2006; Shen et al., 2016) indicated that both whole-word and component morpheme can be used simultaneously and overlap in the time course of word identification. Therefore, Pollatsek et al. (2000) put forward Dual Route Process Modal (DRPM) in which there were two parallel processing routes, a de-compositional route and a direct access route, during the recognition of compound words. A considerable amount of empirical evidence confirmed the significant effect of constituent frequency and whole-word frequency effect on the recognition of compounds, like Finnish two-morpheme compounds (Hyönä & Pollatsek, 1998; Pollatsek et al., 2000) and Chinese compounds. For example, Yan et al. (2006) found that Chinese high-frequency words were more likely to be accessed through a whole-access route while low-frequency words were more likely to be processed via individual constituents.

Lexical awareness may have a facilitative effect on compound learning. Lexical awareness consists of awareness of morpheme component, awareness of construction and

awareness of word class in Gan's (2009, 2010, 2012a, 2012b) view. Gan (2012a; 2012b) found that morpheme was the most important factor in the word-meaning inferring process by interviewing twenty L2 learners of Chinese. Also, intermediate-level CSL learners had the strongest awareness of morpheme component, weakest awareness of construction and partial awareness of word class in compound learning. In her controlled experiment by Gan (2009), it was found that awareness of morpheme component of compound was more important than awareness of construction. Furthermore, Xu and Zhang (2020) investigated word recognition of disyllabic compound words by foreign learners of Chinese and found that both the first and the last morphemes had significant effects on the lexical access of two-syllable compound words. Apart from morpheme awareness, recognition of the words was significantly influenced by semantic transparency and the learners" Chinese proficiency level.

Extensive studies（e.g., Ahmadian et al., 2017; Vanpattern et al., 2004) suggested that the subsystems within vocabulary processing, such as meaning, syntax and lexical form might interact with linguistics context, besides whole-word frequency and component frequency. Language is highly interactive and important advances in the language sciences have been made in understanding how linguistic information interacts with each other. First, morpheme meaning will influence compound word recognition. For example, Wu et al. (2020) examined the processing of ambiguous morphemes in Chinese word recognition with a masked priming lexical decision task. It was found that the more frequently used dominant meanings could be activated more easily than the less frequently used subordinate meanings. Second, sentence context might influence the recognition of lexical meaning at a very early stage. It can be used to access the appropriate meaning of an ambiguous word at an early stage (Zhang et al., 2006). For example, the types of sentences

in which a given verb can appear are at least partially a function of the meaning of that verb (Lee & Naigles, 2008). Thus, learners can use the syntactic frames in which verbs are placed to help discover the verbs' meanings, which is called Syntactic Bootstrapping Effect (Gleitman, 1990) in child acquisition.

To sum up, evidence from the prior studies indicates that many factors might influence compounding learning and representation, like the token frequency of whole word and component morphemes, as suggested in DRPM, the strength of lexical awareness and subsystem like lexical form, meaning and linguistic context etc.

2.5.2 Previous Studies of RVC Acquisition in the Context of L1

The earlier studies on the acquisition of RVCs were mostly conducted in the context of L1. It can be traced back to Erbaugh (1982). He investigated four Chinese children in a diachronic manner and found that children had difficulties in producing V1 of RVC. However, over the several decades since then, relatively fewer of researches on L1 acquisition of Chinese RVCs were satisfactorily conducted. For example, Zhou (2001) and Li (2004) sporadically mentioned Chinese RVC in the development of children's language, possibly because of the difficulty in data collection and limitations from the size of the child language corpus. Previous acquisition studies, though small in number, still yielded some intriguing and important findings in relation to prototypical component morphemes and syntactic patterns.

Frequent V1s were obtained from Mandarin-Chinese children's production. For example, Zhang (2006) collected data from Mandarin-speaking children in three different kindergartens, ranging from 2 to 5 years old in age. It was found that the first slot of RVC could be occupied by physical action verbs such as 走 *zou3 "walking",* 跑 *pao3 "running",*

跳 *tiao4 "jumping",* 写 *xie3 "writing",* and adjectives like 脏 *zang1 "dirty",* 烂 *lan4 "rotten",* 破 *po4 "broken",* 吵 *chao3 "noisy",* 饿 *e4 "hungry",* 累 *lei4 "tired".* Production data of V1s suggested that verbs were more prototypical in percentage than adjectives (69.1% vs 20.9%) and V1s were closely related to children's life scenes or typical life scenarios.

Previous studies seem to indicate that RC was closely related to the prototype. For example, Zhang (2006) found that the most frequent complements among the RCs were directional complements, whether simple or complex, like 上 *shang4 "up",* 出 *chu1 "out"* and complement of result such as 死 *si3 "death",* 掉 *diao4 "drop".* Furthermore, the most frequent RCs in verb-predicated RVCs are 上 *shang4 "upper",* 好 *hao3 "good",* 到 *dao4 "arrive",* 住 *zhu4 "stop",* 完 *wan2 "finish",* 下 *xia4 "down",* 来 *lai2 "come",* 去 *qu4 "go",* 开 *kai1 "open"*, etc. Similar findings were obtained by other scholars, such as Zhang (2008). He found that the both complement of result and direction are the earliest and the most frequently used complements. The acquisition of RC can be attributed to the scale of the prototype in which five parameters were subsumed under the universal criterion of the prototype. Among the five parameters, namely the highest frequency, productivity, the basic cognitive model or ICM, simple cognitive load and simple syntactic structure, frequency of use was the most basic one.

The alternative sentence patterns licensed by RVC indicated a syntactic preference and were in relation to the semantic orientation of RC. For example, it has been found (e.g., Zhang, 2006; Zhang, 2008) that preference was always given to subject-predicate structure by children, whether the subject is an agent or patient in the thematic role, like PSC or Ba-C, while SVO with an agent as grammatical subject appeared in a reduced frequency. Ba-C

with RVCs seemed to be mastered at an early age and children tended to use it quite frequently.

The semantic orientation of RC has been touched on in previous studies and more evidence suggested that object-oriented RVC was the most prototypical. Among the three types of semantic orientation, object-predicated RVC was the structure acquired at an early age despite difficulty in the acquisition of the object, or omission of object in child language, followed by verb-predicated RVC (cf. Zhang, 2008). The subject-oriented structure appeared later and lasted for a long period. The order of children's acquisition of the RVC in terms of semantic predication was presented as follows:

Object-predicated>Verb-predicated>Subject-predicated

Such a sequence is also supported by the type frequency of three different semantic orientation of the RVCs. The object-oriented RVCs enjoy the highest frequency, followed by verb-oriented RVCs.

Prototypicality seems to exhibit itself in polysemous V1s, as exemplified by Chen and Wang (2020). They examined the developmental trajectory of various meanings of 打 *da3 "beat"* and the effects of syntactic, semantic and contextual clues on the acquisition of polysemous 打 *da3 "beat"* by analyzing two different longitudinal Chinese child corpora. It was found that in the child corpora, physical action with hand contact is the most common form of early acquisition and frequent usage of semantic representation, followed by the metaphorical and metonymical use. This finding is in agreement with Gao's (2001) prototypical semantic classification of 打 *da3 "beat"*.

Different theoretical explanations were provided for those said findings, such as Usage-based accounts, rule-based accounts etc. Chen and her fellows (2005, 2008, 2016,

2020) have provided Usage-based account and supporting evidence for those findings. For example, from the spontaneous speech of the two corpora (Chen, 2016), it was found that there was indeed a close correspondence between patterns in the input and patterns in the output, in line with Chen's (2008) finding on the constructional meaning of Chinese RVC. In particular, the role of distributional modal in input which consists of semantic prototypicality and syntactic frames and context cues as well as parents' input provided new supporting evidence for the Usage-based approach to RVC learning. Meanwhile, the experimental findings on the state-change meaning and the meaning of the action verb (V1) in RVCs reported by Chen (2005) and findings on the constructional meaning from Chen (2016) were also supportive of a Usage-based approach to language learning.

However, challenges to the usage-based approach of acquisition are posed by other approaches, like the generativist approach favoured by Hsu et al. (2019) and the rule-based view held by Deng (2019). Hsu et al. (2019) used two triangulating methods: corpus analysis and experimental elicitation task to examine the relationship between input and children's language production of RVC infixation. They found that children could master RVC infixation which was rare in the parent input utterance. By analyzing the longitudinal corpus of two Chinese-speaking children, Deng (2019) found that young children could use RVC productively in the initial developmental stage rather than unanalyzed chunk and their RVC production was not confined to the adult input. This suggested that children go far beyond the input in acquiring RVC and lent support to the rule-based account.

To summarize, qualitative data from child acquisition have indicated one point that prototypicality can exhibit itself in component morphemes, polysemous V1, semantic orientation of RC and related syntactic preference. They were prone to be accounted for regarding Usage-based approach or rules-based approach rather than prototype-based

approach.

2.5.3 Previous Studies of RVC Acquisition in the Context of L2

Chinese RVC is one of the highly frequent linguistic items in the interlanguage of L2 learners. Over the past decades, a great many studies surrounding Chinese RVCs have been carried out in the context of L2. They differentiated each other in terms of the first language (F1) of participants, theoretical framework, research methods, research objectives, and instruments.

L2 acquisition of RVC has been studied among participants with varied F1s. F1 is one of the most important influencing factors in language transfer and the cross-linguistic influence of L2 acquisition. Numerous learners with different Fl backgrounds have been selected as participants to conduct the relevant research, such as Korean (e.g., Bai, 2007; Chang, 2012; Tang, 2007; Xu, 2016; Zhang, 2020), Vietnam (e.g., Wu, 2012; Wang, 2012； Yang, 2005), English (e.g., Jiang, 2013; Lu, 2012; Xie, 2013; Xu, 2017; Zhou, 2013), Spanish (e.g., Cheng, 2020; Jiang, 2014; Li, 2015； Ren, 2014), Thai (e.g., Guan, 2019； Wei, 2014; Wang, 2010), Bahasa Indonesia (e.g., Li, 2011), Russian (e.g., Yang, 2010), Kazak (e.g., Cheng, 2002), Mongolian (e.g., Gesa, 2007), Arabic (e.g., Bassuny, 2020), Polish (e.g., Ma, 2018), Kirghiz (e.g., Liu, 2018) and hybrids (e.g., Wang, 2017). Noted here is that almost all the research was carried out in China (including mainland, Taiwan, Hongkong and Macao) and rare was conducted in overseas countries and districts.

The effect of F1 in the acquisition of RVC can be attributed to the typological discrepancy between L1 and L2. He et al. (2019) investigated the difference in processing both strong and weak RVC by different advanced subjects with different L1 backgrounds and found that the typological strength of RVC affected the processing of RVC. L2

learners whose L1 were endowed with a strong form of the RVC (such as English, Dutch, etc.), demonstrated significant differences in the difficulty of processing strong and weak RVC.

On part of the research method, case study and corpus-based approach were widely adopted in previous studies. As regards the case study method, a long list of RVCs have been investigated in prior research such as "V +到 *dao4 'arrived'*" and "V +着 *zhao2 'succeed in'*"(X.Zhang, 2016), *"*V +满 *man3 'full'*"(J.Wang, 2017), "V + adj" (Jin, 2018), causative RVC(Ma, 2014a), "V +见 *jian4 'see'*"and "V+到 *dao4 'arrived'*"(Zhang, 2012), compounds with adjective as the RC (Yu, 2013), "V+好 *hao3 'good'*" and "V+完 *wan 'finish'*" (Quan, 2013). Apart from those, RVCs with semantically empty verb as the RC (Wei, 2015), complements of 到 *dao4 "arrive"*, 晚 *wan3 "late"*, 好 *hao3 "good"*, 成 *cheng2 "finish"* (Chang, 2012), the acquisition of syntax and semantics of the "V +掉 *diao4 'off'*" (Han, 2014), semantic instruction of RC (Zhang, 2020), RVC in CVC (Xie, 2015; Zhang, 2015) and RVC in Ba-C (Jiang, 2020) have been examined.

Apart from the case study, the corpus-based approach was widely adopted in the prior studies. The most commonly used corpus is the HSK dynamic composition corpus (e.g., Han, 2014; J.Wang, 2017; Y.Wang, 2017; Xu, 2017; Zhou, 2013). Additionally, Yu (2013) used the native language corpus and the interlanguage corpus developed by Nanjing Normal University and Nanjing University to investigate the use of eighteen adjectives as RCs (including eleven monosyllabic and seven disyllabic). Xu (2017) analyzed an interlanguage corpus designed by Jinan University and Sun Yat-sen University to investigate RVC produced by English learners of Chinese.

Various theoretical frameworks, especially in Cognitive Linguistics have been adopted to explain the acquisition of RVC in the context of L2 in numerous previous researches. For example, Conceptual Blending Theory and Construction Fusion Theory were adopted by Ma (2014a, 2014b) to investigate the acquisition of Chinese causative RVC. Construction-grammar-based approach was taken to survey errors in the acquisition of Chinese RVC from native English-speaking Chinese learners (e.g., Lu, 2012; Zhu, 2017). Furthermore, the facilitative role of continuation theory and his writing-following-reading method in learning Chinese RVC were investigated by Liu and Wang (2018). They found that reading and writing can help to prompt the use of Chinese RVC in correcting and modifying the errors and incorrect usage. Talmyan event framework theory was particularly worthy of attention in investigating RVC due to its highly frequent citation in the literature (e.g., Bassuny, 2020; Guan, 2019; Ma, 2018). Unfortunately, none has applied the notion of prototype to the analysis and acquisition of RVC, except for Wu (2018).

Significant differences in syntactic patterns of RVC were evidenced in prior studies. First, SVO and Ba-C were found to be the easiest acquired construction (e.g., Bai, 2007; Jin, 2018; Li, 2011; Tang, 2007; Wang, 2004; Wang, 2017). Tang (2007) attributed the finding to the transitiveness of construction. Second, the semantic orientation of RC might be in relation to the acquisition of alternative constructions (e.g., Bai, 2007; Tang, 2007; Wang, 2004). For example, Wang (2004) found that English learners performed best in SVO and Ba-C with object-oriented RVC, while worst in Ba-C with subject-oriented RVC, in agreement with Bai (2007). Jiang (2020) found that Ba-C with object-oriented RVC was the easiest to learn, followed by verb-oriented. The construction with subject-oriented RVC was the most difficult to acquire. Third, proficiency level might affect the acquisition

of related constructions. Tang (2007) found that among Korean learners of different proficiency levels, intermediate-level learners performed significantly better in transitive construction. Wang (2004) concluded that learners' proficiency level affected syntactic choice, which was in line with Jin's (2018) finding.

In terms of the methodology, qualitative studies overwhelmingly account for the greatest part of the previous research. Error analysis and contrast analysis were frequently carried out to summarize the types of errors committed by the CSL/CFL learners. For example, Zhang (2016) gathered and categorized the errors in the acquisition of Chinese and divided the errors into four categories, like incomplete components. Similar findings were yielded by other scholars like Wang (2012) and Ding (2018). Only a small part of the research was devoted to quantitative or experimental research, such as Zhu (2017). These errors can be explained regarding a long list of factors like negative transfer of L1, over-generalization, problematic teaching material and textbook, misleading context, formal and semantic transparency etc.

Besides the effect of syntactic preference, proficiency level also affected the acquisition of RVC. For example, Xie (2013) found that learners' proficiency level was positively correlated with the acquisition of Chinese RVC. This finding was held by Zhu (2017) who found that the primary level learners were significantly different from those of intermediate and advanced levels in comprehending the form and meaning of RVC. The results from Li (2015) showed that errors might lessen as the proficiency level improved. Cheng (2020) investigated the acquisition of RVC and concluded that the proficiency levels of learners affected the error types of RVC in the acquisition process.

Referring to the instrument, the acceptability judgment test was most often designed and employed to examine the acquisition of RVC. For example, Acceptability

judgment test and translation tasks were employed by Li (2011) to investigate the acquisition of six types of sentence patterns by 90 senior Indonesian Chinese learners. Jiang (2020) employed the semantic acceptability judgment test to investigate the acquisition of Ba-C with RVCs by advanced Korean learners whose F1s are Thai and Kazakh, respectively.

Significant differences among the semantic orientation of RVC were found in empirical studies. For example, Jiang (2020) investigated the acquisition of RVC-based Ba-C by advanced Korean learners whose F1 were Thai and Kazakh. In his research, it was found that the most acceptable RCs were object-oriented followed by verb-oriented. Learners tended to reject the subject-oriented RVC. The verb-oriented RVC is the easiest to understand, followed by object-oriented whereas the least understandable is subject-oriented. In Ba-C, the most prototypical thematic role for the subject is agent and the most prototypical object is patient. Jiang (2013) found that verb-oriented compounds are significantly different from subject-oriented compounds and object-oriented compounds in terms of the frequency of usage and accuracy rate.

In the pedagogical implications, both the V1s and RCs were highlighted, as evidenced by Zhang (2012) and L.Zhang (2016). A multitude of constructive pedagogical sequences on the RVC have been proposed based on the empirical studies. For example, Wen (2017) admitted that RC should be taught along some kind of teaching order in the classroom instruction: lexical RC, such as 完 *wan2 "finish"*, 动 *dong4 "move"* should come first followed by RCs with both lexical and functional meaning, such as 掉 *diao4 "drop"* and 到 *dao4 "arrive"*. The functional RCs like 住 *zhu4 "stop"* should be the last to teach. Yu (2013) claimed that the acquisition order of RC can be ranked as complement of result>complement of degree>complement of state>complement of possibility,

according to the error rate and other parameters. Thus, Liu (2018) made a suggestion that RVC and components should be selected and ordered in textbooks and taught in the classroom according to their difficulty levels or degree of prototypicality.

To conclude, prior research under various theoretical frameworks suggests that several factors have been taken into consideration in the acquisition of RVC such as frequency of component of RVC, learners' proficiency levels, polysemy of V1, syntactic pattern, and semantic orientation. Unluckily, rare has conducted a systematic study on the prototypical RVC and provided a well-defined and empirically testified prototype-based graded membership of prototypical RVCs in terms of lexical form and syntactic usage.

2.6 Research Gap

According to the taxonomy of research gaps built by numerous researchers (e.g., Kumar, 2022; Robinson, et al., 2011; Miles, 2017; Müller-Bloch & Kranz, 2014), in this study, five major gaps, namely theoretical gap, population gap, empirical gap, knowledge gap, methodological gap were to be addressed, respectively.

First, a prototype-based integrated modal of L2 Chinese RVC acquisition can bridge the gap in the theoretical framework. In particular, PET and Dual Route Processing Modal are combined to predict the identification of Chinese RVC by CSL/CFL learners. Moreover, inspired by the Three-Dimensional Grammar Framework evolved by Celce-Murcia and Larsen-Freeman (1999), PET is adopted to investigate the interplay of SeP, LP and SyP of L2 acquisition of RVC. Prototypicality is an under-investigated area in SLA and classroom teaching (Liang, 2014). Prototype-based language teaching and learning are equally suggested by a couple of scholars (Liang, 2014; Tang, 2020). However, among the long list of theoretical frameworks adopted to examine the acquisition of Chinese RVC,

such as Event Frame Theory (Bassuny, 2020; Guan, 2019; Ma, 2018), Internal Aspect Theory (Ma, 2014a, 2014b), Construction Grammar Theory (Zhu, 2017; Lu, 2012), Continuation Theory (Liu &Wang, 2018), Frequency Effect Theory (Hanban, 2010), rare is conducted to examine the L2 acquisition of RVC on the ground of PET and DRPM. Furthermore, not only are grammatical structures collections of forms, but they also convey meaning (semantics) when applied appropriately in a certain situation (Celce-Murcia & Larsen-Freeman, 1999). For example, Li (2007) applied the concept to analyze Chinese RVC. However, scarce study to date touches on the role of prototype-based RVC instruction in the acquisition of Chinese RVC in the context of CFL/CSL mediated by other factors, though their interaction of form, meaning and usage in Child vocabulary acquisition have been stated in Bootstrapping Hypothesis.

Second, the learners recruited from a secondary school in Malaysia can bridge the gap in population. A substantial number of previous acquisition research into RVCs was conducted in mainland China partially due to the generous support from the Chinese government. However, some of the sub-population has been unexplored and under-researched. Just as Ma et al. (2017) nicely put it, the teaching of Chinese was likely to take place in primary and secondary schools in many contexts. Thus, relevant studies should be conducted on teaching primary and secondary school learners whose first language is not Chinese in mainland China and other parts of the world.

Third, qualitative research in this study contributed to the prototypical hierarchy of Chinese RVCs, which is lacking in previous studies. Prototypicality is a complicated notion. The prototypical features of Chinese RVCs have been discussed in the prior literature in a piecemeal manner, such as the transitivity of V1(e.g., Huang, 2009; Xie, 2013) and RVC, syllabi-city of V1 and RC (e.g., Liu, 2001; Liu, 2007; Lyu, 1966),

semantic orientation of RC (e.g., Jiang, 2020; Shi, 2002; Xu, 2017), productivity of V1 and RC (Chen, 2008; Wu, 2018), the frequency distribution of RC, the polysemy V1, syntactic preference in usage (e.g., Bai, 2007; Jin, 2018; Shi, 2002; Wang, 2004) etc. No one has developed a unitary definition of prototypical RVCs in terms of form, meaning and usage. By integrating Rosch's intuition-based criterion and corpus-based frequency criterion, Gilquin and McMichael (2018) proposed a converging criterion for identifying the prototypical members. Boas (2003) has made a usage-based analysis of the V1 and RC licensed by English resultative construction. Nevertheless, a study applying the converging criteria to the prototypical analysis of the lexicon and syntax of Chinese RVC is scarce, together with the acquisition of RVC in the context of CFL/CSL.

Fourth, quasi-experimental research in this study can provide further empirical evidence of interplay among form, meaning and syntactic context lacking in prior research. Thus far, only research on prototypical RVC and components has been conducted by Wu (2018). However, there is a dearth of experimental studies to support her research findings. Chen and Wang (2020) argued for prototypicality in the acquisition of semantics by taking the polysemous verb 打 *da3 "beat"* as an example and concluded that meaning was derived from the confluence of lexical and syntactic cues. However, the problem of how the meaning, lexical cue and syntactic cue join together to affect the acquisition of Chinese "打 *da3+RC"* in the context of CFL/CSL is particularly worthy of answering. The acquisition of RVC has been highlighted by Chen and Wang (2020, p.32) that "future research should be conducted to explore the appropriate methods and assessments of these pedagogical applications".

Lastly, mixed methods study adopted in this study is in urgent need in terms of methodological trends. As reviewed in Section 2.5, previous studies on RVC indicated the

majority of prior research involved qualitative study, to be exact corpus-based error analysis with only a small number of mixed method research. This is in line with analyses by Gong et al. (2020) and Ma et al. (2017). Thus, the present study aims to establish a new inquiry on research design with mixed methods, to grasp a fuller picture of the acquisition of Chinese RVC by CFL/CSL learners.

2.7 Formulation of Research Questions

Existing literature suggests that there are many problems being unsolved in the RVC learning while prior evidence of prototypicality and its consistency in predicting SLA paves a new way to unravel the mystery of L2 acquisition of Chinese RVC. Nevertheless, "prototype is all in all an under-investigated area" (Liang, 2014, p.217) and prototypical RVC is still an ill-defined and unverified area without fully sourced data. Therefore, five research questions were addressed in this study to bridge the gaps in various aspects.

Traditional grammarians have provided detailed accounts of its properties in terms of lexical form, meaning and syntax. Various theories, such as Event Theory have been adopted to make an analysis of RVC and then to probe into relevant problems in acquisition. However, rare has applied the notion of the prototype to the analysis of RVC and its instructed L2 acquisition of RVC. Therefore, PET can bridge the gap in theoretical underpinning, as shown in the research questions in Phase I（refer to Table 2.6).

The only research on RVC from the perspective of the prototype was conducted by Wu (2018). In her research, the graded membership of RVC and component morphemes, namely V1s and RCs were obtained based on frequency information of stimuli from one single corpus and their corresponding cognitive domains. However, lexical form, meaning, and syntactic context are indispensable and basic parts of vocabulary knowledge. Thus, in

Wu's research, semantic and syntactic prototypicality of RVC remain unanswered. Additionally, different from Wu (2018), Gilquin and McMichael (2018) proposed a convergence criterion of the prototype in which frequency information from multi-corpora and intuition-based prototypicality were analyzed individually and then converged. If this criterion is applicable, what are the LP, SeP and SyP of RVC? RQ 2 and 3 were in a position to be answered in Phase II (a) and (b), as stated in Table 2.6. Furthermore, as a prerequisite, before the analysis was conducted, the operational definitions of LP, SeP and SyP were necessary to figure out (as shown in Phase I). Thus, those definitions and prototype-based sequencing of RVC can bridge the knowledge gap for a better understanding of the notion of prototypical RVC.

Another weakness in Wu's (2018) research lies in the shortage of empirical evidence to test her research findings on LP. Furthermore, most of the previous studies on RVC acquisition were conducted by eliciting L2 learners who were studying Chinese at the university of mainland China as participants. In this study, to quantitatively test the findings from Phase II, Malaysian Chinese learners from a local middle school were recruited in a quasi-experimental study to fill the gap in the empirical study, as shown in Phase III(a) and (b) and the population gap.

Table 2.6: Research Questions in the Current Study

Phase(s)	Research Questions
Phase I	1.What factors are inclueded in the tentative definitions of LP, SeP and SyP of RVC?
Phase II (a)	2.What are the suggested prototype-based sequencing of component morphemes, namely V1s and RCs of RVCs?
Phase II (b)	3.What are the suggested prototype-based hierarchies among alternative 打-RC-related sentence patterns ?

Table 2.6 continued

Phase III (a)	4.How can prototype-based component morphemes of RVC explain learners' performance in the instructed L2 learning of RVCs?
Phase III (b)	5.How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 learning of RVC-related syntax?

Taking all the phases together, a multi-phase mixed method research design was adopted which was scarce in the previous studies of Teaching Chinese to Speakers of Other Languages. To be specific, Phase II is to qualitatively find the prototype-based membership of RVC with reference to triangulation data while Phase III aims to quantitatively test the findings derived from Phase II. Thus, this study can bridge the methodological gap.

2.8 Integrated Theoretical Frameworks and Hypotheses in Phase III

As stated previously, Phase III is designed to quantitatively test the qualitative findings in Phase II. To be specific, III(a) aims to examine the effects of prototypicality of V1s, RCs and token frequency of RVCs on the instructed compound learning. Phase III(b) is designed to investigate the effects of prototype-based RVC instruction translated from the findings in Phase II, on outcome of syntactic learning, mediated by LP, SyP and SeP. However, no single extant theory in the SLA has rightly explained the complex phenomenon in the present study. Therefore, the integration of various theories involved, which is built on the brief introduction of relevant theories (as shown in Table 2.7) seems to be necessary.

Table 2.7: Theories Involved in the Current Research (Phase III)

Phase III	Research Objective	Theories involved
a	To verify the validity of prototype-based sequencing of V1s and RCs in instructed L2 acquisition of Chinese RVC.	1.Prototype Effect Theory 2.Frequency Effect Theory 3.Dual Route Processing Modal of Compound Identification

Table 2.7 continued

b	To verify their integrated roles of LP, SeP and SyP in instructed L2 acquisition of Chinese RVC	1.Prototype Effect Theory 2.Interaction among form, meaning and syntax.

2.8.1 Prototype Effect Theory (PET)

According to Stamenkovic and Tasic (2013), PET "has been mostly concerned with nouns, sometimes with adjectives and prepositions, but there have been very few attempts to apply PET to verb analyses (p.218)". Prototype effect has shown up in all areas of language---morphology, syntax, semantics and language acquisition (Lakoff, 1987/2008; Horgan, 2014). The following observations or assumptions were summarized to predict CFL learners" performance in current research.

Observation 1: "PET is a productive theory in the sense that its insights into the structure of lexical categories can be applied in various fields of the lexicon." (Geeraerts, 2006, p.144).

Observation 2: "The category membership of items rated more prototypical (typical) items of a category appears to be learned before that of less prototypical (typical) items." (Rosch et al., 1976a, p.491)

Observation 3: Acquisition is optimized by the introduction of an initial, low-variance sample centered upon prototypical exemplars (Elio & Anderson, 1981,1984).

However, based on the criticisms of PET made by Laurence and Margolis (1999), despite its ability to bridge the indirect link between language and the world through the mind,

PET is not comprehensive enough to be an appropriate theory. It is not versatile enough as its only strength lies in accounting PET (UKEssays, 2018).

2.8.2 Other Theories in Phase III (a)

As shown in Table 2.9, to predict the contributions of V1, RC and RVC to RVC identification, other than the PET, the Frequency Effect Theory (FET) and Dual Route Processing Model (DRPM) were introduced in this part.

First, DRPM for compound identification was proposed by Pollatseck and his fellows (Castelhano et al., 2008; Hyönä et al., 2004; Hyönä &Pollatseck, 1998; Pollatseck et al., 2000). It has claimed that there are two routes of access to the lexicon for complex words, such as RVC. One was a direct access route for which the whole word was the access unit while the other was the de-compositional route. To put it in another way, compound processing is affected by both the whole word frequency and root-morpheme frequency or the frequency of both whole word and component morphemes have effects on compound identification.

Second, due to the strong link between prototypicality and frequency, as well as the role of frequency in DRPM, FET was necessary to be mentioned. According to Ellis (2002), Frequency Effect can manifest itself at all levels of language representation: lexicon (e.g., Kirsner, 1994), morphosyntax (e.g., Ellis & Schmidt, 1997; Taraban & Roark,1996), and meaning etc. Different types of input frequency (construction frequency, type-token frequency, recency) have been confirmed to promote learning (e.g., Azazil, 2020; Bybee, 2010).

Frequency is a necessary component in the theories of language acquisition and processing. In particular, token frequency counts how often a particular item appears in the

text, whereas type frequency refers to the number of distinct lexical items that can be substituted in a given slot in a construction, whether it is a word-level construction for inflection or a syntactic construction specifying the relation among words. Its effect can be illustrated in the following observations (Ellis, 2002).

Observation 1: Frequency determines the second language acquisition of structure. Type and token affect the productivity of patterns and syntactic patterns are a function of type rather than token frequency. High token frequency promotes the entrenchment.

Observation 2: The acquisition of grammar is the piecemeal learning of many thousands of constructions and the frequency-biased abstraction of regularities within them. Language learning is the associative learning of representations that reflect the probabilities of occurrence of form-function mappings.

Observation 3: Type or token units, exemplar, and prototype are importantly different variants of figuring. Language learning is exemplar-based. Prototypes are the typical exemplars in a category.

Observation 4: Our language-processing system is sensitive both to the frequency of individual words and to the number of words that share the same beginnings.

Observation 5: The recognition and production of words is a function of their frequency of occurrence in the language.

Observation 6: There are strong effects of word frequency on the speed and accuracy of lexical recognition processes and lexical production processes.

Observation 7: Frequency--whether of non-linguistic experiences, linguistic forms, linguistic meanings, or form-meaning associations--will be likely to contribute to cognitive entrenchment, which in turn will map onto cognitive salience and thence onto degrees of prototypicality.

2.8.3 Other Theories in Phase III (b)

To test the joint contribution of prototype-based RVC instruction, LP, SeP and SyP to RVC-related syntactic learning, Three-Dimensional Framework of Grammar Teaching by Larsen-Freeman and her fellows (Larsen-Freeman, 2001, 2003; Larsen-Freeman & Long, 1991; Larsen-Freeman & Celce-Murcia, 2016) was succinctly introduced. Instead of the deep-rooted ideas among language learners and instructors that grammar is exclusively equated with a collection of form and explicit linguistic rules, a broad definition of grammar (Larsen-freeman & Celce-Murcia, 2016) was taken. It claims that lexico-grammar should include not only the structure but the lexicon of a language and operated at the word, phrase, sentence. In the Three Dimension Framework of Grammar Teaching, three interrelated dimensions of grammar features are listed : (1) form, which deals with how a particular structure is constructed and how it fits in with other structures in a sentence (i.e., morphology and syntax, respectively); (2) meaning, which is concerned with semantic considerations, such as lexical and grammatical meaning, as well as multi-word units (e.g., at the end of the day), and notions (e.g., space, time), and (3) use, which has to do with the interpretation of grammatical structures in a specific context, whether it be reflective of situational, linguistic, or social difficulties. For example, the passive voice is

frequently used to show that the emphasis is on a certain action rather than who performed it.

Form, meaning and syntax have been hypothesized to be interdependent (Beedham,1986; Dixon, 2000). Their interactions have been supported by a great number of studies: form and meaning (e.g., Ahmadian et al., 2017; Taft, 2003; Vanpattern et al., 2004), meaning and syntax (e.g., Kempson et al., 2016; McKoon & Ratcliff, 2007), form and syntax (e.g., Devlin et al., 2015), as well as form, meaning and use (e.g., Kolliakou, 2004).

There is substantial supporting evidence surrounding interconnections among lexical form, meaning and syntactic context in vocabulary learning in child language acquisition such as Bootstrapping Hypothesis. Bootstrapping means using available information from other domains as leverage to facilitate (boot) acquisition of other domains (Bittner & Ruhlig, 2013). It consists of Pragmatic Bootstrapping, Lexical Bootstrapping, Semantic Bootstrapping and Syntactic Bootstrapping. Pragmatic bootstrapping is considered to be essential for language processing and acquisition in any context or modality (Oller, 2005). It serves to obtain a basic or prototypical vocabulary repertoire. Lexical Bootstrapping holds that lexis and semantics play a crucial role in language learning and specifically, in the development of grammar (Goodman, 1997). The Syntactic Bootstrapping Hypothesis states that language learners use the syntactic frames in which verbs are placed to constrain their likely meanings as revealed by the context (Gleitman, 1990). One of the basic principles of Semantic Bootstrapping claims that language learners can construct a semantic representation of the input sentences with the help of context and the meanings of the individual words in the sentence (Xie, 2010).

2.8.4 Integrated Models of Instructed RVC Learning

The main focus in the present study was on the role of prototype-based RVC instruction in RVC learning, together with other mediating variables like LP, SyP and SeP. Thus, before the integrated models were proposed, the role of instruction in language learning is necessary to restate based on the previous studies.

Instruction might be defined as any systematic attempt or intervention to enable or facilitate language learning by manipulating the mechanisms of language learning and/or the conditions under which these occur (Ellis, 2005; Housen & Pierrard, 2005). The role and effects of instruction in SLA have always been controversial. However, most SLA researchers and L2 teachers believed that instruction of some sort can positively influence L2 learning. Nevertheless, a minority of early theoretical views, such as Krashen, argued that instruction has little impact on L2 acquisition. A growing field of academic inquiry that touches on the role of instruction in SLA is instructed second language acquisition (ISLA) whose primary concern lies in whether instruction is beneficial for L2 acquisition. The entirety of ISLA is rooted in various aspects of multiple SLA theories that view instruction as potentially optimizing L2 development, and perhaps even essential if learners want to achieve advanced levels of L2 proficiency.

The effectiveness of instruction in ISLA is claimed to be mediated by some factors, such as the type of language feature targeted for instruction. Some language features may be more amenable to instruction than others. Possible mediating factors include the perceptual salience of the target feature in the input, its functional or semantic transparency, and its relative (typological, linguistic or cognitive) markedness. All of the factors can be seen as contributing to the relative complexity of the target feature (Housen & Pierrard, 2005).

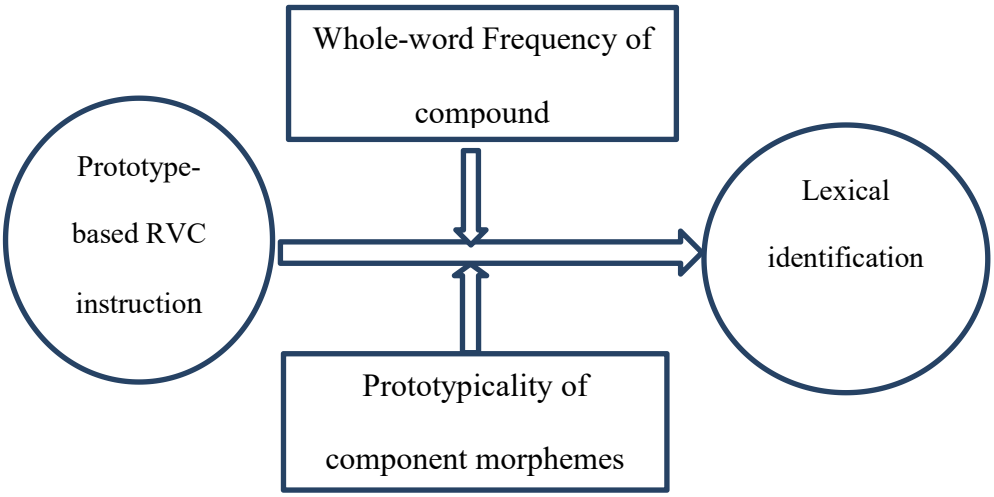


Figure 2.7: Integrated Framework of Compound Identification

Given the positive effect of instruction mentioned above and DRPM on the compound learning, as well as the notional overlap between frequency and prototype, an integrated framework of lexical identification was proposed accordingly in Phase III(a). As shown in Figure 2.7, it states that prototype-based RVC instruction can positively facilitate compounds learning, mediated by prototypicality of component morphemes and whole-word token frequency.

In Phase III (b), an integrated framework for syntactic acceptability of RVC was put forward (Figure 2.8) by combining the role of instruction in ISTA, PET and Tripartite Framework of Grammar Teaching. It claims that prototype-based RVC instruction can facilitate acceptability of RVC-related syntax, mediated by LP, SeP(including prototypicality of polysemous V1 and prototypicality of semantic orientation of RC) and SyP.

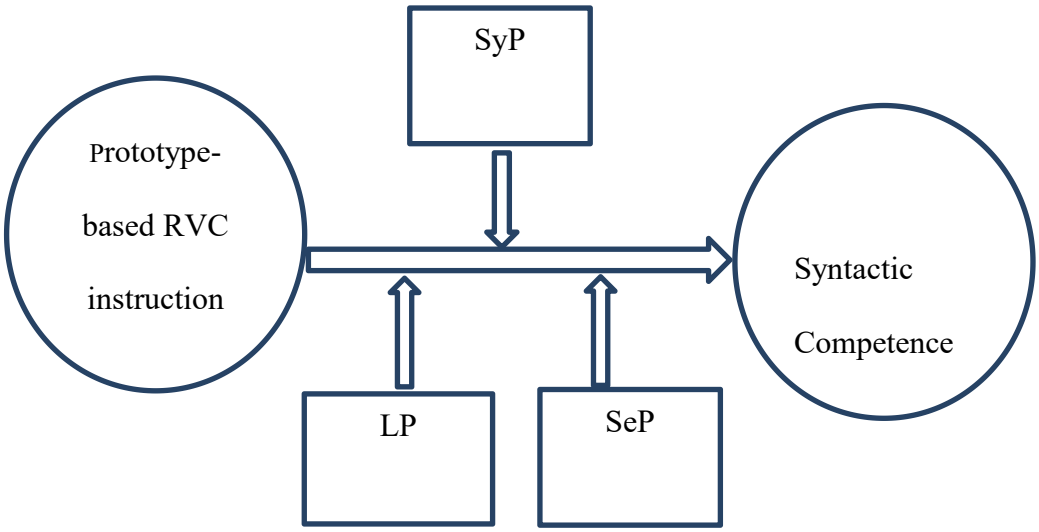


Figure 2.8: Integrated Framework for Syntactic Acceptability

2.8.5 Research Hypotheses

Based on the theoretical frameworks stated above, the following two hypotheses were proposed. When an integrated framework of lexical identification is applied to RVC, hoping to predict the lexical identification of RVC by intermediate learners, it can be hypothesized in Hypothesis 1.

Hypothesis 1(H1) assumes that prototype-based RVC instruction can facilitate RVC learning and it is simultaneously mediated by the prototypicality of V1s and RCs, as well as the token frequency of RVC, which might be instantiated as follows.

(H1-i) The experimental group performs significantly better in the LAJT than the control group, other things being equal.

(H1-ii) The prototypicality of V1s exerts significant influence on CFL learners" performance in the LAJT, other things being equal.

(H1-iii) The prototypicality of RCs exerts significant influence on CFL learners" performance in the LAJT, other things being equal.

(H1-iv) RVCs with high token frequency are more acceptable than less frequent RVCs by CFL learners, other things being equal.

(H1-v) Prototype-based RVC instruction, prototypicality of V1s, prototypicality of RCs and token frequency of RVCs can jointly contribute to the lexical identification of RVC in a significant manner.

Hypothesis 2(H2) is proposed to answer the question of whether prototypical sentences can facilitate RVC learning and when introducing prototypical sentences as illustrative examples, what other factors might be taken into consideration. H2 predicts that prototype-based RVC instruction might have a significant effect on the syntactic acceptability of alternative sentence patterns concerning 打 *da3-RC*, mediated by LP of 打 *da3-RC*, SeP of 打 *da3-RC* (including prototypicality of polysemous 打 *da3 "beat"* and prototypicality of semantic orientation of RC) and SyP. Clearly, for H2 to be confirmed, six types of evidence are needed.

(H2-i) The experimental group performs better than the control group in SAJT, other things being equal.

(H2-ii) Sentences with the most prototypical 打 *da3-RCs* are easier to be accepted by intermediate learners than sentences with other non-prototypical da3-RCs, other things being equal.

(H2-iii) Learners' performance in sentences with object-oriented RVCs significantly differs from the sentences with other types of RVCs in SAJT, other things being equal.

(H2-iv) For a certain RVC, the most prototypical sentences are more likely to be accepted by intermediate CFL learners, other things being equal.

(H2-v) Sentences with prototypical meaning of 打 *da3 "beat"* are more likely to be accepted by intermediate CFL learners, other things being equal.

(H2-vi) A modal which includes prototype-based RVC instruction, LP of 打 *da3-RC*, the prototypicality of polysemous V1, the prototypicality of semantic orientation of RCs, and SyP, can significantly predict the outcome of learners" syntactic acceptability of RVC.

2.9 Summary

Acquisition data can provide us insights into the theoretical issues. Following Deng's (2019) findings in the acquisition who claims the derivation of RVC is a lexical process, the stance is taken in current research that Chinese RVC was a lexical compound rather than syntactic construction. In view of Larson-Freeman's (2001) Tripartite Framework of Grammar, current research aims to analyze prototypical RVC in terms of form, meaning and use by adopting Gilquin and McMichael's (2018) corpus-based cognitive approach to the prototype.

There are 5 major sub-parts to address in this chapter. At the outset, three background theories involved are briefly introduced and described including vocabulary knowledge, corpus-based assumption and techniques as well as the cognitive linguistic theory since prototype effect is a cornerstone theory in Cognitive Linguistics. A specific section is devoted to Prototype Effect Theory, including the defining features of prototype, criteria of the prototypicality and prototype effect in language acquisition. The fundamental part deals with the Chinese RVC, including the previous studies on RVC, theoretically prototypical RVC based on the in-depth analyses of features of RVC in form, meaning and use (lexical prototypicality, semantic prototypicality and syntactic

prototypicality) and acquisition of Chinese RVC, consisting of child language acquisition and second language acquisition. According to the aforementioned statement, the gap of research and 5 research questions are elucidated, respectively. To probe into the question of what factors might be taken into account, two unifying theoretical frameworks were put forward, based on which two research hypotheses were proposed.

CHAPTER 3

METHODOLOGY

3.1 Chapter Overview

This chapter encompassed a discussion of the methodological approach and research design best suited to examine the research questions set out in Section 2.7. To answer the five questions involved, an exploratory sequential mixed methods research design was adopted. It was a three-phase mixed methods design in which the research started with collection and analysis of qualitative data that was then followed by a development phase of translating the qualitative findings into an approach or tool that was tested quantitatively (Creswell & Clark, 2018).

To be specific, following Gilquin and McMichael's (2018) convergence criterion of the prototype framework, corpus data and cognitive data in the qualitative phase were required to identify the prototype-based graded membership of RVCs in terms of lexical form and sentence patterns. What follows was the supporting experimental evidence concerning their roles in prototype-based RVC instruction. The subsequent sections included an illustration of participants, sampling techniques, instrumentation and teaching module, as well as the specific process of data collection by phases, followed by data analysis and pilot study. The chapter concluded with a summary of the preceding sections.

3.2 Research Design: Overview of Mixed Methods Design (MMD)

To answer the five research questions in three phases (see Table 3.1), MMD was adopted. It has been justified by Bitchener's (2010) statement that designing a study appropriate for a specific situation was largely determined by the purpose of the study and questions being investigated and the source available. In particular, as suggested by

Creswell and Clark (2018), apart from RQ1 which provided operational definitions for questions in Phase II, qualitative design was adopted to probe into the RQ2 "*What are the suggested prototype-based sequencing of component morphemes, namely V1 and RC of RVC?"* and RQ3 *"What are the suggested prototype-based hierarchies among alternative 打-RC-related sentence patterns ?".* The quasi-experimental design with control group and pretests was adopted to answer RQ 4 *"How can prototype-based component morphemes of RVC explain CFL learners' performance in the instructed L2 learning of RVC?"* and RQ 5 *"How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 learning of RVC-related syntax?"*.

Besides the research questions, another justification for adopting MMD rested on the triangulating data provided by mixed methods research (e.g., Baker & Egbert, 2016; Clark & Ivankova, 2016; Mackey & Gass, 2015; Sugie & Mitsugi, 2014). Triangulation in MMD was in agreement with the spirit underlying the Gilguin and McMichael's (2018) convergence criterion of the prototype adopted in this study. It referred to the use of more than two sets of data within a single study to improve the validity and reliability of research findings (Shreve & Angelone, 2010). To offset each other's weaknesses, triangulating data can provide a way for a researcher to examine different types of data and increase the overall research reliability and validity (Wen, 2020). The following section began with an overview of the multi-phase exploratory sequential mixed methods research design presented in Table 3.1.

Table 3.1: A Visual Modal of Exploratory Mixed Methods Research Design

Phase(s)	Research Objectives	Research Questions	Method(s)
I(formulation)	To formulate unitary definitions of LP, SeP and SyP by reviewing relevant previous literature.	What factors are included in the operational definitions of LP, SeP and SyP of RVC?	documentation; content analysis
II(a)qualitative analysis	To provide prototype-based sequencing of V1s and RCs by analyzing the target monosyllabic verbs from *Chinese Dictionary of Verb Usage (CDVU)* with reference to their corpus-based information and intuition-based information.	What are the suggested prototype-based sequencing of component morphemes, namely V1 and RC of RVC?	convergent design: corpora-based analysis and cognitive analysis
II(b)qualitative analysis	To provide prototype-based sequencing of alternative RVC-related sentence patterns by analyzing their distribution of 打-RC-related sentence patterns in corpus and learners' production.	What are the suggested prototype-based hierarchies among alternative 打-RC-related sentence patterns ?	convergent design: corpora-based analysis and cognitive analysis
III(a) quantitiative verification	To verify the validity of prototype-based sequencing of V1 and RC in the instructed L2 acquisition of Chinese RVC.	How can prototype-based component morphemes of RVC explain CFL learners' performance in the instructed L2 learning of RVC?	quasi-experimental design with control group and pretests
III(b) quantitative verification	To verify their integrated roles of LP, SeP and SyP in the instructed L2 acquisition of Chinese RVC.	How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 acquisition of RVC-related syntax?	quasi-experimental design with control group and pretests

According to Creswell and Clark (2018), a characteristic property related to the exploratory sequential MMD started with the collection and analysis of both qualitative and then quantitative data. To be specific, before the LP and SyP were examined, unitary definitions of LP, SeP and SyP were first of all developed from sporadic statements in the previous literature, as shown in Phase I. Subsequently, by adopting Gilquin and McMichael's (2018) criterion of the prototype, qualitative analyses of prototypical

component morphemes of RVC and related sentence patterns were conducted in Phase II to answer the research questions 2 and 3. In order to test the presumably positive effects of findings in Phase II on prototype-based RVC instruction, a quasi-experiment design with control group and pretests or pretest-posttest control group design (Cook et al., 2002; Zientek et al., 2016) was adopted in Phase III. In particular, III (a) aimed to examine the effects of prototypicality of component morphemes and whole-word frequency on the instructed L2 acquisition of compound; and III (b) aimed to investigate the joint roles of LP, SeP and SyP in the instructed syntactic acquisition of RVC-related patterns.

In Phase III, a pretest-posttest control group design was adopted in the present study in which two intact classes with perspective participants (HSK-3 level) have been picked out as the control group and experimental group, respectively. Before different teaching interventions were carried out, all the participants were administered Chinese Proficiency Test to examine whether their proficiency levels can meet the requirement of being intermediate CFL learners. Then both groups were measured on L-AJT and S-AJT twice, once as pretest and once as immediate post-test. As with Norris and Ortega's (2000) finding, the current study used pre-tests to check for pre-experimental differences among the research groups. The treatment intervention imposed on two different groups of participants (experiment vs control) differed: the experimental group was exposed to Chinese RVC modules in which CFL learners receive prototype-based RVC instruction translated from Phase II while in the control group, teaching proceeds as scheduled by using the readily available textbook. Prototype-based RVC instruction consisted of an introduction of the knowledge of prototypical features of RVCs in terms of form, meaning and use, mechanical practice using V1s, and RCs with different degrees of prototypicality, followed by some production tasks.

3.3 Participants

Two batches of different participants have been recruited, respectively in the current study. One was in the qualitative phase, including Phase II(a) and Phase II(b) for eliciting intuition-based data for prototypical V1s, RCs and sentence patterns; The other was recruited in the quantitative phase for the implementation of the pretest-posttest control group design. The overview of participants in different phases was presented in Tables 3.2, including the analysis, the number of participants, instruments and participants. The detailed information of participant profile was demonstrated in Table 3.3(a & b).

Table 3.2: Research Phases, Instruments and Participants

Phase(s)	Analysis	Participants	Instruments	No. of Participants
II(a) qualitative analysis	intuition-based prototypical component morphemes of RVC	learners of Chinese in Kamii high school of Inchon in Korean, Dimitrie Cantemir University of Targu Mures in Romania, Confucious Institute of University of Antananarivo in The Republic of Madagascar and international students in Jinggangshan University in mainland China	Cued Lexical Production Task (CLPT)	30
II(b) qualitative analysis	intuition-based prototypical sentence pattern of da-RC	learners of Chinese in Kamii high school of Inchon in Korean, Dimitrie Cantemir University of Targu Mures in Romania, Confucious Institute of University of Antananarivo in The Republic of Madagascar and international students in Jinggangshan University in mainland China	Cued Syntactic Production Task(CSPT)	30
III(a) quantitative verification	positive effect of prototype-based instruction(component morphemes)	two intermediate-level intact seventh-grade prep classes in a local national secondary school located in Sibu, Sarawak, cooperating with Confucius institute of University College Technology Sarawak (UCTS), Sarawak region, Malaysia	Lexical Acceptability Judgment Test(L-AJT)	42:control group(23)vs experimental group(19)

Table 3.2 Continued

III(b) quantitative verification	positive effect of prototype-based instruction(LP, Syp and SeP)	two intermediate-level intact seventh-grade prep classes in a local national secondary school located in Sibu of Sarawak, cooperating with Confucius Institute of University College Technology Sarawak (UCTS), Sarawak region, Malaysia	Syntactic Acceptability Judgment Test (S-AJT)	42:control group(23)vs experimental group(19)

A total of 30 CSL/CFL learners —sixteen male and fourteen female—have been selected to participate in the qualitative phase. The educational institutions that set them apart were the Dimitrie Cantemir University of Targu Mures in Romania, the Confucius Institute of University of Antananarivo in the Republic of Madagascar, Jinggangshan University in mainland China, and Kamii High School in Inchon in Korea. Their Chinese proficiency levels differed. In particular, these participants have received, on average, 3.8 years of instruction in CSL/CFL in Confucius Institute or Confucius Classroom when administered, ranging from 1 year to 8 years. In addition, their L1 backgrounds ranged from Russian, Korean, Vietnamese, Thai, German, Malagasy, and French, among others, as demonstrated in Table 3.3(a), so that L1 influence in the finding could be minimized. Thus, the roughly universal findings could be applicable to Malaysia learner of Chinese as a foreign language.

The participants in the qualitative phase were recruited out of their voluntary will, aiming to elicit the intuition-based prototypical V1s, RCs and sentences via CLPT and CSPT. To produce unbiased data and neutralized findings, the participants in this phase had to meet the following criteria.

I. They were foreign Mandarin learners in formal institutions, regardless of their gender, learning context, schooling, first language etc.

II. They promised to complete the CSPT and CLPT and they are capable of doing so.

Table 3.3(a): Participants Profile in Phase II

Category	Description	Percentage (number of participants)
Fl	Russian	17 (5)
	Korean	10(3)
	Vietnamese	13(4)
	Thai	20(6)
	German	17(5)
	Malagasy	6(2)
	French	17(5)
Gender	Male	53(16)
	Female	47(14)
Educational institution	Dimitrie Cantemir University of Targu Mures in Romania	27(8)
	Confucius Institute of University of Antananarivo in the Republic of Madagascar	37(11)
	Jinggangshan University in mainland China	23(7)
	Kamii High School in Inchon in Korea	13(4)
Years of instruction in CSL/CFL	1 to 3 years	30(9)
	4 to 6 years	43(13)
	7 to 8 years	27(8)

The participants involved in the quasi-experiment phase, including Phase III(a) and Phase III (b) were two intact seventh-grade preparatory classes in a local national public middle school in Sibu of Sarawak. Their Chinese course was implemented in a Confucius Classroom, cooperating with Confucius Institute of University College Technology Sarawak (UCTS), Negeri Sarawak, Malaysia. Most of the learners in this school grew up in multilingual contexts to the effect that they can speak Malay, English and even Chinese as an inheritage language. These participants in the two classes were relatively homogeneous in terms of age, ranging from twelve to fourteen years old, class size and Chinese proficiency level. According to the Chinese Proficiency Test (see Appendix I), these two intact homogeneous classes were randomly divided into two groups: the

experiment group (N=19) and the control group (N=23). Six female and fifteen male learners made up the experiment group whereas nine female and fourteen male learners made up the control group. Only nineteen learners out of 21 learners, of which four were female and fifteen were male, volunteered to take part in the experiment, as revealed in Table 3.3(b).

Table 3.3(b): Participants Profile in Phase III

Category	Description	Percentage	
		Experiment group	Control group
Gender	Male	79	61
	Female	21	39
Age	12	60	57
	13	30	33
	14	10	10
Race	Chinese	90	92
	Malay	7	3
	Aboriginal	3	5

The participants in the quantitative phase were chosen to testify the predictive ability of LP, SeP and SyP in the instructed L2 acquisition of RVC. Thus, they had to meet the following criteria:

I. They were intermediate-level CFL learners according to HSK standards (Teng, 2017) and in two intact classes in a formal institution.

II. They were willing to participate in the teaching experiment.

3.4 Sampling Methods

As stated previously, the present study adopted an exploratory MMD where samples varied from phase to phase according to different research objectives. Therefore,

an overview of sampling methods was necessary (see Table 3.4). To note, the samples which were used in the pilot study have been excluded from the actual study.

In general, purposeful sampling, which was common in MMD was adopted to help answer the research questions in Phase II and Phase III. Purposeful sampling was also referred to as purposive sampling which "means that researchers intentionally select participants and sites that can provide the necessary information to understand the central phenomenon" (Creswell & Clark, 2018, p. 732).

To be specific, in Gilquin and McMichael's (2018) criterion of the prototype, both corpus-based prototype and ease of elicitation or intuition-based prototype from Chinese as L2 learners were necessary for a more valid and reliable prototype. However, intuition-based information on the LP and SyP of RVC from CSL/CFL learners was not included in Wu's (2018) research. To bridge the gap, "maximum variation sampling", which is a type of purposeful sample (Creswell & Clark, 2018, p.732) has been used in Phase II to obtain an intuition-based hierarchy of prototypical V1s, RCs and alternative sentence patterns. Target population in the present study was foreign Chinese learners who had the possibility of learning Chinese, with maximum variation in gender, L1, level of schooling, and learning context.

To test the effects of prototype-based RVC instruction translated from the findings in Phase II and other mediating factors, a quasi-experimental research design with control group and pretests was adopted. The differences between quasi-experimental research and a real teaching experiment rest on the non-probability assignment of subjects and frequent use of intact classes. In light of the stronger morpheme awareness in intermediate learners confirmed in the previous studies (e.g., Gan, 2009, 2012a), a "homogeneous sampling method", another type of purposeful sample(ibid) was adopted in Phase III(see Table 3.4).

The units in the sample shared similar traits and the target population was overseas foreign Chinese learners with intermediate Chinese proficiency levels.

Table 3.4: Sampling Strategies in Various Research Phases

Phases	Site & Participants	Sampling Strategy/Sampling Scheme
II(a)qualitative analysis	CSL/CFL learners in Kamii high school of Inchon in Korean, Dimitrie Cantemir University of Targu Mures in Romania, Confucious Institute of University of Antananarivo in The Republic of Madagascar and international students in Jinggangshan University in mainland China	Purposeful(maximum variation)
II(b)qualitative analysis	CSL/CFL learners in Kamii high school of Inchon in Korean, Dimitrie Cantemir University of Targu Mures in Romania, Confucius Institute of University of Antananarivo in The Republic of Madagascar and international students in Jinggangshan University in mainland China	Purposeful(maximum variation)
III(a)quantitative verification	two intermediate-level intact seventh-grade prep classes in a local national secondary school located in Sibu of Sarawak, cooperating with Confucius Institute of University College Technology Sarawak (UCTS), Sarawak region, Malaysia	Purposeful(homogeneous)
III(b)quantitative verification	two intermediate-level intact seventh-grade prep classes in a local national secondary school located in Sibu of Sarawak, cooperating with Confucius Institute of University College Technology Sarawak (UCTS), Sarawak region, Malaysia	Purposeful(homogeneous)

3.5 Instrumentation

Five instruments have been used in the current research, other than data from three different types of corpora, namely native corpus, learners' corpus and child corpus. They were cued lexical production task (CLPT), cued syntactic production task (CSPT), Chinese proficiency test (CPT), lexical acceptability judgment test (L-AJT) and syntactic acceptability judgment test (S-AJT). The details of those instruments have been summarized in Table 3.5.

Table 3.5 Research Phases, Instruments and Objectives

Phase(s)	Research Objectives	Instruments	No. of Items
II(a) quatitative analysis	to collect intuition-based prototypical component morphemes of RVC	Cued Lexical Production Task (CLPT)	Task 1:15 Task 2: 17
II(b) qualitative analysis	to collect intuition-based information on prototypical degrees of alternative sentence pattern of da-RC	Cued Syntactic Production Task (CSPT)	9
III(a) quantitative verification	to verify the extent to which prototypicality of V1 and RC, whole-word frequency and prototype-based instruction can predict the outcome of compound learning	Lexical Acceptability Judgment Test (L-AJT)	45
III(b) quantitative verification	to verify the extent to which prototypicality of da-RC, polysemous V1, semantic orientation of RC and prototype-based instruction can predict the outcome of sentence learning	Syntactic Acceptability Judgment Test (S-AJT)	47
III(a/b) quantitative verification	To determine whether there is a significant difference between experimental group and whether particianpnt in two intact classes are intermediate learners	Chinese Proficiency Test (CPT)	15

3.5.1 Instruments in Phase II

Production tasks or generation tasks were generally designed to collect cognitive or intuition-based productive data. It has been justified by the underlying logic that prototype usages should be more easily recalled and therefore produced with the greatest frequency. Both Rice (1996) and Gilquin and McMichael (2018) employed the generation task to 30 subjects to generate sentences with a particular target word as a prompt. In the elicitation, the first sentences produced by informants were regarded as the most prototypical usage. There were two instruments in Phase II, namely CLPT and CSPT to elicit the prototypical components and sentence patterns of RVC.

CLPT (see Appendix E), was designed to elicit intuition-based data on prototypical V1s with corpus-based RCs of three different degrees of prototypicality as prompts. It still

held true for the intuition-based prototypical RCs (For the formulation of corpus-based prototypical V1s and RC, readers can refer to the following data collection). In the task, 15 V1s and 17 RCs with different degrees of prototypicality have been chosen (see Table 3.6) as prompts and then presented to the participants. The participants were required to fill in the slot to form RVC as possible as they can. For example, "打 ____" is given to participants, they can insert 碎 *sui4 "broken"*, 完 *wan2 "finish"*, 傻 *sha3 "silly"*, and 累 *lei4 "tired"* to form 打碎 *da3sui4 "beat-broken",* 打完 *da3wan2 "finish beating",* 打傻 *da3sha3* "*beat-silly",* 打累 *da3lei4 "beat tired",* respectively.

Table 3.6: Selection of Stimuli in the CLPT and Examples

Levels of prototypicality	**V1s**	**RCs**
The Most prototypical	拿 *na2 "take"*，学 *xue2 "learn"*，坐 *zuo4 "sit"*	完 *wan2 "finish"*，出 *na2 "out"*，上 *shang4 "up"*
The Less prototypical	弄 *nong4 "make"*，跑 *pao3 "run"*，搞 *gao3 "make"*，读 *du2 "read"*	破 *po4"broken"*，错 *cuo4"wrong"*，来 *lai2 "come"*
The Least prototypical	写 *xie3 "write"*，想 *xiang3 "think"*，抓 *zhua1 "seize"*	光 *guang1 'exhausted/*，入 *ru4 "into"*，累 *lei4 "tired"*

CSPT (see Appendix F) was designed to elicit intuition-based prototypical patterns of RVC. In the task, the 打 *da3+RCs* with different degrees of LP and semantic orientation have been selected as prompts. The participants were asked to use the target "打 *da3+RC"*

to invent sentences as possible as they could. According to the finding of corpus-based prototypical RCs, nine 打 *da3 "beat"+RCs* were chosen as prompts. Among these prompt RVCs, three were lexically most prototypical compounds, namely 打好 *da3hao3 "beat well",*打死 *da3si3 "beat to death",*打出 *da3chu1 "beat out".* Among them, 打出 *da3chu1 "beat out"* and 打死 *da3si3 "beat to death"* were object-oriented whereas 打好 *da3hao3 "beat well"* was verb-oriented. Three of those prompts were lexically less prototypical compounds, namely 打掉 *da3diao4 "beat-drop",* 打错 *da3cuo4 "beat-wrong",* 打破 *da3po4 "beat broken".* Among the three less prototypical RVCs, 打破 *da3po4 "beat broken"* is object-oriented while 打掉 *da3diao4 "beat drop"* and 打错 *da3cuo4"beat-wrong"* were verb-oriented. The lexically least prototypical compounds were 打断 *da3duan4 "beat broken",* 打入 *da3ru4 "beat into",*打惯 *da3guan4 "beat-habitually".* In those least prototypical compounds, 打断 *da3duan4"beat broken"* and 打入 *da3ru4 "beat into"* were object-oriented in semantic orientation while 打惯 *da3guan4"beat-habitually"* was subject-oriented.

3.5.2 Instruments in Phase III

In the quasi-experimental phase (Phase III), three instruments have been specifically designed: Chinese proficiency test (CPT), lexical acceptability judgment test (LAJT) and the syntactic acceptability judgment test (SAJT). CPT was employed before the intervention to examine whether participants were at the intermediate level and whether there was a significant difference in Chinese proficiency level between the control group and the experimental group. The other two were used twice in both the pretest and post-test, respectively.

CPT shed light on the learners' Chinese proficiency level. In order to make up a homogeneous group in terms of learners' Chinese proficiency level, CPT has been administered (see Appendix I). It was designed based on the Hanyu Shuiping Kaoshi (Chinese proficiency test for foreign language learners organized and governed by Chinese Ministry of Education, HSK for short) (level III) for the sake of validity and reliability. HSK (level III) was intended for learners who have studied Chinese for three semesters, with 2 to 3 class hours each week. It was the counterpart of the level III of the Chinese Language proficiency scales for speakers of other languages and the B1 level of the common European Framework of Reference. HSK test (level III) was originally made up of three parts: listening comprehension, reading comprehension and writing sections. Ideally, participants should finish all three parts. However, it was somewhat time-consuming (the whole test contains a total of 80 items and will last for 90 minutes in total) and unnecessary such that only the reading comprehension part was included in the proficiency test. In CPT, there were three parts and a total of fifteen items. Each item on the CPT was worth two points, for a total score of 30. The HSK-3 standard (Teng, 2017) stated that, given the maximum test score of 300 points, 180 points served as a threshold line. As a result, the CPT's threshold line was 18 points, meaning that students who scored higher than this were considered intermediate level learners.

In particular, there were five items in Part I and ten sentences have been provided. Participants were asked to choose the appropriate one from them. In Part II, there were five items and for each item, one or two sentences were provided, in which one word or phrase was missing. The participants were required to choose one of the suggested words or phrases to fill in the blank. Part III was made up of five items and five short passages, each

followed by a question. The participants should choose the best answer from the three choices provided. Examples have been illustrated in Table 3.7.

Table 3.7: Examples of the Items in the CPT

Part(s)	Item	Choice
Part 1	你知道怎么去那儿吗？（E） *"Do you know how to get there?"*	当然。我们先做公共汽车，然后换地铁。 *" Of course, we first took the bus and then transfer the subway."*
Part 2	她说话的（E）多好听啊！ *"How pleasant the (E)she spoke!"*	E 声音 *"voice"*
Part 3	您是来参加今天会议的吗？您来早了一点儿，现在才八点半。您先进来坐吧。 *会议最可能几点开始？（C）* *" Do you come here for today's meeting? you came a little bit earlier, it is half past eight. Well, please come in and have a seat."* *When does the meeting possibly start?(C)*	A 8 点 *"eight"* B 8 点半 *"Half past eight"* C 9 点 *"Nine"*

L-AJT was designed to assess learners' lexical competence of Chinese RVCs by referring to the lexical decision task in psychology. The basic rationales for LAJT

(Appendix J) employed in the pretest and post-test are two-fold:(i) The object of the use of acceptability judgment test in L2 acquisition research was linguistic competence; (ii) second, the concept of judgment hierarchy underlying the acceptability judgment test was in uniform with the scalar notion of prototypicality. According to Greenbaum and Quirk (cf. Bard et al., 1996), three potentially different but often interacting factors can be reflected by speakers' judgments: (1) beliefs about the forms they habitually use, (2) beliefs about the forms that ought to be used, and (3) willingness to tolerate usage in others that corresponds neither to their habitual forms nor prescriptive forms. Lakoff and Mohan(ibid) maintained that there exists an ordinal scale of acceptability within a speech community. Therefore, all speakers were likely to argue on the rank order of acceptability values in a given set of sentences, although they may disagree on the absolute rating of individual sentences.

Table 3.8: Design and Examples of RVCs in L-AJT

Levels of Prototypicality	**V1s**		**RCs**		**RVCs**
the most prototypical	拿 *na2 "take"*; 学 *xue2"learn"*		好 *hao3"good"*; 出 *chu1"out"*	⇨	拿出 *na2chu1 "take out"*; 打出 *da3chu1 "beat out"*; 搬出 *ban1chu1 " move out"*; 睡好 *shui4hao3 "sleep well"*
the less prototypical	打 *da3"beat"*; 读*du2"read"*		错*cuo4"wrong"*;掉 *diao4"drop"*	⇨	拿错*na2cuo "take-wrong"*; 读错 *du2cuo4 "read-wrong"*; 搬掉 *ban1diao4 "move off"*
the least prototypical	睡 *shui4"sleep"*; 搬 *ban1"move"*		烦 *fan2"annoyed"*; 怕 *pa4"afraid"*; 醒 *xing3"awake"*	⇨	学烦*xue2fan2 "learn-annoyed;* 打烦 *da3fan2 "beat annoyed"*; 睡醒 *shui4xing3 "awake"*

L-AJT consisted of forty-five RVCs, generated by combining three levels of prototype-based hierarchical V1s with RCs (as exemplified in Table 3.8). The stimuli RVCs in the L-AJT have been randomized and given separately to the participants to finish within 15 minutes. Participants had to respond by choosing one of five responses-

“completely acceptable”, “moderately acceptable”, “not sure”, “completely unacceptable” or “moderately unacceptable” which were presented in Malay.

SAJT (see Appendix K) was to do with the subjective judgment of how “good” or “odd” a sentence sounds (Culicover, 2013). It was a kind of research method employed for collecting competence data. What should be noted here that acceptability was, crucially, different from grammaticality, or phrased in another way, an ungrammatical sentence was, more often than not, unacceptable, but not all unacceptable sentences were ungrammatical. A sentence with RVC was unacceptable for reasons having to do the those influencing factors. They were LP of RVC, the SeP of RVC including semantic orientation and semantic prototype of 打 *da3 “beat”*, as well as the prototypicality in syntactic context RVC may appear. The details of the test were presented as follows. SAJT was designed to examine the roles of prototype-based RVC instruction in learners’ performance, mediated by some other factors. These mediating factors included LP, prototypicality of V1, prototypicality of semantic orientation and SyP.

In SAJT, 47 sentences have been designed according to the BCC corpus with some revision. Among those sentences in SAJT, 4 different variables (LP, the prototypicality of polysemous 打 *da3 “beat”*, the prototypicality of semantic orientation of RCs and SyP) were incorporated, which could be exemplified in the following examples.

(3-1) 张飞把李广**打死**了。

“Zhang Fei beat Li Guang into death.”

(3-2) 张浩然打车**打掉**了 50 令吉。

“Zhang Haoran spend 50 ringgits in taking a taxi.”

(3-3) 张学良打烧饼**打出**了幸福路。

“Zhang Xueliang led a happy life by making Chinese pancake.”

(3-4) 张肖已经**打好**了关系。

“Zhang Xiao has built well the relationship.”

Sentence (3-1) was a Ba-C, in which 打死 *da3si3 “beat to death”* was the lexically most prototypical RVC according to the finding in this study and it was object-oriented in terms of semantic oriented. The 打 *da3 “beat”* was semantically the most prototypical V1 while in the sentence (3-2), it was a CVC in terms of the five types of alternative sentence patterns. However, 打掉 *da3diao4 “beat-drop”* was a lexically less prototypical RVC, compared with (3-1), and it was a semantically less prototypical meaning of V1. As with (3-2), example (3-3) was identically a CVC. What was different was that 打出 *da3chu1 “beat out”* was a directional RVC in which 打 *da3 “beat”* had a less prototypical meaning though it was also an object-oriented RVC. In the example (3-4), the meaning of 打 *da3 “beat”* was construed in a less prototypical way. What was noted here was the 打好 *da3hao3 “beat well”* in (3-4) was a verb-oriented RVC.

The participants in both groups were required to rate the extent to which a total of 47 sentences were acceptable. Their responses were measured on a 5-point Likert scale ranging from “totally unacceptable”, “totally acceptable” and “moderately unacceptable” to “sound odd but acceptable” and “moderately acceptable”. To facilitate the understanding of the scale, the instructions of the task were in English and Malay when presented to the Malaysian participants, but they were in Chinese when presented to the Chinese participants.

3.6 Teaching Module

Teaching module has been designed to carry out the quasi-experiment study. It aimed to mainly investigate the roles of prototypical V1s, RCs and prototype-based RVC instruction in the compound identification and the roles of LP, SeP, SyP and prototype-based RVC instruction in the syntactic acceptability related to RVC. The module consisted of different teaching materials in the experimental group and the control group (see Appendix G & H) and the procedure of how the teaching experiment was conducted.

3.6.1 Teaching Materials in the Experimental Group and Control Group

Chinese RVC modules or teaching materials as new treatment intervention was developed and designed (see Appendix G), according to the findings in Phase II of mixed methods. It compared the two different groups and measures changes resulting from prototype-based instruction in terms of lexical form, meaning and syntactic patterns. Teaching materials used in the experimental group were chosen based on the findings in the qualitative phase concerning the prototypical V1s, RCs, RVCs, 打 *da3*+RC and patterns for 打 *da3*+RC. Specifically speaking, the first week was dealt with the lexical features, semantic features and syntactic features of the Chinese RVC, together with some practices. Week two focused on the most prototypical V1s, derived examples and some practice, the less prototypical V1s, illustrative examples and practice, and the least prototypical V1s, as well as the review and comprehensive drillings. Week three discussed the prototypical RCs, the less prototypical RCs, the least prototypical RCs and a content review plus some corresponding drills. Last week explained the alternative sentence patterns of RVCs and the prototypical patterns involved with 打 *da3-RCs*, followed by some productive and comprehensive practice.

Teaching materials used in the control group (see Appendix H) were selected from readily available textbooks---The Bahasa Cina of Kericulum standard Kelas Pelarihan (Tan et al., 2019). Specifically speaking, HSK Standard Course-3 targeted at the HSK-3 test was chosen by the Confucius Institute for intermediate-level learners. It consisted of 8 units, in each of which listening, reading, writing and revision were included. In the glossary followed, the monosyllabic adjectives which could function as RC and monosyllabic verbs which could function as V1 have been listed as follows.

Before the learners go to the HSK-3, ideally speaking, they should have learned HSK1 and HSK2 for 60-70 academic sessions and mastered 450 characters and phrases, the monosyllabic verbs which could function as V1 and adjectives and some verbs which could function as RC in HSK1 and 2 have been listed as follows.

Monosyllabic RCs

矮 *ai3 "short",* 饱 *bao3 "full"*, 差 *cha4 "to fall short of",* 短 *duan3 "short",* 饿 *e4 "hungry",* 过 *guo4 "over",* 坏 *huai4 "bad",* 久 *jiu3 "long",* 旧 *jiu4 "old",* 渴 *ke3 "thirsty",* 老 *lao3 "old age"* ,蓝 *lan2 "blue",* 绿 *lv4 "green",* 难 *nan2 "difficult",* 胖 *pang4 "fat",* 瘦 shou4 "thin", 疼 *teng2 "aching",* 甜 *tian2 "sweet".*

Monosyllabic V1s

搬 *ban1 "to move; to carry",* 带 *dai4 "bring",* 发 *fa1 "send",* 跟 *gen1 "follow"*, 关 *guan1 "close"*, 花 *hua1 "pay"*, 还 *huan2 "return"*, 换 *huan4 "exchange"*, 讲 *jiang3 "speak"*, 教 *jiao1 "teach"*, 接 *jie1 "meet"*, 借 *jie4 "borrow"*, 哭 *ku1 "cry"*, 拿 *na2 "catch"*, 骑 *qi2 "ride"*,试 *shi4 "try"*, 站 *zhan4 "stand"*, 长 *zhang3 "grow".*

Before the learners went to the HSK-3, ideally speaking, they should have learned HSK1 and HSK2 for 60-70 academic sessions and mastered 450 characters and phrases, the monosyllabic verbs which could function as V1 and adjectives and some verbs which could function as RC in HSK1 and 2 have been listed as follows.

Monosyllabic V1s(HSK-1)

爱 *ai4 "love"*，吃 *chi1 "eat"*, 读 *du2 "read"*, 喝 *he1 "drink"*, 回 *hui2 "return"*, 叫 *jiao4 "call"*,开 *kai1 "drive"*, 看 *kan4 "to look at"*, 买 *mai3 "to buy"*, 去 *qu4 "go",* 请 *qing3 "invite"*, 说 shuo1 *"speak"*, 听 *ting1 "listen",* 想 *xiang3 "want",* 写 *xie3 "write"*, 住 *zhu4 "live",* 坐 *zuo4 "sit"*, 做 *zuo4 "produce, make"*.

Monosyllabic V1s(HSK-2)

穿 *chuan1 "wear",* 等 *deng3 "wait",* 懂 *dong3 "understand",* 进 *jin4 "enter",* 离 *li2 "leave",*让 *rang4 " allow",* 送 *song4 " send",* 问 *wen4 " ask",* 洗 *xi3 " wash",* 笑 *xiao4 " smile",* 走 *zou3 "walk",* 要 *yao4 "to want to",* 忙 *mang2 "busy"*.

Monosyllabic RCs(HSK-1)

大 *da4 "big",* 多 *duo1 "more",* 少 *shao3 "few",* 好 *hao3 "good",* 回 *hui2 "back",* 会 *hui4 "can",* 冷 *leng3 "cold",* 热 *re4 "hot",* 上 *shang4 "up"*.

Monosyllabic RCs(HSK-2)

白 *bai2 "white"*, 出 *chu1 "to come out",* 长 *chang2 "long",* 错 *cuo4 "wrong",* 到 *dao4 "to* reach", 懂 *dong3 "understand"*, 高 *gao1 "high",* 贵 *gui4 "expensive",* 黑 *hei1 "black",* 红 *hong2 "red",* 进 *jin4 "to enter",* 笑 *xiao4 "smile",* 近 *jin4 "near",* 快 *kuai4*

"quick", 慢 *man4 "slow",* 忙 *mang2 "busy",* 完 *wan2 " finish",* 新 *xin1 "new",* 远 *yuan3 "far".*

3.6.2 Procedure of Teaching Experiment

The Chinese language course in the local national Middle School consisted of 16 teaching periods of classroom instruction in one semester, two periods per week, over eight weeks. The experiment was embedded in the four weeks of the course (see Table 3.9). The time allocation was spread over 8 periods for teaching and practicing. The general 40-minute explicit RVC teaching procedure in the experimental group was as follows: starting from the introduction of basic properties of Chinese RVCs in terms of lexical form, meaning and syntax, V1s and RCs were presented (through PowerPoint) to learners successively based on their degrees of prototypicality with illustrative examples from the most prototypical items to the least prototypical ones.

Table 3.9: Content Distribution of EG and CG Within four-week Language Course

Period	**Week 1**		**Week 2**		**Week 3**		**Week 4**	
	Group		**Group**		**Group**		**Group**	
	EG	CG	EG	CG	EG	CG	EG	CG
period 1	Linguistic properties of RVC	Unit 1 text 1 扁鹊治病	Most prototypical V1	Unit 1 阅读分享渔夫的故事	Most prototypical RC	Unit 2 温故知新芙蓉楼送辛渐	Semantic orientation of RVC and	Unit 3温故而知新: 敕勒歌
period 2	Semantic and syntactic properties of RVC	Unit 1text 2落难王子	Less and least prototypical V1	Unit 1 温故而知新 登鹳雀楼	Less and least prototypical RC	Unit 2 阅读分享小鸟请原谅我	Syntactic distribution and prototypicality	Unit 1-3: Revision
Note: EG=experimental group; CG=control group								

During the presentation, to arouse learners' attention and interest, different classroom activities have been used like word cards on which each V1 or RC was on one side and their collocation on the other. The teacher presented the V1s or RCs with different

degrees of prototypicality and asked the participants to name the possible RVCs. These activities were followed, after the presentation, by different tasks to practice like matching exercises, filling in the missing RVC in the given sentence etc. In the production, learners were asked to find out more RVC learned in the classroom in the local Chinese textbook as an assignment and to share with their classmates next period.

3.7 Data Collection

Before the data collection was formally carried out, as shown in Table 3.10, the first step to be done in the preparatory stage was to formulate the definitions of LP, SeP and SyP of RVC as prerequisites, as revealed in Phase I in Table 3.1.

LP referred to the prototypical lexical forms of Chinese RVC which covered prototypical V1s, RCs and RVCs. According to the literature reviewed in Chapter 2, prototypical V1s could be described as highly frequent and productive transitive physical action verbs; prototypical RCs were concerned with static complements, directional complements and completive complements with high token frequency and type frequency while the prototypical RVCs were defined as transitive achievement verbs with prototypical V1s and RCs. By drawing on Gilquin and McMichael's (2018) corpus-based cognitive criterion of the prototype, prototypical V1s and RCs were produced by converging different strands of data: corpus-based prototypicality and intuition-based prototypicality, among others.

SeP was investigated to examine the meaning of the prototypical RVC from two-fold aspects: the prototypicality of polysemous 打 *da3 "beat"*, a good case of V1s adopted in the current research and the prototypicality of semantic orientation of RC. The most prototypical meaning of 打 *da3 "beat"* has been found to be a semantically physical action

verb with hand contact whereas the most prototypical RCs should be object-oriented in terms of semantic orientation.

SyP meant which sentence tended to be the most prototypical one among the alternative sentence patterns licensed by a target RVC. More evidence in previous studies suggested that prototypicality in syntax was strongly linked with semantic orientation. In particular, SVO was most often used with object-oriented RVC and verb-oriented RVC while the most prototypical pattern for subject-oriented RVC was CVC. Influenced by Gilquin and McMichael's (2018) converging criteria of the prototype, the syntactically prototypical syntactic context for RVC, in general, was measured according to the distribution analysis of alternative constructions in the BCC corpus and availability of RVC in CSL/CFL learners' production.

After the LP, SeP and SyP were well defined, another preparatory work was to obtain the target V1s, RCs and 打 *da3-RCs* which were elaborated as follows before the formal qualitative analyses were carried out as shown in Table 3.2.

The target V1s were selected from Chinese Dictionary of Verb Usage (CDVU) (Meng et al., 1999). The justification of CDVU rests on the statement in its preface by Lǚ Shuxiang, the proposer of the notion of Chinese *dong-jie-shi* (Chinese equivalence to RVC). Apart from as an oft-cited dictionary in RVC research, CDVU has been claimed to be endowed with one of the specialties that in the 1223 verbs, all the verbs that licensed the verb-resultative compounds and verb-directional compounds have been listed, whether monosyllabic or disyllabic.

As stated previously, due to the prototypicality of mono-syllabicity, 460 monosyllabic verbs in CDVU which could license RVCs have been determined as target

V1s. To be specific, all the possible verbs that were claimed to license complement of result and complement of direction, whether monosyllabic or disyllabic, were picked out from CDVU; The total number of verbs listed was 662. In a second step, only those monosyllabic verbs were selected as stimuli for the sake of their superiority in percentage (in those selected verbs, monosyllabic verbs roughly accounted for 70% while disyllabic verbs occupy 30%.), as well as morphological simplicity and defining properties in the LP; Thus 460 verbs survived this step for further analysis (see Appendix B).

Table 3.10: Data Collection in the Different Phases

Phases	Data	Data Sources	Collecting Methods
II(a)qualitative analysis	type and token frequency of target V1s and RCs	BCC corpus	corpus concordance
	token frequency of target V1s and RCs	HSK corpus	corpus concordance
II(a)qualitative analysis	frequent V1s and RCs in child production	Child-oriented studies	manual collection of RVCs
	availability(intuition-based prototypical V1s and RCs)	Cued Lexical Production Task(CLPT)	eliciting the data by a semi-structured questionaire
II(b)qualitative analysis	construction frequency of alternative patterns related to da3+RCs	BCC corpus	extracting the data by Regex
	availability(intuition-based prototypical patterns)	Cued Syntactic Production Task(CSPT)	eliciting the data by a semi-structured questionaire
III(a)quantitative testification	acceptability along 5 Likert scale for alternative RVCs with different prototypical V1s, RCs, frequency of RVCs and teaching treatment	Lexical Acceptability Judgement Test(L-AJT)	eliciting the data by a test with 5-point Likert scale
III(b)quantitative testification	acceptability along 5 Likert scale for alternative sentences with with different LP, SeP,SyP and teaching treatment	Syntactic Acceptability Judgment Test(S-AJT)	eliciting the data by a test with 5-point Likert scale

The target RCs were extracted from all the possible RVCs found in the BCC corpus with 460 V1s as nodes. All the extracted RVCs (N=19824) prompted by the 460 V1s were then put into the online software for the token frequency of Chinese characters (MEIAL, 2016) to pick out those characters functioning as RCs and their type frequency.

Examples were presented to illustrate their exact computation. Some adjectives can merely function as RC, such as 湿 *shi1 "wet"* in 哭湿 *ku1shi1 "cry-wet"* and 弄湿 *nong4shi1 "make-wet"*. Thus, the frequency of 湿 *shi1 "wet"* obtained from online instrument was equivalent to the type frequency of 湿 *shi1 "wet"* while what should be noted here is that some characters can function as both V1 and RC, like 打走 *da3zou3 "beat away",* 走歪 *zou3wai1 "go awry",* 走完 *zou3wan2 "finish walking",* and 踢走 *ti1zou3 "kick away"*. By using an online instrument for the token frequency of Chinese characters, it is not difficult to find that the character 走 *zou3 "walk"* occurred four times. What is different is that only in 打走 *da3zou3 "beat away"* and 踢走 *ti1zou3 "kick away"*, 走 *zou3 "walk"* functions as RC while in 走歪 *zou3wai1 "go awry"* and 走完 *zou3wan2 "finish walking"*, 走 *zou3 "walk"* is a matrix verb. So, the type frequency of RC, such as 走 *zou3 "walk"* is computed by subtracting the frequency of the character as V1 from the frequency of the character obtained from the online corpus instrument. 469 stative verbs and adjective verbs have been found to function as RCs. Among those RCs, 312 RCs were deemed as target RCs (see Appendix C) whose type frequency is above 5 (following Wu's operation).

打 *da3*-RCs (Appendix D) were selected to examine the distributional information of alternative sentence patterns licensed by 打 *da3-RC*, namely SVO, Ba-C, Bei-C, PSC,

and CVC. They were produced as a function of the semantic orientation of RC and LP of RC.To note here, token frequency of 460 target V1s referred to their frequency of occurrence in multi-register mode (including historical data and modern data) in the BCC corpus and HSK corpus. Type frequency of V1s was determined with reference to the number of corresponding RVCs found in the BCC corpus by searching both *"V1+v"* and *"V1+adj"* since RCs can be occupied by verbs (v) or adjectives (adj). BCC corpus was equipped with a function, using which the possible RVCs with a certain target V1 can be provided. For example, by searching "打 *da3 'beat'+v"*and "打 *da3 'beat'+adj"*, 261 打 *da3 "beat"-RCs* have been found. Therefore, a conclusion could be made that the type frequency of 打 *da3 "beat"* was 261.

3.7.1 Data Collection in Phase II

Phase II in Table 3.10 was to obtain the prototype-based sequencing of target V1s, RCs and *da3-RCs*. In Phase II (a), different strands of data, like type frequency and token frequency of target V1s and RCs from the BCC corpus, HSK corpus and Child corpus, as well as the intuition-based data from CLPT converged to produce three levels of prototypical V1s, RCs and 打 *da3-RCs*; Phase II (b) aimed to produce prototype-based graded sequencing among the alternative sentence patterns related to 打 *da3-RCs*.

As stated previously, following Gilquin and McMichael's (2018) criterion of the prototype, three corpora have been employed as data sources in the current study to obtain the corpus-based prototypicality of RVC and related sentence patterns. They were BCC corpus, HSK dynamic writing corpus (HSK corpus for short) and Child corpus. To better understand how the data were collected, a brief introduction of the corpora involved was necessary.

BCC corpus was a large-scale Chinese comprehensive corpus that could fully reflect the language life of contemporary society. It has been designed by Beijing Language and Culture University (BLCU) with roughly 15 billion characters. Those corpus data were distributed in various models: multi-field, newspaper, literature, dialogue, discourse, science, diachronic search, ancient Chinese and self-defined. The online version (BLCU, 2014-) was open and free to those public researchers. In the current study, the multi-field modal which contained both the spoken data and written data, as well as the ancient Chinese was employed to minimize the influence of stylistic characteristics. It could provide us with the information of frequency count of the hit, the collocation and sentence patterns. An example could be presented to readers for a better understanding. When the keyword V 碎 *sui4 "broken"* was searched in the BCC corpus, the concordance of the keyword (see Figure 3.1), together with all the possible V 碎 *sui4 "broken"*and their frequency (Figure 3. 2) could be provided.

In Figure 3.2, all the possible compounds of V 碎 *sui4 "broken"*, like 打碎 *da3sui4 "beat-broken"*, 捏碎 *nie1sui4 "pinch-broken"*, 摔碎 *shuai1sui4 "fall-broken"* and their frequency counts (numbers in red) occurred in the BCC corpus were listed. For example, the token frequency of 打碎 *da3sui4 "broken"* in the BCC corpus was 3631. The number of these compounds could be used as an indicator of productivity or token frequency of compounds with 碎 *sui4 "broken"* as RC. To note, those impossible chunks like *要碎 *yao4sui4*, *觉碎 *jue2sui4*, and *有碎 *you3sui4* (* refers to impossible RVCs) have been excluded from the actual list of RVC.



Figure 3.1: Concordance of the Key Word V 碎 *sui4 "broken"*

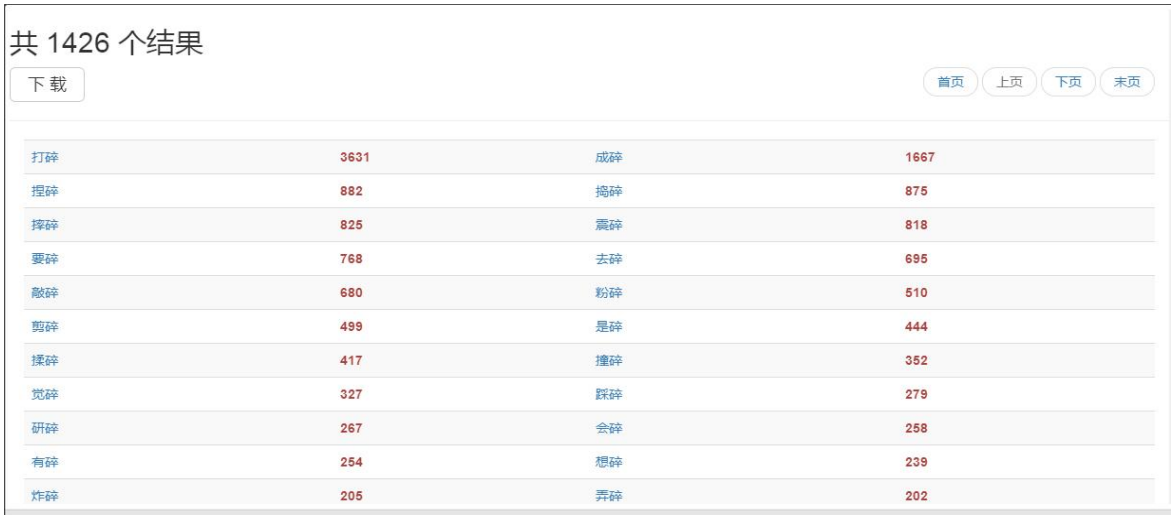


Figure 3.2: Possible V 碎 *sui4 "broken"* in the Text and Frequency

BCC could provide researchers with the frequency of specific sentence patterns by searching the formalized pattern or regular expression (Regex) of each sentence pattern, an important term in Computational Linguistics. For example, when the regex "把 *ba3 'disposal' n* 打死 *da3si3 'beat to death'"* in which "n" referred to any nominal expression was searched in the search engine, all the possible Ba-Cs with 打死 *da3si3 "beat to death"*

could be extracted (Figure 3. 3). The number in the upper right corner of Figure 3.3 revealed that there were altogether 164 patterned sentences in the BCC corpus.



Figure 3.3: Example of Construction with Regex “把 n 打死 *da3si3 ‘beat to death’*”

HSK dynamic writing corpus (HSK corpus for short) was an interlanguage or L2 learners’ corpus which has collected the writing data from HSK Chinese Proficiency Test, targeting those CSL/CFL learners. The Version 1.0 was launched in 2006, with a corpus size of 10740 articles and about 4 million words, ranging from 1992 to 2005. Since then, the corpus has been modified and improved with a corpus of 11569 articles and a total of 4.24 million characters. The online corpus (BLCU, 2019-) was open to researchers and equipped with four functions: string retrieval, advanced retrieval, sentence retrieval and statistical analysis. For example, when 打碎 *da3sui4 “beat broken”* was searched in the string retrieval, the raw data or tagged data could be obtained. In the tagged data, the nationality and gender of the participants, testing time, title of the writing and score of each part of HSK test were included (see Figure 3.4). By searching 打碎 *da3sui4 “beat broken”* in it, the syntactically distributional information shown in Figure 3.4 indicated that two sentences were Ba-C while one sentence was Bei-C.

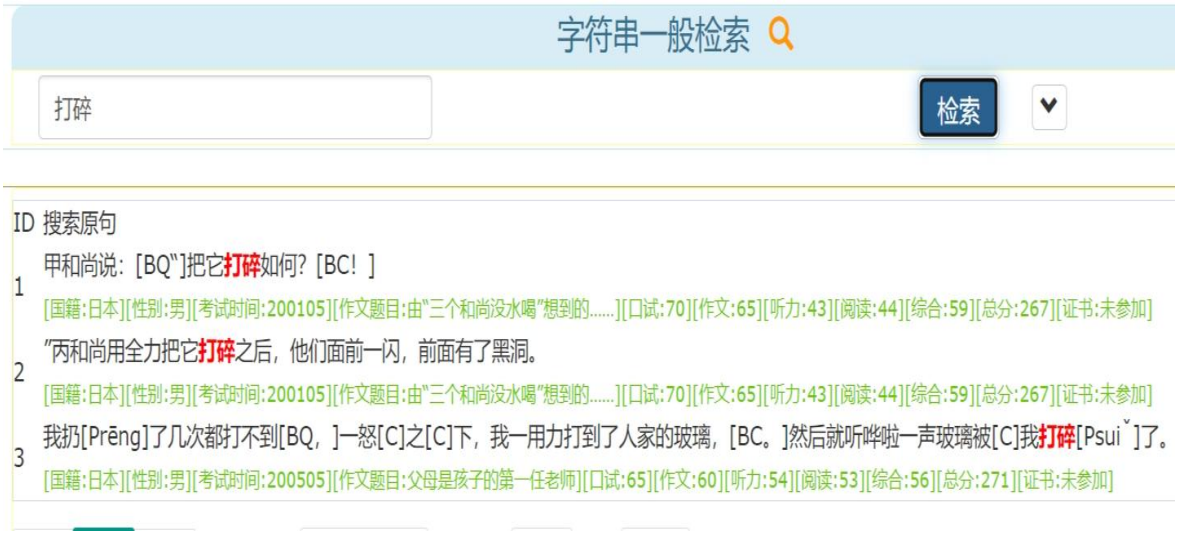


Figure 3.4: Examples of 打碎 "broken" in the HSK Corpus

The Child corpus involved in this study was not a strictly prefabricated corpus but a makeshift collection or dataset whose data have been collected by reviewing seminal literature on child language acquisition of Chinese RVCs by a handful of scholars and picking out those RVC involved (e.g.,Y. Li, 2004; Zhang, 2008; Zhang, 2006; Y.Zhang, 2014; Zhou, 2001). The RVCs appeared in previous literature were selected from prefabricated Child Corpus and Observation in ordinary scenarios from pre-school Chinese native learners. Those RVCs quoted in their research were manually collected and analyzed by using an online word frequency program (MEIAL, 2016-) to obtain the frequent V1s and RCs.

According to the operational definitions of prototypical V1s and RCs in Phase I, the following data tended to be collected through different data sources (as shown in Table 3.11), which was elaborated below.

Table 3.11: Parameters in LP and SyP

Prototypical V1	Prototypical RC	Prototypical pattern of da+RC
Token frequency of V1s in the BCC corpus	Token frequency of RCs in the BCC corpus	Prototypical pattern of '*da+RC*' in the BCC corpus
Token frequency of V1s in the HSK corpus	Token frequency of RCs in the HSK corpus	Prototypical pattern of *'da+RC'* in the CFL learners' output
Frequent V1s in the child acquisition	Frequent RCs in the child acquisition	
Type frequency of V1s in the BCC Corpus	Type frequency of RC in the BCC Corpus	
Transitivity	Frequent RCs in the CFL learners' output	
Physical action verbs		
Frequent V1s in the CFL learners' output		

Corpus-based hierarchy of prototypical V1s was generated by converging four types of corpus information of V1s: token frequency of V1s in the BCC and HSK corpus, frequent V1s in the Child corpus and type frequency of V1s in the BCC corpus. The token frequency of V1 was derived and ranked by searching those 460 target V1s in the BCC and HSK corpus, respectively; The type frequency of V1s in the BCC corpus was measured by using the number of RVCs that a certain target V1 can form.

Frequent V1s and RCs from Chinese children and CFL learners were produced in different manners. For example, frequent V1s and RCs from Chinese children were obtained by collecting manually the RVCs adduced in the previous literature (e.g., Y.Li, 2004; Tian, 2016; Zhang, 2006; Zhang, 2014; Zhou, 2001) and then analyzing those RVCs via online word frequency program. In particular, those literature were retrieved from CNKI (CAJEPHCL, 1998-) surrounding Chinese RVC and online software for the token frequency of Chinese characters (MEIAL, 2016-) was employed to get access to the token frequency of each monosyllabic character. Moreover, frequent V1s and RCs from CFL

learners were produced via CLPT in which the first V1s or RCs were considered as the most prototypical whereas others as the less prototypical ones.

When the corpus-based and intuition-based V1s and RCs have been determined, the hierarchy of prototypical V1s or RCs was generated by converging the two strands of data, together with their specific grammatical features like transitivity or physical action verbs.

To recap, concerning the prototypical grammatical features of V1s and RCs in transitivity and aspect, the semantic and syntactic criterion could be used to distinguish the physical action verb for V1 from the stative verb for RC. According to Gao (2001), physical action verbs were verbs which could not be modified by degree adverb, like 很 *hen3 "very"*，最 *zui4 "most"*，太 *tai4 "too"*，更 *geng4 "more"* and could take aspect particle like 正在 *zheng4zai4 "in the process"*, 了 *liao3 "used after a verb to indicate the completion of an action"*, 着 *zhao2 "used after a verb to indicate the continuation of an action"*, 过 *guo4 "indicating passing by"* etc. As regards RC and transitivity of verbs, stative verbs could be modified by those degree adverbs while transitive and liable verbs accounted for an overwhelmingly large part except for some manner verbs, like 走 *zou3 "walk"*, 笑 *xiao4 "smile"* etc.

Corpus-based prototypical patterns of 打 *da3+RCs* were created from the type frequency of each alternative pattern in the BCC corpus only, for supporting data on the patterns of 打 *da3+RCs* are scarce in HSK corpus and child corpus. In particular, the frequency of SVO was obtained from searching pattern *n* +打 *da3 "beat"-RC+n* in the BCC corpus in which "n" stands for any nominal expression; The frequency of PSC was derived by referring to the regex *n* +*da-RC* 了 *le0 "finish"*; As for the Ba-C, the regexes

with a given compound, are *"n+ba3+n+da3-RC"* and *"n +jiang1+n+da3-RC"*, in which 把 *ba3 "disposal"* and 将 *jiang1 "disposal"* are two often-cited disposal markers with different register(formal and informal). For example, 把 *ba3+n+*打湿 *da3shi1 "make-wet"/* 将 *jiang1 "disposal"+n+* 打 湿 *da3shi1 "make wet"/* (*"n"* refers to nominal expression) were respectively searched in the corpus to obtain the token frequency of Ba-C. The frequency of CVC for a target 打 *da3+RC* was obtained by searching the pattern "打 *da3 'beat' +n+*打 *da3-RC"* and the type frequency of Bei-C is derived by searching Regex "被 *bei4 'by' +n +*打 *da3-RC"* in the BCC corpus.

Prototypical sentence patterns of 打 *da3 "beat" +RCs* were produced by converging corpus-based prototypical patterns of 打 *da3 "beat"+RCs* with intuition-based prototypical sentence pattern. Intuition-based the most prototypical patterns were produced via CSPT in which the patterns of the first sentences produced by CFL/CSL learners was regarded as the most prototypical patterns while others as the less prototypical ones.

3.7.2 Data Collection in Phase III

To test the reliability and validity of findings from Phase II, the data in the quasi-experimental phase (Phase III) were collected based on the following procedure, ranging from Step 1 to Step 3, as diagrammed in Figure 3.5.

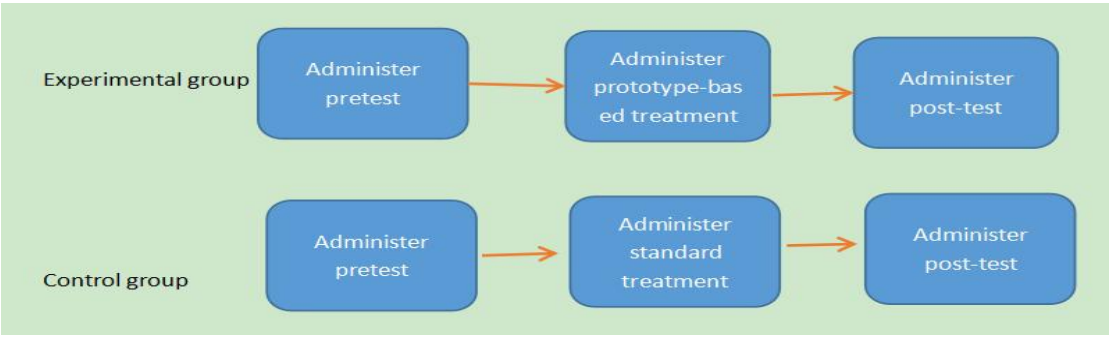


Figure. 3.5: Flow Chart of Data Collection in Phase III

Step 1 After consulting and discussing with the Chinese instructors from the Confucius Institute of UCTS, two intact pre-class Confucius classrooms in a national public secondary school located in Sibu, Sarawak were chosen as target candidates of intermediate CFL learners. After the experimental group and the control group were identified, to examine whether learners from two classes are intermediate CFL learners in the proficiency level and to what extent learners have mastered the Chinese RVC, three pre-tests were administered to 2 Confucius classes (42 learners). The intervention program was carried out at the beginning of the autumn semester of 2022 with the permission and support of the administrative party.

Step 2 In the following week after the pretests, the experimental group started the four-week-long Chinese RVC intensity learning while the control group was subject to regular language and cultural instruction. The assumed only difference between the experimental group and the control group lay in the teaching materials: a prototype-based teaching module of Chinese RVC designed from prototype-based sequencing of Chinese RVC (as referenced in Chapter 4) was introduced to the experimental group while materials in the control group were readily available local textbooks used in Malaysia. To avoid learners' low motivation to participate and high dropout rates in a workshop format, their intervention program was embedded as part of the participants' Chinese class requirements, and the Chinese instructors took the role of direct initiators and monitors of student activities during the intervention program to increase and sustain participants' motivation. The same Chinese instructor from the Confucius Institute of UCTS taught all the learners in both groups. Following the control group, the same 3Ps teaching method (presentation, practice, production) was taken to control teacher and teaching methods variability.

Both groups had the same amount of time (40 minutes) for the explicit instruction of the target items.

Step 3: Due to the public holiday, three days later after the intervention, L-AJT and S-AJT were administered to individuals in both groups (at the beginning of October 2022) to collect their scores with rewards.

3.8 Data Analysis

The main focus of this study is on the qualitative findings (Phase II) concerning the prototype-based hierarchy of V1s, RCs, and RVCs as well as sentences among the alternative sentence pattern and quantitative testing (Phase III) of qualitative findings in the instructed L2 acquisition of RVC. Therefore, the analysis aimed to answer the four research questions as shown in Table 3.12.

In the qualitative analysis phase, when all the data from different kinds of corpora have been individually analyzed, like the type frequency of V1 and RC, as well as the pertinent sentence pattern, they converged to produce the corpus-based prototypical RVC and sentence patterns. CLPT and CSPT were used to collect the intuition-based prototypicality of RVC and relevant sentence patterns. The prototype-based sequencing of RVC and sentence patterns on three levels was generated by combining corpus-based data and intuition-based data, together with other defining features of prototypical RVC and sentences.

To test quantitatively the qualitative findings in Phase II, statistical analysis was conducted in Phase III. Noted here was that frequency in data analysis (last column in Table 3.12) referred to the number of times a target item occur in the corpus. Independent t-test was conducted to see whether difference in CPT between the experimental group and

control group reached a significant level ($p<0.05$) while Multiple linear regression analysis was conducted to measure whether the assumed model was significantly different ($p<0.05$). Before its details came, an elaboration of the variables involved and data coding was necessary.

Table 3.12: Research Questions, Purpose, Data Source and Data Analysis

Research Questions	Purpose	Sources of Data	Data Analysis
RQ2:What is the suggested prototype-based sequencing of component morphemes, namely V1s and RCs of RVC?	to conduct corpus analysis for corpora-based prototypicality of target V1, RCs and da3-RCs	BCC corpus HSK corpus Child corpus	descriptive analysis(frequency) and information integration
RQ3:What is the suggested prototype-based hierarchy among alternative 打-RC-related sentence patterns ?	to conduct cognitive analysis for intuition-based prototypicality of target V1s， RCs and da3-RCs	Cued Lexical Production Task (CLPT) Cued Syntactic Production Task (CSPT); multi-corpora	
RQ4:how can prototype-based component morphemes of RVC explain learners' performance in the instructed L2 learning of RVC?	to evaluate whether participants are intermediate CFL learners in proficiency level and whether there is a significant difference between control group and experimental group	Chinese Proficiency Test (CPT)	Independent t-test
	to find extent to which the prototypicality of V1 and RC, frequency of RVC, and prototype-based instruction can explain the differece in LAJT between control group and experimental group	Lexical-Acceptability Judgment Test(L-AJT)	Multiple Linear Regression(MLR)
RQ5:How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 learning of RVC-related syntax?	to find extent to which the prototypicality of RVC, semantic prototypicality of V1 and RC, and prototype-based instruction can explain the differece in SAJT between control group and experimental group	Syntactic-Acceptability Judgment Test(S-AJT)	

The quasi-experimental study was designed to examine the effects of the prototype-based RVC instruction, as well as some mediating variables like LP, SeP and SyP on the acquisition of RVCs and relevant syntactic constructions. In particular, L-AJT was designed to investigate the role of prototype-based RVC instruction, prototypicality of V1s,

and prototypicality of RCs, together with the token frequency of RVCs in the lexical identification of RVC; while S-AJT aimed to examine the effects of LP, prototypicality of polysemous 打 *da3"beat"*, prototypicality of semantic orientation of RC and SyP, as well as prototype-based RVC instruction on the learning of RVC-related syntax.

Learners' performance in LAJT was scored as a dependent variable, an indicator of the lexical competence of RVC. Independent variables consist of prototypicality of V1s, prototypicality of RCs, token frequency of RVCs and prototype-based RVC instruction. Both the prototypicality of V1s and RCs was a categorical variable which fell into three levels: the most prototypical, less prototypical and least prototypical. Prototype-based RVC instruction was a dummy variable which consisted of a control group and an experimental group. The token frequency of RVC was a continuous variable.

The learners' performance in the SAJT was scored as the dependent variable, measurement of learners' syntactic competence of RVC. There were altogether five independent variables involved in this test: prototype-based RVC instruction, LP of *da3-RC*, prototypicality of polysemous 打 *da3 "beat"*, prototypicality of semantic orientation of RC and SyP. Prototype-based RVC instruction was a dummy variable consisting of an experimental group and a control group. Both LP and SyP were categorical variables, in which LP included three levels: the most prototypical, the less prototypical and the least prototypical while SyP had five levels: SVO, Ba-C, Bei-C, PSC and CVC. As with the prototype-based RVC instruction, the prototypicality of polysemous 打 *da3 "beat"* was a dummy variable, including two levels: the most prototypical and the less prototypical.

Before the data analysis was conducted, the variables needed to be coded. In the L-AJT and S-AJT, mean scores of ratings along the 5-point Likert scale from CFL/CSL

learners were collected as the value of the dependent variable. In L-AJT, both the prototypicality of V1s and RCs were independent variables that could take three values: 1 = the most prototypical, 2 = the less prototypical, 3 = the least prototypical. Teaching intervention was a dummy variable which could take two values: 0 = the control group, 1 = the experimental group. In the S-AJT, there were three values for LP: 1 = the most prototypical, 2= less prototypical, 3 = the least prototypical. The SyP could take five values: 1 = SVO, 2 = Ba-C, 3 = Bei-C, 4 = PSC, 5 = CVC. The prototypicality of semantic orientation took three values: 1= object-oriented 2 = verb-oriented, 3 = subject-oriented. As with the teaching intervention in LAJT, the group difference was a dummy variable and took two values: 0 = control group, 1 = experimental group.

When analyzing data from a pretest-posttest control group design, researchers made several analytic decisions that depended on the research question and how data met associated statistical assumptions. All the data ready, the data collected via L-AJT and S-AJT were analyzed using Multiple Linear Regression (MLR) and independent t-test. An Independent t-test was conducted to control the differences in the pretest. The following statistical methods have been traditionally used to analyze the data from the pretest-posttest control group design: t-test, Repeated measure ANOVA, ANCOVA and MLR. By comparison, the choice of MLR can be the best one which might be justified by the analysis from Zientek et al. (2016) and Dimitrov and Rumrill (2003). As Zientek et al. (2016) nicely put it, in all those methods, MLR subsumed the roles of t-test and ANCOVA and also allowed researchers to isolate the effect of the intervention on post-test while the t-test was somewhat robust to violations of normality and homogeneity of variance especially when sample sizes were equal or near equal and the use of ANCOVA was ill-advised for intact groups or groups that have not been randomly assigned as it unlikely that

the data would meet the associated statistical assumptions for ANOVA. As argued by Dimitrov and Rumrill (2003), prior studies have demonstrated that the results provided by repeated measures ANOVA for pretest post-test data could be misleading.

3.9 Pilot Study

The purpose of the pilot study was to ensure the practicability and feasibility of the research instruments while allowing the researcher to make changes, if necessary (Chen, 2022). For this study, pilot testing of the main data collection instruments has been conducted to determine their reliability and validity and to identify and fix potential difficulties during the actual study (Creswell & Creswell, 2018; Johnson & Christensen, 2019).

In Phase III, based on responses from participants, the items have been lessened to guarantee high motivation of participation and reliability of test. Additionally, to avoid learners' low motivation to participate and high dropout rates in a workshop format, their intervention program has been embedded as part of the participants' Chinese class requirements.

Cronbach's Alpha was used to estimate the internal reliability of tests and to determine the internal consistency of the 5-point Likert scale questionnaire. Each test's reliability was estimated using Spearman Split-Half. To determine the pre-and post-test equivalence, paired samples t-test and Pearson correlation coefficient were utilized. Values of Cronbach's Alpha (Table 3.13) indicated that the five instruments involved were acceptable in general (Chua, 2020).

Table 3.13: Reliability of Instruments in Different Phases

Phases	Instruments	Cronbach's Alpha	Reliability
phase II(a): qualitative analysis	Cued Lexical Production Task(CLPT)	0.735	average
phase II(b):qualitative analysis	Cued Syntactic Production Task(CSPT)	0.832	high
phase III(a):quantitative testification	Lexical Acceptability Judgment Test(LAJT)	0.916	high
phase III(b):quantitative testification	Syntactic Acceptability Judgment Test(SAJT)	0.947	high
phase III(b):quantitative testification	Chinese Proficiency Test(CPT)	0.886	high

3.10 Ethical Issue

Following the ethical guidelines issued by the university ethical committee, privacy and confidentiality have been respected throughout the research process. The participants were met one day before the study started, and the aim of the research and the nature of the study were clearly explained to them. Requests were made for them to participate in the production task for the Chinese RVC compound and related patterns. Requests for quasi-experiment pretest-treatment-posttest were also made at this point. Participants were assured that participation or non-participation would not in any way affect their final assessment or relationship with the institute. They were encouraged to take the written forms away with them to think about their willingness to participate in the study.

Signed consent has been obtained from all participants prior to the commencement of the study. Furthermore, all participants were also assured that the information they provided would be used to fulfil the aim of the research only and were informed of their right to withdraw from the study at any time up until 1 December 2022, without giving a reason.

3.11 Summary

This chapter has outlined the research design and described the procedure used in detail. Qualitative research was adopted in an attempt to determine the defining attributes involved in the three concepts (Phase I), namely, LP, SeP and SyP, together with prototypical members of Chinese RVC and components, namely V1, RC and RVC in Phase II(a). To figure out the prototypical V1s, RCs and RVCs, triangulating data based on corpus triangulation and method triangulation were produced and converged to allow a comprehensive analysis for the RQs 2 and 3. In light of the findings in qualitative research and prototypical syntactic patterns of 打 *da3 "beat"+RC* utilizing corpus data and intuition data, a quasi-experiment study with control group and pretests has been designed to examine the effects of prototype-based RVC instruction and prototypical features in terms of form, meaning and syntactic usage on the acquisition of RVC and related sentence patterns. Finally, efforts were made to ensure the integration of ethical considerations into the research process.

CHAPTER 4

RESULTS

4.1 Chapter Overview

This chapter was intended to report the findings of the current research---an MMD study, consisting of three phases: definition formulation, qualitative analyses of LP, SeP and SyP and the subsequent quantitative testification. Specifically, when the LP, SeP and SyP were explicitly defined, corpus-based cognitive analyses of LP and SyP were conducted. Thus, prototype-based hierarchy of prototypical RVCs can be identified in terms of lexicon and syntax, by adopting Gilquin and McMichael's (2018) converging criterion of the prototype as analytic framework. What was followed was the quantitative testing of the findings from the qualitative analysis.

This chapter was organized as follows: Section 4.2 aimed to clarify what properties or factors have been included into the operational definitions of three concepts involved in this study, namely LP, SeP and SyP, to answer the RQ1; Section 4.3 through Section 4.4 to Section 4.5 presented the answers to RQ 2 and RQ3 about the prototypical V1s, RCs, 打 *da3 "beat"*+RCs and syntactic patterns related to 打 *da3-RC*. The findings in the phase of quantitative testification were embraced in Section 4.6 before all the findings were summarized in Section 4.7. More specifically, each section provided the following types of information: the restatement of the research question, the corpus-based findings, the cognitive or intuition-based findings converged findings as well as a summary as an ending of the section. In Section 4.6, the results of both the pretest and post-test were presented to test the extent to which the two hypotheses have been confirmed.

4.2 Results of Phase I: Checklist Attributes of LP, SeP and SyP

The attributes of LP, SeP and SyP were clarified in this section to answer research question 1 “What attributes are included to define the prototypical RVCs in terms of form, meaning and syntactic usage?”. These attributes were necessary for the further corpus-based cognitive analysis of LP, SeP and SyP covered in Sections 4.3 to 4.5, by following Gilquin and McMichael's (2018) converging criterion of the prototype.

As diagrammed in Table 4.1, the LP of RVCs were examined from three dimensions, to wit prototypical V1, prototypical RC and prototypical RVCs. In particular, six attributes have been involved in the feature matrix of prototypical V1, namely transitivity, syllabicity, productivity, frequency of occurrence, verbal aspect and “availability” (Ungerer, 2001, p.202). This is also true of prototypical RC while four attributes have been taken into consideration in prototypical RVC. To put it in another way, the most prototypical V1s were monosyllabic transitive action verbs that first came to learners’ minds with high token frequency and type frequency. In the same vein, the most prototypical RC was defined as a monosyllabic intransitive stative verb that first came to learners’ minds with high token frequency and type frequency. By contrast, the most prototypical RVCs were disyllabic transitive achievement verbs with the most prototypical V1s and RCs.

Table 4.1: Checklist Attributes of LP of RVCs

Concepts	Dimensions	Attributes
LP	Prototypical V1	Transitivity(transitive)
		Syllabicity(monosyllabic)
		Productivity (high type frequency)
		Frequency of occurrence (high token frequency)
		Verb aspect (action verb)
		Availability (first come to mind)

Table 4.1 continued

LP	Prototypical RC	Transitivity(intransitive)
		Syllabicity(monosyllabic)
		Productivity (high type frequency)
		Frequency of occurrence (high token frequency)
		Verb aspect (stative verb)
		Availability (first come to mind)
	prototypical RVC	Transitivity(transitive)
		Syllabicity(di-syllabic)
		Verb aspect (achievement verb)
		Compositionality (prototypical V1 and RC)

As indicated in Table 4.2, SeP of RVC was investigated from two aspects: the prototypicality of polysemous V1 and the semantic orientation of RC. Taking 打 *da3 "beat"* as an example, semantically prototypical 打 *da3+RCs* were object-oriented RVCs with physical action verbs of hand contact. The most prototypical sentence pertinent to RVC was a highly frequent sentence that first came to the learners' minds.

Table 4.2: Checklist Attributes of SeP and SyP of RVCs

Concepts	Dimensions	Attributes
SeP	prototypical V1	Frequency (literal meaning)
	prototypical RC	Semantic orientation(object-oriented)
SyP	prototypical sentence	Construction frequency (type frequency)
		Availability (first come to mind)

What ought to be noted here was that the attributes involved in the SyP among the alternative sentence patterns related to RVC were the productivity of alternative patterns in the corpus and the availability of alternative patterns in learners' production data. These attributes have been justified by numerous scholars (e.g., Ellis, 2002; Gilquin & McMichael, 2018; Winters, 1990).

When the notions of LP, SeP and SyP have been made explicit, the corpus-based cognitive analyses of LP, SeP and SyP of RVC were in a position to carry out in the

following sections, by employing Gilquin and McMichael"s (2018) criterion of prototype as analytic framework.

4.3 Results of Phase II: Lexical Prototypicality of RVCs

This part centered on the investigation of LP of RVC. In order to answer research question 2 "What are the suggested prototype-based sequencing of component morphemes, namely V1s and RCs of RVC?", the results have been reported in Sections 4.3.1 and 4.3.2, including both the corpus-based and intuition-based evidence, as well as the convergent evidence on the prototypicality of component morphemes. The finding in Section 4.3.3 was presented to answer research question 3 "What are the suggested prototype-based hierarchies among alternative 打-RC-related sentence patterns?".

4.3.1 Prototypical V1s

As reviewed in Chapter 2, word frequency, transitivity and verb aspect have been sporadically discussed to account for the verb prototype. According to Gilquin and McMichael's (2018) converging criterion of the prototype, the construct of LP has been made explicit, namely, prototypical V1s are produced by converging corpus-based data and intuition-based data of target V1s collected from CDVU. Therefore, before prototypical V1s are obtained, corpus-data data of prototypical V1s are reported, including the token frequency of target V1s in the BCC corpus and HSK corpus, the frequent V1s in Child literature, and the type frequency in the BCC corpus. What follows is the intuition-based prototypical V1s generated via CLPT.

4.3.1.1 Corpus-based Prototypical V1s

Findings concerning corpus-based prototypical V1s included the type frequency of target V1s in the BCC corpus, token frequencies of target V1s in the BCC corpus in which

both the modern data and historical data are incorporated and HSK corpus which collected learners' interlanguage. Plus, the frequent V1s adduced in the literature on Child acquisition of RVCs have been collected and extracted.

I. Token Frequency of Target V1s in the BCC Corpus

According to Tummers et al. (2005), "all sorts of prototype-theoretical analyses may be frequency as an indication of prototypicality (p.240)." The token frequency of target V1s in the BCC corpus or the frequent V1s in the BCC corpus was yielded by searching 460 target V1s stepwise in the BCC corpus and then ranking them according to their token frequency. The mean score of frequencies of occurrence for those V1s in the BCC corpus was 346806.9913 (M=346806.9913). Those V1s whose frequency was above the mean frequency were chosen as the candidates of frequent V1s in the BCC corpus for the subsequent operation. There were altogether 111 verbs to survive (see Appendix L) and most of them were transitive action verbs except for some intransitive posture verbs, such as 笑 *xiao4 "smile",* 死 *si3 "die",* 跑 *pao3 "run",* 走 *zou3 "walk/go",* 跳 *tiao4 "jump"* etc. The top ten frequent verbs are 对 *dui4 "match, fit",* 要 *yao4 "want, wish",* 发 *fa1 "launch, discharge",* 着 *zhao2 "attach, touch",* 出 *chu1 "go out",* 看 *kan4 "look",* 下 *xia4 "go down",* 过 *guo4 "pass, cross",* 开 *kai1 "open",* 等 *deng3 "wait".*

It was noteworthy that certain V1s were eligible to function as RC with distinct semantic interpretations, like 发 *fa1 "flourish"* in 赚发 *zhuan4fa1 "earn too much",* 着 *zhao2 "succeed"* in 睡着 *shui4zhao2 "fall asleep",* and 出 *chu1 "go out"* in 走出 *zou3chu1 "walkout".* 下 *xia4 "down"* was another good example to illustrate its bi-function. For example, 下 *xia4 "get off/down"* acted as a matrix verb in the phrase 下错车 *xia4cuo4che1 "get off the wrong bus"* while it was an RC in the compound 摘下 *zhai1xia4*

"pick down". The same can be applied to 过 *guo4 "over"* in 睡过 *shui4guo4 "oversleep",* and 开 *kai1 "open"* in 打开 *da3kai1 "open"* etc.

II. Token Frequency of Target V1s in the HSK Corpus

As previously stated, the usage from L2 learners as evidence of prototypicality has been discussed by Rice (1996) and Gilquin and McMichael (2018). The frequent V1s produced by CSL learners were yielded utilizing the HSK corpus, as with the frequent V1s in the BCC corpus. Of the selected 460 V1s, only altogether 16 verbs had no hits in the HSK corpus: 趴 *pa1 "grovel",* 裹 *guo3 "wrap",*拧 *ning3 "twist",*舔 *tian3 "lick",*捻 *nian3 "entwist",*锯 *jv4 "saw",*轧 *ya4 "roll",*掰 *bai1 "break",*碾 *nian3 "grind",*撬 *qiao4 "pry",* 剁 *duo4 "chop",*涮 *shuan4 "rinse",*噎 *ye1 "choke",*沏 *qi1 "infuse",*赊 *she1 "buy on credit",*耪 *pang3 "loosen soil with a hoe"*. Complexity in strikes and thus less-frequent usage partly accounted for L2 learners' avoidance of using them.

Of those verbs which had hits in the corpus, the mean frequency of occurrence for them was 480.036 (M=480.036) and sixty-nine in totality (see Appendix M) could survive for the following selection and the top ten frequent V1s for L2 learners have been presented as follows.

对 *dui4 "match, fit",*和 *huo4 /he2 "mix, blend, harmonious",*上 *shang4 "go up",*

要 *yao4"want",*说 *shuo1 "speak",* 想 *xiang3 "think",* 去 *qu4 "go",* 给 *gei3 "give",*

做 *zuo4 "do",* 还 *huan2 "return"*.

III. Type Frequency of Target V1s in the BCC corpus

The role of productivity in a construction has been highlighted in Cognitive Linguistics (Clausner & Croft, 1997) and was confirmed by numerous scholars (e.g.,

Crossley et al., 2014; Ellis, 2002; Gilquin & McMichael, 2018; Winters, 1990) to identify the prototype of a category and to foster language acquisition.

The productivity of target V1s was measured by reference to their type frequency in the BCC corpus to the effect that how many RVCs a specific target V1 could create. They were obtained by looking through the BCC corpus for disyllabic compounds that contained a specific target V1 as a pivot, such as the verb 掰 *bai1 "break off with hands"* which can form twenty-seven RVCs with different RCs (as shown below).

掰碎 *bai1-sui4,,*掰折 *bai1-she2,* 掰坏 *bai1-huai4,* 掰完 *bai1-wan2,* 掰掉 *bai1-diao4,* 掰好 *bai1-hao3,* 掰正 *bai1-zheng4,* 掰疼 *bai1-teng2,* 掰早 *bai1-zao3,* 掰直 *bai1-zhi2,* 掰歪 *bai1-wai1,* 掰偏 *bai1-pian1,* 掰断 *bai1-duan4,* 掰开 *bai1-kai1,* 掰死 *bai1-si3,* 掰离 *bai1-li2,* 掰散 *bai1-san3,* 掰转 *bai1-zhuan4,* 掰倒 *bai1-dao3,* 掰错 *bai1-cuo4,* 掰弯 *bai1-wan1,* 掰出 *bai1-chu1,* 掰折 *bai1-she2,* 掰走 *bai1-zou3,* 掰住 *bai1-zhu4,* 掰动 *bai1-dong4,* 掰响 *bai1-xiang3.*

The mean score of type frequencies of those V1s was 43.11 (M=43.11)**,** indicating that on average each V1 could yield at least forty-three compounds. All the V1s that surpassed the mean score were selected as the candidates of highly productive V1s in the BCC corpus. One hundred and sixty-three (N=163) in totality were the highly productive V1s (see Appendix N), the top ten of which were shown as follows.

弄 *nong4 "play, handle, do",* 变 *bian4 "change",* 打 *da3 "play, beat",* 搞 *gao3 "do, work",* 看 *kan4 "look",* 说 *shuo1 "speak",* 转 *zhuan3 "turn, shift",* 写 *xie3 "write",* 笑 *xiao4 "smile",* 压 *ya1 "press, hold".*

It was not difficult to find that what occupied the highest position in productivity were light verbs or super-level verbs: 弄 *nong4 "play, handle, do"*, 打 *da3 "beat"*, 变 *bian4 "change"*, 搞 *gao3 "do, engage in"*. The most productive V1 弄 *nong4 "play, handle, do"* could form at least as many as 263 RVCs and 打 *da3 "beat"* as many as 223 RVCs. What was followed were two physical action verbs related to body parts, such as 看 *kan4 "look"* which pertained to eyes and can produce at least 185 RVCs and 说 *shuo1 "speak"* was related to our mouth and could license 180 RVCs.

IV. Frequent V1s in Children"s Production

One of the criteria in Gilquin and McMichael's (2018) study to identify the prototype of a linguistic category was the pattern in L1 acquisition, which was investigated through a child language corpus. Thus, the frequent V1s in child corpus were obtained by gathering the RVCs adduced in prior relevant studies and utilizing online character frequency tools for further extraction. Those seventy-seven verbs (Appendix O) could fall into eight categories according to different body-parts, as shown below.

手 'hand':	*拿na2 "take"， 摔shuai1 "throw, plunge", 打da3 "beat", 写xie3 "write", 安an1 "install", 拉la1 "pull", 抱bao4 "embrace"， 扔reng1 "throw, toss"， 撕si1 "tea", 抓zhua1 "fix, do", 撞zhuang4 "crash", 爬 pa2 "climb", 搬ban1 "move"， 擀gan3 "roll", 挤ji3 "shove, squeeze", 抹mo3 "apply", 抬tai2 "lift", 捏nie1 "pinch"， 弹tan2 "shoot, flick", 洗xi3 "wash", 扣 kou4 "button up", 放fang4 "put", 关 guan1 "close", 杀sha1 "kill", 修xiu1 "fix"， 绣xiu4 "embroider", 砍ka3 "chop", 戳chuo1 "stab, poke", 逮dai3 "capture", 压ya1 "press", 舀 yao3 "spoon up", 戴dai4 "wear", 钓diao4 "fish", 蘸zhan4 "dip in", 勒 lei1 "halt", 图tu2 "draw", 糊hu1/2 "plaster, paste", 画hua4 "draw", 轧 ya4 "crush", 甩shuai3 "swing"， 做zuo4 "do", 盖gai4 "cover, build", 带 dai4 "bring", 脱tuo1 "take off", 穿chuan1 "dress", 张zhang1 "draw, open", 烧shao1 "burn".*

Light verb:	弄*nong4 "make"*, 搞*gao3 "get"*, 整*zheng3 "do, make"*.
口 *"mouth"*:	吃*chi1 "eat"*, 喝*he4 "drink"*, 讲*jiang3 "speak"*, 吐*tu3 "spit, vomit"*, 吓*xia4 "frighten"*, 唱*chang4 "sing"*， 吵*chao3 "make a noise"*， 吞*tun1 "swallow"*, 念*nian4 "read"*
足 *"foot"*：	跌*die1 "fall"*, 踩*cai3 "step on"*, 磕*ke1 "knock"*， 跳*tiao4 "jump"*， 跑*pao3 "run"*, 蹦*beng4 "jump, leap"*， 踢*ti1 "kick"*
脑 *"brain"*:	想*xiang3 "think"*, 学*xue2 "learn"*.
臀 *"hip"* ：	骑*qi2 "ride"*， 坐*zuo4 "sit"*;
目 *"eye"* :	睡*shui4 "sleep"*
身 *"body"*:	滑*hua2 "slide, rip"*, 绊*ban4 "stumble, trip"*, 冲*chong1 "flush"*, 卡*ka3 "stop"*, 靠*kao4 "lean on"*， 长*zhang3 "grow"*.

In particular, among the seventy-seven V1s (N=77) extracted from the RVCs, what occupied the largest proportion were those verbs connected with hand (N=46), transparently or non-transparently. The rest of them were related to other physical parts like 口 *kou3 "mouth"(N=9),* 足 *zu2 "foot" (N=7),* 身 *shen1 "body" (N=6),* 脑 *nao3 "brain"(N=2),* 股 *gu3 "ass" (N=2),* 目 *mu4 "eye"(N=1),* as well as light verbs: 整 *zheng3 "do, make",* 搞 *gao3 "do, work",* and 弄 *nong4 "play, fool with".*

V. Corpus-based Prototypical V1s

Based on the distribution of V1s in the four lists—the list of highly frequent V1s in the BCC corpus, the list of highly productive V1s in the BCC corpus, the list of highly frequent V1s in the HSK corpus, and the list of frequent V1s in the Child corpus—corpus-based prototypical V1s can be classified into three categories: the most prototypical, the less prototypical, and the least prototypical. Specifically, the V1s that maximally shared four frequency lists were corpus-based the most prototypical ones, whereas the V1s that

appeared only in one list minimally were the least. The ones that fell in between the two extremes were the less prototypical ones.

There were merely five corpus-based most prototypical V1s in number(N=5): 拿 *na2 "take",* 睡 *shui4 "sleep",* 学 *xue2 "learn"*，抓 *zhua1 "seize",* 坐 *zuo4 "sit",* in which 拿 *na2 "take"* and 抓 *zhua1 "seize"* were related to hand while 学 *xue2 "learn"* had relevance to brain. 睡 *shui4 "sleep"* was connected with the eyes and 坐 *zuo4 "sit"* had a bearing on the hip.

There were one hundred and sixty (N=160) corpus-based the least prototypical V1s(see Appendix P), like 揉 *rou2 "knead",* 疼 *teng2 "ache",* 搭 *da1 "put up",* 捅 *tong3 "poke"* while ninety two (N=92) verbs were found to be the less prototypical members (see Appendix Q), such as 弄 *nong4 "make",* 变 *bian4 "change",* 打 *da3 "beat",* 搞 *gao3 "make",* 看 *kan4 "look",* 说 *shuo1 "say"* etc.

4.3.1.2 Intuition-based Prototypical V1s

Using the RC-cued Lexical Production Task to elicit data, the intuition-based prototypicality of target V1s or the availability of prototypical V1s was investigated. The most prototypical V1s were found to be the initial verbs in the CSL/CFL learners' production data, with other verbs being judged to be the less prototypical. Forty-eight V1s (N=48) were among the most prototypical V1s while fifty-eight (N=58) the less prototypical ones. The intuition-based the most prototypical V1s were epitomized as follows (see Appendix R).

看 *kan4 "look",* 打 *da3 "beat",* 写 *xie3 "write",* 坐 *zuo4 "sit",* 进 *jin4 "enter",* 提 *ti2 "lift",* 弄 *nong4 "do, make",* 说 *shuo1 "speak",* 拿 *na2 "take, bring",* 想 *xiang3 "think".*

While the less prototypical ones were displayed as follows (see Appendix S):

说 *shuo1 "speak",* 看 *kan4 "look",* 听 *ting1 "listen",* 做 *zuo4 "do",* 拿 *na2 "hold", zou3 "walk",* 写 *xie3 "write",* 吃 *chi1 "eat",* 打 *da3 "beat",* 读 *du2 "read",* 喝 *he1 "drink".*

4.3.1.3 Prototypical V1s: Converging Evidences

To recap, the most prototypical V1s were transitive action verbs, produced by converging corpus-based the most prototypical V1s with intuition-based most prototypical V1s, which was shown as follows (N=3): **拿 *na2 "take, bring",* 学 *xue2 "learn",* 坐 *zuo4 "sit"***; while less prototypical V1s were generated by combining the corpus-based the less prototypical V1 and V1s in corpus-based most prototypical V1 beyond the scope of most prototypical V1s with intuition-based the most and less prototypical V1s (N=38):

弄 *nong4 "do",* 变 *bian4 "change",* 打 *da3 "beat",* 出 *chu1 "go out",* 读 *du2 "read",* 剪 *jian3 "cut",* 跑 *pao3 "run",* 输 *shu1 "lose",* 走 *zou3 "walk",* 使 *shi3 "use",* 提 *ti2 "lift",* 搞 *gao3 "do, make",* 看 *kan4 "look",* 说 *shuo1 "speak",* 笑 *xiao4 "smile",* 玩 *wan2 "play",* 开 *kai1 "open",* 冲 *chong1 "rush",* 踢 *ti1 "tick",* 累 *lei4 "tired",* 吓 *xia4 "frighten",* 带 *dai4 "bring",* 收 *shou1 "collect",* 加 *jia1 "add",* 听 *ting1 "listen",* 喝 *he1 "drink",* 烧 *shao1 "burn",* 投 *tou2 "throw",* 饿 *e4 "hungry",* 放 *fang4 "put",* 改 *gai3 "correct",* 停 *ting2 "stop",* 倒 *dao4 "turn over",* 过 *guo4 "live",* 吃 *chi1 "eat",* 做 *zuo4 "do",* 用 *yong4 "use",* 长 *zhang3 "grow".*

The rest of them were the least prototypical V1s which were the greatest in number, exemplified as follows:

转 *zhuan3 "shift",* 压 *ya1 "press",* 唱 *chang4 "sing",* 吹 *chui1 "blow",* 踩 *cai3 "trample",* 穿 *chuan4 "dress",* 撞 *zhuang4 "bump",* 洗 *xi3 "wash",* 推 *tui1 "push",* 捏 *nie1 "pinch",* 刮 *gua1 "scrape",* 买 *mai3 "buy",* 气 *qi4 "irritate",* 拉 *la1 "pull",* 考 *kao3 "test",* 排 *pai2 "arrange",* 吸 *xi1 "absorb",* 问 *wen4 "ask",* 调 *tiao2 "adjust",* 找 *zhao3 "look for",* 抹 *mo3 "apply".*

As previously stated, by taking the definition in section 4.2 that the most prototypical V1s should be monosyllabic transitive action verbs and the convergence criterion of prototype by Gilquin and McMichael (2018) together, the prototypicality of target V1s were analyzed in three levels. In particular, the corpus-based and intuition-based prototypicality of target V1s were investigated individually first and then converged. The attributes that made up corpus-based prototypicality of the target V1 were the token frequency and type frequency of V1s in the BCC corpus, the token frequency of target V1s in the HSK corpus and frequent V1s in children's production. As regards the intuition-based prototypicality, there are two levels based on the information of availability or whether target V1s are the first items that appear in the L2 elicited productions. Given the assumption that the most prototypical V1s should be maximally informative (Rosch, 1975a), it has been obtained from their convergence evidence that there were three the most prototypical V1s: 拿 *na2 "fetch with hand",* 学 *xue2 "learn",* 做 *zuo4 "do"* and 38 less prototypical ones. As exemplified above, what was the greatest in number was the least prototypical V1s, a considerable number of which are action verbs with hand contact.

4.3.2 Prototypical RCs

According to Gilquin and McMichael's (2018) convergence criterion, corpus-based prototypical RC and intuition-based prototypical RC were individually investigated and then converged to create prototypical RCs. Thus, the outcomes of intuition-based and corpus-based prototypical RCs were reported in this part, respectively.

4.3.2.1 Corpus-based Prototypical RCs

RCs were derived by inputting all the bi-syllabic RVCs into the online program for the statistics of Chinese characters. It should be noted here that the frequency obtained sometimes was the aggregate of the character both function as V1 and RC, to some extent since some verbs can function as both V1 and RC. For example, 对 *dui4 "check"* could function as V1 in the compound 对好 *dui4hao3 "check well",* while it could function as RC in 算对 *suan4dui4 "compute correctly"*. Therefore, the frequency of the character as RC should be obtained by subtracting the frequency as V1 from the total frequency of the characters. Five hundred and twenty-four characters in total were figured out which can only function as RC. In addition, the index of productivity of RC was 57.05, indicating that each RC could form on average fifty-seven compounds.

As with the prototypical V1s, prototypical RCs were produced by reference to corpus-based prototypicality and intuition-based prototypicality, which were manifested as follows, respectively.

From the BCC corpus, 312 monosyllabic adjectives and verbs were taken out. They were born with the following traits:1) adjectives of degree, like 大 *da4 "big",* 小 *xiao3 "small",* 多 *duo1 "more",* 少 *shao3 "less",* 贵 *gui4 "expensive",* 难 *nan2 "difficult",* 坏 *huai4 "bad",* 忙 *mang2 "busy",* 早 *zao3 "early",* 累 *lei4 "tired",* 近 *jin4 "near"* etc.

Many of them form synonymy such as 没 *mei2 "not have"* and 光 *guang1 "use up"* or antonymous relationships like 大 *da4"big"* in 吹大 *chui1da4 "blow-big"* and 小 *xiao3 "small"* in 弄小 *nong4xiao3 "make small"*, 饱 *bao3 "full"* in 吃饱 *chi1bao3 "eat-full"* and 饿 *e4 "hungry"* in 走饿 *zou3e4 "walk-hungry"* ; (2) colour term like 红 *hong2 "red",* 绿 *lv4 "green",* 黑 *hei1 "black",* 白 *bai2 "white"* etc; (3)verb of direction like *出 chu1 "go out",* 进 *jin4 "enter",* 来 *lai2 "come",* 去 *qu4 "go"* and（4）verb of completion such as 到 *dao4 "arrive",* 完 *wan2 "finish"* etc.

I. Token Frequency of RCs in the BCC corpus

Frequent RCs in the BCC corpus were produced by searching those 312 stimuli RCs in the BCC corpus. According to statistics of their token frequencies in the BCC corpus, the average frequency of those complements－RC less than 5 in token frequency were excluded, as did by Wu (2018) was 572808.3 (M=572808.03). Accordingly, as can be seen in Appendix T, all of the RCs whose token frequency exceeded the mean frequency (N=80) were identified as potential highly frequent RCs in the BCC corpus. The top ten frequent RCs in BCC were displayed as follows.

和 *he2 "harmonious",* 上 *shang4 "upward",* 大 *da4 "big",* 好 *hao3 "good",* 对 *dui4 "correct",*为 *wei2/4 "act as",* 发 *fa1 "fourish",* 着 *zhao2 "complete",* 到 *dao4 "arrived",* 出 *chu1 " go out"* .

in which 上 *shang4 "upward",* 出 *chu1* "out" were directional verbs, 为 *wei2/4 "act as",* 着 *zhao2 "successful",* 到 *dao4 "arrive, reach"* were completive verbs and the rest of them were positive adjectives in semantic prosody.

II. Token Frequency of RCs in the HSK corpus

Frequent RCs in the HSK corpus were generated via the token frequency of each RC obtained by searching 312 RCs in the HSK corpus, an interlanguage corpus, and the statistics suggested that the mean frequency of the RCs was 599.287 (M=599.287). As a result, in terms of the interlanguage corpus, the RCs exceeding the mean frequency (N=43) were selected as candidates for highly frequent RCs (see Appendix U). Evidence suggested that L2 learners utilized significantly fewer RCs than native speakers. The top ten frequent RCs were 乐 *le4 "happy",* 对 *dui4 "correct",* 和 *he2 "harmonious",* 会 *hui4 "understand",* 到 *dao4 "arrived",* 上 *shang4 "upward",* 好 *hao3 "good",* 去 *qu4 "go",* 来 *lai2 "come",* 过 *guo4 "over",* in which 上 *shang4 "upward",* 去 *qu4 "go",*来 *lai2 "come"* were directional verbs while *dao4 "arrive", guo4 "pass"* were completive verbs and 乐 *le4 "happy",* 对 *dui4 "right",* 和 *he2 "harmony",* 会 *hui4 "understand"* and 好 *hao3 "good"* were complement of result that can be adjectives or verbs with positive semantic prosody.

III. Frequent RCs in Children's Production

As with the production of V1 in children's language stated in Chapter 3, 42 frequent RCs in child literature were shown as follows.

Complement of direction (8)	出*chu1 "go out"*, 回*hui2 "back"*, 去*qu4 "go"*, 开*kai1 "open"*, 进*jin4 "enter"*, 下*xia4 "down"*, 上*shang4 "go up"*, 起*qi3 "rise"*
Complement of phase (8)	到*dao4 "arrive"*, 掉*diao4 "drop"*, 成*cheng2 "succeed"*, 过 *guo4 "passing by"*, 好*hao3 "good"*, 完*wan2 "finish"*, 着 *zhao2 "achieve"*, 住 *zhu4 "stop"*.

Complement of result(26)	饱*bao3 "full"*, 错*cuo4 "wrong"*, 倒*dao3 "fall down"*, 丢 *diu1 "lost"*, 饿*e4 "hungry"*, 反*fan3 "opposite"*, 高*gao1 "high"*, 坏*huai4 "bad"*, 会*hui4 "understand"*, 昏*hun1 "faint"*, 极*ji2"very"*, 烂*lan4 "soft, broken"*, 没*mei2 "not have"*, 破*po4"broken"*, 伤*shang1 "hurt"*, 熟*shu2/shou2 "cooked"*, 死*si3 "die"*, 碎*sui4 "smash into pieces"*, 疼*teng2 "ache"*, 笑*xiao4 "smile"*, 晕*yun1 "faint"*, 脏*zang1 "dirty"*, 折*she2 "break"*, 走 *zou3 "walk"*, 醉*zui4 "drunken"*, 气*qi4"annoyed"*.

IV. Productivity of RC

Using online character and word statistics, the productivity of RCs was determined by comparing them to their type frequencies. The type frequency of RCs was averaged (M=57.05), and those that were above the mean score—114 in total—were candidates for highly productive RCs. Several were enumerated as follows (readers can refer to Appendix V for the complete list; the numbers in the bracket corresponded to the type frequency).

完 *wan2 "finish"(460),* 出 *chu1 "out"(357),* 好 *hao3 "well"(355),* 成 *cheng2 "become"(343),* 到 *dao4 "arrived"(333),* 死 si3 "die" (308), 多 *duo1 "much"(283),* 入 *ru4 "enter"(281),* 满 *man3 "full"(281),* 回 *hui2 "back"(265),* 进 *jin4 "enter"(264),* 错 *cuo4 "wrong"(262),* 掉 *diao4 "drop ,off"(259),* 坏 *huai4 "bad"(256),* 累 *lei4 "tired"(231),* 够 *gou4 "enough"(220),* 尽 jin4 "over" (211), 破 *po4 "broken"(205),* 足 *zu2 "enough"(204),* 光 *guang1 "over"(199),* 没 *mei2 "not have"(195),* 左 *zuo3 "over"(186)*, 大 *da4 "big" (182),* 住 *zhu4 "stop" (181)*, 下 *xia4 "up"(175),* 定 *ding4 "determined"(175),* 紧 *jin3 "tense"(166),* 断 *duan4 "broken"(165),* 开 *kai1 "open"(162),* 倒 *dao3 "fall over"(161).*

V. Corpus-based Prototypical Members of RC

As stated at the outset of this chapter, corpus-based prototypical RCs were produced by converging four strands of data, namely highly productive in BCC corpus,

highly frequent in BCC, HSK corpus, as well as child language acquisition data. Those members of RC that were present in four lists of data were the most prototypical, whereas those that were only present in one list of data were the least prototypical. The less conventional one lied in the middle. There were fifteen of the most prototypical RCs: 成 *cheng2 "succeed, become",* 出 *chu1 "go out",* 到 *dao4 "arrive",* 高 *gao1 "tall, high",* 好 *hao3 "well",* 回 *hui2 "return",* 开 *kai1 "open",* 没 *mei2 "not have",* 起 *qi3 "rise",* 去 *qu4 "go"*, 上 *shang4 "go up",* 死 *si3 "die",* 完 *wan2 "finish",* 下 *xia4 "come down",* 住 zhu4 *"stop, halt",* 走 *zou3 "walk".*

in which 出 *chu1 "go out",* 开 *kai1 "open",* 起 *qi3 "rise",* 去 *qu4 "go",* 上 *shang4 "go up",* 下 *xia4 "come down",* 走 *zou3 "walk",* 回 *hui2 "return"* were complements of direction while 到 *dao4 "arrive",* 好 *hao3 "well",* 完 *wan2 "finish",* 住 *zhu4 "stop",* 成 *cheng2 "become"* were completive verb and 高 *gao1 "high",* 死 *si3 "die",* 没 *mei2 "none"* were complements of result.

Some of the least prototypical RCs (see Appendix W) were demonstrated as follows (N=77):

劈 *pi1 "cracked",* 惯 *guan4 "habitual",* 歪 *wai1 "askew",* 妥 *tuo3 "ready",* 紧 *jin3 "tense",* 脏 *zang1 "dirty",* 醉 *zui4 "drunken",* 漏 *lou4 "leaky",* 牢 *lao2 "solid",* 罢 ba4 "stop", 饱 *bao3 "full",* 惨 *can3 "awfully",* 灭 *mie4 "put out",* 净 *jing4 "clean",* 饿 e4 "hungry", 遍 *bian4 "all over",* 湿 *shi1 "wet",* 烦 *fan2 "annoyed",* 够 *gou4 "enough",* 齐 *qi2 "level",*疯 *feng1 "crazy",* 松 *song1 "loose",* 响 *xiang3 "loud",* 贵 *gui4 "expensive",* 断 *duan4 "broken",* 偏 *pian1 "askew",* 忙 *mang2 "busy",* 怕 *pa4 "afraid",* 散 *san3 "scatter",* 爆 *bao4 "awfully",* 久 *jiu3 "long time",* 透 *tou4 "through",* 累 *lei4 "tired",* 慢

man4 "slow", 软 *ruan3 "soft",* 哭 *ku1 "cry",* while the less prototypical members of RCs fell somewhere between the two extremes, which were exemplified as follows.

和 *he2 "harmony"*, 大 *da4 "big"*, 对 *dui4 "right"*, 为 *wei2 "become"*, 发 *fa1 "flourish",* 着 *zhao2 "succeed"*, 来 *lai2 "come"*, 小 *xiao3 "small"*, 会 *hui4 "understand"*, 多 *duo4 "many"*, 过 *duo4 "passing by, too"*, 进 *jin4 "enter",* 新 *xin1 "new",* 全 *quan2 "complete",* 分 *fen1 "apart",* 真 *zheng1 "real",* 实 *shi2 "solid",* 重 *zhong4 "heavy",* 老 *lao3 "old, aged",* 正 *zheng4 "straight",* 通 *tong1 "through",* 长 *chang2 "long",* 活 *huo2 "alive",* 反 *fan3 "reverse",* 平 *ping2 "level",* 干 *gan1 "dry",* 变 *bian4 "changed",* 快 *kuai4 "quick",* 病 *bing4 "ill",* 深 *shen1 "deep",* 难 *nan2 "difficult",* 早 *zao3 "early",* 动 *dong4 "move",* 清 *qing1 "clear",* 笑 *xiao3 "smile",* 白 *bai2 "write",* 直 *zhi2 "straight",* 晚 *wan3 "later",* 少 *shao3 "few",* 近 *jin4 "near",* 热 *re4 "hot",* 低 *di1 "low",* 红 *hong2 "red",* 光 *guang1 "polished, up",* 伤 *shang1 "hurt",* 错 *cuo4 "wrong",* 倒 *dao3 "fall over",* 破 *po4 "broken",* 掉 *diao4 "drop",* 坏 *huai4 "bad",* 熟 *shu2 "cooked, done",* 疼 *teng2 "ache",* 丢 *diu1 "lost",* 碎 *sui4 "broken",* 昏 *hun1 "faint",* 晕 *yun1 "dizzy",* 烂 *lan4 "soft, rotten"*.

4.3.2.2 Intuition-based Prototypical RCs

The most prototypical RCs produced by CFL/CSL learners with various proficiency levels were extracted based on the availability of RC in learners" intuition-based data or first RCs cued by V1 in CLPT (Task 2). There were thirty-one most prototypical members of RCs, which were summarized as follows (the numbers in the bracket were their frequency of occurrence and an English translation was put in the single quotation mark).

Complement of phase (5)	好*hao3(24) "finish, complete"*, 好*hao3(15) "good"*, 住*zhu4(8) "stop"*, 到 *dao4(8) "arrive"*, 着*zhao2(2) "indicate accomplishment or result"*
Complement of direction (5)	下*xia4(8) "down, lower"*, 上*shang4(3) "upward"*, 开 *kai1(2) "open"*, 起*qi3(1) "rise"*, 来*lai2(1) "come"*
Complement of result (21)	死*si3(14) "die"*, 走*zou3(7) "go away"*, 紧 *jin3(5) "tight'*, 定*ding4(4) "fix, stable"*, 出 *chu4(4) "go out"*, 坏 *huai4(4) "bad"*, 丢*diu1(4) "lose ,toss"*, 见*jian4(4) "see"*, 动 *dong3(3) "understand"*, 脏 *zang1(3) "dirty"*, 清*qing1(2) "clear, clean"*, 醒*xing3(2) "awake"*, 乱*luan4(2) "messy"*, 折*she2(2) "broken"*, 错*cuo4(2) "wrong"*, 累*lei4(1) "tired"*, 会*hui4(1) "understand"*, 破*po4(1) "broken"*, 倒*dao3(1) "fall down"*, 飞 *fei1(1) "fly"*, 掉*diao4(1) "drop, off"*

All the RCs which appeared in the other RVCs rather than the first one were considered as the less prototypical intuition-based RCs, which were presented as follows (arranged in order of frequency of occurrence).

好 *hao3 (21)"good"*, 完 *wan2(19) "complete"*, 到 *dao4(15) "arrive"*, 死 si3(14) "die", 错 *cuo4(11) "wrong"*, 出 *chu1(10) "go out"*, 掉 *diao4(9) "drop"*, 定 *ding4(6) "fix, stable"*, 起 *qi3*(5) *"rise"*, 下 *xia4*(5) *"down"*, 会 *hui4(5) "understand"*, 开 *kai1(4) "open"*, 破 *po4(4) "broken"*, 上 *shang4(4) "upward"*, 懂 *dong3*(4) *"understand"*, 清 *qing1(3) "clear*, *clean"*, 丢 *diu1(3) "toss, lose"*, 成 *cheng2(3) "succeed"*, 紧 *jin3(3) "tight"*, 着 *zhao2(3) "indicate the result"*, 坏 *huai4(3) "bad"*, 乱 *luan4*(3) *"messy"*, 碎 *sui4(4) "crash"*, 来 *lai2(2) "come"*, 脏 *zang1(2) "dirty"*, 醒 *xing3(2) "awake"*, 伤 *shang1(2) "hurt"*, 稳 *wen3(2) "stable"*, 住 *zhu4(2) "stop"*, 动 *dong4(1) "move"*, 散 *san3(1) "loose"*, 活 *huo2(1) "alive"*, 见 *jian4(1) "indicate accomplishment or result"*, 去 *qu4(1) "go"*, 反 *fan3(1) "opposite"*, 晚 *wan3(1) "late"*, 通 *tong1(1) "through"*, 累 *lei4(1) "tired"*, 走 *zou3(1) "go away"*, 高 *gao1(1) "high, tall"*, 惯 *guan4(1) "habituate"*, 怪 *guai4 "strange*, odd", 倒 *dao3(1) "fall down"*, 败 *bai4(1) "fail"*, 醉 *zui4(1) "drunken"*, 爆 *bao4(1) "explode"*.

4.3.2.3 Prototypical RCs: Converging Evidences

To recap, the most prototypical RCs were tentatively defined as those highly frequent and productive stative adjectives or intransitive verbs. It followed that prototypical RCs were produced by the converging corpus-based prototypical RCs with intuition-based ones, as well as the information of transitivity and verb aspect. Thus, the most prototypical RCs were generated accordingly, as shown as follows (N=11):

完 *wan2 "complete",* 好 *hao3 "good",* 死 *si3 "die",* 下 *xia4 "down",* 住 *zhu4 "stop",* 到 *dao4 "arrive",* 走 *zou3 "go away",* 出 *chu1 "go out",* 上 *shang4 "upward",* 开 *kai1 "open",* 起 *qi3 "rise".*

Of the eleven RCs, two were complements of result, four were complements of phase, and five were complements of direction. What was followed was the less prototypical RCs which were produced by converging the intuition-based less prototypical RCs and those most prototypical RCs which were excluded from most prototypical RCs with corpus-based less prototypical RCs and those out of the scope of most prototypical RCs, shown as follows (N=18).

坏 *huai4 "bad",* 会 *hui4 "understand",* 通 *tong4 "through",* 晚 *wan3 "late"*, 清 *qing1 "clean, clear"*, 活 *huo2 "alive",* 破 *po4 "broken",* 掉 *diao4 "drop",* 倒 *dao3 "fall",* 丢 *diu1 "toss, lose",* 错 *cuo4 "wrong",* 来 *lai2 "come"*, 成 *cheng2 "succeed",* 高 *gao1 "high, tall"*,着 *zhao2 "succeed"*, 动 *dong4 "move"*, 伤 *shang1 "hurt"*, 去 *qu4 "go".*

The least prototypical RCs were those which were excluded from the lists of the most prototypical RCs and the less prototypical RCs, such as:

多 *duo1 "many"*, 小 *xiao3 "small"*, 过 *guo4 "passing by, too"*, 新 *xin1 "new"*, 全 *quan2 "complete"*, 正 *zheng4 "straight, upright"*, 老 *lao3 "old, aged"*, 长 *chang2 "long"*, 干 *gan1 "dry"*, 平 *ping2 "level, even, flat"*, 反 *fan3 "turn over, reverse"*, 遍 *bian4 "all over, everywhere"*, 病 *bing4 "ill"*, 深 *shen1 "deep"*, 难 *nan2 "difficult"*, 早 *zao3 "early"*, 笑 *xiao4 "smile"*, 白 *bai2 "white"*, 直 *zhi2 "straight"*, 少 *shao3 "few, little"*, 近 *jin4 "close, near"*, 热 *re4 "hot"*, 低 *di1 "low"*, 红 *hong2 "red"*, 光 *guang4 "used up, smooth"*, 熟 *shu2 "cooked*, *done"*, 疼 *teng2 "ache"*, 碎 *sui4 "smash into pieces"*, 昏 *hun1 "dark, confused"*, 晕 *yun1 "dizzy"*, 烂 *lan4 "soft, rotten"* etc.

As indicated above, the overlap and mismatch were found in the distinct lists of prototypical RCs based on various attributes defined in section 4.2. As with the prototypical V1s, three levels of prototypical RCs were derived by converging the corpus-based prototypical RCs and intuition-based prototypical RCs among others. These levels were made up of 11 most prototypical RCs, including 5 directional complements, 4 completive complements and 2 complements of result and 18 less prototypical RCs like 来 *lai2 "come"*, 去 *qu4 "go"*, 坏 *huai4 "bad"* etc. The least prototypical RCs occupied the greatest proportion, among which, the majority of them were degree adjectives.

4.3.3 Prototypical 打 *da3-RCs*

Investigating the effect of prototypicality of RVC, semantic orientation of RC, polysemous V1s, and syntactic prototypicality in the syntactic acquisition of RVC by looking at each of those over 12,000 RVCs may be a laborious but pointless task. Therefore, in this study, 打 *da3-RCs* were selected to achieve the goal. In Wu's (2018) research, prototypical RVCs were measured with respect to prototypical V1s and RCs. On

the ground of research findings of prototypical members of RC, the prototypical members of 打 *da3-RCs* were produced accordingly, which were presented as follows.

The lexically most prototypical *da3-RCs* were generated by combing 打 *da3 "beat"* with most prototypical RCs, ranked according to their token frequency in the BCC corpus.

打开 *da3kai1 "beat-open"* (95760), 打死 *da3si3"beat-death"* (19936), 打下 *da3xia4 "beat down"* (15687),打出 *da3chu1 "beat out"* (15684), 打到 *da3dao4 "beat to"* (10384), 打起 *da3qi3 "began to beat"* (9751), 打好 *da3hao3 "beat well"* (9400), 打完 *da3wan2 "finish beating"* (6882), 打上 *da3shang4 "began to beat"* (4773), 打住 *da3zhu4 "stop"* (2196), 打走 *da3zou3 "beat away"* (172).

The less prototypical *da3-RCs* were those RVCs by collocating 打 *da3 "beat"* with the less prototypical RCs, some of which were demonstrated as follows.

打破 *da3po4 "break"* (40665), 打来 *da3lai2 "beat on"* (10387), 打动 *da3dong4 "move by beating"* (10272), 打倒 *da3dao3 "overturn"* (8833), 打成 *da3cheng2 "become by pounding"* (6435), 打通 *da3tong1 "drill through"* (5743), 打伤 *da3shang1 "hurt by beating"* (4407), 打错 *da3cuo4 "beat in a wrong way"* (4052), 打掉 *da3diao4 "beat off"* (3235), 打去 *da3diao4 "beat away"* (1396), 打紧 *da3jin3 "tighten by drilling"* (1387), 打高 *da3gao1 "rise by beating"* (1006), 打坏 *da3huai4 "beat bad"* (774), 打着 *da3zhao2 "succeed in beating"*(124), 打丢 *da3diu1 "beat and lose"* (22), 打活 *da3huo2 "alive by beating"* (13), 打晚 *da3wan3 "beat at a late time"* (4), 打会 *da3hui4 "acquire by beating"* (2).

As with the most prototypical and the less prototypical 打 *da3-RCs*, the least prototypical 打 *da3-RCs* which were great in numbers were produced by combining 打 *da3 "beat"* with the least prototypical RCs. Some of them have been exemplified as follows.

打过 *daguo4 "win by beating"* (10261), 打碎 *da3sui4 "broken"* (3635), 打昏 *da3hun1 "faint by being beaten"* (776), 打光 *da3guang1 "shoot up"* (739), 打晕 *da3yun1 "faint by being beaten"* (577), 打热 *da3re4 "hot by pounding" (383)*, 打输 *da3shu4 "lost in beating"* (303), 打红 *da3hong2 "become red for beating"* (283), 打直 *da3zhi2 "straighten up"* (176), 打深 *da3shen1 "dig deep"* (151), 打疯 *da3feng1 "beat crazily"* (114), 打疼 *da3teng2 "ache for beating"* (96), 打惯 *da3guan4 "beat in a habitual manner"* (54), 打烦 *da3fan2 "beat in a annoyed manner"* (10).

According to Wu's (2018) measurement that the prototypical RVCs are disyllabic verbs consisting of prototypical V1 and RC, it followed that prototypical 打 *da3+RC* can be derived by combing 打 *da3 "beat"* with the hierarchy of prototypical RCs found in Section 4.3.2. The prototype-based graded membership of 打 *da3-RC* covered the most prototypical 打 *da3-RC* like directional RVC 打下 *da3xia4 "beat-down"*, 打出 *da3chu1"beat-out"*, completive RVC 打完 *da3wan2"beat-finish"*, 打好 *da3hao3"beat-well"* and result RVC 打死 *da3si3"beat-die"*, the less prototypical *da3-RC*, such as 打破 *da3po4"break"*, 打掉 *da3diao4"beat-drop"* and the least prototypical *da3-RC*, including some subject-oriented RVCs like 打惯 *da3guan4"beat habitually",* 打烦 *da3fan2 "beat-impatient"* and 打疯 *da3feng1"beat-crazy"*.

4.4 Results of Phase II: Semantic Prototypicality of 打 *da3-RC*

As discussed in Chapter 2, SeP of RVC was explored in two aspects: the polysemous V1 and the semantic orientation of RC. When it came to 打 *da3-RC*, two levels of prototypical meaning of 打 *da3 "beat",* namely most prototypical meaning and less prototypical meaning that was equivalent to the metaphorical meaning were subsumed under the rubric of prototypicality of polysemous 打 *da3 "beat"* while prototypicality in the semantic orientation of RC declined from object-oriented through verb-oriented to subject-oriented.

The semantic orientation of RC had a significant effect on the prototypicality of 打 *da3-RC*. For example, among the lexically most prototypical 打 *da3-RC,* 打开 *da3-kai1 "beat-open"* and 打死 *da3-si3 "beat-die"* were more semantically prototypical than 打好 *da3-hao3 "beat well"* and 打完 *da3-wan2 "finish beating"* for the fact that the former were object-oriented while the latter are verb oriented. It still held true for the lexically less prototypical 打 *da3-RC* and the least prototypical 打 *da3-RC*. For example, 打坏 *da3-huai4 "beat bad"* was more prototypical than 打晚 *da3-wan3 "beat-late"* due to the fact that 打坏 *da3-huai4 "beat bad"* was object-oriented whereas 打晚 *da3-wan3 "beat-late"* was verb-oriented; 打惯 *da3-guan4 "beat-habitually"* was more prototypical than 打疯 *da3-feng1 "beat crazily"* and 打烦 *da3-fan2 "beat-impatient"* because the latter were subject-oriented while the former is verb-oriented.

The semantically prototypicality of 打 *da3-RC* was also contingent on the object-hood and object-hood would affect the construal of polysemous 打 *da3 "beat"*. For example, in the following two sentences related to 打破 *da3po4 "break"* (as shown in (4-1)

and (4-2)), 打破 *da3po4"break"* in (4-1) was more prototypical than that in (4-2) for the meaning in(4-1) was more basic than in (4-2) according to the classification by Gao (2000) and Tian (2004).

(4-1) 不久其他窗户也会被人**打破**。

"Sooner other windows will be smashed into pieces."

(4-2) 赵菁一举**打破** 100 米仰泳的亚洲纪录。

"Zhao Jing broke the Asia record for the 100-meter backstroke."

4.5 Results of Phase II: Prototypical Sentence Pattern of 打 *da3-RCs*

As designed in Chapter 3, the investigation of the SyP of RVC or prototypical sentence patterns cued by RVC and the following quasi-experimental study might provide empirical evidence for the pedagogical suggestion that when RVC is taught, the prototypical pattern should be introduced to provide a better context for inferring the relevant vocabulary knowledge, like meaning, usage etc. Meanwhile, the finding of syntactic acquisition of RVC might show us that, apart from the prototypicality of alternative sentence patterns involved, other factors might be taken into consideration in selecting prototypical illustrative examples, such as the prototypicality of RVC, polysemous RC and V1 and even the L1 background etc.

Goldberg and Jakendoff (2016) have argued that English resultative construction was a family of constructions or alternative patterns with family resemblance. Gries (2003) introduced a corpus-based quantitative technique (e.g., Linear Discriminate Analysis) to identify the prototypical instance of dative alternation. Inspired by those, it might be bravely assumed that so-called Chinese resultative constructions are a family of

constructions connected by RVC. More specifically, the RVCs can distribute themselves in five alternative sentence structures as mentioned in Chapter 2: SVO, Ba-C, Bei-C, PSC and CVC. The relationship between verbs and the prototypicality of sentence patterns had been similarly discussed by other scholars like Segaert et al. (2014) who reasoned about syntactic preference the likelihood for a speaker to select one alternative structure instead of the other, to the effect that verb and syntactic construction are closely related and the actual linguistic distribution of those alternative constructions varies across verbs. Van de Velden et al. (2014) claimed that a general preference was to use a frequent structure over a less frequent sentence structure, which was called preferred and dis-preferred structure. This section contributed to identifying the prototypical syntactic context related to RVC or syntactic prototypicality with reference to the syntactic distribution test or frequency distribution in the BCC corpus.

4.5.1 Corpus-based SyP of 打 *da3-RCs*

To repeat here, RVCs were compounds with such a large family that it may be difficult, if not impossible to examine the syntactic distribution of each compound. Therefore, it was feasible to choose 打 *da3-RC* as a better example, based on a systematic survey of the compounds, to examine the SyP of RVC. What was more important was that 打 *da3-RC* compounds, to some extent, could demonstrate the LP and SeP, conducive to examining the joint efforts of the SyP, LP and SeP in RVC-related syntactic acquisition.

Among the three different degrees of 打 *da3-RC*, six samples (打完 *da3wan2 "beat over",* 打好 *da3hao3 "beat well",* 打下 *da3xia4 "beat down",* 打出 *da3chu1 "beat out",* 打开 *da3kai1 "beat open"* and 打死 *da3si3 "beat-die"*) were chosen as the most prototypical *da3-RC*, and four samples (打掉 *da3diao4 "beat drop",* 打破 *da3po4*

*"break",*打成 *da3cheng2 "beat-become",* 打错 *da3cuo4 "beat-wrong"*) were selected as the less prototypical *da3-RCs* while five cases (打进 *da3jin4 "beat into",* 打回 *da3hui2 "beat back",* 打惯 *da3guan4 "beat habitually",* 打累 *da3lei4 "beat tiredly"* and 打烦 *da3fan2 "beat-impatient"*) were regarded as the least prototypical *da3-RCs*, in which both the object-oriented, verb-oriented, and subject-oriented RVCs were included. Each Regex (regular expression) or sentence pattern is productive and each pattern with a certain 打 *da3-RC* was searched in the BCC corpus to obtain its type frequency, which has been demonstrated in Table 4.3.

Table 4.3: Corpus-based Syntactic Prototypicality of 打 *da3-RCs*

Da-RCs	SVO	CVC	Ba-C	Bei-C	PSC	Total
打死*da3si3 "beat-die"*	39	9	240	438	540	1266
打开 *da3kai1"beat-open"*	3496	0	2098	120	3193	6268
打下*da3xia4"beat-down"*	171	7	171	128	0	477
打出*da3chu1"beat-out"*	514	16	162	167	0	859
打完 *da3wan2"beat-finish"*	19	4	40	5	33	101
打好*da3hao3"beat-well"*	775	2	103	1	78	793
打成*da3cheng2 "beat-become"*	2564	13	228	110	7	2916
打破*da3po4* "beat-broken"	460	0	19	100	1977	2142
打掉*da3diao4* "beat-drop"	56	4	140	88	64	352
打错 *da3cuo4* "beat-wrong"	99	3	24	2	57	185
打进*da3jin4* "beat-into"	176	4	211	16	0	407
打回*da3hui2* "beat-back"	2	1	47	20	0	70
打累 *da3lei4* "beat-tired"	0	4	0	0	1	5
打惯*da3guan4* "beat-habitual"	34	5	0	9	1	49
打烦*da3fan2* "beat-annoy"	1	4	0	1	4	10
Total	8405	68	3483	1204	5950	15885

Based on the corpus-based distribution of five alternative constructions of the fifteen target 打 *da3-RC,* it was not difficult to find that, the most productive 打 *da3-RC* was 打开 *da3kai1 "beat open"*, a prototypical 打 *da3-RC* that could generate at least 6268

actual sentences, followed by two the less prototypical 打 *da3-RCs*: 打成 *da3cheng2 "become by beating"* and 打破 *da3po4 "break by beating"*. The least productive 打 *da3-RC* is 打累 *da3lei4 "beat tired"* and the structures most often used by 打累 *da3lei4 "beat tired"* were active intransitive construction (PSC) and CVC.

打 *da3-RCs* with different degrees of prototypicality co-occurred with different sentence patterns. For example, active transitive construction (SVO) was the most often used by 打开 *da3kai1 "beat-open"* and 打成 *da3cheng2 "become by beating"*. A similar tendency was equally evidenced in Ba-C. For Bei-C, the often-cited *da3-RCs* are 打死 *da3si3 "beat to death"*, 打出 *da3chu1 "beat out"* and 打下 *da3xia4 "beat down",* while 打出 *da3chu1 "beat out"* and 打成 *da3cheng2 "beat and become"* most often appeared in CVC. However, it seems that this construction (CVC) was not licensed by 打开 *da3kai1* and 打破 *da3po4 "break"*, to some extent suggesting that these RVCs were highly transitive. This finding was consistent with Shi's (2015) view: for the intransitive RVCs, the most prototypical syntactic construction was PSC followed by Bei-C, Ba-C or SV(O) and the least prototypical construction was CVC; For the directional RVC, the most prototypical construction was Ba-C followed by SV(O) and the least prototypical construction was PSC; For the completive RVC, the most prototypical construction was SV(O) followed by Ba-C while the least prototypical construction was CVC.

4.5.2 Intuition-based SyP of 打 *da3-RCs*

Intuition-based data on the SyP of 打 *da3-RCs* were produced via sentence production task primed by target 打 *da3-RCs*. In particular, thirteen different types of 打 *da3-RCs* like 打惯 *da3guan4"beat-habitully"*, 打好 *da3hao3"beat-well"* etc. were

provided to the CFL/CSL learners to elicit the first sentences produced by them. The results were shown in Table 4.4.

Table 4.4: Intuition-based Prototypical Patterns of 打 *da3-RCs*

Da3+RCs	SV(O)	Ba-C	Bei-C	PSC	CVC	Total
打惯*da3guan4* "beat habitually"	4	0	0	0	0	4
打好*da3hao3* "beat well"	7	4	0	1	0	7
打死*da3si3* "beat-death"	9	2	5	0	0	9
打出 *da3chu1* "beat out"	5	5	0	1	0	11
打掉 *da3diao4*"beat-drop"	2	5	4	0	0	11
打断*da3duan4* "beat-broken"	11	0	1	2	0	14
打错*da3cuo4* "beat-wrong"	10	0	1	3	0	13
打烦*da3fan2* "beat-annoyed"	4	0	2	3	1	10
打破*da3po4* "beat-broken"	3	4	5	2	0	14
打进*da3jin4* "beat-enter"	4	6	0	0	0	10
打累 *da3lei4*"beat-tired"	3	0	0	1	4	8
打入 *da3ru4*"beat into"	7	4	0	1	0	12
打下*da3xia4* "beat-down"	7	1	1	0	0	9
Total	76	31	19	14	5	145

As indicated in Table 4.4, compared with the corpus-based SyP on 打 *da3-RC*, only a small number of prototypical sentences were collected, suggesting CSL/CFL learners' incompetence in RVC. The productivity of the pattern for each target 打 *da3-RC* was closer to each other, whether being prototypical or not. The sentence pattern used most often by CSL/CFL learners was SVO, followed by Ba-C and the least produced sentence pattern was CVC, a construction closely related to the least prototypical 打 *da3-RC* in terms of the semantic orientation of RC.

Mixed findings were yielded on the relationship between 打 *da3-RC* and corresponding sentence constructions. For example, 打 *da3-RCs* that were the most likely to be used in SVO were 打断 *da3duan4 "break"* and 打错 *da3cuo4 "beat wrongly",* two

highly transitive 打 *da3-RCs*. 打 *da3-RCs* that were used in Bei-C were those with negative meanings like 打死 *da3si3 "beat to death"* and 打破 *da3po4 "break"*, seemingly indicating that CSL/CFL might have mastered the constructional meaning of Bei-C. The productive data in CVC illustrated that on the one hand, 打 *da3-RCs* related to CVC were subject-oriented RVC, like 打烦 *da3fan2 "beat-impatient"* and 打累 *da3lei4 "beat-tired"* and on the other hand, CVC was a difficult-to-learn or non-prototypical area and this pattern needed to be highlighted in the future instruction.

4.5.3 Converged SyP of 打 *da3-RCs*

Influenced by Gilquin and McMichael's (2018) converging criteria of the prototype, the SyP of 打 *da3-RCs* was determined based on the corpus-based distribution of frequent sentence patterns and intuition-based salient and frequent sentence patterns.

Both congruence and mismatch in syntactic prototype were found when corpus data and intuition-based data converged. The mismatch in the SyP often occurred in the less transitive constructions, which possibly was influenced by learners' Chinese proficiency levels. For example, the corpus-based prototypical pattern for 打破 *da3po4 "beat broken"* was PSC while the intuition-based prototypical pattern was Bei-C. However, great congruence was found in those *da3-RCs*, such as 打惯 *da3-guan4 "beat habitually",* 打好 *da3-hao3 "beat well",* 打入 *da3ru4 "beat into",* 打下 *da3xia4 "beat-down",* 打出 *da3-chu1 "beat-out",* 打错 *da3cuo4 "beat-wrong"* and 打累 *da3lei4 "beat-tired"*. The in-congruent finding of 打烦 *da3fan2 "beat-impatient"* indicated the possible influence of learners' low Chinese proficiency level on the RVC prototype, which was summarized in Table 4.5.

Table 4.5: Convergent Prototypical Patterns of 打 *da3-RCs*

Prototypical pattern	Target 打*da3-RCs*
SV(O)	打惯*da3guan "beat habitually"*, 打好*da3hao3 "beat well"*, 打入*da3ru4 "beat into"*, 打下*da3xia4 "beat down"*, 打出*da3chu1 "beat out"*，打错*da3cuo4"beat wrongly"*.
Ba-C	打掉*da3diao4 "beat-drop"*, 打进*da3jin4 "beat into"*
CVC	打累*da3lei4 "beat tired"*

It was not difficult to find from Table 4.5 that as regards the SyP of RVC, 打 *da3-RCs* licensed by the SVO can be RVCs with complement of direction like 打入 *da3ru4 "beat into"*, 打出 *da3chu1 "beat out"*, 打下 *da3xia4 "beat down"*, RVCs with complement of result, such as 打错 *da3cuo4 "beat-wrong"* and completive RVC like 打好 *da3hao3 "beat well"*. For Ba-C, prototypical *da3-RCs* were 打掉 *da3diao4 "beat off"* and 打进 *da3jin4 "beat into"*, both of which were object-oriented RVCs. For subject-oriented 打 *da3-RCs*, the most prototypical pattern was CVC, like 打累 *da3lei4 "beat tiredly"*.

To conclude, the convergence-based SyP of RVC provided an answer to research question 3 "What are the suggested prototype-based hierarchies among alternative 打-RC-related sentence patterns?". In particular, the corpus-based prototypical syntactic pattern of 打 *da3-RC* from the BCC corpus indicated that the sentences that are most frequently used by Chinese native speakers are SVO and Ba-C, while CVC is the least common construction. Also, a severely skewed distribution can be found in PSC whose frequency of occurrence was disturbed by 打死 *da3si3 "beat-open"* and 打破 *da3po4 "beat-broken"*. In addition, the selection of sentence pattern was influenced by the semantic prosody of RVC, such as the contrary distribution of Bei-C on the negative RVC 打死 *da3si3"beat-die"* and the positive RVC 打好 *da3hao3"beat well"*, as well as the semantic orientation

of RVC, like the distribution of CVC on two subject-oriented RVCs: 打累 *da3lei4"beat-tired"* and 打烦 *da3fan2"beat-impatient"*. These findings were in agreement with the prediction from previous studies (e.g., Chu, 2016; He, 2019; Shi, 2015). The intuition-based prototypical sentence pattern of RVC revealed that in contrast with corpus-based findings mentioned above, a surprisingly low occurrence indicated the L2 learners' low proficiency level on RVC though a similar tendency of SyP was obtained: SVO, Ba-C>Bei-C, PSC>CVC. The convergence evidence suggested that for most of the RVCs, SVO and Ba-C are the most prototypical sentence patterns. Nevertheless, the prototypical sentence is related to the semantic orientation of RVC, such as CVC licensed by subject-oriented RVC.

4.6 Results of Phase III: LAJT and SAJT

This section was dealt with the results of the quasi-experimental study, including the CPT, LAJT and SAJT, aiming to test the findings from Phase II in the instructed L2 acquisition of RVC. A pretest-posttest control group design was adopted to assess the extent to which the two hypotheses formulated in Section 2.8.5 could be confirmed by the data obtained in the quasi-experimental investigation. These results provided the answer to RQ4, *i.e.*, "How can prototype-based component morphemes of RVC explain learners' performance in the instructed L2 learning of RVC" and RQ5, *i.e.,* "How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 learning of RVC-related syntax?"

This section started with the results of Chinese Proficiency Test in Section 4.6.1 for the further investigation in the following sections; Section 4.6.2 and Section 4.6.3 presented the results of L-AJT and S-AJT, respectively for testing Hypotheses 1 (i-v) and

Hypotheses 2 (i-vi). More specifically, each section provided the following information: a restatement of the hypothesis, the empirical manifestation of the hypothesis, the statistical techniques adopted, the statistical result obtained and, finally, the conclusion on whether, and if so, to what extent, the hypotheses have been empirically confirmed.

4.6.1 Results of Chinese Proficiency Test

Before the prototype-based RVC instruction was administered, CPT, one of the three pretests was conducted in advance, on the one hand, to examine whether the subjects were at the intermediate level and on the other hand, to see whether there was a significant difference in their Chinese proficiency levels between the experimental group and the control group.

Table 4.6 presented the descriptive statistics of two groups, namely the experimental group and the control group on the performance in CPT, including the mean score in CPT (M), standard deviation (S.D) and number of participants (N). The mean score in Table 4.6 showed us that all the participants in both groups surpassed the threshold line of intermediate level (M>18), suggesting they have met the basic requirement of being intermediate CFL learners. There were nineteen participants in the experimental group while in the control group, twenty-three learners participated in the research. The mean scores of the two groups were similar (M=20.21 vs 20.22).

Table 4.6: Descriptive Statistics of CPT in Pretest

Group	Number	Mean	Standard. Deviation
the Experimental Group	19	20.21	1.903
the Control Group	23	20.22	1.858

To determine whether the differences between the two groups have reached a statistically significant level, an independent t-test was carried out accordingly. The results

have been summarized in Table 4.7.

Table 4.7: Independent T-test of CPT

Levene's test for equality of variances		T-test for equality of means		
f.	sig.	t.	f.	sig.(2-tailed)
0.008	0.931	-0.012	40	0.991

Independent t-test of CPT shows that the *p*-value (sig.) of Levene's test for equality of variances has rejected the null hypothesis (p=.931>.05), indicating that it has met the basic requirement of parametric test and the *p*-value of the independent t-test for the equality of means suggests that there is no significant difference between the two groups on the Chinese proficiency level (p=.991>.05), revealing that the two intact classes were parallel to each other or they are homogeneous in the Chinese proficiency level.

4.6.2 Results of L-AJT

The aim of designing L-AJT was to answer RQ 4 "How can prototype-based component morphemes of RVC explain CFL learners" performance in the instructed L2 learning of RVC?". According to the integrated framework of compound identification in Figure 2.7, it has been hypothesized in H1(i-v):

(H1-i) The experimental group performs significantly better in the LAJT than the control group, other things being equal.

(H1-ii) The prototypicality of V1s exerts significant influence on CFL learners" performance in the LAJT, other things being equal.

(H1-iii) The prototypicality of RCs exerts significant influence on CFL learners" performance in the LAJT, other things being equal.

(H1-iv) RVCs with high token frequency are more acceptable than less frequent

RVCs by CFL learners, other things being equal.

(H1-v) Prototype-based RVC instruction, prototypicality of V1s, prototypicality of RCs and token frequency of RVCs can jointly contribute to the lexical identification of RVC in a significant manner.

4.6.2.1 Results of Pretest

In the pretest-intervention-posttest control group design employed in this study, L-AJT was administered twice, once as pretest and once as posttest. The data of learners' performance in RVC identification were collected via L-AJT in which 45 different types of RVCs were selected and presented to the CFL learners to obtain their acceptability. L-AJT was employed as a pretest to measure the prior knowledge of CFL learners on RVC before they received prototype-based RVC instruction of prototypical RVC and components.

Table 4.8: The Acceptable RVCs for Two Different Groups (Top Ten)

Rank	Experimental group (n=19)	Token Frequency (in the BCC corpus)	Control group (n=23)
1	吃饱*"eat-full"*	提高 *"improve"*	睡醒 *"awake"*
2	睡醒 *"awake"*	拿出*"take out"*	提高*"improve"*
3	提高 *"improve"*	搞好"make better"	吃饱*"eat-full"*
4	填入 *"fill in"*	提起*"lift up"*	拿走*"take away"*
5	提起 *"lift up"*	吃饱*"eat-full"*	提起*"lift up"*
6	想好 *"think-well"*	想好*"think well"*	想好*"think well"*
7	填上 *"fill in"*	睡醒*"awake"*	喝醉*"drunken"*
8	拿出 *"take out"*	喝醉*"drunken"*	学坏*"learn-bad"*
9	学成 *"learn and achieved"*	坐上*"succeed in sitting"*	看错*"look-wrong"*
10	搞好 *"make better"*	拿走 *"take away"*	拿错*" take-wrong"*

As with the CPT, L-AJT was administered as a pretest. The descriptive statistics of the two groups indicated that twenty-three participants were involved in the control group

while there were nineteen participants in the experimental group. In the experimental group, the highest mean score in terms of acceptability was 2, indicating complete acceptance while the lowest score was -0.27, a sign of unacceptability. The experimental group's mean score (M=0.77) suggests that intermediate learners tend to accept those RVCs. From the top ten acceptable RVCs (see Table 4.8) among the 45 RVCs by the experimental group and the control group, a close relationship between the learners" acceptability and frequency of RVC was detected, such as 睡醒 *shui4xing3 "awake"*, 提高 *ti2gao1 "heighten"*, 吃饱 *chi1bao3 "eat full"*, and 拿走 *na2zou3 "take away"*. Those top frequent RVCs are accepted by both the control group and the experimental group while the top five unacceptable RVCs were 坐烦 *zuo4fan2 "sit-annoyed"* (0.05), 弄红 *nong4hong "make red"* (0), 拿坏 *na2huai4 "hold-bad"* (-0.05), 打烦 *da3fan2 "beat-annoyed"*(-0.26), 杀怕 *sha1pa4 "kill-frightened"*(-0.32), most of which are subject-oriented RVCs.

Pearson correlation test in Table 4.9 demonstrated the strength of correlation between the independent variables and the dependent variable: learners' performance in RVC identification (mean score in L-AJT) was the dependent variable while prototype-based RVC instruction, the prototypicality of V1s and RCs and token frequency of RVCs were four independent variables.

Table 4.9: Correlation among Variable in the Pretest of L-AJT

		Mean scores	Group	Prototypicality of RCs	Prototypicality of V1s	Token frequency of RVC
Pearson correlation	mean score	1	0.022	-0.387	0.056	0.279
	group	0.022	1.000	0.000	0	0.000
	prototypicality of RC	-0.387	0.000	1.000	-0.100	-0.047
	prototypicality of V1	0.056	0.000	-0.100	1	-0.021
	token frequency of RVC	0.279	0.000	-0.047	-0.021	1.000

Table 4.9 continued

Sig.(1-tailored)	mean score	.	0.417	0.000	0.300	0.004
	group	0.417	.	0.500	0.5	0.500
	prototypicality of RC	0	0.500	.	0.174	0.331
	prototypicality of V1	0.3	0.500	0.174	.	0.423
	Token frequency of RVC	0.004	0.500	0.331	0.423	.

Correlation coefficients and significance value suggest that there was a significant moderate correlation(r=-0.387, p=0) between the prototypicality of RCs and the learners' performance in L-AJT. The negative correlation was attributed to the coding of the prototypicality of RCs in a reversed order (1=the most prototypical while 3=the least prototypical). Similar significant finding can be detected with the correlation between the token frequency of RVC and RVC identification(r=0.279, p=0.004<0.05). Also, weak and insignificant correlations to RVC identification were found in the prototypicality of V1s and prototype-based RVC instruction.

After a one-month prototype-based RVC instruction, L-AJT was administered again as a posttest. The correlations of variables in the posttest of L-AJT were presented in Table 4.10.

Table 4.10: Correlations of Variables in the Post-test of L-AJT

	Variables	Degree of acceptability	Group difference	Prototypicality of RCs	Prototypicality of V1s	Token frequency of RVC
Pearson correlation	degree of acceptability	1	0.207	-0.393	0.019	0.271
	group difference	0.271	1.000	0.000	0	0.000
	prototypicality of RCs	-0.393	0.000	1.000	-0.084	-0.047
	prototypicality of V1s	0.019	-0.014	-0.084	1	-0.024
	token frequency of RVC	0.271	0.000	-0.047	-0.024	1.000

Table 4.10 continued

Sig.(1-tailored)	degree of acceptability	.	0.025	0	0.431	0.005
	group difference	0.025	.	0.5	0.449	0.5
	prototypicality of RC	0	0.5	.	0.215	0.331
	prototypicality of V1	0.431	0.449	0.215	.	0.412
	token frequency of RVC	0.005	0.5	0.331	0.412	.

Table 4.10 presented an overview of Pearson correlations and the significance of variables involved in the RVC identification after the prototype-based RVC instruction. The comparison between Tables 4.9 and 4.10 suggested that after the prototype-based RVC instruction, the correlation between the prototypicality of RCs and learners' performance in LAJT remained steady and significant. This finding was true of the correlation between the token frequency of RVCs and learners' performance in LAJT. The marked difference was found in the prototype-based RVC instruction. The strength of correlation between the group difference and learners' performance in LAJT has greatly improved and reached a significant level(p=.025<.05), suggesting the positive effect of prototype-based RVC instruction on RVC learning. However, correlation between the prototypicality of V1s and learners' performance in LAJT weakened and did not reach a significant level at the p=0.05 level after the intervention (p=0.431>0.05). Therefore, to put those data together, Hypothesis 1(i) was confirmed by the correlation data. However, the insignificant relationship between the prototypicality of V1s and acceptance of RVCs suggests that H1(ii) was rejected.

Furthermore, the correlations between the prototypicality of RCs and acceptance in Tables 4.9 and 4.10 revealed that prototype-based RVC instruction seemed to make no difference to the role of the prototypicality of RCs. This finding was yielded based on the observation that the significance and strength of the correlation between the two variables remained constant before and after the intervention. Therefore, the H1 (iii) was confirmed.

As with the finding in terms of the prototypicality of RCs, similar finding was obtained for the steady performance on the correlation between token frequency of RVCs and the acceptance of RVCs. Thus, the H1(iv) was equally confirmed.

4.6.2.2 Results of Posttest (MLR)

To test H1(v), *i.e.*, "Prototype-based RVC instruction, prototypicality of V1s, prototypicality of RCs and token frequency of RVCs can jointly contribute to the learners' performance in LAJT in a significant manner after the teaching intervention", MLR was conducted accordingly, in which mean scores of L-AJT in the posttest were collected as an indicator of the dependent variable---learners' performance in RVC identification while prototypicality of V1s, the prototypicality of RCs, group differences and token frequency of RVCs are independent variables. The results were yielded as follows. Table 4.11 shows us the ANOVA information in the modal. The value of significance (F (4) =7.511, p=.000) seemed to reject the null hypothesis, suggesting that at least one independent variable in the assumed regression model in this study could have a significant effect on the learners' performance in L-AJT.

Table 4.11: ANOVA(b) in L-AJT

	Sum of squares	df.	Mean squares	F	Sig.
Regression	9.422	4	2.356	7.511	.000(a)
Residue	26.656	85	0.314		
Total	36.078	89			

a. Predictors: (Constant), Group, prototypicality of RC, Token Frequency of RVC, prototypicality of V1
b. Dependent Variable: Postscore of L-AJT

According to the ANOVA results (Table 4.11), the sum of squares regression model could explain 9.422 of the observed data, leaving 26.656 unexplained. The variability in RVC learning was modestly accounted for by the regression model that included constant,

group difference, prototypicality of RCs, token frequency of RVCs, and the prototypicality of V1s. What was presented in Table 4.12 was the coefficient of regression model (R=.511), the coefficient of determination (R^2=.261) and the adjusted coefficient of determination (R^2_{adj}=.226).

Table 4.12: Model Summary for Regression in L-AJT

R	R square	Adjusted R square
.511(a)	0.261	0.226

a. Predictors: (Constant), Group, Prototypicality of RC, Token Frequency of RVC
b. Postscore of L-AJT

Only 22.6% of the variance in learning RVCs can be explained by the assumed modal, according to the adjusted R square in the modal summary for regression. This implied that RVC learning was such a complex process that many other elements should be considered in future studies, in addition to the prototype effect and dual route processing modal.

The modal coefficients were presented in Table 4.13, together with the statistics including collinearity, significance, and coefficients. Bao (2011) stated that a tolerance value above 0.2 indicated the absence of a collinearity issue. All the four independent variables appeared to have no collinearity issues, satisfying the MLR criterion.

Table 4.13: Coefficient[a] of Modal in L-AJT

Model	Unstandardized coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std.Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	1.392	0.235		5.921	0		
token frequency of RVC	1.78E-06	0	0.253	2.711	0.008	0.997	1.003
prototypicality of V1	-0.004	0.073	-0.005	-0.05	0.961	0.992	1.008
prototypicality of RC	-0.296	0.073	-0.381	-4.07	0	0.991	1.01
group	0.262	0.118	0.207	2.222	0.029	1	1

a.dependent variable: competence in the L-AJT

Thus, a novel modal was developed in which the token frequency of RVC, group difference, constant, and the prototypicality of RCs could succeed in entering the tested model due to the insignificance of the prototypicality of V1. The tested modal could be presented in the following formula.

Acceptability of RC=1.392-0.296*prototypicality of RC+0.262*teaching+1.78E-06*token frequency of RVC	Equation 4.1

To verify that the conditions for drawing inferences about the coefficients in a linear model have been met, a residual analysis was suggested to conduct. Recall that if a linear modal makes sense, the residuals are approximately normally distributed (with a mean of zero). The following three plots (Figures 4.1, 4.2 and 4.3) presented us with those information.

The standardised residual histogram and their approximate conformance to the normal distribution have been displayed in Figure 4.1. The third condition — the "N" condition — of the linear regression model was that the error terms were normally distributed (Bao, 2011).

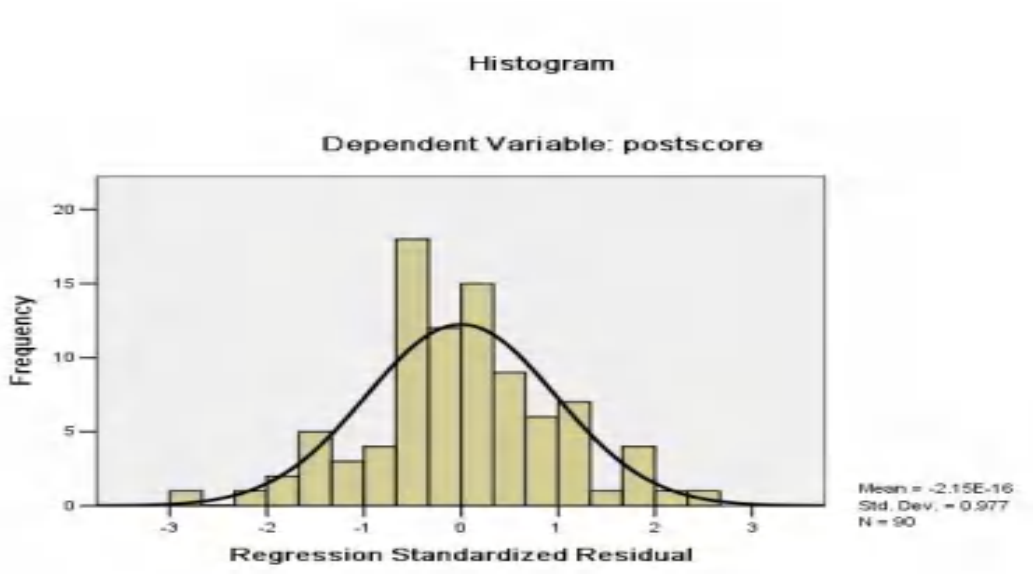


Figure 4.1: Regression Standardized Residual

A more accurate method of determining whether it was appropriate to assume that the error terms are normally distributed was to look at the normal probability plot of the residuals, which has been shown in Figure 4.2. Assuming that the error terms were regularly distributed, the resulting plot was roughly linear.

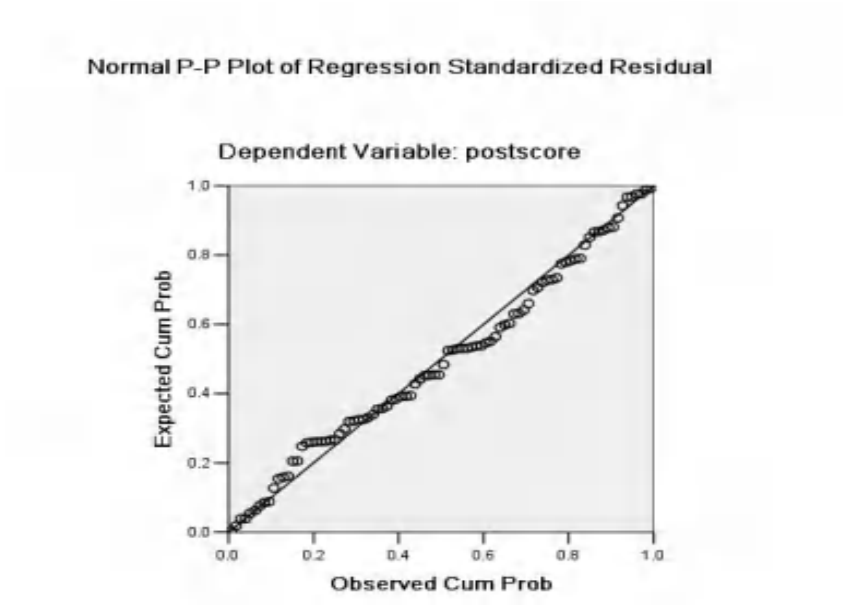


Figure 4.2: Normal p-p Plot of Regression Standardized Residual

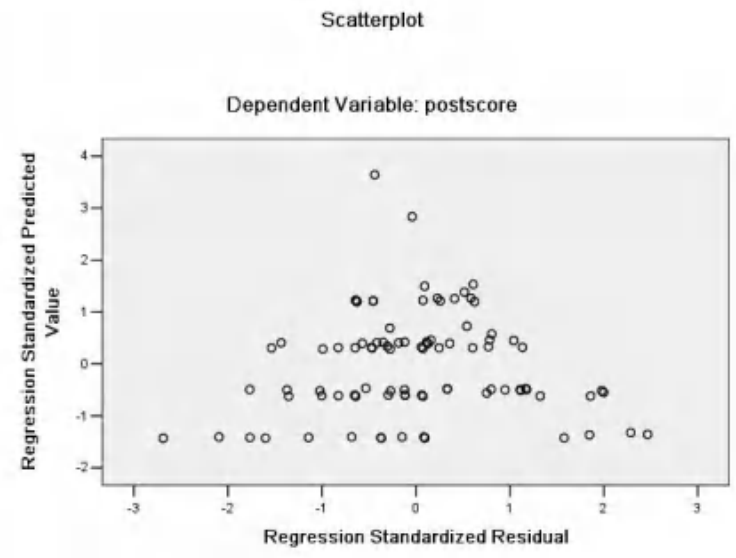


Figure 4.3: Scatterplot of Residual by Predicted Value

The scatter plot of the standardised residual against the standardised anticipated value was shown in Figure 4.3. There was no clear non-random pattern in the residuals, which was observed to be randomly distributed around the zero centre line in the residual by the predicted plot. The normal quantile plot of the residuals showed no evidence of non-regular distribution of the errors. Thus, using the ANOVA, modal summary, and plot data, it was possible to conclude that the regressional data roughly supported H1(v) with a high residue and insignificance of prototypical V1s.

4.6.3 Results of S-AJT

The purpose of S-AJT was to answer RQ 5 "How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 acquisition of RVC-related syntax?". Apart from the prototype-based RVC instruction, there were four mediating variables, namely, LP of da3-RC, the prototypicality of polysemous V1 (打 *da3 "beat"*), the prototypicality of the semantic orientation of RC, and the SyP. It has been hypothesized in H2 (i-vi) based on the integrated framework for syntactic acceptability in Figure 2.8:

(H2-i) The experimental group performs better than the control group in SAJT, other things being equal.

(H2-ii) Sentences with the most prototypical 打 *da3-RCs* are easier to be accepted by intermediate learners than sentences with other non-prototypical da3-RCs, other things being equal.

(H2-iii) Learners' performance in sentences with object-oriented RVCs significantly differs from the sentences with other types of RVCs in SAJT, other things being equal.

(H2-iv) For a given RVC, the most prototypical sentences are more likely to be

accepted by intermediate CFL learners, other things being equal.

(H2-v) Sentences with prototypical meaning of 打 *da3 "beat"* are more likely to be accepted by intermediate-level CFL learners than the less prototypical meanings, other things being equal.

(H2-vi) A modal which includes prototype-based RVC instruction, LP of 打 *da3-RC*, the prototypicality of polysemous V1s, the prototypicality of the semantic orientation of RC and SyP, can significantly predict the outcome of learners' syntactic acceptability of RVC.

4.6.3.1 Results of Pretest

As with L-AJT, the purpose of S-AJT as pretest was to establish a based line measurement that could be compared to post-intervention results. Table 4.14 showed the descriptive statistics of the learners' performance on the LP of 打 *da3-RCs* in the SAJT. The quantity of each type of sentence, the mean scores of the various degrees of lexical prototypicality, the standard deviation, the standard error, and the minimum and maximum data comprised the descriptive statistics of the acceptability of sentences with varying levels of lexical prototypicality.

Table 4.14: Descriptive Statistics of LP in S-AJT

LP of da3-RC	Number	Mean	STD	S. E	Minimum	Maximum
The most prototypical	15	0.64	0.44	0.114	0	1
The less prototypical	12	0.93	0.587	0.177	-1	2
The least prototypical	20	0.74	0.476	0.106	0	2
Total	47	0.75	0.494	0.073	-1	2
Notes: STD=standard deviation S. E=standard error						

According to the findings in the previous studies and the prediction from PET, it

has been expected the sentences with the most prototypical 打 *da3-RCs* were easier to be accepted by CFL learners. Contrary to the expectation, what might bewilder the researcher and instructor was that the sentences with the most prototypical 打 *da3-RCs*, on average, were surprisingly the least likely to be accepted while what was most likely to be accepted were those sentences with the less prototypical 打 *da3-RCs*.

The acceptability of sentences with varying prototypicality of polysemous V1 (打 *da3 "beat"*) has been disclosed in Table 4.15. This table includes the number of sentences, mean score, standard deviation, standard error, and minimum and maximum data. It complied with the prediction concerning the scale of prototypicality of polysemous V1.

Table 4.15: Descriptive Statistics of Prototypicality of Polysemous V1

Prototypicality of polysemous V1s	Number	Mean	STD	S. E	Minimum	Maximum
The most prototypical	20	0.95	0.341	0.078	0	1
The less prototypical	27	0.61	0.541	0.104	-1	2
Total	47	0.75	0.494	0.073	-1	2
Notes: STD=standard deviation S. E=standard error						

Consistent with the results of earlier research, the means score indicated that learners tended to accept the sentences with the most prototypical meaning of 打 *da3 "beat"* (M=0.95) than those with the less conventional ones (M=0.61). The minimum and maximum statistics indicated that, in contrast to the less prototypical sentences, all of the participants accepted sentences with the most prototypical polysemous V1.

Table 4.16 revealed the descriptive information about learners' performance on the different degrees of prototypicality in the semantic orientation of RC, such as the number of sentences, mean score, standard deviation, standard error, and minimum and maximum data, regarding syntactic acceptability with different types of semantic orientation.

Table 4.16: Descriptive Statistics of Semantic Orientation of RCs in S-AJT

Semantic orientation	Number	Mean	STD	S. E	Minimum	Maximum
object-oriented	29	0.86	0.516	0.096	-1	2
verb-oriented	16	0.59	0.42	0.105	0	1
subject-oriented	2	0.4			0	1
Total	47	0.79	0.494	0.073	-1	2
Notes: STD=standard deviation S. E=standard error						

The CFL learners generally accepted RVCs with three different types of semantic orientation. The easiest sentences for CFL learners to accept, according to the mean syntactic acceptability ratings, were those with object-oriented RVCs, followed by those with verb-oriented RVCs. In contrast, a fruitful of learners lacked clarity regarding the acceptability of sentences with subject-oriented RVC. The semantic orientation hierarchy shown in Table 4.16 was consistent with the theoretical analysis of the degrees of prototypicality of semantic orientation in the qualitative phase, namely object-oriented RVC>verb-oriented RVC> subject-oriented RVC based on the mean of each type of semantic orientation. The degrees of SyP in SAJT were demonstrated based on the acceptability of five alternative sentence patterns (as indicated in Table 4.17).

Table 4.17: Descriptive Statistics of SyP in S-AJT

Sentence pattern	Number	Mean	STD	S. E	Minimum	Maximum
SVO	9	1.01	0.359	0.12	0	1
Ba-C	9	0.87	0.385	0.128	0	2
Bei-C	10	0.81	0.566	0.179	0	2
PSC	9	0.62	0.536	0.189	0	1
CVC	10	0.48	0.502	0.159	-1	1
Total	47	0.75	0.494	0.073	-1	2
Notes:STD=standard deviation; S. E= standard error						

The five sentence patterns can be ordered according to the mean score of acceptability in the following hierarchy of acceptability: SVO>Ba-C>Bei-C>PSC>CVC. Particularly, transitive constructions like SVO, Ba-C, and Bei-C were more likely to be accepted among the five alternative sentence patterns prior to the implementation of the

educational intervention, demonstrating the prototypicality of transitiveness. To conclude, the descriptive statistics indicate that except for the acceptability on LP, degrees of the prototypicality of polysemous V1, semantic orientation of RCs and SyP are congruent with the expectation from the previous studies and theoretical framework.

4.6.3.2 Results of Posttest (MLR)

The correlations between the four independent variables—LP (prototypicality of lexicon), SeP (polysemy of V1 and semantic orientation of RC), SyP (syntactic pattern), prototype-based RVC instruction (group), and the dependent variable—the learners' syntactic acceptability—have been displayed in Table 4.18.

Table 4.18: Correlations of Variables Involved before Intervention

		Syntactic Acceptability	LP	Polysemous V1s	Semantic orientation of RCs	SyP	Instruction group
pearson correlation	syntactic acceptability	1.000	0.128	-0.177	-0.014	0.007	-0.135
	LP	0.128	1.000	-0.159	0.266	0.031	0.000
	meaning of polysemou V1	-0.177	-0.16	1.000	0.185	0.026	-0.021
	semantic orientation of RC	-0.014	0.266	0.185	1.000	0.164	0.000
	SyP	0.007	0.031	0.026	0.164	1.000	0.000
	instruction group	-0.135	0.000	-0.021	0.000	0.000	1.000
Sig.(1-tailored)	SA	.	0.112	0.045	0.448	0.475	0.099
	LP	0.112	.	0.066	0.005	0.385	0.500
	meaning of polysemous V1	0.045	0.066	.	0.038	0.403	0.421
	semantic orientation of RC	0.448	0.005	0.038	.	0.059	0.500
	SyP	0.475	0.385	0.403	0.059	.	0.500
	instruction group	0.099	0.500	0.421	0.500	0.500	.

Pearson correlations suggest that before the prototype-based RVC instruction was implemented, among the four independent variables, only the prototypicality of

polysemous V1 reached a significant level while others remained weak and insignificant correlations with learners' performance in SAJT.

Table 4.19: Correlations of Variables Involved after Intervention

		Syntactic Acceptability	LP	Polysemous V1	Semantic orientation of RC	SyP	Instruction group
pearson correlation	SA	1.000	0.032	-0.249	-0.214	-0.373	-0.132
	LP	0.032	1.000	-0.122	0.190	0.045	0.000
	meaning of polysemous V1	-0.249	-0.122	1.000	0.113	0.008	0.000
	semantic orientation of RC	-0.214	0.190	0.113	1.000	0.199	0.000
	SyP	-0.373	0.045	0.008	0.199	1.000	0.000
	instruction group	-0.132	0.000	0.000	0.000	0.000	1.000
Sig.(1-tailored)	SA	.	0.379	0.008	0.019	0.000	0.102
	LP	0.379	.	0.121	0.033	0.334	0.500
	meaning of polysemou V1	0.008	0.121	.	0.139	0.468	0.500
	semantic orientation of RC	0.019	0.033	0.139	.	0.027	0.500
	SyP	0.000	0.334	0.468	0.027	.	0.500
	instruction group	0.102	0.500	0.500	0.500	0.500	.

After the prototype-based RVC instruction was implemented, things have changed on the correlations between the independent variables involved with the syntactic acceptability and their significance, as demonstrated in Table 4.19. A contrast study between the Table 4.18 and Table 4.19 suggested that prototype-based RVC instruction made great difference to the prototypicality of semantic orientation, polysemous V1 and

SyP. Their correlations with the syntactic acceptability have been greatly improved and reached a significant level. However, it seemed that prototype-based RVC instruction did not exert significant influence on the LP. Also, differences of learners' performance in SAJT between the experimental group and the control group did not arrive at a significant level. Thus, H2 (iii), H2 (iv) and H2 (v) are confirmed while H2 (i) and H2 (ii) were denied.

The modal summary, ANOVA, and coefficient were shown in the following tables to examine H2 (vi) regarding the combined prediction of learners' performance by LP, SyP, prototypicality in polysemous V1 and semantic orientation, and group difference.

Table 4.20: Modal Summary in S-AJT

Modal	R.	R square	Adjusted R Square	Std.Error of the Estimate
1	.481[a]	0.232	0.188	0.664
a.Predictors:(Constant), instruction group, LP, SyP, meaning of V1, semantic orientation of RC				

Table 4.21: ANOVA in S-AJT

Modal		Sum of squares	df	Mean square	F	Sig.
1	Regression	11.689	5	2.338	5.310	.000[a]
	Residue	38.747	88	0.44		
	Total	50.436	93			
a.Predictors:(Constant),SyP, LP, meaning of V1, semantic orientation of RC						

The data in Table 4.20 and Table 4.21 suggested that the assumed regression modal could significantly predict learners' performance on SyP (F (5)=5.310; *p*=.000). However, Adjusted R square showed that only 18.8 % of the differences could be explained by the regression modal, indicating that more factors might be taken into consideration in future

work. Taking those data together, it could be concluded that H2 (vi) was only roughly confirmed.

In conclusion, among the six derivations of H2, H2 (iii) to H2 (vi) were fully or roughly confirmed while H2 (i) and H2 (ii) were rejected in which the prototypical *da3-RC* and prototype-based RVC instruction failed to improve learners' acceptability of sentence patterns. The failure of prototypical 打 *da3-RCs* possibly could be attributed to the insignificant effect of prototypicality of V1s on RVC while insignificant role of prototype-based RVC instruction and the adjusted R square in the model suggested that " the human capacity of processing language and syntactic operations still remains an unsolved issue." (Friederici & Brauer, 2009, p.491).

4.7 Summary

The two topics covered in this chapter were the results of a corpus-based cognitive analysis of the lexical, semantic, and syntactic prototypicality of Chinese RVC in the qualitative phase (Phase II), as well as the roles that these prototypicality played in the instructional L2 acquisition of Chinese RVC through quasi-experimental study (Phase III).

In the qualitative phase, the token and type frequency of target verbs from CDVU in the BCC corpus, token frequency from HSK corpus, and frequent RVCs in the Child corpus have been presented, following Gilquin and McMichael's (2018) converging criterion, which include corpus triangulating data (data from multi-corpora) and method triangulating data (corpus data and intuition data).

All of the aforementioned data converged to create prototype-based hierarchy of V1s and RCs since the prototypical V1s and RCs have been defined as those sharing the maximum amount of information. It has been found that the most prototypical V1s were

simple physical action verbs and light verbs whereas the most prototypical RCs were directional complement and completive complement. When it came to SyP, 打 *da3-RCs* were chosen and the relevant Regex was searched in the BCC corpus to produce the corpus-based SyP. CSPT was used to elicit data for the intuition-based SyP. Through convergence of corpus-based data and intuition-based data, transitive constructions like SVO and Ba-C were shown to be more prototypical than others and SyP is a function of semantic orientation of RC.

In terms of the quantitative results, contrast study in L-AJT on CFL learners' performance revealed that the prototypicality of RC, prototype-based RVC instruction, and token frequency of RVC had a significant impact on the RVC identification, suggesting that the DRPM and the PET could jointly explain learners' instructed performance. Meanwhile, the results in S-AJT indicated that descriptive data exhibit a tendency in terms of degrees of SeP and SyP found in the previous studies, in addition to LP. MLR data showed that while LP and prototype-based RVC instruction did not fully contribute to RVC learning, SyP and SeP could predict learners' performance together.

CHAPTER 5

DISCUSSION OF THE FINDINGS

5.1 Chapter Overview

This chapter discusses the major findings of the current study, including the qualitative findings and the quantitative findings, in relation to the proposed integrative theoretical frameworks presented in Chapter 2. It attempts to address the major issues touched upon in this study: *i.e, the prototype-based sequencing of LP and SyP of RVC, as well as the role of prototype-based RVC instruction mediated by LP, SeP and SyP among Chinese as a foreign language learners.* Section 5.2 is to summarize the major findings in the multi-phase mixed method research, followed by Section 5.3 which compares the results in this study with the previous studies, including the findings in both the qualitative phase (Phase II) and empirical phase (Phase III). This is followed by a discussion of qualitative finding of prototypical Chinese RVCs in Section 5.4 and roles of qualitative findings in RVC acquisition in Section 5.5. Eventually, theoretical frameworks involved in this study, namely PET, DRPM, Tri-partite Framework and role of explicit intervention in language acquisition are assessed in an overall manner in Section 5.6. Based on the discussions in practice and theory, a presumed integrated modal and a three-stage procedure are suggested in the Section 5.7 to account for the RVC acquisition prior to the summary being given.

5.2 Major Research Findings

The present study aimed to answer the five research questions concerning prototypicality of Chinese RVC. A mixed method study has been conducted. Except for

the definitions of prototypical RVCs summarized in Section 4.2, the findings in Phase II and III were summarized as follows (see Tables 5.1, 5.2 and 5.3).

Phase II was designed to answer the RQs 2 and 3 concerning the prototypical component morphemes and syntax of RVC. The findings have been summarized in Table 5.1.

Table 5.1： Findings in Phase II

Research questions (RQs)	Dimensions		Results
What are the suggested prototype-based sequencing of component morphemes, namely V1s and RCs of RVC?	LP: V1s	corpus-based	three levels (most/5 vs less/92 vs least/160): 拿*na2 "hold"*、睡*shui4 "sleep"*、学 *xue2 "learn"*、抓*zhua1 "scratch"*,坐*zuo4 "sit"*
		intuition-based	two levels (most /48 vs less/58): 看*kan4 "look"*、打*da3 "beat"*、拿*na2 "hold"*、弄*nong4 "make"*
		convergent	three levels (most/3 vs less/38 vs least): 拿*na2 "hold"*、学*xue2 "learn"*、做*zuo4 "do"*
	LP: RCs	corpus-based	three levels (most/15 vs less/57 vs least/77):好*hao3 "well"*、上*shang4 "up"*、完*wan2 "finish"*
		intuition-based	two levels (most /31 vs less/47): 好*hao3 "well"*、下*xia4 "down"*、死*si3 "die"*
		convergent	three levels (most/11 vs less/18 vs least/31):完*wan2 "finish"*、好*hao3 "well"*、出*chu1 "out"*
What are the suggested prototype-based hierarchies among alternative 打-RC-related sentence patterns ?	SyP	corpus-based	SVO》PSC》Ba-C》Bei-C》CVC
		intuition-based	SVO》Ba-C》Bei-C》PSC》CVC
		convergent	SVO & Ba-C（object-oriented, verb oriented）
			CVC (subject-oriented)

Based on the findings in Phase I, in Phase II, prototype-based graded membership of V1s and RCs, as well as the prototype-based sequencing of alternative patterns were obtained. In prototypical V1 and RC, three levels corpus-based and convergent evidence-based graded membership, together with two levels intuition-based hierarchy were yielded.

In SyP, different prototype-based hierarchy in both corpus and intuition were yielded. The convergent evidence of SyP indicated that the prototype is a function of semantic orientation of RC. In most cases, the most prototypical sentence of RVC is SVO and Ba-C.

Phase III(a) was designed and conducted to answer the research question 4. the findings are summarized in Table 5.2.

Table 5.2： Findings in Phase III (a)

Research Question 4	Research Hypotheses (H1)	Results
How can prototype-based component morphemes of RVC explain learners' performance in the instructed L2 learning of RVC?	(i) The experimental group will perform significantly better in lexical identification than the control group in terms of lexical acceptability of RVC.	Confirmed
How can prototype-based component morphemes of RVC explain learners' performance in the instructed L2 learning of RVC?	(ii) RVCs with different degrees of prototypicality of V1 will differ from each other significantly.	rejected
	(iii) RVCs with different degrees of prototypicality of RC will differ from each other significantly.	confirmed
	(iv) RVCs with high token frequency will be more acceptable than less frequent RVC.	confirmed
	(v) Prototype-based instruction, prototypicality of V1, prototypicality of RC and token frequency of RVC can jointly contribute to the lexical identification of RVC in a significant manner.	roughly confirmed

Descriptive and statistical data in Independent t test and multiple linear regression revealed that among the 5 hypotheses in Phase III(a), four have been fully or roughly confirmed except for the effect of different degrees of prototypical V1 on RVC identification in hypothesis (H1-ii). Thus, the research question 4 has been to a large extent confirmed.

Table 5.3 revealed us the research findings in Phase III (b) on the integrated roles of LP, SeP and SyP on instructed acquisition of Chinese RVC .

Table 5.3: Findings of Phase III (b)

Research Question 5	Research Hypotheses (H2)	Results
How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 learning of RVC-related syntax?	(i) In the posttest of syntactic acceptability of alternative sentence patterns, experimental group will be more likely to accept all the kinds of sentence than control group, other things being equal.	rejected
	(ii) Sentences with prototypical 打*da3-RCs* will be more likely to be accepted by intermediate level learners than less prototypical 打*da3-RCs*.	rejected
	(iii) Sentences with different degrees of 打*da3-RCs* differ from each other significantly.	confirmed
How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 learning of RVC-related syntax?	(iv) For a certain RVC, most prototypical sentences are more likely to be accepted by intermediate learners.	confirmed
	(v) Sentences with prototypical polysemous da3 and prototypical semantic orientation of RC are easier to accept than less or least prototypical ones.	confirmed
	(vi) A modal in which prototype-based instruction, lexical prototypicality of 打*da3-RCs*, semantic prototypicality in terms of polysemous V1 and semantic orientation of RC, as well as syntactic prototypicality, can significantly predict the outcome of syntactic acceptability.	roughly confirmed

With the exception of the impact of prototype-based RVC instruction and prototypical 打 *da3-RC* on syntactic acceptability in hypothesis (H2-I & H2-II), four of the six hypotheses in Phase III(b) have been fully or roughly confirmed, according to descriptive and statistical data from multiple linear regression and the Independent t-test. Thus, there has been some confirmation of research question 5.

5.3 Disparity and Similarity: A Comparison with Wu

The current study is motivated by Wu's (2018) systematic research into the LP of Chinese RVC. It was carried out by adopting a multi-phase exploratory mixed method

design, including a formulation phase, a qualitative phase and a quantitative phase. Therefore, the discussion of the findings is conducted in main two phases, besides the comparison with Wu (2018) in Section 5.3.

First, the discovery of RVCs and RCs in this study has been in a position to greatly raise the validity and reliability of Wu's (2018) findings on prototypical component morphemes of RVC. In this study, cued by the 460 target verbs in CDVU, 19824 disyllabic RVCs have been found from the BCC corpus, quadrupling the finding of Wu (2018) who extracted 4958 disyllabic RVCs to obtain the prototypical RCs; Based on those statistics, 473 RCs are subsequently segmented, doubling the finding in Wu's research (N_{RC}=218). The number of RCs whose type frequency surpassed 5 in this study is 312, three times higher than Wu's finding in which 97 target RCs were included (as summarized in Table 5.4). All these data can be employed to guarantee that the current findings of prototypical RCs are more representative or prototypical than those in Wu (2018), partially due to the number and size of the corpus employed in this study.

Table 5.4: Overall Comparison Between Wu (2018)'s Study and the Current Study

Research	N.of Disyllabic RVCs	N. of RCs	N. of RC(Tf>5)	N. of Corpus involved
Wu 's study	4958	218	97	1
This study	19824	473	312	4
Notes: Tf=type frequency; N. = number				

Second, the convergent evidence centering on the prototypical RCs found in this study significantly updates people's perception of prototypicality of RVC. It has been found that the most prototypical RCs are verbs (directional verbs and completive verbs) rather than adjectives if ignoring the derivational relationship between verbs and adjectives

(cf. Tham, 2013). This outcome seems to be contrary to the previous findings by Chinese traditional linguists (e.g., Zhao, 2005; Zhu, 1999) who have found that the most common RCs were adjectives on the ground that adjectives occupied an overwhelmingly greater proportion in the list of RCs. The most prototypical RCs that occupy the top ten are 完 *wan "finish",* 出 *chu1 "go out",* 好 *hao3 "well, good",* 成 *cheng2 "become",* 到 *dao4 "arrive",* 死 *si3 "die",* 多 *duo1 "many/much",* 满 *man3 "full",* 入 *ru4 "enter",* 回 *hui2 "back".* Among the top ten most prototypical RCs, complements of direction (directional verbs) take up the highest percentage (four in ten), followed by complements of phase or completive verbs (30%) and complements of result (30%). This finding is in agreement with those observations in Wu's (2018) findings. The distinction between the frequency-based and prototypicality-based criterion (Liang, 2014) might be used to explain the variations in the results.

Third, another new finding that stands out from the results reported in this study rests on the most productive RC, compared with Wu's (2018) research. Wu (2018) in her research found that the most productive RC is 出 *chu1 "go out"*, a complement of direction which can form 437 compounds. However, the most productive RC found in this study is 完 *wan2 "finish"*, a complement of phase that can form at least 460 RVCs. The similar finding has been echoed and explained in Gu (2023): RVC is a complex construction in which verb is suffixed with RC to get culmination reading. 完 *wan2 "finish"* is the most commonly discussed RC in RVC to telicize accomplishment predicates and gives rise to the culmination/termination interpretation on the ground that 完 *wan2 "finish"* is a telic predicate.

Finally, the most striking result to emerge from the data is on the prototypical V1s and the subsequent quasi-experiment study, bridging the empirical gap in Wu's (2018) study. In particular, on the one hand, in Wu's research, the prototypicality of V1s has been measured by reference to its classification in terms of cognitive domain. In this study, prototypical V1s were graded according to various sources of data, like frequency information in multi-corpora: the token frequency of stimuli V1s in the BCC corpus, HSK corpus, child corpus. Also, their corresponding type frequency of those V1s and cognitive information on mental lexicon is included. As a result, it is intriguing to find that physical action verb related to body part and light verbs are more prototypical than other types of verbs, in agreement with claims by Gao (2001), among others. This finding is possibly attributed to the nature of embodiment in human's cognition (Ansah, 2014); on the other hand, utilizing the findings in the qualitative phase, a quasi-experimental study in the quantitative phase was conducted to test the findings in the qualitative phase, which is lacking in Wu's research.

Taking the SeP, SyP, the prototypical V1s and the quasi-experimental study together, it is not difficult to find that the current study succeeded in bridging the knowledge gap and empirical gap by comparing with Wu (2018).

5.4 Prototypicality of Chinese RVCs: Triangulating Evidences

Qualitative phase aims to investigate the LP, SeP and SyP of RVC in order to produce the prototype-based sequencing of RVC and relevant sentence patterns. Therefore, apart from the findings discussed by comparing with Wu's research, other findings of the prototypical V1s and RCs, together with the SeP and SyP are discussed in the following sections.

5.4.1 Prototypical V1s

To reiterate, the prototypical V1s are produced by referring to eight attributes of the target V1s. Those eight attributes are transitivity, verbal aspect, syllabicity, token frequency in the BCC and HSK corpus, type frequency in the BCC corpus, frequent V1s produced by child native speaker and their availability in the production of CSL/CFL learners.

Following Gilquin and McMichael's (2018) criterion, frequent V1s from various strands of data were provided in this study, bridging the gap in Wu's (2018) findings, namely data from child learners, adult native learners and CSL/CFL learners. Specifically, as shown in Table 5.5, the most frequent V1s produced by children encompass light verbs like 弄 *nong4 "make"* and 搞 *gao3 "make"* and physical action verbs related to their own ordinary life experience like 拿 *na2"grab",* 坐 *zuo4 "sit",* 吃 *chi1 "eat",* 打 *da3"beat"* and 走 *zou3"walk/ go".* This finding accords with the embodiment property of cognition and earlier observations (e.g., Ansah, 2014; Gao, 2001; Tardif, 1996). Prototypicality of light verb can be explained in Chao's (1968/2017) claim that verb of very general meaning can have a greater variety of complements than very specific verb.

The prototype has been construed in the literature as the frequent and simple form that first comes to learners' mind (Lakoff, 1987/2008). On the contrary, advanced CSL learners tended to produce more complex action verbs in their prototypical output, like 喂 *wei4 "feed",* 捅 *tong3 "poke",* 罚 *fa2 "fine",* 交 *jiao1 "hand in" etc.*, possibly influenced by the topic of their writing in the HSK test and their proficiency levels. In contrast, adult Chinese native speakers preferred to use a totally different list of verbs from the advanced CSL learners, like 要 *yao4 "want",* 发 *fa1 "distribute",* 看 *kan4 "look"* etc. Several

factors such as their Chinese proficiency levels, life experience, culture differences etc., might partially contribute to these differences.

Table 5.5: Frequent V1s Produced by Different Types of Learners (Top Ten)

Adult Native speaker	Advanced CSL/CFL learner	Child Native speaker
对*dui4 "match, answer*, treat", 要*yao4 "want"*, 发 *fa1 "launch, discharge"*, 着 *zhao2 "attach, touch"*, 出 *chu1 "go out"*,看*kan4 "look"*, 下*xia4 "play"*, 过 *guo4 'live'*, 开*kai1 "open"*, 等*deng3 "await"*	喂*wei4 "feed"*, 捅*tong3 "poke, stick"*, 罚*fa2 "punish"*, 缴*jiao3 "hand in, pay"*, 出*chu1 "go out"*, 留*liu2 "remain"*, 跪*gui4 "kneel"*, 吐*tu3 "omit"*, 使*shi3"send, make"*, 蘸*zhan4 "dip in"*	打*da3"beat"*, 拿*na2 "take"*, 弄 *nong4"make"*, 搞*gao3"make"*, 吃 *chi1 "eat"*, 放*fang4 "fly"*, 关 *guan1 "close"*, 喝*he1 "drink"*, 杀 *sha1"kill"*, 摔*shuai1"smash"*

As previously stated, verb aspect and literal meaning of verb have been covered in the construct of prototypical lexical form and meaning of V1. In this study, it was found that the frequent V1s in the native corpus are closely associated with the concrete body parts, like hand contact, mouth, foot, head etc. A great proportion of prototypical V1s were found to be endowed with those characters related to 手 *shou3 "hand"*, such as 拿 *na2 "take with hand"*, 打 *da3 "beat with hand"*. This finding validated the prototypicality of action verb reported in Gao (2001) who argued for the prototypicality of physical action verb with hand contact as prototypical V1s. Furthermore, a moderate similarity between frequent V1s by Chinese native speakers found in this study and the previous findings was detected. For example, Xiao et al. (2009) found that the most frequent monosyllabic verbs are 要 *yao4 "want"*, 出 *chu1 "go out"*, 看 *kan4 "look"*, 想 *xiang3 "think"*, 用 *yong4 "use"*, 走 *zou3 "walk"*, 吃 *chi1 "eat"*, 听 *ting1 "listen"* etc. (see Table 5.5).

In Gilquin and McMichael's criterion, both corpus-based data and intuition-based data were used to produce the prototype of a linguistics category. It has been found in this study that corpus-based the most prototypical V1s are 拿 *na2 "take"*, 睡 *shui4 "sleep"*, 学

xue2 "learn", 抓 *zhua1 "seize",* 坐 *zuo4 "sit".* Furthermore, intuition-based the most prototypical V1s are 看 *kan4 "look",* 打 *da3 "beat",* 写 *xie3 "write",* 坐 *zuo4 "sit",* 拿 *na2 "take",* 弄 *nong4 "make".* This finding is in line with the discovery by Alderson (2007) who also found the mismatch between the corpus frequency and native speakers" intuition, in spite of the central role of frequency information in language learning. In the previous studies, many scholars (e.g., Crossley et al., 2014; Ellis, 1994; Mönnink,1999; Xiao et al., 2009) have cast doubt on the validity of the sole use of intuitive data or frequency information derived from large corpora in linguistic description. Therefore, the similarity and difference of frequent V1s between corpus-based data and elicited cognitive data suggest the incentive to combine corpus and experimental data in methodology. In Mönnink's (1999) view, intuition data and corpus data form a full data cycle, occupying the two ends on the data scale. Therefore, descriptive linguistics can benefit greatly from a combination of both intuitive data and corpus data.

Apart from the verb aspect mentioned above, among the attributes to define prototypical V1, availability and frequency information are of great importance. The overlap such as 拿 *na2 "take",* 坐 *zuo4 "sit"* between corpus-based prototypical V1s and intuition-based V1s indicates the positive relation among availability, prototypicality and frequency. As put it in Mcgee (2009), Tversky and Kahneman (1973) noted that availability to the effect that what is more frequent is more available, is influenced by prototype-related factor such as salience.

Prior evidence suggests that light verb is prototypical due to its semantic basicness, high frequency and productivity (Basciano, 2010a, 2010b; Diao, 2004; Ellis, 2012; Ellis & Ferreira-Junior, 2009; Tao & Hu, 2019; Mervis & Pani, 1980). Among the less

prototypical V1s in this study, there are four Chinese light verbs: 弄 *nong4 "make,do"*, 变 *bian4 "change"*, 使 *shi3 "make, do"* and 搞 *gao3 "make, do"*. Prototypicality of light verbs found in this study corroborates with the previous cross-linguistic evidence (e.g., Duvignau et al., 2005; Ellis, 2012; Miller & Fellbaum, 1991). For example, Zhang and Liu (2014) found that light verbs such as *"make"* are among the most commonly-used English verbs by Chinese learners and German-speaking learner. Theakston et al. (2004) discovered the range of the English light verbs licensed by other verbal phrases: *bring, come, do, get, give, go, make, put,* and *take*. The cross-linguistic universality of the prototypicality of light verb may be attributed to semantic generality, frequency and tendency to grammaticalize cross-linguistically (Lin, 2014; Sharif, 2024; Tao & Hu, 2019).

As regards the frequency information, Zipf's law states that in human language, the frequency of words decreases as a power function of their frequency rank. Through the analysis of the first 30 V1s out of 460 target V1s in this study, it has been discovered that they make up 70% of the total token frequency in the HSK corpus, 20% of the overall type frequency in the BCC corpus, and 46% of the total token frequency in the BCC corpus. This finding seems to follow a Zipfian profile whereby the highest frequency words account for the most linguistic tokens and types. In accordance with Goldberg's (2006) argument, Zipfian distributions of constructions of natural language, like natural categories, optimize them for learning by providing one very high-frequency exemplar that is also prototypical in meaning. Thus, Zipfian covering determines basic categorization, the structure of semantic classes and the language form-semantic structure interface (Ellis, 2012).

In the Usage-based account, some basic psychological processes accounted for a linguistic structure, such as entrenchment, schema formation. “Schema formation is made possible by type frequency whereas high token frequency leads to entrenchment (Behrens, 2009, p.386)”. Thus, prototypicality of V1s examined in this study seems to further support the tenets in the usage-based account. The seemingly universal most prototypical V1s, namely 拿 *na2 “take”,* 学 *xue2 “learn”* and 坐 *zuo4 “sit”* are in relation to Usage-based account. A case in point is those frequent expressions in the ordinary classroom input. Those verbs are evidently related to the learners” learning experience in the classroom, like “请拿出课本 *‘please take out your textbook’*, 起立-坐下 *‘stand up- sit down’,* 上课要坐好 *‘sit well when instruction’,* 这些知识点学会/学懂了吗？ *‘Do you learn and understand language points?’*” etc.

5.4.2 Prototypical RCs

As with the prototypical V1s, the prototypical RCs were produced by reference to the token frequency of target RCs in the BCC corpus, HSK corpus and Child corpus. The top ten RCs which were found to be frequent in the various corpora have been summarized in Table 5.6. Different degrees of overlap and mismatch were found between the findings in this study and previous work concerning the frequent verbs or adjectives by various learners. For example, Xiao et al. (2009) found that the most frequent adjectives which can function as RC are 大 *da4 “big”,* 好 *hao3 “well”,* 多 *duo1 “more”,* 小 *xiao3 “small”,* 高 *gao1“high”,* 新 *xin1 “new”,* 全 *quan2“complete”.* The most frequent verbs functioning as RC are 到 *dao4 “arrived”,* 会 *hui4 “able”,* 出 *chu1 “go out”,* 来 *lai2 “come”,* 没 *mei2 “missing”.* Furthermore, 到 *dao4 “arrive”*, 好 *hao3 “well”*, 成 *cheng2 “become”*, 完 *wan2 “finish”* and 掉 *diao4 “drop”* are the most frequent RCs by CSL/CFL learners found

by Wang (2017) who examined the relevant acquisition data of Southeast Asia learners of Chinese. It is evident that the overlap is due to the prototype-based factor while variances in the types of learners contribute to the mismatch.

Table 5.6: Frequent RCs Produced by Different Types of Learners (Top Ten)

Adult native speakers	Advanced CSL learners	CFL learners	Child native speakers
和*he2 "harmonious"*，上*shang4 "up"*，大*da4 "big"*，好*hao2 "well"*，对*dui4 "right"*，为*wei2 "become"*，发*fa1 "flourish"*，着*zhao2 "succeed"*，到*dao4 "arrive"*，出*chu1 "go out"*	乐*le4 "happy"*，对*dui4 "right"*，和*he2 "harmonious"*，会*hui4 "understand"*，到 *dao4 "arriveat"*，上*shang4"up"*，好*hao3 "well"*，去*qu4 "go"*，来*lai2 "come"*	完*wan2 "finish"*，好*hao3 "well"*，死*si3 "die"*，下*xia4 "down"*，住*zhu4 "stop"*，到*dao4 "arrived"*，走*zou3 "walk"*，紧*jin3 "tense"*，定*ding4 "determined"*，出*chu1 "go out"*	饱*bao3 "full"*，成*cheng2 "become"*，出*chu1 "out"*，错*cuo4 "wrong"*，倒*dao3 "fall down"*，到*dao4 "arrive"*，掉*diao4 "drop"*，丢*diu1 "lost"*，饿*e4 "hungry"*，反*fan3 "opposite"*

The complement constituent in RVCs exemplifies the productive nature of Chinese morphemes (Xiao & McEnery, 2004). By combining the productive RCs, 11 RCs were found to be the most prototypical RCs: 完 *wan2 "complete"*, 好 *hao3 "good"*, 死 *si3 "die"*, 下 *xia4 "down"*, 住 *zhu4 "stop"*, 到 *dao4 "arrive"*, 走 *zou3 "go away"*, 出 *chu1 "go out"*, 上 *shang4 "upward"*, 开 *kai1 "open"*, 起 *qi3 "rise"*. As diagrammed in Table 5.7, a comparison is made between the commonest RCs from the Chinese Proficiency Test Syllabus(Wang, 2021) and the findings in the present study. The contrast study shows that there is an overlap, such as 好 *hao3 "well"*, 住 *zhu4 "stop"*, 上 *shang4 "upward"*, 开 *kai1 "open"* and mismatch like 大 *da4 "big"*, 多 *duo1 "many/much"* etc. This result is possibly attributed to the difference in the criterion of prototype. Furthermore, the distribution of the prototypical RCs in three different levels of RC is consistent with Wu's

(2018) finding that the largest proportion is occupied by complement of direction, followed by complement of phase.

Table 5.7: The Most Prototypical RCs in the HSK Syllabus and the Current Study

Research	the Most prototypical RCs
Level one (12)	大*da4 "big"*, 多*duo1 "much"*, 好*hao3 "well"*, 会*hui4 "able, understand"*, 开*kai1 "open"*, 冷*leng3 "cold"*, 热*re4 "hot"*, 上*shang4 "go up"*, 少*shao3 "little, few"*, 小*xiao3 "small"*, 在*zai4 "exist"*, 住*zhu4 "stop"*.
the Current Study (10)	完*wan2 "complete"*, 好*hao3 "good"*, 死*si3 "die"*, 下*xia4 "down"*, 住*zhu4 "stop"*, 到*dao4 "arrive"*, 走*zou3 "go away"*, 出*chu1 "go out"*, 上*shang4 "upward"*, 开*kai1 "open"*, 起*qi3 "rise"*

The earliest discussion of prototypicality in Cognitive Psychology originated from the color term (Rosch, 1975a). Other than the gradable adjectives and completive verbs etc., color terms are among the list of target RCs. It has been found in this study that 红 *hong2 "red"*, 白 *bai2 "white"*, 黑 *hei1 "black"* are the highly productive RCs in the BCC corpus while 绿 *lv4 "green"* is the highly frequent in the BCC corpus. This similar phenomenon also holds true for English resultatives. A case in point is the colour term in the sentence "Bill kick Bob black and blue," which was presented in Kemmerer (2006). Their distinctions in wording are ascribed to cultural difference between Chinese and English. That is why, when initially discussing the prototypicality of color category, Rosch and her fellows (Rosch & Oliver,1972; Rosch, 1975; Rosch & Mervis, 1975) claimed that color domain is a radical category and its prototype effect can be demonstrated in acquisition.

Regarding the vocabulary instruction, lexical syllabus and curriculum specified frequency-based difficulty levels of lexicon (Confucius Institute Headquarter, 2014; Hanban, 2010). In this study, prototype-based sequencing of Chinese RVCs offered CSL/CFL instructors a new outlook on Chinese RVCs to account for the challenges and

errors of certain RVCs encountered by the CSL/CFL learners. Discovery in the prototypical RVCs provides the instructors and researchers with an additional explanation for the challenge of learning certain RVCs, such as 哭湿 *ku1shi1 "cry-wet"*. For example, Feng (2017) offered an explanation on the difficulty of 哭湿 *ku1shi1 "cry-wet"* based on how the event structures were processed using an e-experiment. If one were to consider an alternate explanation based on prototypicality, one might easily conclude that the challenge of learning 哭湿 *ku1-shi1 "cry-wet"* stems from its low prototypicality in whole word and components. In particular, 哭 *ku1 "cry"* is not a prototypical V1 due to its in-transitivity and low frequency in type and token. On top of that, 湿 *shi1 "wet"* is among the list of least prototypical RC. Taking the components together, the non-prototypicality of 哭湿 *ku1-shi1 "cry-wet"* lies in being an intransitive compound and less frequent in usage.

5.4.3 Semantic Prototypicality

As stated in Chapter 2, SeP is discussed from the perspective of prototypicality of two component morphemes, namely, 打 *da3 "beat"* --a good case of polysemous V1s and semantic orientation of RCs.

The previous analyses of the prototypical verb (e.g., Gao, 2001, Hong et al., 2008) have indicated that a prototypical word should be an item with literal and core sense and prototypical meaning of a verb should be physical action verb with hand contact. A conclusion can be made that prototype plays an important role in the network representation of multiple sense of a verb. It has been validated by the qualitative analysis of polysemous 打 *da3 "beat"* (Gao, 2001; Tian, 2004) and the subsequent empirical evidence from Chen and Wang(2020). Based on the findings in the previous studies, two levels of prototypicality of the polysemous 打 *da3 "beat"* were established. In this study,

descriptive statistics in S-AJT revealed the sentences with a more prototypical meaning of 打 *da3 "beat"* are more liable to be accepted than the non-prototypical sentence. The prototypicality of polysemous 打 *da3 "beat"* can significantly explain the difference in the CFL learners" acceptability between two groups.

Previous evidence in historical origin, linguistic typology and acquisition data seem to favor the prototypicality of object-oriented RVCs in terms of semantic orientation of RC. Goldberg (1995) has argued that verb meanings is closely related to the construction that they frequently appear. Thus, prototypicality of object-oriented RVC can be triangulated by the transitiveness of prototypical RVC and RVC-related sentence pattern. That might be the reason why subject-oriented RVC is the least prototypical while CVC in which subject-oriented RVCs always appear is the least prototypical construction among the alternative sentence patterns. In this study, the descriptive data in the S-AJT have indicated that sentences with object-oriented RVC are more likely to be accepted by CFL learners than that with verb-oriented and subject-oriented RVCs. The MLR data suggest that semantic orientation of RC is a significant factor to account for the difference in learners" acceptability between two groups. Thus, this finding is in congruence with Jiang's (2020) conclusion that object orientation was prototypical in language processing and comprehension.

5.4.4 Syntactic Prototypicality

Prior evidence suggests that prototypicality can apply to alternative sentence patterns licensed by RVC, namely SVO, Ba-C, Bei-C, PSC and CVC (e.g., Huang, 2005; Huang, 1996; Shi, 2015; Song, 2004). As with the prototypical RVC, the SyP of RVC in this study is determined by investigating the corpus-based prototypicality and intuition-

based prototypicality of 15 RVCs on three distinctive types. In this study, convergent evidence of SyP indicated that 6 RVCs have been identified. Their corpus-based prototypicality and intuition-based prototypicality are compatible with one another on SVO. The prototypicality of SVO found in this study is in agreement with Klaiman's (1991) assertion that among the three-way cross-linguistic classification of voice type, active voice is unmarked, basic type or prototypical. Also, Sun and Givón (1985) argued convincingly, that modern Mandarin Chinese is still primarily SVO. The congruence between corpus-based SyP and intuition-based SyP might be explained by the relative similarity between the corpus data and intuitive data (Littlemore & McArther, 2012). Corpus data and intuitive data can complement each other, leading to a better understanding of prototypical item itself and psycholinguistics process underlying it.

According to earlier research, the mixed finding on the SyP of RVC may be attributed to syntactic transitivity, verb type, the idea of affectedness, and semantic orientation (He, 2019; Huang, 2009). Apart from the congruence of data by native speakers and CSL/CFL learners, the mismatch (6 in 15) is also evidenced between both of them. For example, 打破 *da3po4 "beat-broken"* is always found in PSC produced by native speakers whereas it is prototypically used in Bei-C by the CSL/CFL learners. An intriguing finding concerning the syntactic transitivity is strongly linked with directional RVC which seems to lose the potentiality to co-occur with PSC. This striking mismatch of directional RVC in SVO and Ba-C is possibly explained in relation to the degree of transitivity of RVC. Specifically, according to the scale of syntactic transitivity (He, 2019), Ba-C is more transitive than SVO. It follows that 打进 *da3jin4 "beat-into"* and 打回 *da3hui2 "beat back"* which often co-occur with Ba-C are more transitive than 打出 *da3chu1 "beat out"* and 打下 *da3xia4 "beat down"* that often appear in SVO.

According to different criteria, like transitivity, frequency etc., scholars in different schools put forward distinctive sequencing of SyP of RVC. In the present study, except for PSC, the scale of SyP from both the corpus-based and intuition-based prototypicality is SVO>Ba>Bei-C>CVC. This finding is in accordance with Chu's (2016) analysis. For example, among the sentences prompted from 15 RVCs, more or less half of them is occupied by SVO in both corpus-based and intuition-based prototypicality. Nevertheless, the great contrast in the scale between corpus-based and intuition-based prototypicality lies in PSC. PSC occupied the second place in the scale of prototypicality according to corpus data while it came the last but one in the intuition-based SyP. The prototypicality of PSC based on corpus data seems to support He's (2019) argument that PSC is extensive in native learners' production and regarded as basic sentence together with Ba-C. Furthermore, according to Xiao and McEnery (2010), PSC is often referred to as notional passive sentence and can take the unmarked form. However, the prototypicality of PSC based on the intuition data from CSL/CFL learners roughly agrees with transitivity scale of five alternative sentence patterns (He, 2019). The main reason of the mismatch between corpus data and cognitive data rests on that fact that prototypicality is susceptible to many other factors other than frequency, such as entrenchment, salience, learners" lower proficiency level and cross-linguistic influence etc.

Ba-C is a construction that has greatly drawn a lot of interests from scholars (e.g., Shi, 2023a; Wang, 1987; Zheng, 2002). In this study, more evidence suggests that it is more prototypical than Bei-C and CVC. This finding might be explained by its structural peculiarity which can attract learners' attention. There is no syntactic pattern corresponding to the Ba-C in other languages, especially in alphabetical languages such as English (Tsung & Gong, 2021). Furthermore, among the 15 target RVCs to investigate the

SyP, the most prototypical RVCs that co-occur with Ba-C is 打开 *da3kai1 "open"*, a directional RVC and 打死 *da3si3 "beat to death"*, a result RVC, which is in agreement with corpus-based finding from Children"s data (e.g., Chang & Zheng, 2017; H.Wang, 2012). In Children"s data, the most often used RVCs in Ba-C by Children are directional RVC and result RVC. The contrastive interlanguage analyses of Ba-C between corpus-based and intuition-based SyP indicates the similarity in terms of the proportion to all the production of alternative sentence patterns (21.9% for native speaker vs 21.3% for L2 learner production). Nevertheless, learners in each of alternative sentence patterns produce less than native speakers. Similarly, this discovery can be found in Du's (2016) study from six yearlong learners that Ba-Cs produced by L2 learner are near to native speaker proficiency over the course of the year.

Another sentence pattern licensed by RVC is Bei-C which occupies the middle place along the scale of transitivity (He, 2019). According to Xiao and McEnery (2010), "Bei-C plays a role similar to that of RVCs in delimiting situations aspectually (p.97)". In particular, Bei-C is closely linked to aspect while RVCs in Chinese contribute to both situation aspect and viewpoint aspect in that they typically express a telic notion and grammatically mark the completive aspect. Following Ba-C, the relatively lower proportion of Bei-C in both the corpus-based and intuition-based prototypical sentences is in accordance with He's (2019) argument that Bei-C is marked compared with Ba-C. Taking the case of 打死 *da3si3 "beat-die"* as an example, it is not difficult to find that the most prototypical sentence for 打死 *da3si3 "beat-die"* is Bei-C. The result seems to support finding that pragmatic function of Bei-C is to convey negative construction meaning(Chu, 2016; Xiao & McEnery, 2010).

What was widely acknowledged in the previous studies is that CVC is the least prototypical sentence pattern. In this study, CVC is found to be the least prototypical sentence, whether based on the corpus data or cognitive data. More supporting evidence concerning this finding is detected by numerous scholars (e.g.,Chu, 2016; He, 2019). The non-prototypicality of CVC can be partially accounted for by the fact that subject-oriented RVCs that often co-occur with CVC are the least prototypical in the semantic prototypicality. In the present study, the 打 *da3-RCs* that can license CVC are 打死 *da3si3 "beat death",* 打出 *da3chu1 "beat out",* 打下 *da3xia4 "beat down",* 打错 *da3cuo4 "beat-wrong",* 打掉 *da3diao4 "beat off",* 打进 *da3jin4 "beat into",* 打回 *da3hui2 "beat back",* 打入 *da3ru4 "beat into"*, 打断 *da3duan4 "beat broken"* etc. This strongly supported Chang's (1991) statement that RVCs with resultative complement and directional complement allow CVC. However, data in this study indicate that completive RVC can also license the CVC, such as 打好 *da3hao3 "beat well",* 打成 *da3cheng2 "beat and become"* and 打完 *da3wan2 "finish beating"*. Thus, it is safer to conclude that CVC can be licensed by all kinds of RVC, whether completive verb compounds, directional verb compounds or resultative verb compounds.

5.5 Effects of the Prototype Factors and Prototype-based Instruction on RVC Learning

Quasi-experimental study was designed to quantitatively test the findings in Phase II, including the prototype of V1s and RCs, as well as the semantic and syntactic prototypicality. The effects of prototypical V1s and RCs on the instructed L2 acquisition of RVC was investigated in L-AJT while the effect of LP, SeP and SyP was examined in S-AJT. Since the pretest-posttest control group design was adopted to conduct the quasi-

experimental study, the results of pretest and posttest in L-AJT and S-AJT are reported respectively in the follow part.

5.5.1 Effects of the Prototype and DRPM on Compound Identification

L-AJT aims to examine the role of prototypical V1, RC and prototype-based RVC instruction in the instructed L2 acquisition of RVC. According to the integrated framework of compound identification, it has been hypothesized that prototypicality of V1s and RCs, the token frequency of RVC, as well as the prototype-based instruction can jointly and significantly predict CFL learners' performance in L-AJT. Based on the statistics of both pretest and posttest in L-AJT, it has been found that prototypicality of RCs and token frequency of RVCs significantly influence RVC identification. This result, to a large extent has confirmed the effectiveness of PET and DRPM in compound learning.

The positive effect of prototypical RC found in this study in which frequency information has been included indicates the role of frequency and prototypicality in vocabulary acquisition. Just as Crossley et al. (2016) stated, "learners would be exposed to words that are both frequent and salient, maximizing the potential for acquisition (p.704)". The relationship between the prototypicality of RCs and compound identification may partly be explained in relation to the inclusion of type and token frequency in the construct of prototypical RCs as well as integration of the frequency information and intuition-based elicited data in the prototypicality of RC. This similar finding has been implied in Bybee's (1995) suggestion that lexical schemas are constructed on the basis of a combination of variables, including type and token frequency.

Frequency Effects demonstrated in the positive effect of whole-word token frequency in Chinese RVC word processing match those observed in earlier observation

(e.g., Lee et al., 2021; Taft & Zhu, 1995; Zhang & Peng, 1992; Zhao et al., 2021). The speed of accessing a compound word depends on how frequent a word appears as a whole. It has been reported that character frequency plays a role in compound word processing and high-frequency words are accessed via their characters and low-frequency words are accessed as a whole word. Comparison of the findings with those of other studies (e.g., Baayen et al., 1997; Libben & Jarema, 2006) confirms the effectiveness of general dual-route models of morphological processing. Identification of a compound word is simultaneously and independently accessed via direct retrieval of a whole-word representation and a decomposition-then composition process of constituent (character) representations.

"Sensitivity to morphological cues within morphologically complex words largely predicts L2 Chinese vocabulary knowledge (Zhang, 2016, p.390)". The positive role of RC and insignificant role of V1 found in this study indicate that in contrast with V1, prototypical RC is more salient. Different from English, telicity and perfective aspect of Chinese RVC are always realized on RC rather than V1. The salience of RC might be explained by the headedness of RVC. RC as the head of RVC was supported by numerous scholars (e.g., Hsueh, 1989; Shen & Mochizuki, 2010; Tai, 2003) depending on different reasons like inheritance of arguments (Shen & Mochizuki, 2010) or typological properties (Hsueh, 1989; Tai, 2003). Chinese is primarily a verb-framed language and only secondarily a satellite-framed language. V1 expresses the cause and it conflates Motion and Co-event to present the subordinate event while RC expresses the result by conflating Motion and Path to present the main event. However, the insignificance of prototypical V1 must be interpreted with caution. Several possible reasons might contribute to the insignificant role of prototypical V1s, such as cross-linguistic influence. Mandarin is verb-

preferred language in which speakers use relatively more verb tokens in their everyday speech and a greater variety of verbs (verb types) than other noun-preferred language speakers (Liu et al., 2010).

5.5.2 Effects of the Prototype and Tripartite Framework on Syntactic Competence

S-AJT was designed to investigate the role of LP of da3-RC, SeP of RVC including the prototypicality of polysemous 打 *da3 "beat"* and the semantic orientation of RC, and the SyP of RVC in the instructed L2 acquisition of RVC-related patterns. It was discovered from the regression modal in the posttest that semantic prototypicality, consisting of prototypicality of polysemous 打 *da3 "beat"* and prototypicality of semantic orientation of RC, and SyP succeeded in entering the predictive modal. Nevertheless, LP of RVC and prototype-based teaching intervention failed to do so. The significant roles of SeP and SyP on syntactic acquisition, to a large extent confirmed the Bootstrapping Effect (semantic vs syntactic) and Prototype Effect employed in RVC learning. On the one hand, semantics of components and syntactic context might have effect on syntactic processing; on the other hand, Prototype Effect can exhibit itself in terms of polysemous V1, semantic orientation of RC and syntactic pattern. Just as Lakoff (1987/2008) claimed, "Prototype Effect has shown up in all areas of language ---phonology, morphology, syntax and semantics (p.61)".

Regarding the SyP in S-AJT, according to its descriptive data in S-AJT, it has been revealed that the acceptability order of alternative syntactic patterns from multilingual learners of Chinese in Malaysia is SVO>Ba-C>Bei-C>PSC>CVC. This sequencing is in line with the scale of SyP reported in the intuition-based SyP from CSL/CFL learners (as shown in Table 4.4) and the scale except PSC by Chu (2016). Chu found 4 sentence patterns can be ordered as SVO>Ba-C>Bei-C>CVC based on their frequency. The

sequencing of SyP in pretest and its significant effect on the instructed syntactic acquisition seem to support Abbot-Smith and Tomasello's (2010) argument. They claimed that transitive presentation is graded in strength depending on both the amount of input they have previously processed and relative salience of perceptual cue to the semantic roles. However, it is somewhat different from the transitivity scale of five alternative construction types summarized in Figure 2.6. What is understandable is that many of the participants tend to reject the CVC and subject-oriented RVC, such as 打累 *da3lei4 "beat-tired"*. It is possibly because L2 learners have not realized that "when the resultative is underlyingly the predicate of the subject, CVC becomes the only means available for Chinese speakers to express an object and a resultative within one sentence (Shi, 2002, p.213)".

As regards the semantic orientation in SeP, descriptive data suggest that the degree of acceptability of sentences with different types of semantic orientation declines along the scale object-oriented>verb-oriented>subject-oriented. This is in line with the order of children"s acquisition of RVC by Z.Zhang (2008). A number of previous studies on the acquisition of RVC (Jiang, 2013, 2020) in the context of L2 also demonstrated such a tendency. This outcome is in agreement with that of Jin (2018) who found semantic orientation exerts significant effect on L2 acquisition of RVC by English learners of Chinese.

Apart from the semantic orientation of RC, another dimension to investigate SeP is polysemous V1. The descriptive statistics of the prototypicality of polysemous V1 show that the sentence with the most prototypical meaning of 打 *da3 "beat"* are more acceptable than sentences with less prototypical meaning of 打 *da3 "beat"*. This finding is consistent

with result by Chen and Wang (2020) who found that in polysemous 打 *da3 "beat",* prototypical meaning is more acceptable than less prototypical meaning. Semantic prototypicality has been confirmed by the regression data, indicating that both polysemous V1 and semantic orientation of RC can be incorporated into the modal (see Equation 4.1). This finding seems to be in accord with L.Zhang (2016) that retrieving the meaning of compound words may depend on the extraction of individual characters and morphological information and also semantic transparency may influence whole-word meaning activation.

The insignificant effect of LP on syntactic processing and the high residue of regression modal obtained in the quasi-experimental phase run counter to statements in the previous studies. In particular, the descriptive statistics of LP in the pretest indicate that the most acceptable sentences are those with the less prototypical 打 *da3+RC*, followed by the least prototypical one. The role of LP did not reach the significant level whether before or after the intervention. However, Crossley et al. (2014) claimed that prototypical verbs occur more frequently in specific constructions and promote the learning of the construction as well as the specific verb associated with the construction. Also, high Residue in regression modal suggests that variables involved in this study only account for a conservatively small part of difference in lexical competence and pertinent syntactic continent. Many other factors, like different learners' proficiency levels, different FLs, compositionality of construction, detach-ability of morpheme, animacy of Causer, formal and semantic transparency might be investigated further to gain a fuller picture of RVC acquisition. This suggestion has been mentioned in previous studies (e.g., Bai, 2007; Bassuny, 2020; Liu, 2018) since in the current research only the intermediate-level learners are involved.

In this study, prototypicality of V1 fails to have significant effect on RVC identification while effect of prototypicality of RVC on acceptability of RVC-related sentence pattern did not reach a significant level. Their insignificant roles might be explained by Bates and MacWhinney's Competition Model. According to the modal (Jordan, 2004), language processing involves competition among various cues and cue strength. Each of the cues contributes to a different resolution in sentence interpretation, such as the LP, prototypicality in polysemous V1 and semantic orientation of RC, SyP etc. Within a language, the cues often converge to give a clear interpretation of a sentence. For example, the semantic prototypicality and syntactic prototypicality succeed in entering the modal to explain the acceptability of those RVC-related sentences. The insignificant role of prototypicality of V1 in RVC identification are possibly attributed to the similarity between their heritage language and Mandarin, such as actions and result in Cantonese (Cheung & Clark, 2006). To note here, Malaysia is a multilingual country in which Bahasa Melayu is standardized national language and English is an official language. In Malaysia, various dialects, such as Cantonese, Hakka, Hokkien are always spoken by ethnic Chinese at home as heritage language while Mandarin Chinese is an educational goal to be taught in schools (Vollmann & Soon, 2020).

To sum up, the present study yielded mixed findings on the role of prototypicality in terms of form, meaning and syntactic usage. Thus, more further investigation is required in future work.

5.5.3 Effect of the Prototype-based Instruction on RVC Learning

Facilitative effects of both prototype and instruction have been assumed in language acquisition in the context of both L1 and L2, language pedagogy and Cognitive Psychology. When prototype principle is applied to material design in the instruction,

prototype-based instruction is suggested which claims that teaching materials in L2 classroom should be designed according to prototypical hierarchy of lexical chunks. Just as Vanpatten et al. (2020) argued that one kind of constraints on acquisition comes from markedness, a term closely pertinent to prototype. The more marked structures are more difficult to acquire than less marked structures. In the present study, positive effect of instruction based on the prototypical hierarchy of RVC and component morphemes has been evidenced in lexical identification and syntactic acceptability, suggesting the prototype-based RVC instruction is advisable in the CFL classroom.

Significant role of explicit prototype-based RVC instruction in RVC identification and semantic prototypicality and semantic prototypicality after teaching intervention validated a decisive role of explicit instruction in RVC learning. In particular, prototype-based lexical, semantic and syntactic knowledge might be imparted to learners and the most prototypical RC should be highlighted and introduced first in the classroom. Prototypical sentence patterns, such as SVO or Ba-C should be presented as illustrative examples to facilitate RVC learning.

In S-AJT, performance by the experimental group who received prototype-based RVC instruction is significantly different from that in the control group, indicating the facilitative role of prototype-based RVC instruction. In the integrated modal to predict acceptability of alternative sentence patterns, instruction and other mediating variables can jointly exert influence on syntactic acceptability. Significant role of syntactic prototypicality in S-AJT indicates that prototypical syntactic context is necessary for lexical learning. This argument is reflected in the Sentence Writing Method which has been proposed by researchers to facilitate vocabulary learning. In this method, the learners are not only asked to restate the definition of the target words in the generated sentence but

to construct a sentence containing the target words to be memorized (Nielsen, 2002). Empirical studies (e.g., Laufer, 1997; Saddler & Preschern, 2007; Sagirli, 2016) suggest that sentence writing is an effective method for facilitating memorization of words. Sentence provides a context for vocabulary learning, which is suggested in the implications from a synthesis of the research findings. In particular, teachers for CFL learners at the initial level should devote more time to teaching decontextualized vocabulary, progressively moving towards context-based vocabulary learning as their learners' language skills advance. Besides, those findings might provide ample evidence to the teaching practice that when RVC is taught, prototypical illustrative examples ought to be given. For example, for object-oriented RVC, SVO and Ba-C should be presented first while for subject- oriented RVC, CVC should be given to CSL/CFL learners.

In the acceptability of alternative sentences licensed by RVC, acquisition data in the pretest indicate that there do exist prototypicality scale in the polysemous V1, semantic orientation and syntactic choice. Comparison between pretest and post-test data suggests that though explicit instruction did not reach a significant level, SeP and SyP significantly affected learners' performance in SAJT after intervention, plus both SyP and SeP(including polysemous V1 and semantic orientation) reached a significant level. Thus, the joint efforts of the instruction, SyP and SeP was partially supported.

The finding on the role of prototype-based RVC instruction seems to be mixed. In particular, the significant effect of explicit prototype-based RVC instruction has been found in de-contextulized condition (compound identification) while in S-AJT, the prototype-based RVC instruction did not reach a significant level. However, this finding does not necessarily reject the significance of instruction due to the fact that prototype-based RVC instruction did make a significant difference to the prototypicality of semantic

orientation. It is likely to be accounted for from at least three perspectives. First, the pandemic and short session of teaching experiment might undermine the validity of the online learning in the teaching experiment; Second, this finding may show that explicit prototype-based RVC instruction possibly fosters lexical learning. Third, the differences in the types of students who participated in the experiments (Chinese native speakers and Chinese foreign language speakers) and the instructional materials (second language teaching materials and mother tongue textbook) may account for the finding. Nevertheless, it plays a limited role in pertinent syntactic processing on the ground that syntactic processing is more complicated than lexical processing. Therefore, in the future, more implicit or both the implicit and explicit teaching should be introduced to booster the RVC learning.

Evidence from the role of prototype-based RVC instruction suggests that Mandarin RVCs are teachable and learnable, to some extent. This argument is also shared by Liu and Wang (2018) who found that writing-after-reading method can facilitate RVC learning. In this study, the experimental group with prototype-based RVC instruction was found to be significantly different from the control group in lexical acceptability test but not in syntactic acceptability test. To be precise, prototype-based RVC instruction exerted significant effect on less and least prototypical rather than most prototypical RVC.

These findings on the role of prototype-based RVC instruction are significant in the *ISLA.* The role of instruction is always treated as a cover term for a wide range of activities and practices differing along a number of dimensions and potentially affecting different aspects of L2 learning, L2 competence and L2 performance. It can be broadly defined as "any systematic attempt to enable or facilitate language learning by manipulating the mechanisms of learning and/or the conditions under which these occur." (Buysse et al., 2018, p.480). ISLA merits our attention because an increasing number of people around

the world, are learning Chinese a second or foreign language through instruction, especially in the controlled environment, like Confucius Institute or Confucius Classroom.

Furthermore, its theoretical value on its own right rests on a reconsideration of a wide range of theoretical issues pertaining to the nature of language, language learning, language knowledge, language processing and their interaction among them. Analyses and findings on prototypical properties of V1 hold potential for CFL/CSL instruction. L2 Chinese learners are encouraged to reach the correct meanings of unknown transparent characters containing familiar radicals once they have a sense of how character components (i.e., phonetic and semantic radicals) combine with each other and are willing to guess.

The facilitative role of explicit prototype-based RVC instruction has been partially confirmed in this study, which has been argued for by Zhang (2014). He claimed that intermediate learners "will benefit from explicit instruction on the compositionality of RVCs and on forming verb compounds (p.20)". The success of instruction of RVC can be accounted for with respect to the prototypical input supported by psychological reality and corpus data. Another reason is that explicit instruction can arouse learners' awareness of constructional properties, both lexical and syntactic, form and meaning. As stated in Notice Hypothesis, learners have to notice formal features in the put in order for those forms to become intake and subsequently acquired (Vanpatten et al., 2020). The present research inspired by PET suggests that instruction can lead learners to skip stages in a developmental sequence if the instruction is targeted at the more prototypical word knowledge including grammatical features and form-function mapping in an implicationally related hierarchy of forms. Instruction can provide learners with exposure to the target language (*i.e.* input and output opportunities) which is otherwise insufficiently

available. This finding runs counter to the bias that instruction in school or in classroom has nothing to do with language acquisition. Most SLA researchers nowadays, would consider the bias misguided or at least premature. Instead, SLA is typically considered to be a process which is open to the influence of instruction.

The significant role of syntactic prototypicality in the regression modal of SAJT indicates that prototypical illustrative examples should be presented to learners in the L2 classroom to enable them to infer meaning and usage of lexicon. This research investigates how RVCs with different degrees of prototypicality help CFL learner to infer the word knowledge of RVC. Supposed that for a RVC, its prototypical syntactic usage is SV construction, it means that the prototypical usage of such a RVC is intransitive. If its prototypical syntax is Ba-C, that indicates that such a RVC is transitive compound verb and it is object-orientation in meaning.

When teaching RVC, most prototypical lexicons with prototypical meaning should be presented first as seeds for the further learning or learners should associate the prototypical semantic concept with prototypical orthographic form. Schmitt (2008) states that the first step in the vocabulary acquisition process is establishing an initial form-meaning link. The establishment of form-meaning connections is largely a conscious process and there is often conscious, intentional, explicit learning that is done in order to acquire those form-meaning connections. The type of knowledge that occurs as a result of vocabulary learning may be explicit like morphological awareness, or implicit such as word frequency, collocation etc. However, collocations can also be the target of direct, explicit instruction and frequency-based word lists are also sometimes used in L2 instruction.

However, beyond the form-meaning connection, there are other aspects of vocabulary knowledge that have been explored (González-Fernández, 2022; Nation, 2013;

Schmitt, 2019). In current study, in order to use lexical items accurately, learners need to know if words can function as transitive verbs or intransitive, predicate or complement. In many cases, such information is presented explicitly in the L2 classroom.

The confirmed role of teaching intervention in this study indicates that instruction, whether explicit or implicit, is crucial in vocabulary acquisition. It has been testified by extensive studies. For example, Takač's (2008) insisted that vocabulary acquisition cannot just rely on the implicit incidental learning which refers to learning words from reading, but need to be controlled. Jiang (2004) maintained that instructional intervention has an important role to play in helping learners understand how concept is lexicalized. Cobb and Horst (2004) argued that the probability of word learning from reading is likely to be even lower than 0.07% for L2 readers. According to this view, explicit or planned vocabulary teaching is suggested. Planned vocabulary teaching refers to deliberate and explicit vocabulary teaching, which encompasses the ways in which teachers introduce and present the meaning and form of new lexical items. For example, the vocabulary is presented from holistic chunks to analytic components or through context as suggested by RVC learning. Phrased in another way, the teacher creates a situation (a sort of a scenario) in which he or she clearly contextualises the lexical item. The context can be given in one sentence only, but the teacher can also give several alternative sentences in which the word may appear such as SVO, Ba-C etc. for RVCs. Explicit vocabulary teaching would ensure that lexical development in the target language follows a systematic and logical path, thus avoiding uncontrolled accumulation of sporadic lexical items.

Prototype Effect in RVC learning in this study are in line with ideas held by numerous scholars, such as Gass (1979), Bogaards and Laufer (2004). For example, Gass (1979) reported that a significant body of research show that the prototypes is the

foundation for L2 vocabulary development. Learners more readily learn the prototypical meanings of lexical items, whereas non-prototypical meanings are learned later. Bogaards and Laufer (2004) argued that from the learner's point of view, a crucial factor in L2 vocabulary acquisition regardless of word frequency, is word "learnability". That is the ease or difficulty with which a particular word can be acquired. Prototypicality or learnability might well account for the convergence of corpus-based data to obtain word frequency information in this study and intuition-based data produced according to the criteria of ease of elicitation. They feel that frequency lists cannot be the sole basis for the selection and gradation of vocabulary for language instruction. Further research should explore other factors that may determine selection, like transitivity, aspect semantic orientation in current research etc.

Quantitative research in MMD has indirectly confirmed the significant role of transitive, type frequency and token frequency, monosyllable, form, meaning and usage in learners' lexical competence and syntactic competence. Thus, it is reasonable to propose the prototype-based approach to Chinese RVC since theory construction must adopt an interactive approach, taking into account the multiple variables and their dynamic interaction. Nation (2013) proposed an extensive construct of word knowledge and lists the different aspects involved, dividing them into three fields: form, meaning, and use. The form implies the knowledge of the spoken and written forms plus the part of speech, while meaning refers to relations with form, concepts, and referents, as well as semantic relations. Finally, to know how to use a word means knowing its grammatical functions, collocations, and constraints.

Prototype Principle in Chinese vocabulary learning is reflected on the focus on the monosyllabic morpheme, which is not a novel idea. For example, there has been a debate

focusing on opposition between character unit theory and word unit theory. Xu Tongqiang (Shen, 2015) maintains that Chinese does not have a unit corresponding to the word and that character is not tantamount to morpheme. Numerous scholars such as Lü Bisong(2006, 2008), who advocated the move from a word-based Chinese teaching to a character-based one, have supported his claim. A word in Chinese may, or may not, correspond to the morpheme, the smallest combination of meaning and sound. The most common patterns of words in modern Chinese are (1) one morpheme/one syllable/one character and (2) two morphemes/two syllables/ two characters. As is widely known, modern Chinese vocabulary is mostly composed of compound words made up of two morphemes, which involves various semantic and syntactic relations. Looking at the words included in the Xiandai hanyu pinlü cidian *"rhythm dictionary of Mandarin Chinese"* (Anonymous, 1986), 12% are monosyllabic and 88% are disyllabic. Despite this, the occurrence of monosyllabic words is far higher than disyllabic occurrences. This is also the rationale for the initial use of monosyllabic characters in Chinese learning and instruction.

According to the prototype-based approach to Chinese RVCs, a safer conclusion might be made that in classroom setting, teaching starts with highly productive morphemes, analyzing their meanings and showing how they combine to form words in order to consolidate lexical knowledge and expand vocabulary size. Instructors should present the most prototypical compounds with prototypical components to intermediate learners as seeds. Prototypical compounds and components should constitute prototypical form, meaning and illustrative examples. As the Competition Model claims, "the second language learner begins learning with a parasitic lexicon, a parasitic phonology, and a parasitic set of grammatical constructs" (Jordan, 2004, p.242).

5.6 Overall Assessment of the Adopted Theoretical Framework

To recapitulate, this study investigates the contribution of prototypical vocabulary knowledge to Chinese RVC learning, including the prototypical form (lexicon & syntax) and meaning (polysemous V1 and semantic orientation of RC). In order to predict the roles of LP, SeP and SyP in the instructed L2 acquisition, two theoretical frameworks, namely integrated framework for compound identification and integrated framework for syntactic acceptability were put forward, respectively. Besides the theories on the positive role of prototype-based RVC instruction in ISLA, the PET and DRPM were combined in the integrated framework of compound identification to examine the instructed RVC identification. In addition, PET and Tripartite Framework were integrated in the framework of syntactic acceptability as theoretical framework to investigate RVC-related sentence processing in the instructed setting. In light of the research findings in the multi-phase mixed methods research, four theories involved in the integrated frameworks, namely PET, DRPM, Tripartite framework and the role of instruction in ISLA are reassessed to gain the theoretical insights and pedagogical implications.

5.6.1 Prototype Effect Theory

Prototype Effect Theory (PET) has primarily focused on nouns in previous research, with occasional attention to adjectives and prepositions. It has rarely been used to study verbs (Stamenkovic & Tasic, 2013). Plus, "verb frequency was an insufficient factor in establishing verb prototypicality (p.224)." Therefore, in this study, Gilquin and McMichael's (2018) converging evidence of the prototype was adopted to investigate the prototypical RVCs in terms of component morphemes and syntactic usage. As a result, the majority of these qualitative findings have been fully or partially confirmed in the subsequent quasi-experimental research. However, it might be much earlier to rush to a conclusion that the prototype-based graded membership of component morphemes and

syntax of RVC have been achieved. As Stamenkovic and Tasic (2013) put it mildly, “prototypicality of verb seems to be difficult to analyze (p.226)”. Nevertheless, in contrast with the previous studies conducted by other scholars (e.g., Jin, 2022; Stamenkovic & Tasic, 2013; Wu, 2018), Gilquin and McMichael’s (2018) triangulating measurement of the prototype can bring us a step closer to such a goal.

PET is a rudimentary theory in Cognitive Linguistics and the prototype is a multi-faceted notion. In this regard, this study focuses on the prototypicality in the lexical form, meaning and syntactic usage of Chinese RVC. Apart from the overall assessment of PET, four specific focuses are laid on the transitivity, frequency, Usage-based theory and methodological pluralism.

First, prior evidence has suggested that Prototype Effect can permeate itself in all the areas of language, including lexicon, semantics, syntax etc. (Lakoff, 1987/2008). Prototype Effect found in this study surrounding LP, SeP and SyP of RVC indicates the relationship between language and cognition. Those prototypical items that have higher salience cues are more likely to be cognitively entrenched. For example, Ungerer (2001) admitted that “main advantage of the prototypicality lies in cognitive economy: the largest amount of information with the least degree of cognitive effort (p.201).” From the early 1980s onwards, prototype-based categorization becomes a major impetus for the emergence of Cognitive Linguistics. A common assumption of Cognitive Linguistics is that speakers frame utterances in terms of templates known as "schémas" that are based on prototypical instantiations of constructions (Hopper, 2001). PET, as one of cornerstone theories in Cognitive Linguistics accounts for the interaction between language and cognition on various aspects of vocabulary knowledge.

Second, PET appears to be a productive theory in the sense that its insights into the structure of lexical categories can be easily applied in various fields of the lexicon. Prototype-based analyses of RVC indicate that membership of lexical categories can take a prototype-clustering approach as membership criteria. Thus, according to integral aspects of vocabulary knowledge, prototypicality of vocabulary can fall into three basic dimensions: LP, Sep and SyP. In particular, three baskets of criteria, namely semantic criteria, morphological criteria, syntactic criteria are introduced to analyze the matrix verbs which can act as V1, in conformance with the idea concerning the prototypical view of syntax. In the same vein, the adjectives which can function as RC are also divided into more prototypical one which covers size adjectives, color adjective, auditory adjectives, shape adjectives, taste adjective, tactile adjectives and less prototypical. The less prototypical RC signals either less concrete properties or more transitory states, like evaluative, transitory states, states of living according to their semantic characterization (Givon, 1979).

Within linguistics, PET was initially presented as a novel way of dealing with matters of word meaning (Tsohatzidis,2014). It has been argued that the prototypical model of lexical polysemy is an indispensable aspect of any theory trying to classify the diverse forms of semantic information that may be incorporated in lexicographical reference works (Geeraerts, 2014; Lu & Wei, 2019). For example, the SeP underpinned by PET is a cover term for at least two types of expression in this study: polysemy of V1 and semantic orientation of RC. The polysemy of V1 in this study is typically understood by adducing 打 *da3 "beat"* as a good example (Chen & Feng, 2020; Gao, 2001).

When PET was applied to the semantic orientation of RC, the analyses and empirical data have confirmed the prototypical semantic orientation of RC is a scalar or

prototypical notion along an object-oriented to subject-oriented continuum. The high acceptability of the sentence with object-oriented RVC in the acquisition data of this study agrees with theoretical analysis of the prototypicality of semantic orientation. It can be explained by reference to the local attachment preference. There are many different versions of local attachment that have been proposed such as right association, attach low, minimal attachment, argument attachment preferences. Argument attachment preference claim that argument attachments are favoured over other structural factors attachments in general in spite of their frequency. Minimal attachment tends to prefers attachments which minimize the number of new nodes built, and therefore attachment as an argument of the verb is preferred over attachment as a complement of the verb. Thus, it follows that object-oriented reading is the most prototypical for the fact that its reading is in congruent with the prediction by argument attachment and minimal attachment preference.

PET is a major theoretical underpinning based on which the prototypical RVCs are investigated with reference to the empirical analysis triangulated by multi-corpora and intuition, together with acquisition data. In addition, the findings obtained in this study have shed new light on a series of issues, such as transitivity and frequency in the notion of the prototype and prototypical RVCs, methodological exploration as well as relevant theories like Usage-based Theory etc.

The notion of prototypical RVC in this study encompasses an array of information, including frequency information like token frequency and type frequency, transitivity in terms of lexicon and syntax, aspect of activity and state, as well as cognitive data. Therefore, the following discussion centers on these issues.

5.6.1.1 Prototype and Transitivity

Transitivity as a prototypical concept can exhibit itself in terms of lexical form-meaning correspondence. The application of transitivity has been specifically discussed in term of form, meaning, acquisition and processing by Brandt and García (2010). In this study, transitivity of V1s and RVCs has been integrated in the notion of prototypical V1s and RVCs. The empirical and theoretical analyses on object-orient RVCs in terms of semantic orientation of RC seem to support the argument that transitivity can be used as structural cue to telicity semantics from another aspect. As regards the notion of transitivity, traditional Chinese grammarians often adopted the dichotomy to divide the action verb into transitive verb and intransitive verb. However, in cognitive linguists' view (e.g., Guajardo, 2023;Wang, 2016), transitivity is a matter of degree rather than being an "either/or" issue, and transitive verb is a good example of a "grammar rule" operating as a radial category. Taking this study and previous relevant studies together, it is intriguing to discover that lexicon is actually prototype-based with transitiveness and intransitiveness as two extremes, as suggested by Hopper and Thompson (1980). What is occupied in the middle of the continuum is the labile verb (Zhang, 2019). Therefore, L2 learners might be sensitized to find that some verbs are more prone to transitivity than others (Littlemore, 2009).

Apart from the prototypical transitivity in lexicon, it can also demonstrate itself in the SyP or the alternative syntactic patterns licensed by RVC, as indicated in He (2019). According to the finding in the present study, among the five alternative sentence patterns pertinent to RVCs, SV(O) has been proved to be universally accepted as an unmarked or prototypical structure in Modern Chinese, and prototypicality of sentence pattern is closely related to transitivity of RVC, which is in line with He's (2019) analysis. This conclusion is also held by other scholars (e.g., Chan et al., 2009; Hsu, 2018; Huang et al., 2009). Besides, the findings on the degrees of transitivity concerning alternative construction

differ from each other based on different criteria, like cue validity(e.g., Chan et al., 2009; Hsu, 2018; Huang et al., 2009), textual frequency(e.g., He, 2019; Wang, 1954/2011) and argument permission(e.g., Shi, 2002).

As stated previously, the most prototypical V1s should transitive action verbs while in Mandarin, most of the action verbs are transitive. Unfortunately, the prototypicality of V1s did not find its due role in predicting learners' performance in L-AJT. However, there are numerous other supporting evidence to indicate the prototypicality of action verb in verb prototypicality. For example, both Gao (2001) conducted qualitative analysis to find that prototypical V1s in RVCs should be physical action verb closely related to body parts. Prototypicality of action verb is also supported by f-MRI studies which "have shown that comprehension of action verbs, action sentences, and words denoting manipulable objects frequently activate sensory–motor brain areas (Dam & Desai, 2016, p.12)" since sensory-motor stage is the earliest stage of cognitive domain.

5.6.1.2 Prototype and Frequency

It is undeniable that frequency should be deemed as core criterion index of the prototypicality, though previous scholars have admitted the inadequacy of frequency alone in the notion of prototypicality and language acquisition. This study has incorporated type frequency and token frequency of target verbs to define the prototypical RVCs and component morphemes. The idea implying such a criterion is that one of the essential characteristics of language lies in both productivity and conventionality.

Type frequency or productivity might be of central concern to linguistic prototypicality since more focuses were placed on the token frequency in previous studies. The productivity of any construction, like Chinese RVC, whether morphological or

syntactic in nature, is its tendency to be used to form novel expressions (Backus & Mos, 2011). In the derivational morphology, productivity is a term used to denote the degree to which particular component morphemes are used to form a new compound. In SyP, the syntactic productivity refers to all kinds of alternative sentence patterns such as Ba-C, CVC, SVO etc, in which different types of RVCs can fill in the open slots of schematic representation of that construction.

Positive effects of the prototype in this study demonstrate the role of productivity or type frequency effect of a construction within the matrix attributes of the prototypicality. This finding has been echoed in previous studies. For example, Bybee (2008) makes the most explicit claims about type frequency effects in the instructed L2 acquisition that exposure to a wide variety of kinds in a construction will be more beneficial in gaining productivity than exposure to a large number of identical tokens. High type frequency is assumed to be necessary for the abstraction of item-general schemas and constructions as well as for the productive generalization and extension of patterns beyond the input. In terms of teaching productive morphology, the most effective method would have two stages. First, focus on a single lexical paradigm that exemplifies the productive pattern, and then, move to the pattern is exemplified with other lexical types. The repeated type provides familiarity with the relations in the pattern while the range of different types aids parsing and provides practice of the analogical extension of the pattern.

In this study, the type frequency and token frequency from different types of corpora have been used to establish the RVC prototype. Therefore, a safe conclusion can be made that Frequency Effect is a subset of Prototype Effect in a broader category due to the fact that language learning is not solely based on frequency but also the salience of linguistic items (MacWhinney, 2008). To note, in terms of lexical acquisition, frequency

alone may be a poor predictor of acquisition because it is compounded by differences in word type and word token frequency (Crossley et al., 2014). In addition, word frequency is not always a strong predictor of word learning. It is likely that for lexical items, prototypicality in which salience, intuitive typicality, frequency and others may be a more robust indicator of acquisition than frequency alone.

5.6.1.3 Prototype and Usage-based Theory

Supposed that Frequency Effect is a subset of Prototype Effect, it is reasonable to argue that Usage-based Theory (UBT) of language acquisition seems to lend support to Prototype Effect of Chinese RVC. It is widely acknowledged that UBT is an important theory in Cognitive Linguistics to examine lexical development that strongly links with frequency information. According to Crossley et al. (2016), Usage-based learning relies on the salience and prototypicality of item. Usage-based approaches to language acquisition hold that schematic constructions emerge as prototypes that reflect frequency-biased abstractions from relevant language experience (Ellis, O'Donnell & Römer, 2013). Thus, the rationale for the link between UBT and PET can be two-fold. On the one hand, UBT has been adopted by Chen (2020) to account for the acquisition of Chinese RVC in the context of L1. On the other hand, both PET and UBT are concerned with frequency information, the information central to many of theoretical proposal made in the Usage-based language acquisition theory. To put it simply, Frequency Effect is a key foundation of Usage-based approaches to language learning. For example, one common approach to examining lexical development that has strong links with Usage-based approach is word frequency (Ellis, 2002; Gries, 2008; MacWhinney, 1997).

Due to the close relationship between PET and UBT, the significance of the research into the Chinese RVC under the framework of PET in this study can be reflected

in the development of UBT. As with the PET, UBT is increasingly adopted to investigate the development of a number of constructions (e.g., Ellis & Ferreira-Junior, 2009; Gries & Wulff, 2005). However, previous studies have suggested that Usage-based approach to second language acquisition most commonly focuses on the syntactic development. More rarely, Usage-based approaches provide information about the lexical development in L2 learners possibly because the features commonly measured in Usage-based studies (e.g., type frequency, salience, and prototypicality) are more difficult to open-rationalize from a lexical perspective (Crossley et al., 2014, 2016).

This study reemphasizes that the prototype is a multi-faceted notion encompassing token frequency, type frequency and other strands of data. The study stresses the importance of prototype-based input and RVC instruction in RVC learning. These findings can be traced from the following observations of UBT (Han, 2017).

Observation 1: Exposure to input is necessary for SLA.

Observation 2: There are limits on the effects of frequency on SLA.

Observation3: A developmental sequence— from formula, through low-scope pattern, to schematic construction. Formulas are lexical chunks that result from binding frequent exemplars and their type and token.

According to UBT (Tomasello, 2003), an individual's creative linguistic competence emerges from the collaboration of memories of all the meaningful interactions in their history of language usage. An item-based or exemplar-based path for learning a second language claims that developmental sequence, whether L1 or L2 is from formulas or exemplar through low-scope pattern to full or high productive schematic pattern (Ellis, 2002, 2012).

Taking the principles in the UBT and the findings in this study together, prototype-based development of RVC can be illustrated with respect to the prototype, token frequency and type frequency, as diagrammed in Figure 5.1. There are four layers in the RVC development: exemplar layer, low scope layer, medium scope layer and full scope layer. In each layer, the prototype acts as a seed for the following growth. In addition, token frequency tends to entrench those expressions in the language learners' experience while type frequency of V1 and RC (that is, the number of different forms in which the language learner experiences the expression)determines the abstractness or schematicity of construction RVC underlies the productivity of the construction.

RVC								full-scope
V1-RC				V1-**RC**				medium-scope
拿 na2 "take"-RC		打 da3 "beat"-RC		V1-*碎 sui4 "broken"*		V1-好 *hao3 "well"*		low-scope
拿出 *"take out"*	拿坏 *"take-broken"*	打碎 *"broken"*	打死 *"beat-die"*	打碎 *"broken"*	踢碎 *"tick-broken"*	写好 *"write-well"*	弄好 *"make-well"*	item/exemplar

Figure 5.1: Exemplar-based Development of RVC

Both the Usage-based approach to L2 learning and prototype-based findings in this study highlight the important role of frequent items in the input. Usage-Based approach to L2 learning holds that learners unconsciously register linguistic patterns in the input, and these patterns are strengthened when learners encounter multiple examples in the input (Ellis & Wulff, 2015). Some researchers have utilized large corpora consisting of naturally occurring oral and/or written language to explore frequently recurring linguistic items in L2 input such as lexical bundles— recurring multi-word constructions such as "*as a result of", "at the time of", "if you look at*", etc. (e.g., Biber & Barbieri, 2007). Usage-based

approach to RVC learning has been adopted to explain the child acquisition data. The prototypical analyses of RVC and component morphemes and their roles in CSL/CFL learning provided further evidence to account for CFL acquisition data. Thus, CFL researchers and educators can use the findings in those studies to manipulate classroom input to increase exemplars of a specific linguistic structure.

According to the PET, RVC prototype is established by reference to the type frequency of monosyllabic verbs and constructions and token frequency of verbs. In the same vein, UBT attaches great importance to both token frequency and type frequency. It is not only the frequency of a construction that leads to learning, but also a construction's type frequency. Frequency and Usage-based approach converge under the notion that it is not the raw input that learners are exposed to that necessarily leads to acquisition, but rather how the input is patterned in conversation (Ellis, 2012). The meaningful patterns of input that occur frequently are often referred to as linguistic constructions, which are basically conventionalized form-meaning mappings (Madlener, 2015). There is an overlap between Usage-based approach and a pure word frequency approach, but commonalities are not strong because word frequency studies cannot take into consideration form–meaning mappings based on matching patterns of acquisition (Crossley et al., 2014). Usage-based research may consider construction frequency (e.g., how often the pattern of a particular verb–argument construction occurs) or type of frequency (e.g., how many lexical types can fit into a specific verb–argument construction). Both of them examine regularities in language that go beyond the individual word.

In view of the affinity between the prototype and UBT, the best way to teach Chinese RVC is to show a prototypical RVC and related components, supported by previous studies. For example, research on category learning suggests that acquisition is

optimized by the introduction of an initial, low-variance sample centered on prototypical exemplars (Cohen & Lefebvre, 2017; Elio & Anderson, 1981, 1984; Murphy, 2003). Research inspired by Markedness Theories suggests that instruction can lead learners to skip stages in a developmental sequence if the instruction is targeted at the more marked forms in an implicationally related hierarchy of forms such as relative clause structures (Housen & Pierrard, 2005).

5.6.1.4 Prototype and Methodological Pluralism

Since the prototype is a multifaceted phenomenon, the processes of collecting prototypical RVC and components in qualitative phase seem to shed light on methodological pluralism, to wit the value of triangulating techniques from different methodological traditions. Particularly, according to Gilquin and McMichael's convergence evidence of the prototype, both corpus triangulation and method triangulation are included in the construct of LP and SyP.

As regards the corpus data, a distinction has been made between token frequency effect and type frequency effect (Bybee, 2008). Thus, the first issue to be addressed in methodological pluralism lies in the combination of type frequency and token frequency of target words from multi-corpora. Results of an artificial language learning task by Casenhiser and Goldberg (2005) shows that both type and token frequency are important to learning productive constructions, like Chinese RVC. Particularly, The greater the token frequency of an exemplar, the more it contributes to defining the category, and the greater the likelihood that it will be considered the prototype (Ellis & Ferreira-Junior, 2009). Token Frequency Effect works in terms of repetition and autonomy. Repetition of linguistic units has an impact on their availability or accessibility. Availability refers to the fact that, in experiments where participants are asked to name out the first words or

sentences in their minds, they respond much more quickly to more prototypical or higher frequency words or construction than to less prototypical or frequent ones.

Second, a combination of corpus data regarding a construction's type and token frequency and psychological data regarding the availability of prototypical uses can yield useful and complementary information in this respect. Recall that the LP and SyP are produced by integrating corpus data by means of corpus-triangulation and intuition data elicited via CLPT, a classical psychological test. The intuition-based psychological data can tell us the mental phenomena which underlie the production of corpus data. The idea of combining corpus data with intuition-based psychological data has been shared by Leech (1992/2011) and Gries et al. (2005). For example, in Leech's view, studying linguistics performance proceeds in two ways: either as process or product. Corpus linguistics is concerned about the product while psychological data considers process. Thus, the combination of psycho-linguistic and corpus methods can contribute to a better description, explanation, and understanding of processes involved in vocabulary learning. It can offer a different perspective on the data, creating a richer and more accurate understanding of the RVC acquisition investigated in this study.

Another aspect of methodological pluralism rests on the combination of the qualitative analysis and quasi-experimental study, since the current research is a mixed methods study, bridging the methodological gap in Wu's (2018)research. In particular, in the context of mixed methods study, the empirical findings in qualitative research need to occupy its due role in the instructed second language acquisition, thus to be transformed into materials that are suitable for language teaching practitioners, mainly in the service of professional development and teacher training. The qualitative phase witnessed the prototypical membership of RVC and related components and syntax. However, as Tao

(2016) said, truly insightful linguistic findings should find their value in applications such as language teaching. Without actively engaging in explorations of possibilities, it would be difficult to see potentials of theory for application. Thus, in quantitative phase, quasi-experiment research was designed accordingly.

5.6.2 Dual Route Processing Modal

As previously stated, DRPM was used in L-AJT to predict the role of component morphemes of RVC and whole compound in RVC identification. The positive effects of prototypicality of RC and token frequency of RVC found in the L-AJT, provide a new supporting evidence that DRPM (Perea & Pollatsek, 1998; Pollatsek et al., 2000) is applicable to explain the acquisition of Mandarin Chinese RVC except for the role of V1. Nevertheless, as reviewed in Chapter 2, DRPM in lexical identification merely offers us an answer to the question pertaining to the role of token frequency of component morphemes of compound and the whole word without referring to the role of more full-fledged prototypicality. This is the rationale to combine the DRPM and PET, bridging the theoretical gap.

The significance of DRPM lies in that it provides us with a theoretical platform to investigate the role of both the component morphemes of RVC and the whole word in compound learning. In the previous studies, Liang (2014) has proved that prototypicality is a powerful predictor of L2 acquisition by examining polysemous 上 *shang4 "go up"*, an important complement of direction. Nevertheless, she has warned that prototypicality of 上 *shang4 "go up"* is merely "a representative but not exhaustive (p.217)" of RC; Chen and Wang (2020) investigated L1 acquisition of Mandarin Chinese polysemous V1 打 *da3 "beat"* and concluded that prototypicality significantly predicted the learning outcomes.

Therefore, The DRPM-based conclusion broadens the scope of earlier conclusions about the function of prototypicality in the context of L1 and L2. What is different is that due to the inadequacy of frequency of occurrence alone in establishing prototypicality (Ellis, 2002; Stamenkovic & Tasic, 2013), many other determining factors in the acquisition process, such as semantic basicness, salience etc. are included in the construct of prototype (e.g., Divjak & Arppe, 2013; Slobin, 1997).

Since the whole-word frequency of RVC has been verified, it ought to be a crucial factor in the RVC instruction of TCSOL. Chinese RVC can be seen as constructions, a basic unit in Cognitive Linguistics. Construction type/token frequency distribution in natural language might thus optimize learning by providing one very high-frequency exemplar that is also prototypical in meaning and widely applicable. In the acquisition of other categories, it is the conspiracy of these several different factors working together that drives acquisition of linguistic constructions: (i).the frequency, the frequency distribution, and the salience of the form types; (ii). the frequency, the frequency distribution, the prototypicality and generality of the semantic types, their importance in interpreting the overall construction; It needs supplementing with experimental investigations that compare the effects of skewed versus even frequencies of type/token distributions, as well as prototypicality versus non-prototypicality of leading exemplar, upon early acquisition in training studies of the sorts (Goldberg et al., 2004; Year & Gordon, 2009).

The significant roles of prototypical RC and token frequency of RVC deepen our understanding of the process of compound identification. DRPM states that both the frequency of component morphemes and whole-word frequency can predict the compound identification. However, prototypical V1 failed to significantly affect RVC identification. This mixed finding might be explained depending on the headedness of RC by numerous

scholars (e.g., Deng, 2019; Shen & Mochisuki, 2010; Tai, 2003). Besides, there are several other possible explanations for the insignificant difference regarding the effect of the prototypicality of V1s, such as the mismatch of prototypical V1s between Chinese in Malaysia and Mandarin Chinese, as well as the multilingual context. For example, the commonly used action verbs in Malaysia Chinese like 掷 *zhi4 "toss",* 割 *ge1 "nick",* 啃 *ken3 "nibble"* (Guo, 2022) are not found in the list of prototypical V1s in this study. Furthermore, participants in this study lived in a multilingual context where Mandarin Chinese learning is affected by various languages or language variations like Mandarin Chinese, English, Malay, dialects of Mandarin like Cantonese, southern Fujian dialect etc. (Diao, 2022).

5.6.3 Prototype-based Tripartite Framework of Grammar

Prototype-based Tripartite Framework of Grammar was adopted to investigate the effects of LP, SeP and SyP on syntactic acceptability of RVC-related sentence patterns. This framework was established by combining PET and Three-dimensional Framework of Grammar Teaching. Since PET has been discussed above, this section is exclusively dealt with the joint role of form, meaning and syntax in vocabulary acquisition. It is not difficult to figure out from the findings that the notion of transitivity is an important pivot to connect form, meaning and syntactic usage attested in the quasi-experimental phase. In particular, as defined in chapter 4, prototypical V1 and RVC should be transitive verbs while prototypical RVC in meaning is object-oriented which is closely related to transitive RVC. The significant role of SyP in S-AJT and prototype-based qualitative analysis of alternative sentence pattern indicate that prototypical sentence pertinent to RVC should be more transitive, such as SVO and Ba-C.

Comparison of the findings in this study with those of other studies confirms that both form(lexical form and related syntax) and meaning (semantics) play a crucial role in vocabulary acquisition. In this study, it has been found that SeP and SyP can significantly influence syntactic acceptability related to RVC and that prototypical RC and token frequency of RVC can affect the lexical identification. These findings have been highlighted in the previous studies. For example, Croessley et al. (2014) found that the form-meaning and form-function mappings that occur most frequently are argued to be learned first. Behrens (2009) has claimed that all linguistic phenomena are considered to be form-function correspondences. They may differ in size (from morphemes to idioms) and in degrees of abstractness or schematicity and productivity. Therefore, Finneran (2015) suggested that, in order to teach vocabulary effectively, instructors need to be aware of the interconnection of language form, meaning, and syntactic usage and teach their learners to be aware of it as well. Fundamental to this pedagogical approach is the concept that language form, meaning and usage are inextricably linked, which has been attested in the regression modal from the present quasi-experimental study. There are many other supporting evidence in the previous observations (e.g., Finneran, 2015; Han & Lew, 2012; William, 2007). As Celce-Murcia and Larsen-Freeman (1999) put it, “Grammar is not merely a collection of forms but rather involves the three dimensions of (morpho)syntax, semantics, and pragmatics. Grammatical structures not only have a morphosyntactic form, they are also used to express meaning (semantics) in context-appropriate use (pragmatics)(p.6)”.

The interdependence and interaction between form, meaning and syntax of vocabulary acquisition implied in the findings of this study can be reflected in the Bootstrapping mechanism in the child vocabulary acquisition. Bootstrapping was first

discussed by Pinker (2009, 2014) and originally refers to the mechanism by which simple (prototypical) system can boot the more complex (less prototypical) ones. “Depending on which type of information is used to initiate the bootstrapping process, one distinguishes between lexical, semantic, syntactic or pragmatic bootstrapping.” (Ruhlig & Bitter, 2013, p.1). For example, Lexical Bootstrapping Hypothesis focuses on two mechanism of lexical-semantic acquisition. According to the lexical-semantic organization of verb acquisition, a three-level organization should be followed: light verb, generic verb and specific verb (Parente et al., 2013). This argument has been confirmed in the current research. Therefore, it is reasonable to follow that the prototypicality in terms of form and meaning act as a seed to play their decisive role in verb acquisition.

In response to the problem of the prototypicality of illustrative sentence in vocabulary instruction (J.Wang, 2011; Zhang, 2008), prototypical syntactic context is advisable and of great importance to vocabulary learning due to the SyP existing in the alternative syntactic patterns and the confirmed influence of syntax on verb acquisition in this study which is further supported by Lee and Naigles (2005) who also investigated the role of syntax in verb learning in Mandarin Chinese. This finding is in agreement with Syntactic Bootstrapping Hypothesis in spirit (Gleitman, 1990; Lee & Naigles, 2008; Pinker, 1994) which claims that children always make use of the syntactic contexts to decode the meaning of a verb. For example, a RVC used in a transitive context, such as SVO or Ba-C is assigned a causative reading. In particular, the verb placed in SVO is more likely to be construed as a transitive verb while it is high probable that RVC appeared in CVC is predicated on the subject. Thus, it is fair to say that the types of sentence patterns in which a given RVC can occur are partially a function of the meaning of RVC.

5.6.4 Prototype-based Approach in ISLA

The materials and instruction developed out based on the prototype-based approach have been implemented in the experimental group of this study. The findings are mixed: prototype-based RVC instruction found its due role in the lexical identification while it failed to do so in the syntactic acceptability. That does not necessarily refute the facilitative role of instruction, especially prototype-based RVC instruction for sentence processing is far more complicated than lexical acquisition. In view of the decisive role of prototype in the RVC acquisition, the role of input design in the prototype-based RVC instruction is discussed in the following part, together with the morpheme awareness in the instruction of Chinese compound.

It has been implicated from this study that the introduction of prototype-based input to CFL/CSL instruction is necessary. For example, teachers should make some adjustment to the teaching material of Chinese RVC. For the beginning level learners of Chinese as a foreign language, the most prototypical RVC should be introduced such as object-oriented RVC while the least prototypical RVC can be introduced to the advanced learners, like subject-oriented RVC. Just as Goldberg and Casenhiser (2008) put it, extensive previous studies have suggested that "it is advantageous to supply targeted input that includes ample prototypical instances early in training (p.207)". The similar argument is also echoed in other teaching methods. For example, Layering Method (Xing, 2006) claims that usage or function of any grammatical element, be it word or sentence should be divided into three categories: basic function, commonly used function and special function, in line with the LP in spirit found in this study. She suggests that teachers should provide appropriate guidance for learners to move forward from low level (the most prototypical level)to advanced stage.

Since previous studies have shown that the explanatory power of input frequency is limited in the context of both L1 and L2 (e.g., Ellis, 2002; Steinkrauss, 2017), a shift should be witnessed from the emphasis on input frequency alone to the prototypicality of input, including the type frequency and toke frequency in various corpora and the language-specific properties, among others, as indicated in this study. That is the reason why Ellis and Collins (2009) recommends "to introduce a new construction using an initial, low-variance sample centered upon prototypical exemplars to allow learners to get a "fix" on the central tendency that will account for most of the category members (p. 331)". On the one hand, the decisive role of prototypicality in the RVC acquisition has revealed that the frequency of occurrence of linguistic items and pattern does affect the representation in learners' mind, since token frequency plays a central role in establishing the prototypicality; on the other hand, other frequency information should be covered in the input, which is held by usage-based models of language which assume the language acquisition is input-driven and input should be sensitive to type and token frequency, "resulting in item-specific knowledge and more abstract categories of form-meaning relationship that integrated with and supported by conceptual structures (Robinson & Ellis, 2008, p.494)."

Effect of instruction on the RVC identification and on the prototypicality of polysemous V1 and syntactic prototypicality show that input in the instruction should be enhanced with respect to prototypicality. That input matters comes as no surprise to second language practitioners, but the issue of exactly how input affects second language acquisition (SLA) is another matter (Piske & Young-Scholten, 2008). The present study has indicated that prototypical input should be provided to facilitate the lexical learning. Gan (2010) found that in the learners' mental lexicon, the prototype modal began to work in various types of words and word class is moderately correlated to lexical learning and

93% intermediate learners realized the importance of word class and tend to learn the new lexical item via syntactic categories.

Besides, the evidence from the significant role of prototypical RC and prototype-based RVC instruction in the RVC identification reveals that morphological awareness and radical awareness should be highlighted in Mandarin compound instruction. Morphological awareness refers to "the ability to reflect upon and manipulate individual component and employ word formation rules" (Zhang et al., 2012, pp.753-754) whereas radical awareness is a multifaceted construct, which relies on learners' orthographic knowledge, radical knowledge, and character knowledge, as well as the abilities to apply this knowledge (Chen & Feng, 2020). It has been widely accepted that morphological awareness and radical awareness play a significant role in lexical learning (Tong & Yip, 2014; Zhang & Roberts, 2019). For example, Zhang (2016) asserted that Chinese vocabulary development could benefit from direct instruction in morphological awareness while extraction of key radical information in characters contributes to character learning and memorization across different proficiency levels (Shen, 2010; Shen & Ke, 2007). Thus, great importance should be attached to instruction of RC, in agreement with suggestion by Zhao (1994), since Chinese is highly productive in the categories of word formation rules, different from alphabetical languages. However, in contrast with Chinese native speakers, CSL/CFL learners do not have a better-developed knowledge though they have morphological awareness (Feng, 2003). Therefore, instructors in TCSOL are encouraged to directly teach intermediate learners how to segment Chinese RVC into meaningful immediate constitutes and extract core morphemic cues to more easily derive construction meanings.

Referring to RVC, whole-word frequency of RVC is crucial in selecting the RVC in the classroom of TCSOL. Psycho-linguistic evidence on the processing of compound

words has suggested that in Chinese, familiar lexicalized compounds tend to be accessed as whole units whereas low frequency or novel compounds are decomposed into constituent morphemes (Taft & Zhu, 1995; Zhang & Peng, 1992). Also, Hsu et al. (1998) found that productivity of different types of compounds influences lexical processing. Thus, more work should be done in the future to gain the fuller picture of the RVC acquisition, such as the interactive effects of prototypical RVC and RC on the RVC identification.

5.7 General Summary: A Unifying Account of L2 Acquisition of Chinese RVCs

This study presents us a comprehensive analysis of RVC which cast insights into prototype-based language teaching and acquisition by integrating Cognitive Linguistics and Corpus Linguistics. In light of the findings in qualitative phase and quantitative phase, a unified account of L2 acquisition of Chinese RVC for intermediate learners is proposed.

It is certainly not a new idea to suppose the collaboration of multiple language acquisition mechanisms. For example, Song (2020) contended Unifying Theory of Bootstrapping in which Pragmatic Bootstrapping, Semantic Bootstrapping and Syntactic Bootstrapping are unified for first language acquisition in which Pragmatic Bootstrapping is an essential intuitive mechanism for language processing and acquisition and serves to obtain basic vocabulary repertoire. while Grimshaw (1994) has proposed a Reconciliation Model, which combines the Semantic Bootstrapping and Syntactic Bootstrapping as an integrated one. Though Bootstrapping Hypotheses are mostly discussed in the context of L1, Song (2020) argued in the Unifying Theory of Bootstrapping that Universal Grammar is neither a prerequisite nor a main factor for language acquisition and assumed that it is acquired from patterns in the exposure language. Based on that model, Xie (2010) has carried out an empirical study of L2 acquisition of English raising predicates by Chinese EFL learners to prove its validity.

In view of the interdependence of lexical form, meaning and syntax analyzed and testified in this study and decisive and permeative role of prototype, it is necessary to integrate PET with theories on the interaction among from, meaning and syntax, as diagrammed in Figure 2.8. It claims (see Figure 5.2) that form, meaning and syntactic usage of a grammatical item form a indispensable and interactive integration centering on prototypicality, which is called lexical bootstrapping, semantic bootstrapping and syntactic bootstrapping. Each of the three layers should start with the prototypical one, namely prototypical word, meaning and syntax. Its pedagogical derivation in the instruction suggests that for intermediate CSL/CFL learners, compound acquisition should commence with the prototypical component with the most prototypical meaning. The prototypical sentences should be offered to learners as illustrative examples or syntactic context to help decode the grammatical and semantic features of the compounds.

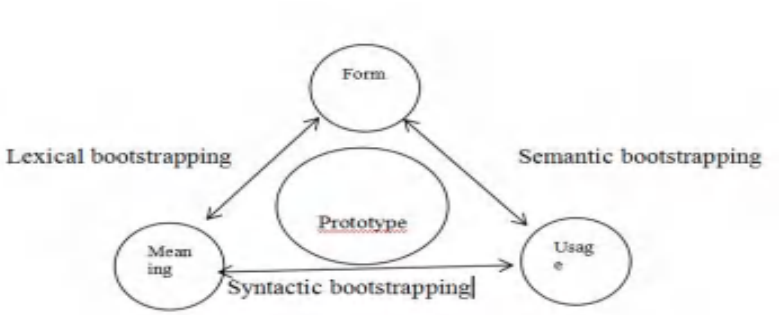


Figure 5.2: Integrated Modal of Prototype-based Vocabulary Acquisition

Since it is a new model which interactively reconciles the lexicon, meaning, syntax and prototypicality in one model, its rationality and feasibility can be justified by those observations listed in Ellis (2002).

Observation 1: In syntax, the productivity of pattern depends on type frequency of the construction.

Observation 2: Syntactic patterns are controlled by lexical items and lexical items provide cues for sentence production.

Observation 3: Less frequent constructions are more difficult. Frequent analyses are preferred to less frequent ones.

Observation 4: Many constructions are based on particular lexical items.

Observation 5: Semantically prototypical verbs are "pathbreakers" in that they seed the growth of verb-centered argument-structure patterns. Generalizations of the verb-centered instances emerge gradually as the verb-centered categories themselves are analyzed into more abstract argument-structure constructions.

Observation 6: Whereas frequency explains some of the variance of morpheme acquisition order, it does so in interaction with other determinants such as perceptual salience, semantic complexity, morphological regularity, and syntactic category.

Observation 7: The different degrees of salience or prominence of elements involved in situations that we wish to describe affect the selection of subject, object, adverbials, and other clause arrangement.

According to Nation (2013), the vocabulary knowledge consists of orthographic form, meaning and usage pattern etc. Taking the research findings in present study and the theoretical framework adopted in the current research, it follows that a learner is assumed to undergo three stages of acquisition before the ultimate mastery of Chinese RVC, i.e., beginner, intermediate and advanced.

Firstly, vocabulary learning should start from the piecemeal learning of concrete

exemplars with prototypical form and meaning. Learners should be exposed to large number of RVCs as unanalyzable chunks while instructors should present the prototypical syntactic examples to illustrate the target compound. (beginner)

Secondly, teaching starts from highly prototypical morphemes, analyzing their prototypical meanings and showing how they combine to form words in order to consolidate lexical knowledge and expand vocabulary size. Items with various kinds of type variation and different abstraction levels can be taught stepwise to learners in a frequent and logical fashion. When that is done, the non-prototypical items will be learned in different mechanism like analogy, metaphor etc. (intermediate)

Finally, learners can use Chinese RVCs to express cause-effect event by combing V1 and RC in an accurate and flexible way. (advanced)

It is hoped that more data are able to support and enhance the presumed integrated model in Figure 5.2 in future work, and more empirical research is in a position to confirm whether the three steps of RVC learning are being followed.

5.8 Summary

In this chapter, the main aim is to discuss the research findings gained in this study in a much wider theoretical and empirical scope so that the significance of the current research, the novelty of research can be understood in a deeper sense. The first part focuses on the research finding to bridge the gap in Wu's (2018) study, including the prototype-based sequencing of V1 and RC, as well as the quantitative evidence to testify the qualitative finding. What follows is the discussion of qualitative finding, including LP, SeP and SyP and finding in quantitative phase in which results of L-AJT and S-AJT are encompassed.

Apart from the empirical findings, the integrated theoretical frameworks are necessary to be assessed in an overall manner, consisting of PET, DRPM, Prototype-based Tripartite framework and prototype-based approach in ISLA. Based on the discussion in the theory and practice, an integrated model is proposed accordingly to explain the phenomenon in acquiring Chinese RVC followed by a three-stage procedure of learning RVC in the classroom of TCSOL. The general discussion enables us to deepen the understanding the prototypicality of RVC and practical benefits of applying the notion of prototype to the TCSOL.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Chapter Overview

This chapter winded up the whole thesis. The conclusion section first summarized the research findings of the present study in Section 6.2.1, from which implications were drawn in Section 6.2.2, including theoretical implications and pedagogical implications. Finally, limitations in this study and recommendations for future work were addressed accordingly.

6.2 Conclusion

This was a three-phase exploratory mixed methods study centering on the prototypicality of Chinese RVCs. In this study, the prototype-based sequencing of component morphemes of RVC, namely V1s and RCs, as well as the alternative sentence patterns licensed by RVC was defined and analyzed in Phase I and II. Subsequently, based on the prototype-based graded membership of component morphemes and syntactic patterns, a quasi-experimental study with control group and pretests (Phase III) was designed. Its aim was to examine the effect of prototype-based RVC instruction on compound and syntax learning, mediated by LP, SeP and SyP. In the following section, what has been gained in this study was summarized, from which the theoretical and pedagogical implications were derived.

6.2.1 Summary of the Research Findings

Chinese RVC is a significant lexical item prescribed in the official guidance documents of TCSOL (Confucius Institute Headquarters, 2014; Hanban, 2010; TCSOL Office, 2002). Since its launch, it has been given great importance. Previous studies on the

instruction of Chinese RVC have been conducted, based on the frequency-based graded membership of RVC in those official documents. However, the frequency-based criterion of the difficulty level of Chinese RVC has its own inherent weakness (cf. Ellis, 2002). In addition, evidence for prototypicality and its consistency in predicting SLA in prior studies have paved grounds for the current research (Chen & Wang, 2020; Deng, 2019; Liang, 2014). As a result, many scholars (e.g., Liu et al., 2010, X.Zhou, 2013) have suggested that Chinese RVCs should be graded in the lexical syllabus, textbooks and classroom instruction according to a full-fledged notion — Prototype. In the notion of the prototype, various strands of data are included rather than frequency of occurrence alone, so that it can provide the instructors with the more effective subject matter content knowledge of prototype-based graded membership of Chinese RVC.

Previous studies on the RVC acquisition merely centred on one facet of it, to wit lexical form, meaning or syntax based on frequency information from corpus. However, to date, none has taken a systematic view, namely taking lexical form, meaning and syntactic usage as an integration to provide instructors with prototype-based sequencing of Chinese RVC. No study has been conducted to analyze the prototypical RVCs based on Gilquin and McMichael's (2018) convergence evidence of the prototype. Also, Wu (2018), the only scholar to investigate the LP of RVC failed to provide empirical evidence to predict the effects of her findings on prototype-based RVC instruction. These three significant gaps are being addressed in this study. To reiterate, the aim of the study is to develop the prototype-based sequencing of Chinese RVC by employing Gilquin and McMichael's (2018) "convergence criterion of the prototype" framework.

Following the aim of this study, Chinese RVCs need to be first of all well-defined based on the fragmentary statements in the existing literature in Phase I. This was followed

by Phase II in which graded membership of RVC has been analyzed in terms of lexical form, meaning and alternative sentence patterns. In Phase III, the findings on LP, SeP and SyP of RVC are then tested via a quasi-experiment study to examine their predictability in compound identification of RVC and relevant syntactic acquisition.

Furthermore, given the research gaps in previous studies, five research questions were posed in this study. The first research question (Phase I) was "What factors are included in the operational definitions of LP, SeP and SyP of RVC?"; In Phase II, there are two research questions to be addressed, namely RQ2 "What are the suggested prototype-based sequencing of component morphemes, namely V1 and RC of RVC?" and RQ3 "What are the suggested prototype-based hierarchies among alternative 打 -RC-related sentence patterns ?". In Phase III, two research questions are to be answered, to wit, the fourth research question "How can prototype-based component morphemes of RVC explain learners' performance in the instructed L2 learning of RVC?" and RQ 5 "How do integrated roles of LP, SeP and SyP predict learners' performance in the instructed L2 learning of RVC-related syntax?".

In order to accomplish the research aims, the research design and methodology were established based on the integrated theoretical frameworks. In general, a multi-phase exploratory mixed-method research design was adopted to address the research questions mentioned above. It consists of the formulation of definitions of LP, SeP and SyP in Phase I, corpus-based cognitive analyses of LP and SyP in Phase II and testification of findings from Phase II in Phase III. In particular, the Phase I study's focus is on the formulation of tentative and unitary operational definitions of LP, SeP and SyP, on which their prototype-based analyses were built. In Phase II, a convergent design was adopted to investigate LP, SeP and SyP of RVC identified in Phase I, based on Gilquin and McMichael's (2018)

convergence criterion of the prototype. Subsequently, a quasi-experimental design with control group and pretest was adopted in Phase III.

To address research questions 4 and 5, an integrated theoretical framework of compound identification was adopted which consists of PET, DRPM and the positive role of instruction mediated by the prototype in ISLA. In the same vein, another integrated theoretical framework of syntactic acceptability was adopted in which PET, Tripartite Framework of Grammar and the positive role of instruction mediated by prototype in ISLA were combined. In the quasi-experiment phase, 5-point Likert scale L-AJT and S-AJT (Phase III) were utilized to elicit data on learners' performance before and after the prototype-based RVC instruction. More specifically, 42 learners in two intact classes first attended three pretests---CPT, L-AJT and S-AJT, and then underwent the prototype-based RVC instruction based on the findings in Phase II. Lastly, they took two posttests, namely L-AJT and S-AJT. An independent sample t-test was used to examine whether the participants are intermediate level in Chinese proficiency and whether there is a significant difference between the experimental group and the control group in the proficiency levels. On top of it, an MLR test was applied to check the role of prototype-based RVC instruction in lexical and syntactic identification, mediated by LP, SeP and SyP.

Prototype-based hierarchy of V1s and RCs has been derived from corpora-based cognitive analysis on Chinese RVCs in the qualitative phase (Phase II). The findings indicate that the prototype effect can permeate all aspects of vocabulary knowledge of Chinese RVCs, like form, meaning and syntactic context. The most prototypical V1s should be the monosyllabic transitive physical action verbs with high frequency in types and tokens triangulated in different types of corpora and different data sources, like 拿 *na2 "hold"*, 学 *xue2 "learn"*. It also holds true for the prototypical RCs except for the

attributes of the intransitivity and stativity (verb and adjective), such as 完 *wan2 "finish"*, 好 *hao3 "well"*. The most prototypical RVCs should be disyllabic transitive highly frequent object-oriented compounds, like 打死 *da3si3 "beat to death"*, 打开 *da3kai1 "open"*. The most prototypical syntactic context for RVC learning should be transitive constructions like SVO, Ba-C and Bei-C. Moreover, the Prototype Effect also exhibits itself in the polysemous V1 and the semantic orientation of RC.

Besides, findings in the L-AJT (Phase III) reveal that prototypical RC and token frequency of RVC can significantly affect intermediate CFL learners" RVC identification after the prototype-based RVC instruction despite the insignificance of prototypical V1. Additionally, the findings in the S-AJT indicate that SeP and SyP have significant effects on the learners' RVC-related syntactic competence except for the LP of da3-RC. Also, the high residue in the model in the L-AJT and S-AJT has shown that RVC acquisition is a rather complicated process though prototype plays a decisive role in L2 vocabulary acquisition. Just as Ellis (2015) stated, second language acquisition is such a surprisingly complex process that the factors involved are more numerous, like age and learners' proficiency level, psychological factors, social factors, cognitive factors, input and interaction, instruction (explicit and implicit) etc.

As stated in the research design, the prototype-based DRPM is proposed to account for the findings of learners' RVC identification in the quantitative phase (Phase III). The positive effects of prototypical RC and token frequency of RVC, on the one hand, indicate prototype effect. On the other hand, they are in agreement with Pollatsek et al.'s (2000) claim that both the component frequency and whole-word frequency have effects on compound identification. However, prototype-based RVC instruction on syntactic knowledge do not find its role in the syntactic competence.

Finally, mixed findings were yielded centering on the role of prototype-based RVC instruction. In particular, the significant role of explicit prototype-based RVC instruction surrounding the morphological knowledge of RVC was found in RVC identification. Nevertheless, no evidence of prototype-based instruction was found to have a significant effect on syntactic acceptability. To note, these results need to be interpreted with caution. The findings might be explained by the idea that most vocabulary knowledge is explicit while some aspects of vocabulary knowledge may be implicit and learners might not be taught in an explicit way (Loewen, 2020). In other words, insignificance of prototype-based RVC instruction in syntactic competence does not mean to reject the role of instruction. Possibly due to the time limit and pandemic, in future work, more procedural and implicit knowledge is of paramount importance, apart from the declarative knowledge and explicit knowledge involved in the current study.

6.2.2 Implications of the Present Study

This study has both theoretical and pedagogical implications. These implications are: i) providing other researchers with the tentative operational definitions of prototypical RVC for further related studies; ii) providing working hierarchies of prototypical V1s, RCs and syntactic patterns; iii) conducting a teaching experiment to indicate that when choosing RVC in the classroom, the prototypicality of RC, frequency of RVC and instruction should be taken into consideration by instructors before L2 learners acquire the Chinese RVC; and iv) conducting an experiment to indicate that when selecting prototypical sentence to illustrate the usage of RVC, the prototypicality of the polysemous V1, the semantic orientation of RC and sentence patterns should be considered.

6.2.2.1 Theoretical Implications

The first theoretical implication that emerges from the research findings lies in the insight into the notion of prototype and prototype-based criterion of vocabulary selection. In the earlier studies, researchers most relied on intuition to analyze the prototypicality of a linguistic category. Later, frequency of occurrence has been adopted to produce the prototypical words. The more frequent a word is, the easier it will be for vocabulary learning. That is possibly the reason why Milton (2009) claimed that frequency is the agreed-upon criterion of vocabulary selection. However, frequency alone does not account for the successful learning of any particular feature associated with verbs (Littlemore & MacArthur, 2007, 2012). Therefore, Kellerman (1977) suggested that a prototypicality-based approach should be employed to determine the choice of lexicon in that prototypicality has the greatest power to significantly predict learning outcomes. Furthermore, Pauwels (2012) concluded that "sufficiently informative" materials are most effective in terms of the context of vocabulary presentation. The present study has applied a convergent notion of prototypicality that is maximally informative to Chinese RVCs. The result indicates that convergence-based prototypicality is a better indicator to establish verb prototypicality in linguistics and difficulty levels of vocabulary in language acquisition, which bridges the knowledge gap in the previous literature. To put it more simply, the Frequency Effect is a subset of the Prototype Effect.

Second, the present study emphasizes the importance of data triangulation or methodological pluralism in producing verb prototype. Data triangulation is a valid way to obtain data on prototypical lexical categories. It can demonstrate itself in two aspects in the present study—convergence of corpus-based data from different data sources and convergence of corpus-based data and cognitive data. The different strands of data can complement each other, bridging the methodological gap in establishing the RVC

prototype. As an analytic framework to produce prototypical RVC in this study, the noteworthy feature of Gilquin and McMichael's convergence criterion of prototype lies in the data triangulation, including the corpus triangulation and method triangulation. In the corpus triangulation, corpus-based data from different data sources are combined, such as the token frequency of target verbs from the native corpus, learners' corpus and child corpus is integrated with their type frequency in the native corpus. This can be partially explained by the finding of a contrast study (Tardif et al., 1997) that Mandarin speakers used relatively more verb tokens and verb types. Littlemore and Macarthur (2012) stated that neither the corpus nor the intuitive data can provide a perfect representation of "general usage". Their statement can account for the method triangulation, namely the convergence of corpus-based data and cognitive data.

Third, the present study stresses the significance of combining theoretical analysis with pedagogical testification for theory construction. The current research adopts a mixed-method research design which integrates the corpus-based cognitive analysis of RVC in the qualitative phase with the quantitative testification of the qualitative findings in a quasi-experimental phase. This design bridges the methodological gap in the previous study of TCSOL. According to Ma et al.'s (2017) statistics, only a small number of studies have been conducted using the mixed methods design. Thus, the convergence of qualitative data and quantitative data is necessary in a teaching experiment. Its necessity can find its reason in Tao's (2016) statement that truly convincing findings should find their supporting evidence in applications like language teaching. "Without actively engaging in explorations of possibilities, it would be difficult to see potentials of theory for application (p.xiii)".

Fourth, from the qualitative analyses of prototypical RVC and supporting evidence in quasi-experiment research, this study puts forward four generalized principles to identify the prototype of a lexical category. They are Frequency Principle (FP), Transitive Principle (TP), Morphological Simplicity Principle (MP) and Interaction Principle (IP), which can provide a theoretical underpinning for establishing verb prototype.

FP occupies the chart-topping place among the four principles due to the fact that frequency is the backbone of the notion of prototypicality. Prototype Effect, to some extent, might be explained by frequency effect. Findings in this research indicate that frequency information to obtain prototypical members should consist of at least token frequency and type frequency in multi-corpora for the sake of validity. Osborne (2001) argued that "corpus data not only increases the chances of learners being confronted with relatively infrequent instances of language use, but also of their being able to see in what way such uses are atypical, in what contexts they do appear, and how they fit in with the pattern of more prototypical uses (p.481)". The use of multi-corpora can be supported by Meunier (2002) and Xu and Zhang (2020). Meunier (2002) asserted that frequency information obtained from native speaker corpora alone is not sufficient to inform curriculum and materials design. Xu and Zhang (2020) claimed that if a learner relies solely on one source alone, he or she may not be able to successfully acquire compound.

In TP, transitiveness is another important concept to account for the prototypicality. In traditional grammar, the dichotomy of transitiveness is always adopted to classify the category of action verbs. The fact seems to be that transitive and intransitive are two extremes of a continuum, inter-mediated by labile verbs between them (Zhang, 2019). Also, transitiveness can be applied to account for the prototypicality of syntactic construction.

Highly Transitive sentences along the scale of transitivity such as SVO, Ba-C and Bei-C are more likely to be accepted than less transitive sentences like CVC and PSC.

MP indicates that the most prototypical lexical item should be the morphologically simplest form. It follows that vocabulary learning should start from a simple morphological form. As quoted in Siegel (2004), "The notion of simplicity in language and language description has been a perennial issue in linguistics as in other disciplines (Furguson & Dil, 1971, p.144)". Hopper and Traugott (cf. Laufer, 1997) have treated simplicity from derivational morphology on a separate cline which goes from lexical items on the left to the compound on the right. In Monosyllabic Myth, it has been suggested that teaching starts with highly productive morphemes, analyzing their meanings and showing how they combine to form words to consolidate lexical knowledge and expand vocabulary size (Romagnoli, 2017). The linguistic label of basic-level concepts tends to be morphologically simple (Pütz & Niemeier, 2001; Ungerer & Schmid, 1996).

IP refers to the interaction among different interfaces of a linguistic category, like form, meaning and syntax as well as the interaction among different influencing factors. The interaction among form, meaning and syntax is derived from the findings in this study that syntactic acceptability of RVC is a function of SeP and SyP of RC, in line with the spirit implied in Tripartite Framework and Bootstrapping Effects. The interaction among different influencing factors originates from prototype-based analyses of RVC. It has been echoed in Goldschneider and DeKeyser's (2001) argument that frequency explains some of the variance of language, and it does so in interaction with other determinants such as perceptual salience, semantic complexity, morphophonological regularity, and syntactic category.

6.2.2.2 **Implications for TCSOL**

Apart from the theoretical implications mentioned above, the findings in the present study have contributed to the TCSOL. These contributions are (i) bridging the empirical gap on the prototype-based sequencing of LP and SyP of RVC; (ii) stressing the importance of morpheme awareness in TCSOL; (iii) highlighting the role of prototype-based input in TCSOL; (iv) reminding L2 instructor of the potential of corpora in classroom practice; (v) following the four-step developmental path of RVC in the prototype-based RVC instruction. Thus, some pedagogical implications are required to be present, depending on the study's findings.

First, the present study contributes to the prototype-based analysis of RVC in terms of LP, SeP and SyP, bridging the empirical gap of prototype-based sequencing of Chinese RVC in the previous studies. Thus, the initial point that merits attention is that TCSOL instructors, as well as textbook writers and syllabus designers, should acquaint themselves with the prototypical vocabulary knowledge of RVCs and related sentence patterns before introducing the notion of the prototype into the TCSOL classroom, textbook and lexical syllabus. This knowledge consists of syllabicity, transitivity, frequency information etc., together with functional ones like the semantic prototype of morphemes and the role of prototypicality in language acquisition and instruction. As stated by Tao (2016), "Language teaching practitioners often encounter teaching and learning issues that are not readily addressed by theoretical linguistics research and find themselves in need of enriching their knowledge about the language for a better-informed pedagogy (p.xiii)". With this knowledge, teachers can teach RVC systematically and sequentially from the most prototypical RVC and components to the least prototypical ones. For example, when the V1s of RVC are introduced by teachers to learners of Chinese as a foreign language, for beginner level learners, they should start from the most prototypical V1s such as 拿 *na2*

"hold"，坐 *zuo4 'sit'* etc., followed by less prototypical V1s like 打 *da3 "beat"*，弄 *nong4 "make".*

Second, the inclusion of corpus triangulation into the prototype construct in the present study reminds L2 instructors of the potential of corpora which is conducive to language teaching and learning, syllabus design and lexicography (Hunston, 2002; Leech,1998/2014). Frequency information from native speaker corpus alone such as BCC in Chinese, is not sufficient to inform the prototypical members, curriculum and material design (Meunier, 2002). Thus, various corpora from different types of learners or corpus triangulation are needed, such as the HSK corpus, Child corpus etc., adopted in this study. The advantage or strength of using corpora has been summarized in McEnery and Xiao (2004) and Glynn (2016): i) it gathers the intuition of a great number of speakers and makes the data more objective and valid; ii). it allows lexicographers and language teachers to extract prototypical illustrative examples of the usage of RVC; iii). it can readily provide frequency information, a basic part in the full-fledged notion of prototypicality and collocation information to define the prototypical vocabulary to help learners of different modern languages; iv). it enables a more sensible grouping of words that are polysemous.

Third, the present study quantitatively reiterates the importance of morpheme awareness in TCSOL, including compound awareness and radical awareness, in compound learning for intermediate CSL/CFL learners. In the prototype-based DRPM of this study, the prototypicality of RC and token frequency of RVC were found to significantly affect RVC identification. The qualitative analyses of component morphemes of RVC indicate that the prototypicality of V1 is in association with body parts, such as 拿 *na2 "hold"* in the list of the most prototypical V1s, 打 *da3 "beat"*, 提 *ti2 "lift"*, 搞 *gao3 "make"*, 投

tou2 "throw" among the less prototypical V1 and 撞 *zhuang4 "bump"*, 推 *tui1 "push"*, 捏 *nie1 "squeeze"*, 拉 *la1 "pull"*, 找 *zhao3 "look for"*, 抹 *mo3 "apply"* etc. within the least prototypical V1. All these physical action verbs share the same radical "扌'hand'", indicating hand. Therefore, when teaching V1s, instructors should intentionally design activities, such as guessing methods(as illustrated in 6.1) or compounding methods(as shown in 6.2) (Xing 2006), so that learners can be aware of the relationship between radical indicating body-part and prototypical V1s. In addition, when selecting RVCs to illustrate the usage of V1 or RC, the prototypicality of RC and token frequency of RVC should be within their consideration, since compound awareness serves as a guiding principle for comprehending and producing compound words (Chen et al., 2008).

(6.1)

Radical	Phonetic	Character	English meaning
口*"mouth"*	+乞	= 吃	"eat with mouth"
扌"hand"	+丁	= 打	"beat with hand"
足 "foot"	+易	= 踢	"kick with foot"
心 "mind"	+相	=想	"think in mind"

(6.2) 打__ 打碎 打下 打胜 打完

Besides, prototype-based analysis of alternative sentences licensed by RVC and the positive effect of SyP on the syntactic acceptability in this study solved the problem in the illustrative example that most teachers and textbook writers relied on the teaching experience or intuition to provide illustrative examples (Zhang, 2008). This finding provides CFL instructors with supporting evidence for the suggestion that prototypical illustrative sentences should be presented to CFL learners first when RVCs are taught. Gan

(2010) has concluded that intermediate-level CSL/CFL learners, have commenced realizing the importance of syntactic categories for lexical learning and most of the learners prefer to make use of the syntactic categories to learn the new word. Prototypical sentence patterns can offer a prototypical context for language learners to decode and practice syntactic functions and semantics of vocabulary. According to Xing (2006), prototype-based sentencing should be a straightforward exercise to learn new RVC. To note, based on the findings in this study, SyP is a function of transitivity, semantic prosody and semantic orientation of RVC.

Furthermore, in view of the facilitative role of prototype-based RVC instruction, the present study attaches importance to the presentation of prototype-based input in teaching RVC. Strong arguments for the role of input in L2 acquisition state that L2 acquisition relies on the quality of available input (Ellis & Collins, 2009) and corpus linguists argue that second language or foreign language learning is a process of learning explicit knowledge with awareness which requires a great deal of exposure to language data. Based on the findings in this study, form-meaning and/or form-function mappings that occur most prototypically are argued to be presented and taught first. Thus, one way of classifying RVC in the classroom is based on the degree of their prototype: from most prototypical form-meaning mapping to the least one with increasingly more explicit techniques like controlled focused exercises, and the presentation and discussion of metalinguistic rules (Smith, 1993).

Finally, according to the item-based or exemplar-based path proposed in Usage-based effect for learning a second language assumed, the developmental sequence, whether L1 or L2 is from un-analyzable formulas or exemplar through low-scope pattern to full or high productive schematic pattern (Ellis, 2002). These predictions are strongly linked with

other researchers, like Zhang (2014). Zhang (2014) proposed a three-phase acquisition pattern of RVCs from non-compositional world-word formula processing through weak compound awareness and morphological process to solidified development of lexical knowledge and mature understanding of the compositionality of RVC. Taking findings in the previous studies, like the Usage-based effect and three-phase acquisition pattern of RVCs by Zhang (2014), and findings in the present study together, a four-phase development path of RVC was proposed. As shown in Figure 5.1, it consists of an exemplar phase for beginner-level learners, a low-scope phase and medium-scope phase for intermediate-level learners and a full-scope phase for advanced learners. In each phase, the prototype acts as a seed for the growth of RVC.

6.3 Limitations and Recommendations

Since prototypicality per se is a prototypical concept and due to the nature of the quasi-experimental research method adopted in Phase III, the present study has some limitations, though it has produced some intriguing and exhilarating findings.

First, as regards the conceptualization of prototypicality, in this study, a list of factors that potentially play a critical role in the prototypicality of Chinese RVCs have been introduced and measured, namely semantic criteria, morphological criteria and syntactic criteria. However, if factors subsumed under the framework are competing, a decision has to be made on whether the factors are equally weighted or whether some factors are more important than others in determining the prototype, as admitted by Gilquin and McMichael(2018). Moreover, it has to be admitted that a multi-faceted concept of prototypicality has the obvious advantage of accommodating several types of empirical evidence. Thus, it can give more substance to the notion of a prototype, which possibly accounts for the reason why triangulating data were used to establish prototypicality. As

stated by Gilquin (2008), theoretically speaking, the more exhaustive the list is, the more prototypical the item will be. Therefore, in future studies, more factors should be considered. These factors cover the influence of F1, polysemy of RC, semantic transparency of RVC, the interface among lexicon, semantics and syntax, and specific mechanisms on how L2 learners make use of prototype as a lexical, semantic and syntactic cue to facilitate the learning of Chinese RVCs etc.

Second, the prototype-based sequencing of V1s and RCs has been produced by investigating 460 target V1s from CDVU and 312 target RCs from the BCC corpus. It should be noted that the sequencing of prototype-based V1s and RCs in this study is a representative but not exhaustive list of component morphemes of prototypical RVC. In addition, the list of 打 *da3-RC* is only used in the present study as an instrument and example to investigate the effect of prototype-based instruction on learners" performance in S-AJT. In future studies, more V1s, RCs and RVCs should be covered to generalize the findings in this study.

Third, due to the pandemic, data on the intuition-based prototypicality were collected from only those CSL/CFL learners who volunteered to participate in the study, which possibly does not represent the totality of CSL/CFL learners. The frequent V1s and RCs in the child language were extracted from the RVCs adduced in the literature retrieved from the internet, which may not be representative of the whole child language. There are numerous Chinese child corpora, such as the Corpus of Spoken Language for Chinese Preschool children in Singapore (Zhao & Liu, 2008), Chinese Children (2-6) Natural Everyday Conversation Corpus designed by Nanjing Normal University (Ji, 2006). Moreover, Mandarin Corpus on the Dynamic Development of Children designed by Capital Normal University (Zhang & Xu, 2021), Chinese Children's lexicon of oral words

by Central China Normal University (Li, et al., 2023), Chinese children multi-modal Language corpus by Linyi University (Xie & Zhang, 2017) are among the list. However, most of these corpora are not made public on the one hand and cannot meet the specific requirement of investigating RVC on the other hand. Thus, in future studies, more participants and corpora available can be implemented to further foster the validity of the findings.

Fourth, the study was conducted during the COVID-19 pandemic, which may have affected the results of the quasi-experimental phase (Phase III) due to the unique circumstances of remote learning. In addition, the small sample size in Phase III is another limitation. As stated by Farber and Fonseca (2014, p27), "too small a sample may prevent the findings from being extrapolated and using a sample smaller than the ideal increases the chance of assuming as true a false premise." It is highly likely that the results will be affected by the Type-II errors. Besides, Phase III only included learners with intermediate proficiency levels in two intact classes from a local national se school in Malaysia. They may not be representative of other CSL/CFL learning contexts. The smaller sample size, the differences of participants' background, the purposive sampling method and quasi-experimental design may post risk on the outcome of the study and limit the generalizability and internal validity of the findings to other institutions and proficiency levels. More evidence from ideal sample size and other research analysis, such as weighted treatment of sample size or non-parametric test might provide a more complete and consistent picture of the developmental path of Chinese RVCs in the classroom.

Fifth, there are numerous different types of Chinese corpus while the corpora employed in this study are those which are made public and researchers have access to. In future work, some other different types of corpora can be used to verify the findings

obtained in this study. To illustrate, the CCL corpus of Peking University, LIVAC corpus of City University of Hong Kong, Lancaster Chinese corpus, the parallel corpus by the State Language Commission, Sinica Corpus by Academia Sinica of Taiwan etc. are available.

Finally, based on the prototype-based sequencing of V1s and RCs, a further study with more focus on the compilation of the dictionary of RVC collocation is therefore suggested. According to Xia (2015), collocation can be classified into grammatical collocation, semantic collocation and lexical collocation. RVC is a V-V collocation. They vary between patterns that are fully decomposable (e.g., 吃饱 *chi1bao3 "eat-full"*) and patterns that involve different degrees of figurative interpretation of one of the component words (e.g., 吃上饭 *chi1shang4fan4 "have dinner to eat"*). Previous studies on dictionary use (e.g., Atkins & Varantola, 1997; He, 2008) suggest that L2 learners are more apt to turn to the dictionary for collocational information when coming across less prototypical compounds. However, only one specific learner dictionary on RVC collocation has been edited by Wang et al. (1987). Unsatisfactorily, RVCs in Wang et al.'s dictionary were ordered according to their frequency of occurrence in the corpus rather than prototypicality.

6.4 Summary

In this section, findings obtained in present study have been summarized, such as the unitary definitions of prototypical RVC in terms of lexical form, meaning and syntax, the prototype-based sequencing of V1 and RCs, prototypical sentence pattern of RVC as well as the role of the prototype in compound identification and inter-dependency of prototypical form, meaning and syntax in syntactic competence. According to those findings, in theory the prototype-based dual route processing model and tripartite model

for RVC learning were proposed. Besides, four principles have been put forward to identify the verb prototype. In TCSOL, it should be highlighted that the teaching material of Chinese RVC can be designed and introduced based on the prototype-based sequencing of RVC. However, the present study was not without limitations like conceptualization of prototypicality in Gilquin and McMichael's (2018) framework, the smaller sample size of participants in quasi-experimental phase, understanding of less prototypical PSC as well as the pandemic influence and accessible corpus. Thus, more future work is required to gain a more accurate and consistent picture of prototypical Chinese RVC.

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APPENDICES

Appendix A: Journal Publications

1. **Zhang, Y. F**., Pandian, A. (2021). 汉语动结式习得研究综述[Literature review on the acquisition of Chinese resultative verb compounds]. *高等教育前沿*[Advances in Higher Education], *4*(8), 41-43.

2. **Zhang, Y. F**., Pandian, A., Soo, R. S. (2023). Effect of prototypicality and dual route processing modal on instructed second language acquisition of Chinese resultative verb compounds. *Global Chinese*, *9*(2) , 231-256.

Appendix B: Stimuli V1s: Monosyllabic Verbs in CDVU (460)

弄 nong4 “make”	变 bian4 “change”	打 da3 “beat”	搞 gao3 “make”
看 kan4 “look”	说 shuo1 “say”	转 zhuan3 “turn”	写 xie3“write”
笑 xiao4 “smile”	压 ya1 “press”	唱 chang4 “sing”	睡 shui4 “sleep”
跑 pao3 “run”	挤 ji3 “squeeze”	叫 jiao4 “cry”	玩 wan2 “play”
磨 mo2 “grind”	开 kai1 “open”	走 zou3 “walk”	吹 chui1 “blow”
冲 chong1 “flush”	踢 ti1 “kick”	闹 nao4 “disturb”	踩 cai3 “stamp”
穿 chuan1 “wear”	咬 yao3 “bite”	撞 zhuang4 “bump”	热 re4 “hot”
读 du2 “read”	洗 xi3 “wash”	推 tui1 “push”	刮 gua1 “scrape”
画 hua4 “draw”	捏 nie1 “pinch”	刷 shua1 “brush”	坐 zuo4 “sit”
拖 tuo1 “pull”	摔 shuai1 “fall off”	买 mai3 “buy”	累 lei4 “tired”
摇 yao2 “shake”	吓 xia4 “frighten”	惊 jing1 “surprise”	挖 wa1 “scoop”
拍 pai1 “pat”	骂 ma4 “scold”	敲 qiao1 “knock”	砸 za2 “pound”
扯 che3 “pull”	摸 mo1 “feel”	碰 peng4 “touch”	气 qi4 “irritate”
挑 tiao1 “pick”	练 lian4 “practise”	带 dai4 “take”	逼 bi1 “force”
挂 gua4 “hang”	烫 tang4 “scald”	扭 niu3 “twist”	想 xiang3 “think”
拉 la1 “pull”	踏 ta4 “stamp”	跳 tiao4“jump”	拿 na2 “take”

考 kao3 “test”	吸 xi1 “absorb”	排 pai2 “arrange”	弹 tan2 “play”
问 wen4“ask”	学 xue2 “learn”	调 diao4/tiao2 “adjust”	夹 jia1 “clip”
收 shou1 “collect”	砍 kan3 “cut”	扣 kou4 “button”	卖 mai4 “sell”
疼 teng2 “ache”	揉 rou2 “knead”	找 zhao3 “look for”	炒 chao3 “fry”
扫 sao3 “sweep”	抄 chao1 “copy”	输 shu1 “lose”	加 jia1 “add”
抹 mo3 “apply”	讲 jiang3 “speak”	换 huan4 “change”	哭 ku1 “cry”
搅 jiao3 “stir”	追 zhui1“chase”	听 ting1 “listen”	点 dian3 “point”
喝 he1 “drink”	拨 bo1 “dial”	贴 tie1 “paste”	抢 qiang3 “rob”
喂 wei4 “feed”	吵 chao3 “noise”	抱 bao4 “embrace”	炸 zha2 “explode”
谈 tan2 “discuss”	拧 ning3 “twist”	煮 zhu3 “boil”	扎 zha1 “prick”
划 hua2 “row”	抹 mo3 “apply”	背 bei4 “recite”	烧 shao1 “burn”
烤 kao3 “toast”	减 jian3 “subtract”	熬 ao2 “stew”	堵 du3 “block”
饿 e4 “hungry”	接 jie1 “pick up”	投 tou2 “throw”	催 cui1 “urge”
提 ti2 “lift”	修 xiu1 “fix”	吻 wen3 “kiss”	抓 zhua1 “seize”
喷 pen1 “spurt”	翻 fan1 “turn”	拼 pin1 “put together”	使 shi3 “use”
送 song4 “send”	等 deng3 “wait”	放 fang4 “put”	抽 chou1 “shrink”
扑 pu1 “attack”	剪 jian3 “cut”	记 ji4 “remember”	选 xuan3 “select”
涂 tu2 “paint”	管 guan3 “manage”	传 chuan2 “pass”	卷 juan3 “roll”

发 fa1 “send”
游 you2 “travel”
塞 sai1 “block”
缩 suo1 “shrink”

抛 pao1 “throw”
留 liu2 “leave”
浇 jiao1 “water”
拆 chai1“dismantle”

捧 peng3 “hold”
割 ge1 “cut”
铲 chan3 “shovel”
流 liu1 “flow”

改 gai3 “correct”
爬 pa2 “crawl”
停 ting2 s “stop”
磕 ke1 “knock”

喊 han3 “shout”
过 guo4 “live”
填 tian2 “fill”
倒 dao4 “fill”

戴 dai4 “wear”
扔 reng1 “throw”
擦 ca1 “wipe”
铺 pu1 “pave”

订 ding4 “revise”
混 hun4 “mix”
淋 lin2 “pour”
搭 da1 “put up”

顶 ding3 “jack”
捅 tong3 “poke”
退 tui4 “quit”
逃 tao2 “flee”

滚 gun3 “roll”
搓 cuo1 “twist”
赚 zhuan4 “earn”
染 ran3 “dye”

演 yan3 “perform”
跪 gui4 “kneel”
缠 chan2 “wind”
捞 lao1 “take out”

淹 yan1 “drown”
掐 qia1 “pinch”
拔 bo1 “finger”
躺 tang3 “lie”

包 bao1 “wrap”
插 cha1 “insert”
吃 chi1 “eat”
泡 pao4 “submerge”

摆 bai3 “put out”
撕 si1 “tear”
梳 shu1 “comb”
装 zhuang1 “install”

念 nian4 “read”
脱 tuo1 “take off”
捉 zhuo1 “catch”
撒 sa3 “spill”

训 xun4 “train”
逛 guang4 “ramble”
印 yin4 “print”
捂 wu3 “cover”

蹲 dun1 “squat”
抬 tai2 “raise”
掏 tao1 “draw”
凿 zao2 “dig”

做 zuo4 “do”
关 guan1 “close”
冻 dong4 “freeze”
解 jie3 “untie”

垫 dian4 “spread”
射 she4 “shoot”
搁 ge1 “put”
对 dui4 “check”

掉 diao4 “drop” 跟 gen1 “follow” 围 wei2 “surround” 花 hua1 “spend”

举 jv3 “put up” 碾 nian3 “grind” 用 yong4 “use” 治 zhi4 “cure”

给 gei3 “give” 搬 ban1 “move” 理 li3 “crop” 晕 yun1 “faint”

剥 bo1 “peel” 捻 nian3 “twist with finger” 逗 dou4 “tease” 绕 rao4 “circle”

摊 tan1 “spread” 砌 qi4 “build” 渗 shen4 “seep” 飞 fei1 “fly”

靠 kao4 “lean” 配 pei4 “match” 站 zhan4 “stand” 晒 shai4 “bask”

掀 xian1 “lift” 套 tao4 “hitch” 灭 mie4 “put out” 当 dang1 “work as”

回 hui2 “return” 编 bian1 “weave” 长 zhang3 “grow” 照 zhao4 “shine”

办 ban4 “deal with” 煎 jian1 “fry” 掘 jue2 “dig” 牵 qian1 “pull”

洒 sa3 “sprinkle” 埋 mai2 “bury” 锁 suo3 “lock” 蹦 beng1 “jump”

揭 jie1 “uncover” 批 pi1 “criticize 挪 nuo2 “move” 拐 gua3 “steal”

寄 ji4 “mail” 钻 zuan1 “drill” 救 jiu4 “help” 栽 zai1 “plant”

撤 che4 “withdraw” 惹 re3 “offend” 锯 jv4 “saw” 数 shi3 “count”

借 jie4 “borrow” 蒸 zheng1 “steam” 舔 tian3 “lick” 养 yang3 “feed”

赶 gan3 “expel” 运 yun4 “transport” 轧 ya4 “run over” 查 cha2 “check”

弯 wan1 “bend” 绑 bang3 “tie” 存 cun2 “deposit” 讨 tao3 “beg”

动 dong4 “move” 生 sheng1 “bear” 干 gan4 “do” 闻 wen2 “smell”

化 hua4 “melt” 端 duan1 “carry” 握 wo4 “hold” 算 suan4 “computer”

托 tuo1 “support”	淘 tao2 “wash”	泼 po1 “splash”	杀 sha1 “kill”
裂 lie4 “split”	掰 bai1 “break off”	搂 lou3 “embrace”	盖 gai4 “build”
盯 ding1 “stare”	赔 pei2 “compensate”	落 luo4 “fall	上 shang4 “go up”
签 qian1 “sign”	认 ren4 “know”	登 deng1 “climb”	捡 jian3 “pick”
补 bu3 “pick”	骑 qi2 “ride”	抠 kou1 “pick”	丢 diu1 “lose”
挠 nao2 “scratch”	嚼 jiao2 “chew”	交 jiao1 “hand in”	摘 zhai1 “pick”
腾 teng2“make”	趴 pa1 “bend over”	卸 xie4 “unload”	探 tan4 “explore”
哄 hong3 “coax”	劝 quan4 “persuade”	出 chu1 “go out”	漏 lou4 “leak”
扶 fu2 “help”	顺 shun4 “follow”	叠 die2 “overlap”	糊 hu1 “paste”
骗 pian4 “cheat”	冒 mao4 “emit”	堆 dui1 “pile”	猜 cai1 “guess”
啃 ken3 “bite”	披 pi1 “wrap”	沾 zhan1 “touch”	迈 mai4 “stride”
伸 shen1 “stretch”	撬 qiao4 “pry”	去 qu4 “go”	裁 cai1 “cut”
剁 duo4“chop”	绣 xiu4 “embroider”	比 bi3 “compare”	采 cai3 “pick”
滴 di1 “drip”	吐 tu3 “emit”	漂 piao1 “float”	愁 chou2 “worry”
活 huo2 “live”	躲 duo3“hide”	捆 kun3 “tie”	陪 pei2 “accompany”
教 jiao1 “teach”	夺 duo2 “grab”	裹 guo3“wrap around”	拦 lan2 “lock”
挨 ai2 “endure”	扛 kang2 “carry”	派 pai4 “send”	添 tian1 “lick”
试 shi4 “try”	褪 tui4 “discolor”	切 qie1 “cut”	乘 cheng2 “take”

织 zhi1 “weave”	拌 ban4 “stir”	闭 bi4 “close”	藏 cang2 “hide”
缴 jiao3 “pay”	描 miao2 “describe”	偷 tou1 “steal”	升 sheng1 “ascend”
炼 lian4 “smelt”	逮 dai3 “catch”	审 shen3 “examine”	剔 ti4 “pick”
钓 diao4“fish”	测 ce4 “measure”	立 li4 “erect”	剃 ti4 “shave”
受 shou4 “endure”	跌 die1 “fall down”	撵 nian3 “chase”	差 cha4 “differ”
罚 fa2 “fine”	晾 liang4 “air”	忘 wang4 “forget”	望 wang4 “look”
嚷 rang3 “shout”	锄 chu2 “hoe”	夸 kua1 “praise”	守 shou3 “defend”
种 zhong4 “plant”	招 zhao1 “attract”	捣 dao3 “pound”	评 ping2 “assess”
递 di4 “pass”	吞 tun1 “swallow”	耕 geng1 “plough”	拾 shi2 “pick”
住 zhu4 “live”	指 zhi3 “point”	租 zu1 “rent”	凑 cou4 “assemble”
称 cheng1 “weigh”	铡 zha2 “cut”	缝 feng2 “sew”	献 xian4 “offer”
锈 xiu4 “rust”	串 chuan4 “string”	拴 shuan1 “tie”	合 he2 “close”
斗 dou4 “fight”	谢 xie4 “thank”	戒 jie4 “avoid”	赏 shang3 “reward”
闯 chuang3	取 qu3 “get”	死 si3 “die”	尝 chang2 “taste”
咽 yan4 “swallow”	盛 cheng2 “fill”	敬 jing4 “respect”	扇 shan1 “fan”
涮 shuan4 “rinse”	造 zao4 “make”	分 fen1 “separate”	作 zuo4 “do”
下 xia4 “get off”	安 an1 “install”	宰 zai3 “kill”	驮 tuo2 “carry”
掸 dan3 “dust”	挡 dang3 “block”	让 rang4 “make”	除 chu2“rid”

起 qi3 “rise”　量 liang2 “measure”　请 qing3 “invite”　蘸 zhan4 “dip”

噎 ye1 “choke”　捎 shao1 “bring”　定 ding4 “decide”　筛 shai1 “sift”

腌 yan1 “pickle”　通 tong1 “unstop”　遇 yu4 “meet”　邮 you2 “mail”

渴 ke3 “thirst”　沏 qi1 “make”　瞒 man2 “cheat”　要 yao4 “want”

叮 ding1 “sting”　澄 cheng2 “purify”　赊 she1 “buy on credit”　赛 sai4 “match”

还 huan2 “return”　防 fang2 “defend”　删 shan1 “delete”　帮 bang1 “help”

避 bi4 “avoid”　着 zhao2 “ignite”　破 po4 “break”　害 hai4 “harm”

松 song1 “loosen”　亲 qin1 “love”　紧 jin3 “fasten”　响 xiang3 “sound”

够 gou4 “touch”　怪 guai4 “blame”　耪 pang3 “hoe”

Appendix C: Stimuli of RCs (312)

乐 le4 “happy”	完 wan2 “finish”	出 chu1 “go out”	好 hao3 “well”
成 cheng2”become”	到 dao4 “arrive”	死 si3 “die”	多 duo1 “much”
入 ru4 “into”	满 man3 “full”	回 hui2 “back”	进 jin4 “enter”
错 cuo4 “wrong”	掉 diao4 “drop”	坏 huai4 “bad”	累 lei4 “tired”
够 gou4 “enough”	尽 jin4 “exhaust”	破 po4 “broken”	足 zu2 “enough”
光 guang1 “over”	没 mei2 “none”	左 zuo3 “left”	大 da4 “big”
住 zhu4 “stop”	下 xia4 “down”	定 ding4 “determined”	紧 jin3 “tense”
断 duan4 “broken”	开 kai1 “open”	倒 dao3 “collapse”	走 zou3 “walk”
对 dui4 “right”	翻 fan1 “overturn”	少 shao3 “less”	烂 lan4 “rotten”
落 luo4 “fall”	红 hong2 “red”	齐 qi2 “level”	高 gao1 “high”
透 tou4 “through”	爆 bao4 “explode”	散 san3 “scatter”	久 jiu3 “long time”
遍 bian4“all over”	平 ping2 “even”	碎 sui4 “crash”	上 shang4 “up”
准 zhun3 “accurate”	空 kong1 “empty”	净 jing4 “clean”	近 jin4 “near”
乱 luan4“messy”	伤 shang1 “hurt”	傻 sha3 “silly”	歪 wai1 “askew”
清 qing1 “clear”	醒 xing3 “awake”	痛 tong4 “hurt”	正 zheng4 “straight”
动 dong4 “move”	干 gan1 “dry”	低 di1 “low”	活 huo2 “alive”
疼 teng2 “ache”	疯 feng1 “crazy”	早 zao3 “early”	惯 guan4 “habitual”
全 quan2 “complete”	去 qu4 “go”	快 kuai4 “quick”	晕 yun1 “dizzy”
起 qi3 “rise”	实 shi2 “solid”	直 zhi2 “straight”	离 li2 “separate”

远 yuan3 “far”　小 xiao3“small”　急 ji2 “urgent”　惨 can3 “misery”

稳 wen3“steady”　通 tong1 “through”　妥 tuo3 “ready”　丢 diu1 “lost”

哭 ku1 “cry”　穿 chuan1 “through”　反 fan3 “opposite”　跑 pao3 “run”

熟 shu/shou2 “cooked”牢 lao2 “solid”　晚 wan3 “late”　白 bai2 “white”

飞 fei1 “fly”　烦 fan2 “annoyed”　偏 pian1 “partial”　深 shen1 “deep”

怕 pa4 “afraid”　热 re4 “hot”　长 chang2 “long”　黑 hei1 “black”

湿 shi1 “wet”　劈 pi1“split”　灭 mie4 “put out”　罢 ba4 “stop”

重 zhong4/chong2 “heavy/overlap”　响 xiang3 “loud”　松 song4 “loose”

昏 hun1 “dim”　细 xi4 “thin”　残 can2 “disable”　慢 man4“slow”

软 ruan3 “soft”　漏 lou4 “leaky”　裂 lie4 “split”　肿 zhong3 “swollen”

折 she2 “broken”　毁 hui3 “ruin”　瞎 xia1 “blind”　匀 yun2“even”

顺 shun4 “smooth”　饱 bao3 “full”　短 duan3 “short”　脱 tuo1 “come off”

酸 suan1”sour”　老 lao3 “old”　瘦 shou4 “thin”　退 tui4 “retreat”

黄 huang2 “yellow”　迟 chi2 “late”　扁 bian3 “flat”　吐 tu4 “emit”

剩 sheng4 “left”　脏 zang1 “dirty”　塌 ta1 “collapse”　冷 leng3“cold”

失 shi1 “lost”　腻 ni4 “greasy”　弯 wan1 “bend”　硬 ying4“hard”

严 yan2 “strict”　青 qing1 “blue”　薄 bo/bao2 “thin”　穷 qiong2“poor”

跌 die1 “fall”　差 cha4 “bad”　饿 e4 “hungry”　化 hua4 “melt”

轻 qing1 “light”　厚 hou4 “thick”　麻 ma2 “numb”　凉 liang2 “cool”

醉 zui4 “drunken”　熄 xi1 “put out”　绿 lv4 “green”　暖 nuan3 “warm”

圆 yuan2” round”　赢 ying2 “win”　臭 chou4 “smelly”　淡 dan4 “light”

停 ting2 “stop”　炸 zha4 “explode”　合 he2 “close”　蒙 meng1“blind”

输 shu1 “lose” 肥 fei2 “fat” 宽 kuan1 “wide” 垮 kua3 “collapse

斜 xie2 “askew” 瘪 bie3 “shrivelled” 苦 ku3 “bitter” 美 mei3 “beautiful”

糊 hu2 “overcook” 狠 hen3 “ruthless” 败 bai4 “fail” 沉 chen2 “sink”

僵 jiang1 “stiff” 崩 beng1 “collapse” 混 hun2 “mix” 废 fei4“disable”

会 hui4 “understand” 笑 xiao4 “smile” 困 kun4 “trapped” 糟 zao1“bad”

粗 cu1 “rough” 来 lai2 “come” 杀 sha1 “kill” 呆 dai1“dull”

火 huo3 “prosperous” 浅 qian3 “shallow” 皱 zhou4 “wrinkled” 强 qiang2 “strong”

睡 shui4 “sleep” 旧 jiu4 “old” 胖 pang4 “fat” 焦 jiao1 “scorched”

拢 long3 “together” 毙 bi4 “die” 暗 an4 “dark” 慌 huang1” flurried”

哑 ya3 “dumb” 尖 jian1“pointed” 砸 za2 “smash” 趴 pa1 “bend over”

懂 dong3“understand”结 jie2 “knot” 忘 wang4 “forget” 明 ming2 “bright”

虚 xu1 “empty” 浓 nong2 “thick” 闷 meng4 “blind” 稀 xi1“rare”

紫 zi3 “purple” 瘫 tan1 “paralyse” 秃 tu1“bare” 精 jing1“conversant”

挂 gua4 “die” 旺 wang4 “flourish” 缓 huan3 “slowly” 亏 kui1“deficient

暴 bao4 “savage” 窄 zhai3 “narrow” 猛 meng3 “suddenly” 分 fen1 “separate”

贵 gui4 “expensive” 见 jian4“see” 迷 mi2 “confused” 弱 ruo4“weak

神 shen2 “divine” 丑 chou3 “ugly” 滥 lan4 “excessive” 矮 ai3 “low”

缩 suo1 “shrink” 胀 zhang4 “swollen” 酥 su1 “crispy” 新 xin1“new”

除 chu2 “rid” 香 xiang1 “fragrant” 笨 ben4 “stubborn” 野 ye3“wild”

涨 zhang3 “go up” 跪 gui4 “kneel”着 zhao2 “succeed in doing”难 nan2“difficult”

转 zhuan4 “turn” 渴 ke3 “thirsty” 杂 za2 “irregular” 密 mi4 “dense”

卷 juan3“roll” 倦 juan4 “tired” 陷 xian4 “sink” 岔 cha4 “diverge”

蠢 chun3 “stupid” 抽 chou1 “shrink” 服 fu2 “convinced 升 sheng1 “ascend”

露 lou4 “leak” 乏 fa2 “tired” 串 chuan4 “mixed up”煞 sha4 “extremely”

噎 ye1 “choke” 为 wei2“become” 忙 mang2 “busy” 富 fu4 “rich”

缺 que1 “imperfect” 返 fan3 “return” 疲 pi2 “tired” 钝 dun4“blunt”

馋 chan2 “greedy” 真 zhen1 “real” 颠 dian1“jolt” 嫩 nen4“tender”

凹 ao1 “concave” 变 bian4“change” 假 jia4 “false” 懒 lan3 “lazy”

静 jing4“quiet” 鼓 gu3 “expand” 咸 xian2 “salty” 闭 bi4 “close”

蓝 lan2 “blue” 痴 chi1 “crazy” 枯 ku1 “withered” 邪 xie2 “evil”

滚 gun3 “boiled” 浑 hun2“muddy” 聋 long2 “deaf” 熔 rong2 “melt”

翘 qiao4“die” 瘸 que2“crippled” 病 bing4 “ill” 亲 qin1 “love”

止 zhi3 “stop” 超 chao1 “surpass” 甜 tian2 “sweet” 乖 guai1“lovely”

融 rong2 “melt” 贱 jian4“cheap” 坍 tan1 “collapse” 蔫 nian1 “spiritless”

欢 huan1 “happy” 纯 chun2 “pure” 恼 nao3 “annoyed” 俗 su2 “vulgar”

壮 zhuang4 “strong” 阔 kuo4 “wide” 滑 hua2 “slippy” 靓 liang4 “pretty”

稠 chou2 “dense” 亮 liang4 “bright” 至 zhi4 “arrive”

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APPENDICES

Appendix A: Journal Publications

1. **Zhang, Y. F**., Pandian, A. (2021). 汉语动结式习得研究综述[Literature review on the acquisition of Chinese resultative verb compounds]. *高等教育前沿*[Advances in Higher Education], *4*(8), 41-43.

2. **Zhang, Y. F**., Pandian, A., Soo, R. S. (2023). Effect of prototypicality and dual route processing modal on instructed second language acquisition of Chinese resultative verb compounds. *Global Chinese*, *9*(2) , 231-256.

Appendix B: Stimuli V1s: Monosyllabic Verbs in CDVU (460)

弄 nong4 “make”	变 bian4 “change”	打 da3 “beat”	搞 gao3 “make”
看 kan4 “look”	说 shuo1 “say”	转 zhuan3 “turn”	写 xie3“write”
笑 xiao4 “smile”	压 ya1 “press”	唱 chang4 “sing”	睡 shui4 “sleep”
跑 pao3 “run”	挤 ji3 “squeeze”	叫 jiao4 “cry”	玩 wan2 “play”
磨 mo2 “grind”	开 kai1 “open”	走 zou3 “walk”	吹 chui1 “blow”
冲 chong1 “flush”	踢 ti1 “kick”	闹 nao4 “disturb”	踩 cai3 “stamp”
穿 chuan1 “wear”	咬 yao3 “bite”	撞 zhuang4 “bump”	热 re4 “hot”
读 du2 “read”	洗 xi3 “wash”	推 tui1 “push”	刮 gua1 “scrape”
画 hua4 “draw”	捏 nie1 “pinch”	刷 shua1 “brush”	坐 zuo4 “sit”
拖 tuo1 “pull”	摔 shuai1 “fall off”	买 mai3 “buy”	累 lei4 “tired”
摇 yao2 “shake”	吓 xia4 “frighten”	惊 jing1 “surprise”	挖 wa1 “scoop”
拍 pai1 “pat”	骂 ma4 “scold”	敲 qiao1 “knock”	砸 za2 “pound”
扯 che3 “pull”	摸 mo1 “feel”	碰 peng4 “touch”	气 qi4 “irritate”
挑 tiao1 “pick”	练 lian4 “practise”	带 dai4 “take”	逼 bi1 “force”
挂 gua4 “hang”	烫 tang4 “scald”	扭 niu3 “twist”	想 xiang3 “think”
拉 la1 “pull”	踏 ta4 “stamp”	跳 tiao4“jump”	拿 na2 “take”

考 kao3 “test”	吸 xi1 “absorb”	排 pai2 “arrange”	弹 tan2 “play”
问 wen4“ask”	学 xue2 “learn”	调 diao4/tiao2 “adjust”	夹 jia1 “clip”
收 shou1 “collect”	砍 kan3 “cut”	扣 kou4 “button”	卖 mai4 “sell”
疼 teng2 “ache”	揉 rou2 “knead”	找 zhao3 “look for”	炒 chao3 “fry”
扫 sao3 “sweep”	抄 chao1 “copy”	输 shu1 “lose”	加 jia1 “add”
抹 mo3 “apply”	讲 jiang3 “speak”	换 huan4 “change”	哭 ku1 “cry”
搅 jiao3 “stir”	追 zhui1“chase”	听 ting1 “listen”	点 dian3 “point”
喝 he1 “drink”	拨 bo1 “dial”	贴 tie1 “paste”	抢 qiang3 “rob”
喂 wei4 “feed”	吵 chao3 “noise”	抱 bao4 “embrace”	炸 zha2 “explode”
谈 tan2 “discuss”	拧 ning3 “twist”	煮 zhu3 “boil”	扎 zha1 “prick”
划 hua2 “row”	抹 mo3 “apply”	背 bei4 “recite”	烧 shao1 “burn”
烤 kao3 “toast”	减 jian3 “subtract”	熬 ao2 “stew”	堵 du3 “block”
饿 e4 “hungry”	接 jie1 “pick up”	投 tou2 “throw”	催 cui1 “urge”
提 ti2 “lift”	修 xiu1 “fix”	吻 wen3 “kiss”	抓 zhua1 “seize”
喷 pen1 “spurt”	翻 fan1 “turn”	拼 pin1 “put together”	使 shi3 “use”
送 song4 “send”	等 deng3 “wait”	放 fang4 “put”	抽 chou1 “shrink”
扑 pu1 “attack”	剪 jian3 “cut”	记 ji4 “remember”	选 xuan3 “select”
涂 tu2 “paint”	管 guan3 “manage”	传 chuan2 “pass”	卷 juan3 “roll”

发 fa1 “send”
游 you2 “travel”
塞 sai1 “block”
缩 suo1 “shrink”

抛 pao1 “throw”
留 liu2 “leave”
浇 jiao1 “water”
拆 chai1“dismantle”

捧 peng3 “hold”
割 ge1 “cut”
铲 chan3 “shovel”
流 liu1 “flow”

改 gai3 “correct”
爬 pa2 “crawl”
停 ting2 s “stop”
磕 ke1 “knock”

喊 han3 “shout”
过 guo4 “live”
填 tian2 “fill”
倒 dao4 “fill”

戴 dai4 “wear”
扔 reng1 “throw”
擦 ca1 “wipe”
铺 pu1 “pave”

订 ding4 “revise”
混 hun4 “mix”
淋 lin2 “pour”
搭 da1 “put up”

顶 ding3 “jack”
捅 tong3 “poke”
退 tui4 “quit”
逃 tao2 “flee”

滚 gun3 “roll”
搓 cuo1 “twist”
赚 zhuan4 “earn”
染 ran3 “dye”

演 yan3 “perform”
跪 gui4 “kneel”
缠 chan2 “wind”
捞 lao1 “take out”

淹 yan1 “drown”
掐 qia1 “pinch”
拔 bo1 “finger”
躺 tang3 “lie”

包 bao1 “wrap”
插 cha1 “insert”
吃 chi1 “eat”
泡 pao4 “submerge”

摆 bai3 “put out”
撕 si1 “tear”
梳 shu1 “comb”
装 zhuang1 “install”

念 nian4 “read”
脱 tuo1 “take off”
捉 zhuo1 “catch”
撒 sa3 “spill”

训 xun4 “train”
逛 guang4 “ramble”
印 yin4 “print”
捂 wu3 “cover”

蹲 dun1 “squat”
抬 tai2 “raise”
掏 tao1 “draw”
凿 zao2 “dig”

做 zuo4 “do”
关 guan1 “close”
冻 dong4 “freeze”
解 jie3 “untie”

垫 dian4 “spread”
射 she4 “shoot”
搁 ge1 “put”
对 dui4 “check”

掉 diao4 “drop” 跟 gen1 “follow” 围 wei2 “surround” 花 hua1 “spend”

举 jv3 “put up” 碾 nian3 “grind” 用 yong4 “use” 治 zhi4 “cure”

给 gei3 “give” 搬 ban1 “move” 理 li3 “crop” 晕 yun1 “faint”

剥 bo1 “peel” 捻 nian3 “twist with finger” 逗 dou4 “tease” 绕 rao4 “circle”

摊 tan1 “spread” 砌 qi4 “build” 渗 shen4 “seep” 飞 fei1 “fly”

靠 kao4 “lean” 配 pei4 “match” 站 zhan4 “stand” 晒 shai4 “bask”

掀 xian1 “lift” 套 tao4 “hitch” 灭 mie4 “put out” 当 dang1 “work as”

回 hui2 “return” 编 bian1 “weave” 长 zhang3 “grow” 照 zhao4 “shine”

办 ban4 “deal with” 煎 jian1 “fry” 掘 jue2 “dig” 牵 qian1 “pull”

洒 sa3 “sprinkle” 埋 mai2 “bury” 锁 suo3 “lock” 蹦 beng1 “jump”

揭 jie1 “uncover” 批 pi1 “criticize 挪 nuo2 “move” 拐 gua3 “steal”

寄 ji4 “mail” 钻 zuan1 “drill” 救 jiu4 “help” 栽 zai1 “plant”

撤 che4 “withdraw” 惹 re3 “offend” 锯 jv4 “saw” 数 shi3 “count”

借 jie4 “borrow” 蒸 zheng1 “steam” 舔 tian3 “lick” 养 yang3 “feed”

赶 gan3 “expel” 运 yun4 “transport” 轧 ya4 “run over” 查 cha2 “check”

弯 wan1 “bend” 绑 bang3 “tie” 存 cun2 “deposit” 讨 tao3 “beg”

动 dong4 “move” 生 sheng1 “bear” 干 gan4 “do” 闻 wen2 “smell”

化 hua4 “melt” 端 duan1 “carry” 握 wo4 “hold” 算 suan4 “computer”

托 tuo1 “support”	淘 tao2 “wash”	泼 po1 “splash”	杀 sha1 “kill”
裂 lie4 “split”	掰 bai1 “break off”	搂 lou3 “embrace”	盖 gai4 “build”
盯 ding1 “stare”	赔 pei2 “compensate”	落 luo4 “fall	上 shang4 “go up”
签 qian1 “sign”	认 ren4 “know”	登 deng1 “climb”	捡 jian3 “pick”
补 bu3 “pick”	骑 qi2 “ride”	抠 kou1 “pick”	丢 diu1 “lose”
挠 nao2 “scratch”	嚼 jiao2 “chew”	交 jiao1 “hand in”	摘 zhai1 “pick”
腾 teng2“make”	趴 pa1 “bend over”	卸 xie4 “unload”	探 tan4 “explore”
哄 hong3 “coax”	劝 quan4 “persuade”	出 chu1 “go out”	漏 lou4 “leak”
扶 fu2 “help”	顺 shun4 “follow”	叠 die2 “overlap”	糊 hu1 “paste”
骗 pian4 “cheat”	冒 mao4 “emit”	堆 dui1 “pile”	猜 cai1 “guess”
啃 ken3 “bite”	披 pi1 “wrap”	沾 zhan1 “touch”	迈 mai4 “stride”
伸 shen1 “stretch”	撬 qiao4 “pry”	去 qu4 “go”	裁 cai1 “cut”
剁 duo4“chop”	绣 xiu4 “embroider”	比 bi3 “compare”	采 cai3 “pick”
滴 di1 “drip”	吐 tu3 “emit”	漂 piao1 “float”	愁 chou2 “worry”
活 huo2 “live”	躲 duo3“hide”	捆 kun3 “tie”	陪 pei2 “accompany”
教 jiao1 “teach”	夺 duo2 “grab”	裹 guo3“wrap around”	拦 lan2 “lock”
挨 ai2 “endure”	扛 kang2 “carry”	派 pai4 “send”	添 tian1 “lick”
试 shi4 “try”	褪 tui4 “discolor”	切 qie1 “cut”	乘 cheng2 “take”

织 zhi1 “weave”	拌 ban4 “stir”	闭 bi4 “close”	藏 cang2 “hide”
缴 jiao3 “pay”	描 miao2 “describe”	偷 tou1 “steal”	升 sheng1 “ascend”
炼 lian4 “smelt”	逮 dai3 “catch”	审 shen3 “examine”	剔 ti4 “pick”
钓 diao4“fish”	测 ce4 “measure”	立 li4 “erect”	剃 ti4 “shave”
受 shou4 “endure”	跌 die1 “fall down”	撵 nian3 “chase”	差 cha4 “differ”
罚 fa2 “fine”	晾 liang4 “air”	忘 wang4 “forget”	望 wang4 “look”
嚷 rang3 “shout”	锄 chu2 “hoe”	夸 kua1 “praise”	守 shou3 “defend”
种 zhong4 “plant”	招 zhao1 “attract”	捣 dao3 “pound”	评 ping2 “assess”
递 di4 “pass”	吞 tun1 “swallow”	耕 geng1 “plough”	拾 shi2 “pick”
住 zhu4 “live”	指 zhi3 “point”	租 zu1 “rent”	凑 cou4 “assemble”
称 cheng1 “weigh”	铡 zha2 “cut”	缝 feng2 “sew”	献 xian4 “offer”
锈 xiu4 “rust”	串 chuan4 “string”	拴 shuan1 “tie”	合 he2 “close”
斗 dou4 “fight”	谢 xie4 “thank”	戒 jie4 “avoid”	赏 shang3 “reward”
闯 chuang3	取 qu3 “get”	死 si3 “die”	尝 chang2 “taste”
咽 yan4 “swallow”	盛 cheng2 “fill”	敬 jing4 “respect”	扇 shan1 “fan”
涮 shuan4 “rinse”	造 zao4 “make”	分 fen1 “separate”	作 zuo4 “do”
下 xia4 “get off”	安 an1 “install”	宰 zai3 “kill”	驮 tuo2 “carry”
掸 dan3 “dust”	挡 dang3 “block”	让 rang4 “make”	除 chu2“rid”

起 qi3 “rise”　量 liang2 “measure”　请 qing3 “invite”　蘸 zhan4 “dip”

噎 ye1 “choke”　捎 shao1 “bring”　定 ding4 “decide”　筛 shai1 “sift”

腌 yan1 “pickle”　通 tong1 “unstop”　遇 yu4 “meet”　邮 you2 “mail”

渴 ke3 “thirst”　沏 qi1 “make”　瞒 man2 “cheat”　要 yao4 “want”

叮 ding1 “sting”　澄 cheng2 “purify”　赊 she1 “buy on credit”　赛 sai4 “match”

还 huan2 “return”　防 fang2 “defend”　删 shan1 “delete”　帮 bang1 “help”

避 bi4 “avoid”　着 zhao2 “ignite”　破 po4 “break”　害 hai4 “harm”

松 song1 “loosen”　亲 qin1 “love”　紧 jin3 “fasten”　响 xiang3 “sound”

够 gou4 “touch”　怪 guai4 “blame”　耪 pang3 “hoe”

Appendix C: Stimuli of RCs (312)

乐 le4 “happy”	完 wan2 “finish”	出 chu1 “go out”	好 hao3 “well”
成 cheng2”become”	到 dao4 “arrive”	死 si3 “die”	多 duo1 “much”
入 ru4 “into”	满 man3 “full”	回 hui2 “back”	进 jin4 “enter”
错 cuo4 “wrong”	掉 diao4 “drop”	坏 huai4 “bad”	累 lei4 “tired”
够 gou4 “enough”	尽 jin4 “exhaust”	破 po4 “broken”	足 zu2 “enough”
光 guang1 “over”	没 mei2 “none”	左 zuo3 “left”	大 da4 “big”
住 zhu4 “stop”	下 xia4 “down”	定 ding4 “determined”	紧 jin3 “tense”
断 duan4 “broken”	开 kai1 “open”	倒 dao3 “collapse”	走 zou3 “walk”
对 dui4 “right”	翻 fan1 “overturn”	少 shao3 “less”	烂 lan4 “rotten”
落 luo4 “fall”	红 hong2 “red”	齐 qi2 “level”	高 gao1 “high”
透 tou4 “through”	爆 bao4 “explode”	散 san3 “scatter”	久 jiu3 “long time”
遍 bian4“all over”	平 ping2 “even”	碎 sui4 “crash”	上 shang4 “up”
准 zhun3 “accurate”	空 kong1 “empty”	净 jing4 “clean”	近 jin4 “near”
乱 luan4“messy”	伤 shang1 “hurt”	傻 sha3 “silly”	歪 wai1 “askew”
清 qing1 “clear”	醒 xing3 “awake”	痛 tong4 “hurt”	正 zheng4 “straight”
动 dong4 “move”	干 gan1 “dry”	低 di1 “low”	活 huo2 “alive”
疼 teng2 “ache”	疯 feng1 “crazy”	早 zao3 “early”	惯 guan4 “habitual”
全 quan2 “complete”	去 qu4 “go”	快 kuai4 “quick”	晕 yun1 “dizzy”
起 qi3 “rise”	实 shi2 “solid”	直 zhi2 “straight”	离 li2 “separate”

远 yuan3 “far”　小 xiao3“small”　急 ji2 “urgent”　惨 can3 “misery”

稳 wen3“steady”　通 tong1 “through”　妥 tuo3 “ready”　丢 diu1 “lost”

哭 ku1 “cry”　穿 chuan1 “through”　反 fan3 “opposite”　跑 pao3 “run”

熟 shu/shou2 “cooked”牢 lao2 “solid”　晚 wan3 “late”　白 bai2 “white”

飞 fei1 “fly”　烦 fan2 “annoyed”　偏 pian1 “partial”　深 shen1 “deep”

怕 pa4 “afraid”　热 re4 “hot”　长 chang2 “long”　黑 hei1 “black”

湿 shi1 “wet”　劈 pi1“split”　灭 mie4 “put out”　罢 ba4 “stop”

重 zhong4/chong2 “heavy/overlap”　响 xiang3 “loud”　松 song4 “loose”

昏 hun1 “dim”　细 xi4 “thin”　残 can2 “disable”　慢 man4“slow”

软 ruan3 “soft”　漏 lou4 “leaky”　裂 lie4 “split”　肿 zhong3 “swollen”

折 she2 “broken”　毁 hui3 “ruin”　瞎 xia1 “blind”　匀 yun2“even”

顺 shun4 “smooth”　饱 bao3 “full”　短 duan3 “short”　脱 tuo1 “come off”

酸 suan1”sour”　老 lao3 “old”　瘦 shou4 “thin”　退 tui4 “retreat”

黄 huang2 “yellow”　迟 chi2 “late”　扁 bian3 “flat”　吐 tu4 “emit”

剩 sheng4 “left”　脏 zang1 “dirty”　塌 ta1 “collapse”　冷 leng3“cold”

失 shi1 “lost”　腻 ni4 “greasy”　弯 wan1 “bend”　硬 ying4“hard”

严 yan2 “strict”　青 qing1 “blue”　薄 bo/bao2 “thin”　穷 qiong2“poor”

跌 die1 “fall”　差 cha4 “bad”　饿 e4 “hungry”　化 hua4 “melt”

轻 qing1 “light”　厚 hou4 “thick”　麻 ma2 “numb”　凉 liang2 “cool”

醉 zui4 “drunken”　熄 xi1 “put out”　绿 lv4 “green”　暖 nuan3 “warm”

圆 yuan2” round”　赢 ying2 “win”　臭 chou4 “smelly”　淡 dan4 “light”

停 ting2 “stop”　炸 zha4 “explode”　合 he2 “close”　蒙 meng1“blind”

输 shu1 “lose” 肥 fei2 “fat” 宽 kuan1 “wide” 垮 kua3 “collapse

斜 xie2 “askew” 瘪 bie3 “shrivelled” 苦 ku3 “bitter” 美 mei3 “beautiful”

糊 hu2 “overcook” 狠 hen3 “ruthless” 败 bai4 “fail” 沉 chen2 “sink”

僵 jiang1 “stiff” 崩 beng1 “collapse” 混 hun2 “mix” 废 fei4“disable”

会 hui4 “understand” 笑 xiao4 “smile” 困 kun4 “trapped” 糟 zao1“bad”

粗 cu1 “rough” 来 lai2 “come” 杀 sha1 “kill” 呆 dai1“dull”

火 huo3 “prosperous” 浅 qian3 “shallow” 皱 zhou4 “wrinkled” 强 qiang2 “strong”

睡 shui4 “sleep” 旧 jiu4 “old” 胖 pang4 “fat” 焦 jiao1 “scorched”

拢 long3 “together” 毙 bi4 “die” 暗 an4 “dark” 慌 huang1” flurried”

哑 ya3 “dumb” 尖 jian1“pointed” 砸 za2 “smash” 趴 pa1 “bend over”

懂 dong3“understand”结 jie2 “knot” 忘 wang4 “forget” 明 ming2 “bright”

虚 xu1 “empty” 浓 nong2 “thick” 闷 meng4 “blind” 稀 xi1“rare”

紫 zi3 “purple” 瘫 tan1 “paralyse” 秃 tu1“bare” 精 jing1“conversant”

挂 gua4 “die” 旺 wang4 “flourish” 缓 huan3 “slowly” 亏 kui1“deficient

暴 bao4 “savage” 窄 zhai3 “narrow” 猛 meng3 “suddenly” 分 fen1 “separate”

贵 gui4 “expensive” 见 jian4“see” 迷 mi2 “confused” 弱 ruo4“weak

神 shen2 “divine” 丑 chou3 “ugly” 滥 lan4 “excessive” 矮 ai3 “low”

缩 suo1 “shrink” 胀 zhang4 “swollen” 酥 su1 “crispy” 新 xin1“new”

除 chu2 “rid” 香 xiang1 “fragrant” 笨 ben4 “stubborn” 野 ye3“wild”

涨 zhang3 “go up” 跪 gui4 “kneel”着 zhao2 “succeed in doing”难 nan2“difficult”

转 zhuan4 “turn” 渴 ke3 “thirsty” 杂 za2 “irregular” 密 mi4 “dense”

卷 juan3“roll” 倦 juan4 “tired” 陷 xian4 “sink” 岔 cha4 “diverge”

蠢 chun3 “stupid” 抽 chou1 “shrink” 服 fu2 “convinced 升 sheng1 “ascend”

露 lou4 “leak” 乏 fa2 “tired” 串 chuan4 “mixed up”煞 sha4 “extremely”

噎 ye1 “choke” 为 wei2“become” 忙 mang2 “busy” 富 fu4 “rich”

缺 que1 “imperfect” 返 fan3 “return” 疲 pi2 “tired” 钝 dun4“blunt”

馋 chan2 “greedy” 真 zhen1 “real” 颠 dian1“jolt” 嫩 nen4“tender”

凹 ao1 “concave” 变 bian4“change” 假 jia4 “false” 懒 lan3 “lazy”

静 jing4“quiet” 鼓 gu3 “expand” 咸 xian2 “salty” 闭 bi4 “close”

蓝 lan2 “blue” 痴 chi1 “crazy” 枯 ku1 “withered” 邪 xie2 “evil”

滚 gun3 “boiled” 浑 hun2“muddy” 聋 long2 “deaf” 熔 rong2 “melt”

翘 qiao4“die” 瘸 que2“crippled” 病 bing4 “ill” 亲 qin1 “love”

止 zhi3 “stop” 超 chao1 “surpass” 甜 tian2 “sweet” 乖 guai1“lovely”

融 rong2 “melt” 贱 jian4“cheap” 坍 tan1 “collapse” 蔫 nian1 “spiritless”

欢 huan1 “happy” 纯 chun2 “pure” 恼 nao3 “annoyed” 俗 su2 “vulgar”

壮 zhuang4 “strong” 阔 kuo4 “wide” 滑 hua2 “slippy” 靓 liang4 “pretty”

稠 chou2 “dense” 亮 liang4 “bright” 至 zhi4 “arrive”

Appendix D: Stimuli of da3-RC (N=213)

打光 da3guang1 “to run out”

打坏 da3huai4 “to damage”

打破 da3po4 “to break”

打掉 da3diao4 “to knock off”

打碎 da3sui4 “to break into pieces”

打裂 da3lie4 “to crack”

打疼 da3teng2 “to beat and ache”

打折 da3she2 “to break”

打死 da3si3 “to beat to death”

打哭 da3ku1 “to beat and cry”

打够 da3gou4 “to beat enough”

打输 da3shu1 “to lose”

打赢 da3ying2 “to win”

打通 da3tong1 “to open up”

打牢 da3lao2 “to make the firm”

打完 da3wan2 “to finish beating”

打着 da3zhao2 “to hit”

打齐 da3qi2 “to type complete”

打全 da3qi2 “to type complete”

打稀 da3xi1 “to stir weak”

打直 da3zhi2 “to straighten”

打斜 da3xie2 “to pound and slanting”

打浅 da3qian3 “tp dig shallow”

打深 da3shen1 “to dig deep”

打歪 xie2 “to deflect”

打正 da3xie2 “to straight”

打满 da3man3 “to play the full”

打累 da3lei4 “to play-tired”

打错 da3cuo4 “to misplay”

打稳 da3wen3 “to hold steady”

打怕 da3pa4 “to play and dread”

打肿 da3zhong3“to bung up”

打好 da3hao3 “to lay solid foundation”

打小 da3xiao3 “to pound small”

打黑 da3hei1 “to beat black”

打大 da3da4 “to pound big”

打扁 da3bian3 “to whack”

打残 da3can2 “to beat and disable”

打快 da3kuai4 “to box quickly”

打少 da3shao3 “to type less”

打痛 da3tong4 “to beat and hurt”

打傻 da3sha3 “to be silly for being beaten”

打亮 da3liang4 “to make a light”

打黄 da3huang2 “to beat and fall through”

打瘦 da3shou4 “to play and thin”

打早 da3zao3 “to play early”

打净 da3jing4 “to play clean”

打匀 da3yun2 “to beat well”

打长 da3chang2 “to lengthen”

打实 da3shi2 “to solidify”

打近 da3jin4 “to beat near”

打活 da3huo2 “to beat and live”

打透 da3tou4 “to beat through”

打惨 da3can3 “ to be cruelly beaten”

打细 da3xi4 “to pound thin”

打圆 da3yuan2 “to pound round”

打笨 da3ben4 “to beat stubborn”

打丑 da3chou4 “to beat ugly”

打轻 da3qing1 “to beat slightly”

打久 da3jiu3 “to beat for a long time”

打闷 da3men4 “to beat and depress”

打急 da3ji2 “to beat urgently”

打远 da3yuan3 “to beat far”

打醒 da3xing3 “to beat and awake”

打热 da3re4 “to pound and become hot”

打白 da3bai2 “to beat white”

打重 da3zhong4 “to beat awfully”

打准 da3zhun3 “to shoot accurately”

打薄 da3bao2 “to pound thin”

打浑 da3hun2 “to stir muddy”

打青 da3qing1 “to beat blue”

打定 da3ding4 “to determine”

打软 da3ruan3 “to pound soft”

打清 da3qing1 “to pound clear”

打疼 da3teng2 “to beat and ache”

打破 da3po4 “to break away from”

打空 da3kong1 “to miss the target”

打左 da3zuo3 “to hit wrong”

打高 da3gao1 “to beat above the average”

打平 da3ping2 “to pound flat”

打足 da3zu2 “to pump up”

打红 da3hong2 “ to beat red”

打多 da3duo1 “to beat too much”

打烂 da3lan4 “to break”

打牢 da3lao2 “to solidify”

打湿 da3lao2 “to damp”

打绿 da3lv4 “to beat green”

打慢 da3man4 “to beat slowly”

打凹 da3ao1 “to dent”

打暴 da3bao4 “to beat violently”

打差 da3cha4 “to beat in a wrong way”

打苦 da3ku3 “to fight bitterly”

打狠 da3hen3 “to beat awfully”

打松 da3song1 “to loosen”

打矮 da3ai3 “to shorten”

打酸 da3suan1“ to be aching for beating”

打穷 da3qiong2 “to be poor for playing”

打猛 da3meng3 “to beat violently”

打脏 da3zang1 “to be dirty”

打乱 da3luan4 “to disrupt”

打僵 da3jiang1 “to beat stiff”

打麻 da3ma2 “to numb”

打慌 da3huang1 “to type in a flurried way”

打晚 da3wan3 “to beat late”

打熟 da3shu2 “to play skillfully”

打浅 da3qian3 “to dig shallow”

打烦 da3fan2 “to be tired of beating”

打暗 da3an4 “to be darker”

打野 da3ye3 “to beat untamed”

打神 da3shen2 “to beat magically”

打饱 da3bao3 “to beat fully”

打胀 da3zhang4 “to bloat”

打糟 da3zao1 “beat badly”

打虚 da3xu1 “to be out of focus”

打毛 da3mao2 “to roughen”

打蠢 da3chun3 “to beat into fool”

打毒 da3du2 “to beat brutally”

打美 da3mei3 “to beat happily”

打焦 da3jiao1 “to scorch”

打惯 da3guan4 “beat habitually”

打遍 da3bian4 “to be unbeatable”

打进 da3jin4 “to beat in”

打胖 da3pang4 “to beat and become fat”

打宽 da3kuan1 “to dig wide”

打臭 da3chou4 “to play badly”

打厚 da3hou4 “to thicken”

打瘪 da3bie3 “to shrunken”

打勤 da3qin2 “to beat frequently”

打紧 da3jin3 “to screw tightly”

打秃 da3tu1 “to fire bluntly”

打疲 da3pi2 “to beat tired”

打迟 da3chi2 “to beat late”

打飞 da3fei1 “to beat to fly”

打钝 da3dun4 “to blunt”

打乏 da3fa2 “to beat and become tired”

打散 da3san3 “to beat and scatter”

打尖 da3jian1 “to become sharp by beating”

打缓 da3huan3 “to play slowly”

打到 da3dao4 “to beat to”

打分 da3fen1 “to beat and separate”，

打定 da3ding4 “determine”

打退 da3tui4 “to beat back”

打砸 da3za2 “to beat and fall through”

打会 da3hui4 “to beat and understand”

打疯 da3feng1 “to beat crazily”

打横 da3heng2 “to beat and be transverse”

打穿 da3chuan1 “to stave in”

打回 da3hui2 “to give back”

打成 da3cheng2 “to forge into”

打上 da3shang4 “to type in”

打响 da3xiang3 “to break out”

打趴 da3pa1 “to flatten”

打脱 da3tuo1 “to miss”

打对 da3dui4 “to type right”

打弯 da3wan1 “to bend”

打毁 da3hui3 “to destroy”

打倒 da3dao3 “to knock down”

打哭 da3ku1 “to beat and cry”

打爆 da3bao4 “to blow up”

打晕 da3yun1 “to stun”

打跑 da3pao3 “to beat and run”

打跌 da3die1 “to beat and fall”

打走 da3zou3 “to beat away”

打混 da3hun3 “to blend”

打昏 da3hun1 “to stun”

打开 da3kai1 “to open”

打出 da3chu1 “to type out”

打没 da3mei2 “to beat and disappear”

打花 da3hua1 “to type dimly”

打反 da3fan3 “to type opposite”

打瞎 da3xia1 “to beat blind”

打罢 da3ba4 “to finish beating”

打入 da3ru4 “to beat into”

打漏 da3lou4 “to beat and leave out”

打怕 da3pa4 “to be afraid of fighting”

打灭 da3mie4 “to put out”

打败 da3bai4 “to defeat”

打塌 da3ta1 “to beat and give way”

打离 da3li2 “to beat and separate”

打熄 da3xi1 “ to put out”

打挂 da3gua4 “to be beaten to death”

打瘫 da3tan1 “to cripple”

打瘸 da3que2 “to be lame”

打断 da3duan4 “ to break”

打拢 da3long3 “to hold together”

打呆 da3dai1 “beat and being blank”

打至 da3zhi4“to beat to”

打崩 da3beng1 “to beat and collapse”

打翻 da3fan1 “to overturn”

打丢 da3diu1 “to miss”

打住 da3zhu4 “to stop”

打饿 da3e4 “to be hungry for playing”

打愣 da3leng4 “to dumbfound”

打停 da3ting2 “to beat and stop”

打尽 da3jin4 “to perish”

打止 da3zhi3 “to stop”

打服 da3fu2 “to play and be convinced”

打蒙 da3meng1 “to be knocked senseless”

打干 da3gan1 “to draw water and dry up”

打下 da3xia4 “to capture”

打哑 da3ya3 “to put out of action”

打失 da3shi1 “ to miss”

打落 da3luo4 “to drop”

打聋 da3long2 “to play and deaf”

打伤 da3shang1 “to wound”

打醉 da3zui4 “to beat and drunken”

打废 da3fei4 “to disable for being beaten”

打坍 da3tan1 “to beat and collapse”

打剩 da3sheng4 “to beat and remain”

打腻 da3ni4 “to be tired of playing”

打吐 da3tu4 “to emit for playing”

打炸 da3zha4 “to beat and explode”

打封 da3feng “to beat and close”

打糊 da3hu2 “to overcook”

打跪 da3gui4 “to beat and kneel”

打卧 da3wo4 “to beat and lie”

打近 da3jin4 “ to hit near”

打枯 da3ku1 “to spray and wither”

打结 da3jie2 “to twist into a knot”

打偏 da3pian1 “ to miss”

打动 da3dong4 “to move”

打胜 da3sheng4 “to win”

打顺 da3shun4 “to play without a hitch”

Appendix E: Cued Lexical Production Task

Task1

1. 请使用以下动词尽可能多的写出你所知道的动结复合词。

(write the resultative compounds with the following verbs as much as possible)

例：喝_____：喝死，喝饱，喝醉...

吹_____:_____

读_____:_____

打_____:_____

搞_____:_____

看_____:_____

拿_____:_____

弄_____:_____

学_____:_____

睡_____:_____

杀_____:_____

跑_____:_____

想_____:_____

写_____:_____

抓_____:_____

坐_____:_____

Task2

2. 请使用以下形容词或动词尽可能多的写出你所知道的动结复合词。

(write the resultative compound with the following verbs or adjectives as much as you can)

例(example):____少: 买少，穿少，带少

高:_____

出:_____

死：_____

完:_____

惯：_____

错：_____

破:_____

来:_____

断:_____

见:_____

上:_____

成:_____

光:_____

入:_____

坏:_____

累:_____

疯:_____

Appendix F: Cued Sentence Production Task

Instruction:用以下所给复合词造句（make a sentence by using the given compounds）.

打好

打死

打出

打掉

打错

打烦

打累

打入

打下

Appendix G: Teaching Plan of Chinese Resultative Verb Compounds (the Experimental Group)

Teaching contents	**Research findings**	**Period/Week**
Basics on Chinese Resultative Verb Compounds	Definition of Lexical Prototypicality	1/1
Polysemy of V1 and Semantic orientation of RC	Definition of Semantic prototypicality	2/1
Syntactic distribution of RVCs and their prototypicality	Definition of Syntactic prototypicality	1/2
V1（1）	Most prototypical V1s	2/2
V1（2）	Less and the least prototypical V1s	1/3
RC（1）	Most prototypical RCs	2/3
RC（2）	Less and the least prototypical RCs	1/4
Review and practice	All above	2/4

Teaching Plan （Period 1/Week 1）				
Subject	Chinese RVC	**Type**	New lesson	
Key Points	Properties of RVC	**Difficulty**	Identification of RVC	
Teacher	Lyu Zhenhua	**Students**	Pre-class of middle school	
Teaching Methods	3Ps methods	**Teaching Mode**	Classroom instruction	
Topic	Basics on Chinese RVCs		**Duration**	40 minutes
Presentation	你们知道什么是动结复合词？ 动+结 （打碎）: 动作动词（因）结果动词（果） 名词或者两者都有。 （1）因：他打花瓶。果：花瓶碎了。 （2） 他打碎了花瓶。 上面两个句子你更喜欢拿一个？为什么？ 动结复合词通常是两个字构成： 例: 打烂，推倒，写错 也可以是多于两个字如想清楚，想明白。			

	动结复合词可以是后面接名词也可以是不接 例：他喝醉了。（后没名词） 他喝醉了酒。（后有名词） 他打疼了我。（后有名词）。 我打疼了。（×） 1.前面加“没” 例：没（吃饱），没（打碎），没（拿出） 2.中间加“不” 例：睡醒，打死，踢烂 睡不醒，打不死，踢不烂
Practice	一、 找出下列句子中包含的动结复合词。 1.我们一定要珍惜<u>吃饱穿暖</u>的每一个时刻。 2.彭亨一轿车<u>撞翻</u>了老年代步车。 3.Jack 马把事情<u>搞砸</u>了。 二、改写句子 1.他打了我。我疼。 答案：他（打疼）了我。 2.我拿书。书是错的。

	答案：我（拿错）了书。 3.我们吃饭。我们饱了。 答案：我们（吃饱）了饭。
Production	一、连线题 V1　　RC 打　　上 想 拿　　完 学　　成 吃　　碎 二、找出生活中或课本中碰到的 5 个动结复合词，和大家分享你的分析。

Teaching Plan （Period 2/Week 1）				
Subject	Chinese RVC	**Type**	New lesson	
Key Points	Prototypical meaning of V1s; semantic orientation of RC	**Difficulty**	Subject-oriented RVC	
Teacher	Lyu Zhenhua	**Students**	Pre-class of middle school	
Teaching Methods	3Ps methods	**Teaching Mode**	Classroom instruction	
Topic	Polysemy of V1(打 da3) ; semantic orientation of RC		**Duration**	40 minutes
Presentation	1. 打破 例：1.用手或器具撞击物体：**打破**了那面鼓。 2.器皿，蛋因撞击而破碎：鸡蛋**打破**了。 3.殴打，攻打：打架把胳膊**打破**了。 4.比赛：**打破**纪录。 2.打完 例：1. 打完比赛　play			

	2. 打完电话 phone 3. 打完水 fetch 4. 建造，建筑 例：房子的基础打完了。build 5. 制造 例：家具打完了。 make 他吃完了饭。什么完成了？ (Students answer) 今天上课，我来晚了。什么晚了？来得晚（不好意思！） (Students answer) 例：这件衣服做大了。（都是我的错！） 坑挖浅了。（没达标！） 酒喝多了。（真不应该！） 我听懂了他的话。谁懂了？（我 or 他的话） （students answer） 我学会了滑冰。谁会了？（我 or 冰） (Students answer) 他摔倒了。谁倒了？（答案：他） (Students answer) 我笑疯了。谁疯了？（答案：我）(Students answer)

Practice	一、回答问题 张三把苍蝇打死了。 问题： 谁死了？（A） A. 苍蝇 B.未知 C.张三 打谁？（B） A.张三 B.苍蝇 C.未知 二、请用以下所给复合词填空。 A 拿出 B 学会 C.坐上 D. 学成 E.拿下 F 听懂 1. 请（）你们的课本。 **A** 2. 这些内容你（）了吗。**F** 3.他（）火车就跑了。 **C** 4.请把你的手（）。 **E** 5.祝贺你能（）归来。 **D**

Production	一、问答题 1.动结复合词 由（）和（）构成？ 2.动结复合词 述语 通常由（）充当？补语由（）充当？ 3.动结复合词可以用哪几种句型？请举例说明 4.动结复合词的补语指向有几种类型？举例说明。 二、选择题 1.张三骑累了马？ 谁累了？　　（A /B） A. 张三　B. 马　　C. 骑 2.张三骑马骑累了。 谁累了？(A) A. 张三　B. 马　C. 骑 3.杰克打完了比赛，汤姆接着打。 完成了什么？　　(C) A. 杰克　B. 比赛　C.　打比赛 三、把下列动结复合词按补语指向分类 打完，打出，打死，打通，打裂，打疯，打累，打蒙，打惨，打断，打通

Teaching Plan （Period 1/Week ）				
Subject	Chinese RVC	**Type**	New lesson	
Key Points	Understanding 5 alternative sentence patterns	**Difficulty**	1. Copy verb construction 2.Matching between RVC and pattern	
Teacher	Lyu Zhenhua	**Students**	Pre-class of middle school	
Teaching Methods	3Ps methods	**Teaching Mode**	Classroom instruction	
Topic	Syntactic distribution of RVC and their prototypicality		**Duration**	40 minutes

Presentation	动结复合词允许的句法结构 1.主谓宾（SVO） 2.把字句（Ba-C） 3.被动句（Bei-C） 4.受事主语句（PSC） 5.动词拷贝句（**CVC**） 主谓宾（SVO） 例：我吃完了饭。 “我”是主语，是动作吃的发出者。 “饭”是宾语，是动作吃的对象。 “完”指的是吃的动作的完成。 “吃完”是动结复合词，作谓语。 把字句 Ba-C 例：他把灯泡打烂了。 “他”是主语，是谓语动作的发出者。 “灯泡”是打烂的宾语，从打烂后放到了把字后面，以强调。 “打烂”是动结复合词，作谓语。 受事主语句 PSC

	例：花瓶打碎了。 花瓶是“打碎”的对象，原来是打碎的宾语，现在做句子的主语。 被动句 **Bei-C** 例：钱被他花光了。 SVO ：他花光了钱。 被动句因“被”字得名。钱原来是花光的宾语，现在是句子的主语，这一点和受事主语句一样，但是受事主语句中没有“被”字出现。 动词拷贝句 **CVC** 例：你想钱想疯了吧。 想疯是句子的谓语，是动结复合词。想疯前面构成复合词的 V1 想第二次出现，后接宾语，因此被称为动词拷贝句，这里的动词指的就是 V1。
Practice	一、请说出以下句子的类型。 1.小刘骑马骑累了。（CVC） 2.张红开车撞翻了游客。（SVO） 3.花被摘光了。（Bei-C）

	4.子弹打光了。 （PSC） 5.大家把书放下。（Ba-C）
Production	从课本当中找出 5 种不同句型的例子，下次课和大家分享。

<table>
<tr><td colspan="5">Teaching Plan （Period 2/Week 2）</td></tr>
<tr><td>Subject</td><td>Chinese RVC</td><td>Type</td><td colspan="2">New lesson</td></tr>
<tr><td>Key Points</td><td>Most Prototypical V1s and related RVC with examples</td><td>Difficulty</td><td colspan="2">Meaning of RVC and type of sentence pattern</td></tr>
<tr><td>Teacher</td><td>Lyu Zhenhua</td><td>Students</td><td colspan="2">Pre-class of middle school</td></tr>
<tr><td>Teaching Methods</td><td>3Ps methods</td><td>Teaching Mode</td><td colspan="2">Classroom instruction</td></tr>
<tr><td>Topic</td><td colspan="2">Basics on Chinese RVCs</td><td>Duration</td><td>40 minutes</td></tr>
<tr><td>Presentation</td><td colspan="4">典型动词的特征

1.及物动词 transitive verb

2.动作动词 physical action verb

3.常用 common verb

学(learn)

1.study, learn 例：学本领，学文化，学知识

2.imitate, copy 例：学大人说话；鹦鹉学舌

RVC</td></tr>
</table>

	例：学坏，学会，学乖，学好,学疯，学成 Look at the examples and tell the meaning of sentence and structure. 学坏（learn-bad）Vt &vi 例：1.他把脑筋学坏了。 2.罗拉学坏了。 学完 (finish learning) 例: 1.他学完了 24 门课程。 2.《诗经》，预计到 5 月底全部学完。 3.他已经把初中数理化课程全部学完。 学好(learn well) 例：1. 中学的文化都没学好。 2. 我一定要把数学学好。 3. 学生要学好一口标准的普通话。 学出 (learn out) 例：1. 他学出了一身毛病。 2.他决心拜师学艺，学出个名堂来。 3.他把脑壳学出了问题。

	学走(learn away) 例：1. 为了怕人学走了他的医术，他从不开处方。 2.我们的文化会被老外学走了。 学到 (learn and get) 例：1.感觉啥都没有学到。 2.学生在初中阶段能够学到一门技术。 3.只有努力才能把汉语学到家。 4.他学英语学到了走火入魔。 5.方法，理念可以被人学到。 学遍(learn all) 例：1.我立志要学遍天下武术。 2.她愿意学遍中国方言。 3.历史上优秀的书派都学遍了。 学错 (learn wrongly) 例：1.我学错专业了。 2.你学画学错了。 3.后人学他们学错了。 4.我专业学错了。

	5.我把东西学错了。 学会 (learn and understand)（学不会，没学会） 例: 1. 你一定要学会沟通的学问。 2.我想把 tiktok 学会。 3.你必须把 26 个字母学会。 4.这么难的东西竟然被我学会了。 5.这首歌学会了没有？ 学全（learn all） 例：1.小关不知不觉把 36 种手法都学全了。 2.好处没有学会，毛病却学全了。 3.老万学全了所有的操作知识。 4.你老爸的功夫都学全了？ 学傻（learn-silly） 例：1.他学习学傻了。 2.你学英语学傻了？ 3.这孩子学傻了。 学成（manage to master） 例：1.他学成一套新功夫。

	2.我已经学成了，他学也没学成。 3.你恨不得几天就把绝技学成。 学通(learn through) 例：1.大家一定要学通 “干”和 “搞”的用法。 2.语言很难真正学通。 3.等你把方位学通了，看图就容易了。 拿 1. hold, take 拿走， 2. catch，capture 拿住 3. put sb into a corner 拿住 4. behave in a certain manner 拿出（哥哥的样子） 5. get receive 拿到（三块金牌） 6. be in charge 7. present show 拿得出手 拿完(finish fetching) 例：1.红包拿完了。 2.老太太拿完东西又回到厨房。 3.水果被人家拿完了。

	4.胡杏儿把奖都拿完了。 拿出(take out) 例: 1.他从冰箱里拿出一盒酸奶。 2.中国拿出 0.5 个名额给澳大利亚。 3.请大家把书拿出来。 4.没病拿药拿出病来。 5.体育课本被学生拿出书包。 拿住(hold) 例：1.电话没拿住。 2.妖怪被他拿住。 3.不能让钱 把人拿住。 4.他右手拿住两只笔。 拿开 例：1.麻烦把你的粗腿拿开。 2.手拿开。 3.他轻轻的拿开她的手。 4.茶几被拿开。 拿好(hold well)

	例：1.车票已拿好。 2.请把东西拿好。 3.我拿好一包纸巾。 4.下课记得把书包拿好。 拿下 例：1.请把书拿下楼。 2.我的资格证考试一举拿下。 3.张伯伦单场拿下 100 分。 4.小偷被警察拿下。 拿到 (take it successfully) 例：1.一毛钱都没拿到。 2.这球很明显最后被苏轼拿到了。 3.他把水果拿到窗台。 4.他把作业拿到教室。 5.我拿到奖学金了。 拿起(take upward) 例：1.那女子说完走了过来，把碗拿起。 2.记着随手拿起一本书。

	3.茶杯已被人拿起。 4.连一本书都不能拿起。 拿掉 （take it away） 例：1. 不要把口罩拿掉。 2.他拿掉 “暂停营业”的牌子。 3.康达的头罩被拿掉。 4.眼睛上的纱布已拿掉了。 拿错 （take-wrong） 例：1.那样的东西常常会被人拿错。 2.杰克有一天上课拿错了书。 3.小吴把充电器拿错了。 4.药拿错了。 拿多 （take too much） 例：1.没想到，最后还拿多了一个大奖。 2.不就是拿奖学金拿多了嘛。 3.冠军拿多了也有烦恼。 拿光 例：1.球已经被小孩子拿光了。

	2.办公室的东西基本拿光了。 3. 他拿光了我的钱。 4.他把家里能拿的东西都拿光了。 坐下 （sit down， intransitive） 例：你给我坐下。 坐上（succeed in taking） 例：1.我坐上地铁 10 号线。 2.最后一班公交终于坐上了。 3.那个位子早就被人坐上了。 4.自己把屁股坐上去。 坐到(sit to) 例：1.我从一点坐到十点，玩我呢？ 2.他一声不响的坐到角落里。 3.坐车坐到一半，我不坐了。 4.把水壶坐到灶台即可。 坐死（sit-die） 例：1.让豆豆姐姐去坐死他。 2.他被女友一屁股坐死了。

	3.女朋友把男朋友一屁股坐死了。 4.姐今天坐车坐死了。 5.我要坐死了。 坐错（sit in a wrong way） 例：1.他居然坐错了两次车。 2.他坐车坐错了。 3.呵呵，地铁都坐错了。 坐坏（sit-bad） 例：1.凳子坐坏了。 2.把人家饭堂的椅子都坐坏了。 3.眼镜不小心被我坐坏了。 4.Andrew 坐坏了第三把椅子。 坐反（sit in an opposite way） 例：1.果然地铁坐反了。 2.坐车坐反两次。 3.我今天和他坐反了地铁。 4.结果他们把车坐反了。

Practice	一、请用下列所给动词组成复合词 拿 学 坐 弄 搞 读 打 二、请用所给复合词填空。 A. 拿出 B. 学会 C.坐上 D. 学成 E.拿下 F. 听懂 1. 请（）你们的课本。 2. 这些内容你（）了吗。 3.他（）火车就跑了。 4.请把你的手（）。 5.祝贺你能（）归来。
Production	作业 请从词典中找出更多由“**拿，学，坐**”组成的动结复合词，下次和大家分享。

Teaching Plan （Period 1/Week 3）				
Subject	Chinese RVC	**Type**	New lesson	
Key Points	Less and least prototypical V1s	**Difficulty**	Least prototypical V1 and related compound	
Teacher	Lyu Zhenhua	**Students**	Pre-class of middle school	
Teaching Methods	3Ps methods	**Teaching Mode**	Classroom instruction	
Topic	Basics on Chinese RVC		**Duration**	40 minutes
Presentation	弄 nong4，变 bian4，打 da3 “beat”, 出 chu1，读 du2，剪 jian3，跑 pao3，输 shu1，走 zou3，使 shi3，提 ti2，搞 gao3，看 kan4，说 shuo1，笑 xiao4，玩 wan2，开 kai1，冲 chong1，踢 ti1，累 lei4，吓 xia4，带 dai4，收 shou1，加 jia1，听 ting1，喝 he1，烧 shao1，投 tou2，放 fang4，改 gai3，停 ting2，倒 dao4，过 guo4，吃 chi1，做 zuo4，用 yong4，长 zhang3. 弄 1.play with 2. do, handle 3. fetch 4. get sb into a specified condition 5.play 例：弄完，弄好，弄死，弄住，弄到，弄开，弄坏，弄通，弄			

	错，弄丢，弄破，弄伤，弄小，弄疼，弄烂，弄碎，弄全， 1. 弄完（完成） 例：1.双方把最后一件事弄完。 2.我刚把电脑弄完。 3.妈妈已经弄完了一些。 4.作业终于弄完了。 2.弄好（make-well，good） 例：1.我一定要把那资料弄好。 2.我今天晚上弄好方案。 3.帽子弄好了。 4.我的指甲弄好了。 3.弄死（make-die） 例：1.我想把自己给弄死。 2.然后他被鹿弄死了。 3.该男子扬言要弄死交警。 4.弄开（make-open） 例：1.快过来把这小姑娘弄开。 2.车门还是没有弄开。

	3.我终于弄开一扇窗户钻进了教室。 4.绳结终于被弄开了。 打（Polysemy） 1.beat, hit 2.break, smash 3. attack, fight 4.beat, spatter 5.catch hunt 6.collect, gather in 7.draw, ladle 8.mix, stir 9.build， construct 10. make 11.open, dig 12.knit, weave 13. draw, paint.14. hold up, raise 15.pack, tie up 16. do, engage in 17.buy 18. play 19. write 20. tie, knot 21.remove get rid of 22.dispatch, fire 23. inject 24. speak in a certain way 25. make out 26. design etc. 1.打完（完成） 例：1.仗已经打完了。（fight） 2.比赛打完了。（play） 3.等你把电话打完我再去。（make） 4.藤大爷刚打完一个电话。 2.打开（open） 例：1.请把门打开。 2.用钥匙打开 11 号柜。 3.请打开书，翻到 25 页。 4.病房的门被打开了。

	5.然后房门打开了。 3.打死（die） 例：1.猎人开枪打死了一只小鸟。 2.你把我打死了。 3.敌人全被打死了。 4.羽毛打掉了，鸟也打死了。 4.打通 例：1.工人们打通了 7 条隧道。 2.政治，战略对话的渠道都已打通。 3.一条条生命通道被打通。 5.打破（beat-broken, break the record） 例：1.孩子不小心打破了杯子。 2.所有窗户被打破。 3.他打破了 9 项世界纪录。 4.3 项世界纪录被打破。 6.打伤 例：1.父亲被包工头打伤了。 2.一男子打死打伤 10 多名师生。

	3.他全身被子弹打伤 17 处。 4.我巴不得把对手打伤。 5.他打人打伤了。 7.打红（red） 例：1.屁股都打红了。 2.他的脸都被你打红了。 3.我手真重，把你的脸都打红了。 4.他此刻已经打红了眼。 8.打光（polished, use up） 例：1.城东的几个村子已经 被敌人的炮火打光。 2.所有舰艇全部打光。 3.子弹打光了。 4.王海把子弹打光了。 5.他把金属打光，看上去像金子一样。 9.打累（tired） 例：1.姐姐打字打累了。 2.我们打球打累了。 3.羽毛球打累了。

	4.那家伙打累了才住手。 10.打烦（annoyed） 例：1.很多人已经打仗打烦了。 2.这些游戏是不是已经打烦了。 不典型主动词（the least prototypical V1s） 转 zhuan3，压 ya1，唱 chang4，吹 chui1，踩 cai3，穿 chuan4，撞 zhuang4，洗 xi3，推 tui1，捏 nie1，刮 gua1，买 mai3，气 qi4，拉 la1，考 kao3，排 pai2，吸 xi1，问 wen4，调 tiao2，找 zhao3，抹 mo3. 唱 (sing) 例：唱完，唱出，唱好，唱会，唱高，唱错，唱全，唱烦，唱遍，唱累 1. 唱红(sing-popular) 例：1.我唱红了两首歌。 2.我的脸被他唱红了。 3.两兄弟唱红了你的眼圈。 2.唱累 (intransitive, sing-tired) 例：1.我唱歌唱累了。

	2.他唱戏唱累。 3.他们唱累了。 唱高 （sing-high） 例：1.那个调唱高了。 2.他唱高了三个音符。 3.我觉得他似乎唱高了。 洗（wash） 例：洗完，洗好，洗掉，洗烂，洗红 洗烂 例：1.衣服洗烂了。 2.他把一双手都洗烂了。 3.羽绒服被他洗烂了。 4.他用洗衣机洗烂了三件衣服 洗掉 例：1.我们要洗掉身上的泥土。 2.你要把油洗掉才行。 3.指甲油洗掉了。 4.他脸上的妆已经被雨水洗掉了。

	捏(pinch) 例：捏成，捏好，捏死，捏住，捏开，捏坏，捏破，捏疼，捏大 1. 捏死（pinch-die） 例：1.我会亲手把他捏死。 2.他捏死了一只臭虫。 3.毒蛇被我捏死了。 4.蟑螂捏死了。 2.捏大（pinch-big） 例：从小脸就是这样被捏大的。 3.捏开(pinch-open) 例：1.他直接空手捏开了一个核桃。 2.他伸出手捏开了汪峰的嘴巴。 3.孟子把他的嘴巴捏开。 4.她的下颌被重重的捏开了。 5.药丸捏开了。 买（buy） 例：买完，买好，买下，买光，买走，买通，买错，买晚 1. 买完

	例：1.东西没买完呀。 2.我把考试的东西买完。 3.那本书被全部买完了。 4.昨天我去商场买完东西就下楼了。 2.买好（buy-well） 例：1.电影票已经买好了。 2.我要不要提前把蛋糕买好。 3.我帮老人买好了一周的米。 撞 例：撞出，撞伤，撞死，撞开，撞倒，撞碎，撞晕，撞疼 1.撞完 例：昨天老公刚撞完车。 2. 撞碎 例：1.大客车整个撞碎。 2.另一个人企图用自己的果子把目标撞碎。 3.石板多处被撞碎。 4.他撞碎了一扇窗户。 3.撞伤

	例：1.易建联右膝盖不幸被撞伤。 2.一号电动车女士被车撞伤。 3.被告把陶女士撞伤了。 4.韩某无证驾驶撞伤了一名中年妇女。 5.你的额头撞伤了。
Practice	一、请找出由以下动词构成的动结复合词。 吃，喝，搞，看，说，提，变，跑 二、用所给复合词填空 1.拿好 2. 学累 3. 读错 4. 搞丢 5. 提高 6. 喝饱 7.倒洒 8. 抹平 9. 吸入 10. 推倒 1.你怎么能把狗狗（）在地呢？ 10 2.汤都（）了。 7 3.你把这个单词的发音（）了。 3 4.下车记得把贵重物品（）。 1 5.他学英语（）了。 2 6.还好你没把自己（）。 4 7.倒杯水都（）了。 7 8.农民的生活水平不断的（）。 5

	9.有些不能平整的结合处用石膏（）。 8 10.（）9 升空气直到把肺吸满。 9
Production	一、在空中填入合适的动词（不唯一） 1.请大家（）出课本。 （拿） 2.小心点，别把我的玩具（）坏了。（弄） 3.姚明（）破了奥运记录。 （打） 4.我（）见你在超市。 （看） 5.能够（）正错误还是好孩子。 （改） 6.他把核桃（）开。 （砸/敲） 7.衣服被他（）烂了。 （弄/穿） 二、找出用下列动词构成的动结复合词，和大家一块分享吧？ 吹，推，拉，抹，问，穿，踩，找

Teaching Plan （Period 2/Week 3）				
Subject	Chinese RVC	**Type**	New lesson	
Key Points	Prototypical RC and related RVC with examples	**Difficulty**	Meaning and related pattern	
Teacher	Lyu Zhenhua	**Students**	Pre-class of middle school	
Teaching Methods	3Ps methods	**Teaching Mode**	Classroom instruction	
Topic	Basics on Chinese RVC		**Duration**	40 minutes
Presentation	完 wan2 ：“complete，finish”(打完); “end”; “use up, run out”(拿完) 好 hao3： “good”(睡好); “friendly”(和好); “ready, done”(弄好); “in good condition”(看好病) 死 si3： “die;desperately”(踢死); fixed, rigid(卡死) 下 xia4 ：“lower”(坐下，吃下); “result/completion”(打下); “capable”(容下) 住 zhu4 ：“stop, halt”(问住，打住) 到 dao4： “arrive, get to”(走到); result of an action(拿到); considerate”			

	走 zou3： “go away”(搬走); “leak”(说走了嘴) 出 chu1 ： “go out”(走出); “a completed action”(看出，找出); “in excess”(高出，长出) 上 shang4： “upward(走上(台阶))；attainment of an objective(考上，当上)，beginning of an action(爱上) 开 kai1： “open”（打开），beginning of action(唱开)，spreading of action(传开)；clarity(说开) 起：qi3 “rise” （升起）；begin(做起)；upwards(拿起) Look at those RCs, tell us the meaning of sentence and types of pattern 完 (completion of action) 吃完(finish eating) 例：吃完简单的早餐后，我就去上学了。 吃完（eat up） 例：1.好饱呀，还要把这两碗吃完？ 2.鸡柳吃完了。 3.一盘菜已经被人吃完了。 打完(finish beating) 例：1.这个人真嚣张，打完张三打李四。

	2.打完比赛，我去洗个澡。(finish playing) 3.电话打完了没有？(finish phoning) 4.打完这一仗，咱就解放了。(finish fighting) 5.所有人 才把稿子打完。(finish typing) 读完（complete reading） 例：1.天黑了才把文章读完。 2.我想读完 10000 本书需要多长时间？ 3.起诉书终于读完了。 好(good, well) 例：考好，睡好，唱好，办好，坐好，听好，说好，做好，变好，搞好，吹好，过好，放好，打好，吃好，贴好, 弄好 1. 考好（test-good） 例：1.各科都要考好。 2.我需要做的就是把明天的试考好。 3.其实我每次都没考好。 4.我的语文没考好。 5.等我考好了试就去找你。 2.搞好（make-good）

	死 （die） 例：饿死，吃死，打死，刺死，晕死，烦死，疼死，笑死，摔死，堵死，搞死，跌死，吓死，玩死，想死，抽死，撑死，害死 1. 打死（beat to death） 例：1.你打死了几个敌人？ 2.六姨太的弟弟被人打死了。 3.老虎打死了，谁干的 ？ 4.人们会立即把疯狗打死。 2.笑死（laugh to death/laughable） 例：1.奶奶，你要笑死我了。 2.我的妈呀，把大家笑死了。 3.你这样做不行，会被爹娘笑死的。 4.他笑得心肌梗塞，笑死了。 下（down） 例：栽下，停下，吃下，蹲下，拿下，买下，取下，退下，写下，生下，留下，坐下，打下 1. 坐下（sit down） 例：1.我同别人坐下聊天。

	2.把他按到椅子上坐下。 2.拿下（take down） 例：1.不能随便把胳膊拿下。 2.看我怎么把包拿下车。 3.两人高高兴新的拿下壁上挂的剑。 4.最后一局拿下了，我们就赢了。(win) 住（stop） 例：看住，拉住，抱住，震住，吓住，忍住，叼住，守住，拖住，冻住，困住，叫住，停住，扣住，搂住 1. 搂住（hold in one”s arms） 例：1.那姑娘紧紧搂住我不放。 2.他一把把我搂住。 3.枪搂住了，别掉了。 4.我被搂住了。 2.看住（keep an eye on） 例：1.你只要牢牢看住他就行。 2.人给我看住了，别让跑了。 3.老头早已被人看住。

	4.你在这里把我的车子看住。 到(arrive) 1. 走到(walk up to） 例：1.张飞走到二楼的楼梯口停了下来。 2.拉萨最后走到了吗？ 2.买到（obtain by buying） 例：1.一个人只要有了钱就可以买到他所需的东西。 2.什么药都能买到，只有后悔药买不到。 3.最后一本书被他买到了。 4.这年代能够把粮食买到是很不容易的。 走（walk, away） 例：拿走，提走，拖走，要走，打走，拉走，送走，飞走，抽走，赢走，取走，抱走，转走，接走 1. 拿走(take away) 例：1.这些人就会任意拿走公家的东西。 2.利润的大部分被外企拿走了。 3.人们把他柜子里的东西都拿走了。 4.东西既然拿走了就不能再要了。

	2.打走(beat away) 例：1.我就立刻把他们打走。 2.大伙要一条心打走鬼子，好过太平日子。 3.将来鬼子打走了，就成立个家庭。 4.陌生男子闯入女护士家中被打走。 出(out) 例：拿出，摆出，哭出，吐出，打出，炸出，摸出，寄出，做出，跑出，蹦出，飞出，钻出，造出，讲出，冒出，递出，作出，掏出 1.打出(beat out) 例：那个人被打出了鼻血。 上(up) 例：1.爬上 3 楼的教室，累的背都酸了。 2.请把你自己的衣服穿上。 3.下次来杭州一定要让我吃上西湖醋鱼。 4.可惜电脑最后也没装上。 5.拿上你的臭钱赶紧走。 开 (open)

	例：转开，睁开，挣开，划开，炸开，轰开，撬开，打开，捅开，撞开，凿开，跑开，煮开，迈开，撬开，弄开，整开 例：1.爸爸连眼睛都没睁开。 2.我撕了半天才撕开。 3.请把盒子打开。 4.车门还是没有弄开。 5.孔子墓被用炸药炸开了。
Practice	一、 找出下列句子中包含的动结复合词。 1.**打完**菜我去你们宿舍找你。 2.半夜了我才把作业**写完**。 3.Jack 马讲的笑话**笑死**我了。 二、改写句子 1.他打了我。我死。 他（**打死**）了我。 2.我走。我到河边。 我（**走到**）了河边。 3.我们吃饭。饭完了。 我们（**吃完**）了饭。

Production	一、连线题 V1 RC 打 上 读 开 拿 完 学 死 吃 好 二、找出生活中或课本中碰到的结果补语为“完，好，死，下，住，到，走，出，上，开，起”的复合词，和大家分享你的分析。

Teaching Plan （Period 1/Week 4）				
Subject	Chinese RVC	**Type**	new lesson	
Key Points	Less and least prototypical RC and related RVC with examples	**Difficulty**	Least prototypical RCs and RVCs	
Teacher	Lyu Zhenhua	**Students**	Pre-class of middle school	
Teaching Methods	3Ps methods	**Teaching Mode**	Classroom instruction	
Topic	Basics on Chinese RVC		**Duration**	40 minutes
Presentation	坏 huai4 “bad”，会 hui4 “understand”，通 tong4 “through”，晚 wan3 “late”，清 qing1 “clean, clear”，活 huo2 “alive”，破 po4 “broken”，掉 diao4 “drop”，倒 dao3 “fall”，丢 diu1 “toss, lose”，错 cuo4 “wrong”，来 lai2 “come”，成 cheng2 “succeed”, 高 gao1 “high, tall”，着 zhao2，动 dong4 “move”，伤 shang1，去 qu4 “go” Tell us the meaning of these RVC and support idea with examples. 坏（bad, break down） 例：做坏，累坏，饿坏，冻坏，吃坏，搞坏，惯坏，憋坏，办坏，咬坏，气坏，炸坏，踩坏，演坏，撕坏，穿坏，磨坏，走坏，系坏，用坏，坐坏，转坏，敲坏，吹坏，写坏，放坏，洗坏，愁坏，			

	哭坏，撑坏，喝坏，震坏，剪坏，笑坏，学坏，打坏，弄坏，变坏 错 （wrong，mistake） 例：搞错，说错，听错，记错，猜错，找错，选错，发错，出错，答错，放错，跑错，读错，搭错，带错，杀错，穿错，投错，转错，站错，抓错，踏错，坐错，看错，弄错，打错，走错，写错，想错，吃错，算错，拿错，要错，讲错，叫错 伤（hurt） 例：刺伤，咬伤，想伤，砍伤，抓伤，脱伤，震伤， 吃伤，射伤，听伤，裹伤，拉伤，砸伤，炸伤，弄伤，压伤，耗伤，晒伤，说伤，扎伤，踢伤，砍伤，轧伤 晚 （late） 例：吃晚，说晚，听晚，起晚，爱晚，想晚，开晚，唱晚，出晚，设晚，来晚，到晚，睡晚，做晚，进晚，上晚，下晚，使晚，整晚，发晚，作晚，插晚，穿晚，求晚 破（broken） 例：跌破，磨破，捅破，挤破，喊破，震破，撑破，打破，敲破，挑破，磕破，溶破，刺破，割破，吓破，搞破，撞破，弄破，射破，扎破，顶破，叫破，碰破，刮破，笑破，吹破 高（high）

	例：穿高，使高，提高，喝高，读高，起高，说高，做高，叫高，出高，上高，拉高，打高，顶高， 掉 （lose，drop，fall behind） 例：脱掉，打掉，输掉，戒掉，拿掉，挂掉，坏掉，放掉，喝掉，烂掉，断掉，退掉，逃掉，吞掉，抽掉，辞掉，剥掉，嫁掉，砸掉，做掉，埋掉，用掉，摔掉，搬掉，搞掉，掀掉，刷掉，抖掉，裁掉，吓掉，熄掉，停掉，剃掉，卖掉，花掉，走掉，换掉 倒 （fall over, collapse） 例：扑倒，迷倒，躺倒，醉倒，瘫倒，坐倒，搬倒，砍倒，踢倒，绊倒，说倒，冲倒，震倒，喝倒，骗倒，考倒，搞倒，射倒，放倒，掀倒，干倒，碰倒，笑倒，砸倒，挤倒，熏倒，吃倒 丢（lose，toss） 例：弄丢，走丢，搞丢，追丢，跟丢，寄丢，看丢，出丢，叫丢，看丢，做丢，罚丢，说丢，跑丢，想丢，包丢，玩丢，寄丢。 RC:多，少，小，热，昏，疼，红，白，早，难，光，熟，傻，累 多(more than enough) 例：花多，喝多，吃多，买多，取多，想多 例：1.饺子吃多了。

	2.今天中午我吃多了。 3.我害怕万一吃多了脂肪，得了高血压。 4.我没有想多。 5.我看你是想鸡腿想多了吧？ 6.2 个行李袋不够，明天一定要买多一个。 傻 (silly) 例：变傻，说傻，冻傻，笑傻，吓傻， 例：1.我猜是我被冻傻了。 2.把我脑袋冻傻了。 3.整个人都冻傻了。 4.我真的笑傻了。 5.他都快把自己笑傻了。 累 (tired) 例：喊累，看累，逛累，哭累，说累，斗累，打累，学累，坐累，想累，玩累，闹累 例：1.大家都学累了。 2.今天坐车坐累了。 3.徐胖子坐累了。

	4.姐姐打字打累了。 5.他打累了。 光 (use up)
Practice	一、请在括号内填入合适的结果补语 1.一场飓风把路边的那棵大树刮（）了。 倒 2.迈克罚（）了决定胜负的一球，比赛进入到了加时。 丢 3.你今天吃（）了药了？对我们发火？ 错 4.汽车在路上把小明撞（）了，被送进了医院。 倒/昏 5.谷爱凌打（）了世界纪录。 破 6.一天没有吃东西了，把饿（）了。 昏/死 7.今天起（）了，没能赶上最后一班车。 晚 8.小芳跑（）告诉我说她得奖了。 来 9.电话打了几次，都没有打（） 通
Production	一、用所给词语填空。 调小，涨红，脱光，哭累，吓傻，取多， 1.太吵了，请把音量（）。

	2.他的表演让主持人当场（）了。 3.我在银行（）300 元钱。 4.孩子们（）衣服，跳到水池里。 5.她感到浑身燥热，脸色（）。 6.累了你就哭，（）你就睡。 二、填入合适的结果补语。 1.怕迟到，怕迟到，结果来（）了。 迟 2.这样的规定使离婚变（）了。 少/多 3.好冷呀，今天穿（）了。 少 4.面粉大战有没有把闺女抹（）呀？ 白 5.把白菜放到锅里炒（）。 熟 6.孩子在使劲哭，一定是打（）了。败

Teaching Plan （Period 2/Week 4）				
Subject	Chinese RVC	**Type**	New lesson	
Key Points	Revision	**Difficulty**	Least prototypical RVCs and sentence patterns	
Teacher	Lyu Zhenhua	**Students**	Pre-class of middle school	
Teaching Methods	3Ps methods	**Teaching Mode**	Classroom instruction	
Topic	Basics on Chinese RVC		**Duration**	40 minutes
Presentation	你们知道什么是动结复合词？ 动+结 （打碎）动作动词（因） 结果动词（果）（1）因：他打花瓶。果：花瓶碎了。（2） 他打碎了花瓶。上面两个句子你更喜欢拿一个？为什么？动结复合词通常是两个字构成： 例： 打烂，推倒，写错 也可以是多于两个字如想清楚，想明白。 动结复合词可以是后面接名词也可以是不接名词或者两者都有。 例：他喝醉了。（后没名词） 他喝醉了酒。（后有名词）			

	他打疼了我。（后有名词）。 我打疼了。（×） 1.前面加“没” 没（吃饱），没（打碎），没（拿出） 2.中间加“不” 例：睡醒，打死，踢烂 睡不醒，打不死，踢不烂（Students answer）
Practice	一、找出下列句子中包含的动结复合词和所属句型。 1.老师把孩子**吓哭**了。 2.老爸喝酒**喝醉**了。 3.刘翔**打赢**了官司。 二、改写句子 1.他撕了我的情书。我的情书碎了。 他（撕碎）了我的情书。 2.我用斧子砍。斧子断了。 我（砍断）了斧子。 3.我们吃了饭，但我们没饱。 我们没（吃饱）饭。

Production	复习 一、请用以下复合词造句 打下，踢坏，笑疯，读烦，看懂，拿错 二、请说出你记住的典型动词和典型结果补语 三、请简单说明动结复合词允准的 5 种基本句型及典型特征。

Appendix H: Teaching Plan of Bahasa Cina (Pre-class) (the Control Group)

<table>
<tr><td colspan="2">Unit</td><td colspan="6">Unit 1 智慧源泉　　一、扁鹊治病</td></tr>
<tr><td>Instructor</td><td>Lyu Zhenhua</td><td>Period /week</td><td>1/1</td><td>Duration</td><td>40-minute</td><td>Teaching Mode</td><td>Classroom instruction</td></tr>
<tr><td colspan="2">Teaching Objective</td><td colspan="6">1、认识生字新词。
2、正确、流利、有感情地朗读课文。联系有关词句，体会人物的想法，体会到防微杜渐、不要讳疾忌医，要善于听取别人正确意见的道理。</td></tr>
<tr><td colspan="2">Key points</td><td colspan="6">明白课文传递的道理；</td></tr>
<tr><td colspan="2">Difficulty</td><td colspan="6">相关难度较大的字、词、句。</td></tr>
<tr><td colspan="4">Teaching Contents</td><td colspan="4">Activity</td></tr>
<tr><td colspan="4">扁鹊、蔡桓公、 固执、高明、邀功、皮肤、肠胃、敷烫、几剂汤药骨髓、无能为力、医治等词语或短语的学习；
相关练习；
课文（会话）相关的话题训练；</td><td colspan="4">1 学时；
突出学生的主体作用，教师少说，学生多说；
多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量；</td></tr>
</table>

	讨论与作业：扁鹊的做法；蔡桓公应该怎么做。
教学参考	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系；

<table>
<tr><td colspan="2">Unit</td><td colspan="6">Unit 1 智慧源泉 二、落难王子</td></tr>
<tr><td>Instructor</td><td>Lyu Zhenhua</td><td>Period/ week</td><td>2/1</td><td>Duration</td><td>40 minutes</td><td>Teaching Mode</td><td>Classroom instruction</td></tr>
<tr><td colspan="2">Teaching Objectives</td><td colspan="6">1、认识生字新词。
2、正确、流利、有感情地朗读课文。
明白“厄运能使脆弱的人变得坚强起来”的道理。</td></tr>
<tr><td colspan="2">Key points</td><td colspan="6">明白课文传递的道理；</td></tr>
<tr><td colspan="2">Difficulty</td><td colspan="6">相关难度较大的字、词、句。</td></tr>
<tr><td colspan="4">Teaching contents</td><td colspan="4">Activity</td></tr>
<tr><td colspan="4">异国他乡、厄运、
泪流满面、正色等词语或短语的学习；
相关练习；
课文（会话）相关的话题训练；</td><td colspan="4">1 学时；
突出学生的主体作用，教师少说，学生多说；
多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量；</td></tr>
</table>

	讨论与作业：如何看待生活中的苦难、挫折。
教学参考	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系；

<table>
<tr><td colspan="2">Unit</td><td colspan="6">Unit 1 智慧源泉 阅读分享 三、渔夫的故事</td></tr>
<tr><td>Instructor</td><td>Lyu Zhenhua</td><td>Period/week</td><td>1 /2</td><td>Duration</td><td>40 minutes</td><td>Teaching Mode</td><td>Classroom instruction</td></tr>
<tr><td colspan="2">Teaching Objective</td><td colspan="6">1、认识生字新词。
2、正确、流利、有感情地朗读课文。
尝试分析渔夫与魔鬼的性格。</td></tr>
<tr><td colspan="2">Key points</td><td colspan="6">明白课文传递的道理；</td></tr>
<tr><td colspan="2">Difficulty</td><td colspan="6">相关难度较大的字、词、句。</td></tr>
<tr><td colspan="4">Teaching Contents</td><td colspan="4">Activity</td></tr>
<tr><td colspan="4">所罗门、锡、耸立、倒霉、智慧、
妖气、挪、说谎等词语或短语的学习；
相关练习；
课文（会话）相关的话题训练；</td><td colspan="4">1 学时；
突出学生的主体作用，教师少说，学生多说；
多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量；</td></tr>
</table>

	讨论与作业：该向渔夫学习什么。
教学参考	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系；

<table>
<tr><td colspan="2">Unit</td><td colspan="6">Unit 1 智慧源泉 温故知新：登鹳雀楼</td></tr>
<tr><td>Instructor</td><td>Lyu Zhenhua</td><td>Period/ Week</td><td>2/2</td><td>Duration</td><td>40 minutes</td><td>Teaching Mode</td><td>Classroom instruction</td></tr>
<tr><td colspan="2">Teaching Objectives</td><td colspan="6">1、认识生字新词。
2、正确、流利、有感情地朗读这首诗。
明白诗歌的意境。</td></tr>
<tr><td colspan="2">Key Points</td><td colspan="6">明白诗歌蕴含的道理；</td></tr>
<tr><td colspan="2">Difficulty</td><td colspan="6">相关难度较大的字、词、句。</td></tr>
<tr><td colspan="3">Teaching Contents</td><td colspan="5">Activity</td></tr>
<tr><td colspan="3">鹳雀楼、白日、穷、千里目等词语或短语的学习；
相关练习；
课文（会话）相关的话题训练；</td><td colspan="5">1 学时；
突出学生的主体作用，教师少说，学生多说；
多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量；
讨论与作业：说说你对“欲穷千里目，更上一</td></tr>
</table>

	层楼”这句诗的理解。
教学参考	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系；

Unit		Unit 2 崇高品德 阅读分享：蝉与萤					
Instructor	Lyu Zhenhua	**Period/ Week**	1 /3	**Duration**	40 minutes	**Teaching Mode**	Classroom instruction
Teaching Objectives		1、认识生字新词。 2、正确、流利、有感情地朗读课文。 明白“蝉有蝉的优点长处，萤有萤的优点长处，人也是如此”的道理。					
Key Points		明白课文传递的道理；					
Difficulties		相关难度较大的字、词、句。					

Teaching Contents	Activity
恣肆、扑朔迷离、涤、娇憨、藐视等词语或短语的学习； 相关练习； 课文（会话）相关的话题训练；	1 学时； 突出学生的主体作用，教师少说，学生多说； 多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量； 讨论与作业：人，各有各的长处。不要随便崇拜别人，也不要轻易看不起别人。

教学参考	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系；

Unit		**Unit 2 崇高品德 温故知新：芙蓉楼送辛渐**					
Instructor	Lyu Zhenhua	Period/ Week	2/3	**Duration**	40 minutes	**Teaching Mode**	Classroom instruction
Teaching Objectives		1、认识生字新词。 2、正确、流利、有感情地朗读这首诗。 明白诗歌的意境。					
Key points		明白诗歌蕴含的道理；					
Difficulty		相关难度较大的字、词、句。					

Teaching Contents	**Activity**
平明、楚山、冰心、玉壶等词语或短语的学习； 相关练习； 课文（会话）相关的话题训练；	1 学时； 突出学生的主体作用，教师少说，学生多说； 多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量； 讨论与作业：理解作者送别有友人时的心情。

教学 参考	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系；

<table>
<tr><td colspan="2">Unit</td><td colspan="6">Unit 3 走入大自然 阅读分享：小鸟，请原谅我</td></tr>
<tr><td>Instructor</td><td>Lv Zhenhua</td><td>Period/ Week</td><td>1/4</td><td>Duration</td><td>40 minutes</td><td>Teaching Mode</td><td>Classroom instruction</td></tr>
<tr><td colspan="2">Teaching Objectives</td><td colspan="6">1、认识生字新词。
2、正确、流利、有感情地朗读诗歌。
明白爱护鸟类的重要性。</td></tr>
<tr><td colspan="2">Key Points</td><td colspan="6">明白诗歌传递的道理；</td></tr>
<tr><td colspan="2">Difficulty</td><td colspan="6">相关难度较大的字、词、句。</td></tr>
<tr><td colspan="4">Teaching Contents</td><td colspan="4">Activity</td></tr>
<tr><td colspan="4">弹弓、闺女、伴侣、孤零零、坟头等词语或短语的学习；
相关练习；
课文（会话）相关的话题训练；</td><td colspan="4">1 学时；
突出学生的主体作用，教师少说，学生多说；
多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量；
讨论与作业：你小时候有没有做过弹弓？
小鸟是人类的朋友，该如何爱护鸟类？</td></tr>
</table>

教学资源	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系；

<table>
<tr><td colspan="2">Unit</td><td colspan="6">Unit 3　走入大自然 温故知新：敕勒歌</td></tr>
<tr><td>Instructor</td><td>Lyu Zhenhua</td><td>Period/ Week</td><td>2/4</td><td>Duration</td><td>40 minutes</td><td>Teaching Mode</td><td>Classroom instruction</td></tr>
<tr><td colspan="2">Teaching Objectives</td><td colspan="6">1、认识生字新词。
2、正确、流利、有感情地朗读诗歌。
体会诗歌展现的水草丰美的意境。</td></tr>
<tr><td colspan="2">Key points</td><td colspan="6">欣赏诗歌展现的美；</td></tr>
<tr><td colspan="2">Difficulty</td><td colspan="6">相关难度较大的字、词、句。</td></tr>
<tr><td colspan="3">Teaching Contents</td><td colspan="5">Activity</td></tr>
<tr><td colspan="3">阴山、穹庐、笼盖四野、见等词语或短语的学习；
了解更多北朝民歌；
相关练习；
课文（会话）相关的话题训练；</td><td colspan="5">1 学时；
突出学生的主体作用，教师少说，学生多说；
多鼓励，多支持，尽一切可能增加学生的课堂参与度与训练量；
讨论与作业：有没有感受到诗歌里描绘的景物之美？具体说一说敕勒川的美。</td></tr>
<tr><td colspan="3"></td><td colspan="5"></td></tr>
</table>

教学资源	教材资源，网上资源；
课后反思	把所学内容与学生的生活实际相联系.

Appendix I: Chinese Proficiency Test

导语

亲爱的同学，非常感谢您能参加此次问卷调查。我是马来西亚砂拉越大学语言与传媒学院的博士研究生张亚锋，学号 20010080，本次调查的目的是了解大家对汉语动结复合词的学习状况，调查结果可提供为教育主管部门和相关教师改善外国留学生动结复合词的学习状况。问卷采用匿名形式，不会对您造成任何负面影响，希望您能如实填写各项内容，对您宝贵时间的耽误，特此表示歉意，谢谢谢合作。

Instruction

Dear volunteers, thank you so much for your participating in this questionnaire survey.My name is Zhang Yafeng, PhD candidate from Faculty of Language and Communication, Universiti Malaysia Sarawak. My ID number is 20010080. The purpose of this survey is to explore the SLA of Chinese resultative verb compounds, and the survey results can help education authorities and teachers to improve the learning of Chinese resultative compounds for foreign language learners of Chinese.The questionnaire is anonymous and will not have any negative impact on you. We hope you can fill in all the contents truthfully. We sincerely apologize for the delay of your precious time if it does.

Name: _____ Country:_____Age _____

Years of learning Chinese:_____years

Part I

There are 5 items in Part I. In this section, 10 sentences will be provided and the test taker will be asked to correlate them.

第 1-5 题

A 爷爷教了我很多次。

B 做作业遇到不会的词语时，你用铅笔在旁边记一下。

C 我还以为你忘了呢，你真好！

D 决定了没？去还是不去？

E 当然。我们先坐公共汽车，然后换地铁。

F 你先吃个苹果吧，我去给你做面条儿。

例如：你知道怎么去那儿吗？（ E ）

1．生日快乐！这是我给你买的礼物，喜欢不喜欢？（ ）

2．天阴了，我怕一会儿要下雨，明天吧？（ ）

3．现在去看字典吧，字典里有。（ ）

4．你的游泳水平最近提高很快啊。（ ）

5．我饿了，冰箱里有什么吃的吗？（ ）

Part II

There are 5 items in Part II. For each item, one or two sentences will be provided, in which one word/phrase is missing. The test taker should choose one of the suggested words/phrases to fill in the blank.

第 6-10 题

A 刻　B 双　C 音乐　D 其他　E 声音　F 干净

例如：她说话的（ E ）多好听啊！

6．除了数学，弟弟的（ ）成绩都不错。

7．我特别想买这（ ）鞋，问题是我的脚太大。

8．这条裤子昨天洗过了，是（ ）的。

9．现在是三点一（ ），别担心，我们不会迟到。

10．姐姐从小就喜欢唱歌，现在她是一位（ ）老师。

Part III

There are 5 items in Part III. This part consists of 5 short passages, each followed by a question. The test taker should choose the best answer from the 3 choices provided.

第 11-15 题

例如：您是来参加今天会议的吗？您来早了一点儿，现在才八点半。您先进来坐吧。

★ 会议最可能几点开始？

A 8 点

B 8 点半

C 9 点 √

11．中国人经常说：早饭要吃好，午饭要吃饱，晚饭要吃少。

★ 根据这句话，可以知道：

A 早饭要少吃

B 午饭要多吃

C 不要吃晚饭

12．公司来了一位新同事，长得跟我有点儿像，而且我们都姓王，很多人总是笑着问我："新来的同事是不是你哥哥？"

★ 新来的同事：

A 是我哥

B 长得像我

C 长得像我弟弟

13．北京的秋天比较短，但这是北京最好的季节。秋天的北京不冷也不热，下雨的时候不多，这时候去北京旅游最好。北京的春天也很漂亮，只是有时候会刮大风。

★ 北京的秋天：

A 很舒服

B 非常热

C 经常刮风

14．张先生，您到饭店以后，先休息一下。中午我们一起吃午饭，下午 4 点以前没有什么事，如果您愿意，我可以带您到附近看看。5 点，我们经理和您

见面，晚上经理请您吃晚饭。

★ 张先生 5 点做什么？

A 和经理见面

B 到外面去看看

C 和经理一起吃饭

15．小李，洗手间在一楼东边，如果有客人要去，你带他们去。还有，注意洗手间的灯不要关。

★ 根据这段话，可以知道：

A 小李是客人

B 小李表示同意

C 别关洗手间的灯

Appendix J: Lexical Acceptability Judgment Test

姓名 Nama penuh:

性别 Jantina: 男 Lelaki 女 Perempuan

注意：请判断一下复合词是否可以接受，判断的维度通过选择以下数字来完成。

2	=absolute acceptable	（完全接受）
1	=moderately accept	（基本接受）
0	=not sure	（不确定）
-1	=moderately unacceptable	（完全不能接受）
-2	=absolutely unacceptable	（基本不能接受）

1.拿错	◎2	◎1	◎0	◎-1	◎-2
2.睡好	◎2	◎1	◎0	◎-1	◎-2
3.抓出	◎2	◎1	◎0	◎-1	◎-2
4.坐上	◎2	◎1	◎0	◎-1	◎-2
5.学成	◎2	◎1	◎0	◎-1	◎-2
6.杀死	◎2	◎1	◎0	◎-1	◎-2
7.提高	◎2	◎1	◎0	◎-1	◎-2
8.想好	◎2	◎1	◎0	◎-1	◎-2
9.读出	◎2	◎1	◎0	◎-1	◎-2

10.填上 ◎2 ◎1 ◎0 ◎-1 ◎-2

11.打死 ◎2 ◎1 ◎0 ◎-1 ◎-2

12.搬出 ◎2 ◎1 ◎0 ◎-1 ◎-2

13.爬出 ◎2 ◎1 ◎0 ◎-1 ◎-2

14.推出 ◎2 ◎1 ◎0 ◎-1 ◎-2

15.拉成 ◎2 ◎1 ◎0 ◎-1 ◎-2

16.拿出 ◎2 ◎1 ◎0 ◎-1 ◎-2

17.睡过 ◎2 ◎1 ◎0 ◎-1 ◎-2

18.抓红 ◎2 ◎1 ◎0 ◎-1 ◎-2

19.坐坏 ◎2 ◎1 ◎0 ◎-1 ◎-2

20.学坏 ◎2 ◎1 ◎0 ◎-1 ◎-2

21.杀错 ◎2 ◎1 ◎0 ◎-1 ◎-2

22.提为 ◎2 ◎1 ◎0 ◎-1 ◎-2

23.想错 ◎2 ◎1 ◎0 ◎-1 ◎-2

24.读错 ◎2 ◎1 ◎0 ◎-1 ◎-2

25.填坏 ◎2 ◎1 ◎0 ◎-1 ◎-2

26.打掉 ◎2 ◎1 ◎0 ◎-1 ◎-2

27.搬掉 ◎2 ◎1 ◎0 ◎-1 ◎-2

28.爬红 ◎2 ◎1 ◎0 ◎-1 ◎-2

29 推掉 ◎2 ◎1 ◎0 ◎-1 ◎-2

30.拉坏 ◎2 ◎1 ◎0 ◎-1 ◎-2

31.拿累 ◎2 ◎1 ◎0 ◎-1 ◎-2

32.睡够 ◎2 ◎1 ◎0 ◎-1 ◎-2

33.抓入 ◎2 ◎1 ◎0 ◎-1 ◎-2

34.坐烦 ◎2 ◎1 ◎0 ◎-1 ◎-2

35.学烦 ◎2 ◎1 ◎0 ◎-1 ◎-2

36.杀怕 ◎2 ◎1 ◎0 ◎-1 ◎-2

37.提惯 ◎2 ◎1 ◎0 ◎-1 ◎-2

38 想累 ◎2 ◎1 ◎0 ◎-1 ◎-2

39 读烦 ◎2 ◎1 ◎0 ◎-1 ◎-2

40.填入 ◎2 ◎1 ◎0 ◎-1 ◎-2

41.打烦 ◎2 ◎1 ◎0 ◎-1 ◎-2

42.搬够 ◎2 ◎1 ◎0 ◎-1 ◎-2

43.爬累 ◎2 ◎1 ◎0 ◎-1 ◎-2

44.推惯 ◎2 ◎1 ◎0 ◎-1 ◎-2

45.拉入 ◎2 ◎1 ◎0 ◎-1 ◎-2

Appendix K: Syntactic Acceptability Judgment Test

姓名 Nama penuh:

性别 Jantina: 男 Lelaki 女 Perempuan

注意：你觉得以下句子是否可以接受，比如完全可以接受就在 2 前面打上对勾，觉得很别扭，完全不能接受就在-2 前面打对勾，不能确定就选 0，具体要求见下表。

-2 sama sekali tidak boleh diterima 完全不能接受

-1 pada dasarnya tidak boleh diterima 有些不能接受

0 tidak pasti 确定不了

1 penerimaan asas 还可以接受

2 diterima sepenuhnya 完全可以接受

1.张亚锋打死了李世民。

◎2 ◎1 ◎0 ◎-1 ◎-2

2.姚明打出了好成绩。

◎2 ◎1 ◎0 ◎-1 ◎-2

3.张飞把李广打死了。

◎2 ◎1 ◎0 ◎-1 ◎-2

4.李四打死了。

◎2 ◎1 ◎0 ◎-1 ◎-2

5.姚明把比赛打惯了。

◎2 ◎1 ◎0 ◎-1 ◎-2

6.李浩被张三丰打死了。

◎2 ◎1 ◎0 ◎-1 ◎-2

7.比赛被李世民打惯了。

◎2 ◎1 ◎0 ◎-1 ◎-2

8.比赛打惯了。

◎2 ◎1 ◎0 ◎-1 ◎-2

9.张三打比赛打惯了。

◎2 ◎1 ◎0 ◎-1 ◎-2

10.张浩然打车打掉了五十令吉。

◎2 ◎1 ◎0 ◎-1 ◎-2

11.孩子打掉了。

◎2 ◎1 ◎0 ◎-1 ◎-2

12.孩子被徐达打掉了。

◎2 ◎1 ◎0 ◎-1 ◎-2

13.花瓶被李白打破了。

◎2 ◎1 ◎0 ◎-1 ◎-2

14.张娟把孩子打掉了。

◎2 ◎1 ◎0 ◎-1 ◎-2

15.花瓶打破了。

◎2 ◎1 ◎0 ◎-1 ◎-2

16.张学良打断了我的腿。

◎2 ◎1 ◎0 ◎-1 ◎-2

17.姚明打惯了比赛。

◎2 ◎1 ◎0 ◎-1 ◎-2

18.张纳云把我的腿打断了。

◎2　　◎1　　◎0　　◎-1　　◎-2

19.张蕾把关系打好了。

◎2　　◎1　　◎0　　◎-1　　◎-2

20.我的腿被李世民打断了。

◎2　　◎1　　◎0　　◎-1　　◎-2

21.关系被张三丰打好了。

◎2　　◎1　　◎0　　◎-1　　◎-2

22.关系打好了。

◎2　　◎1　　◎0　　◎-1　　◎-2

23.曹雪芹打关系打好了。

◎2　　◎1　　◎0　　◎-1　　◎-2

24.李阳的爸爸打李阳打惯了。

◎2　　◎1　　◎0　　◎-1　　◎-2

25.方向打死了。

◎2　　◎1　　◎0　　◎-1　　◎-2

26.方向被张三打死了。

◎2　　◎1　　◎0　　◎-1　　◎-2

27.李阳被他爸爸打惯了。

◎2　　◎1　　◎0　　◎-1　　◎-2

28.张小泉把方向打死了。

◎2　　◎1　　◎0　　◎-1　　◎-2

29.比赛打惯了。

◎2 ◎1 ◎0 ◎-1 ◎-2

30.李白的爸爸把李白打惯了。

◎2 ◎1 ◎0 ◎-1 ◎-2

31.李阳的爸爸打惯了李阳。

◎2 ◎1 ◎0 ◎-1 ◎-2

32.张丽打掉了孩子。

◎2 ◎1 ◎0 ◎-1 ◎-2

33.球被姚明打入了。

◎2 ◎1 ◎0 ◎-1 ◎-2

34.张飞打人打上瘾了。

◎2 ◎1 ◎0 ◎-1 ◎-2

35.姚明打球打入了。

◎2 ◎1 ◎0 ◎-1 ◎-2

36.张祥和打人打掉了指甲套。

◎2 ◎1 ◎0 ◎-1 ◎-2

37.世界纪录被刘恩铭打破了。

◎2 ◎1 ◎0 ◎-1 ◎-2

38.张丽把我手中的碗打掉了。

◎2 ◎1 ◎0 ◎-1 ◎-2

39.张纳云打掉了我手中的碗。

◎2 ◎1 ◎0 ◎-1 ◎-2

40.张肖已经打好了关系。

◎2 ◎1 ◎0 ◎-1 ◎-2

41.张三丰打球打怕了。

◎2 ◎1 ◎0 ◎-1 ◎-2

42.李阳打孩子打怕了。

◎2 ◎1 ◎0 ◎-1 ◎-2

43.张蕾打断了我们的谈话。

◎2 ◎1 ◎0 ◎-1 ◎-2

44.张蕾把鸡蛋打入了锅内。

◎2 ◎1 ◎0 ◎-1 ◎-2

45.鸡蛋打入了锅内。

◎2 ◎1 ◎0 ◎-1 ◎-2

46.张祥和打鸡蛋打入了锅内。

◎2 ◎1 ◎0 ◎-1 ◎-2

47.张学良打烧饼打出了幸福路。

◎2 ◎1 ◎0 ◎-1 ◎-2

Appendix L: Frequent V1s in BCC Corpus (111)

对 dui4 “check”	要 yao4 “want”	发 fa1 “send”	着 zhao2 “ignite”
出 chu1 “go out”	看 kan4 “look”	下 xia4 “go down”	过 guo4 “pass”
开 kai1 “open”	等 deng3 “wait”	分 fen1 “separate”	还 huan2 “return”
作 zuo4 “make”	当 dang1 “work as”	用 yong4 “use”	起 qi3 “rise”
提 ti2 “lift”	想 xiang3 “think”	上 shang4 “go up”	问 wen4 “ask”
给 gei3 “give”	做 zuo4 “do”	关 guan1 “close”	比 bi3 “compare”
去 qu4 “go”	说 shuo1 “say”	打 da3 “beat”	走 zou3 “walk”
改 gai3 “correct”	回 hui2 “go back”	通 tong1 “unstop”	长 zhang3 “grow”
和 huo4 “mix”	排 pai2 “arrange”	搞 gao3 “deal with”	压 ya1 “press”
喝 he1 “drink”	吃 chi1 “eat”	种 zhong4 “plant”	管 guan3 “manage”
点 dian3 “point”	转 zhuan3 “turn”	合 he2 “close”	安 an1 “install”
干 gan1 “do”	指 zhi3 “point”	变 bian4“change”	放 fang4 “put”
听 ting1 “listen”	理 li3 “crop”	带 dai4 “bring”	解 jie3 “unfasten”
推 tui1 “push”	投 tou2 “throw”	动 dong4 “move”	调 tiao2/diao4 “adjust
生 sheng1 “bear”	治 zhi4 “cure”	运 yun4“transport”	笑 xiao4 “smile”
办 ban4 “deal with”	传 chuan2 “pass”	流 liu2 “flow”	采 cai3 “pick”

气 qi4 “annoy”	跟 gen1 “follow”	包 bao1 “wrap”	让 rang4 “allow”
考 kao3 “test”	住 zhu4 “live”	玩 wan2“play”	游 you2 “travel”
吸 xi1 “absorb”	倒 dao4 “fall over”	找 zhao3 “look for”	睡 shui4 “sleep”
取 qu3 “fetch”	死 si3 “die”	亲 qin1 “kiss”	立 li4 “erect”
花 hua1 “spend”	请 qing3 “invite”	买 mai3 “buy”	防 fang2 “defend”
举 jv3 “raise”	存 cun2 “deposit”	讲 jiang3 “speak”	帮 bang1 “help”
定 ding4 “decide”	差 cha1 “fall short of”	拉 la1 “pull”	评 ping2 “assess”
学 xue2 “learn”	落 luo4 “fall”	飞 fei1 “fly”	加 jia1 “add”
坐 zuo4“sit”	拿 na2 “take”	造 zao4 “make”	配 pei4 “match”
照 zhao4 “illuminate”	穿 chuan1 “wear”	留 liu2 “leave”	抓 zhua1 “seize”
除 chu2 “rid”	装 zhuang1 “load”	站 zhan4 “stand”	化 hua4 “melt”
招 zhao1 “recruit”	停 ting2 “stop”	收 shou1 “collect”	

Appendix M: Frequent V1s in HSK Corpus (69)

喂 wei4 “feed”	捅 tong3 “poke”	罚 fa2 “fine”	缴 jiao3 “hand in”
出 chu1 “send”	流 liu2 “flow”	跪 gui4 “kneel”	吐 tu3 “emit”
使 shi3 “use”	蘸 zhan4 “dip in”	累 lei4 “tired”	闭 bi4 “close”
剃 ti4 “pick”	滴 di1 “drip”	着 zhao2 “catch”	嚷 rang3 “shout”
叮 ding1 “sting”	坐 zuo4 “sit”	吹 chui1 “blow”	讨 tao3 “require”
修 xiu1 “fix”	捣 dao3 “crush”	取 qu3 “fetch”	睡 shui4 “sleep”
输 shu1 “loose”	填 tian2 “fill”	转 zhuan3/4 “turn”	下 xia4 “step down”
存 cun2 “deposit”	剪 jian3 “cut”	缠 chan2 “wind”	磕 ke1 “knock against”
轧 ya4 “squeeze”	刮 gua1 “scrape”	搭 da1 “put up”	包 bao1 “wrap”
筛 shai1 “sift”	驮 tuo2 “carry on back”	治 zhi4 “cure”	当 dang1 “work as”
掘 jue2 “scoop”	走 zou3 “walk”	想 xiang3 “think”	念 nian4 “read”
跑 pao3 “run”	要 yao4 “want”	淹 yan1 “flood”	提 ti2 “lift”
抓 zhua1 “seize”	学 xue2“learn”	等 deng3 “wait”	测 ce4 “test”
喷 pen1 “spurt”	对 dui4 “check”	杀 sha1 “kill”	让 rang4 “concede”
考 kao3 “test”	读 du3 “read”	掸 dan3 “dust”	饿 e4 “hungry”

捞 lao1 “dredge”	骗 pian4 “cheat”	愁 chou2 “worry”	养 yang3 “raise”
拿 na2 “take”	褪 tui4 “faint”	造 zao4 “make”	捡 jian3 “pick”

Appendix N: Highly Productive V1s in BCC Corpus (163)

弄 nong4 “make”	变 bian4 “change”	打 da3 “beat”	搞 gao3 “make”
看 kan4 “look”	说 shuo1 “say”	转 zhuan4/2 “turn”	写 xie3 “write”
笑 xiao4“smile”	压 ya1“press”	唱 chang4 “sing”	睡 shui4“sleep”
跑 pao3 “run”	挤 ji3 “squeeze”	叫 jiao4 “shout”	玩 wan2 “play”
磨 mo2 “grind”	开 kai1 “open”	吹 chui1“blow”	走 zou3“run”
冲 chong1 “rush”	踢 ti1 “kick”	闹 nao4 “annoy”	踩 cai3 “stamp”
咬 yao3 “bite”	穿 chuan1 “wear”	撞 zhuang4 “knock”	热 re4 “hot”
读 du2 “read”	洗 xi3 “wash”	刮 gua1 “scrape”	推 tui1 “push”
画 hua4 “draw”	捏 nie1 “pinch”	刷 shua1 “brush”	坐 zuo4“sit”
拖 tuo1“drag”	摔 shuai1 “fall down”	买 mai3 “buy”	累 lei4 “tired”
摇 yao2 “shake”	吓 xia4 “frighten”	惊 jing1 “frighten”	挖 wa1 “scoop”
骂 ma4 “scold”	拍 pai1 “pat”	敲 qiao1 “knock”	砸 za2 “pound”
扯 che3 “pull”	摸 mo1 “feel”	碰 peng4 “touch”	气 qi4 “annoy”
挑 tiao1 “pick”	练 lian4 “practice”	带 dai4 “bring”	逼 bi1 “force”
烫 tang4 “scald”	挂 gua4 “hang”	扭 niu3 “twist”	淋 lin2 “pour”
想 xiang3 “think”	踏 ta4 “stamp”	拉 la1 “pull”	跳 tiao4 “jump”

拿 na2 “take”　考 kao3 “test”　吸 xi1 “absorb”　排 pai2 “arrange”

弹 tan2 “play”　问 wen4 “ask”　学 xue2 “learn”　调 tiao2 “adjust”

夹 jia1 “pinch”　砍 kan3“cut”　收 shou1 “collect”　扣 kou4 “button”

揉 rou2 “knead”　卖 mai4 “sell”　疼 teng2“ache”　炒 chao3 “fry”

找 zhao3 “look”　扫 sao3 “sweep”　抄 chao1 “copy”　输 shu1 “lose”

抹 mo3 “apply”　加 jia1 “add”　换 huan4 “switch”　讲 jiang3 “speak”

哭 ku1 “cry”　搅 jiao3 “stir”　追 zhui1 “chase”　拨 bo1 “finger”

听 ting1 “listen”　贴 tie1 “paste”　喝 he1 “drink”　点 dian3 “point”

抢 qiang3 “rob”　喂 wei4“feed”　吵 chao3 “make a noise”拧 ning3/2 “twist”

炸 zha4 “explode”　抱 bao4 “embrace”　谈 tan2 “discuss”　煮 zhu3 “boil”

扎 zha1 “prick”　划 hua2 “paddle”　背 bei4 “recite”　烧 shao1 “burn”

烤 kao3 “toast”　减 jian3 “subtract”　熬 ao2 “stew”　堵 du3 “block”

饿 e　4“hungry”　接 jie1 “meet”　投 tou2 “throw”　催 cui1 “urge”

修 xiu1 “fix”　提 ti2 “raise”　吻 wen3 “kiss”　抓 zhua1 “seize”

喷 pen1 “spew”　翻 fan1 “turn over”　拼 pin1 “join together”使 shi3 “use”

送 song4 “send”　剪 jian3 “cut off”　等 deng3 “wait”　扑 pu1 “attack”

抽 chou1 “lash”　放 fang4 “put”　记 ji4 “remember”　涂 tu2 “paint”

选 xuan3 “select”　管 guan3 “manage”　传 chuan2 “pass”　卷 juan3“roll”

发 fa1 “send”	塞 sai1 “block”	游 you2 “travel”	缩 suo1 “shrink”
抛 pao1 “throw”	浇 jiao1 “water”	留 liu2 “remain”	捧 peng3 “hold”
割 ge1 “cut”	拆 chai1 “dismantle”	铲 chan3 “scoop”	流 liu2 “flow”
磕 ke1 “knock”	改 gai3 “correct”	爬 pa2 “crawl”	停 ting2 “stop”
喊 han3 “shout”	填 tian2“fill”	过 guo4 “pass”	戴 dai4 “wear”
倒 dao4 “collapse”	扔 reng1 “throw”	擦 ca1“wipe”	铺 pu1 “spread”
订 ding4 “revise”	混 hun4 “mix”		

Appendix O: Frequent V1s in Children's Production

打 da3 "beat"	拿 na2 "take"	弄 nong "make"	搞 gao3 "do, work"
吃 chi1 "eat"	放 fang4 "put"	关 guan1 "close"	喝 he1 "drink"
杀 sha1 "kill"	摔 shuai1"plunge"	写 xie3 "write"	安 an1 "install"
带 dai4 "bring"	跌 die1"fall"	讲 jiang3 "speak"	拉 la1 "pull"
脱 tuo1"take off"	洗 xi3"wash"	抱 bao4 "embrace"	穿 chuan1"wear"
滑 hua2 "slide"	爬 pa2 "climb"	扔 reng1 "throw"	撕 si1"tear"
踢 ti1"kick"	吐 tu3 "spit"	吓 xia4 "frighten"	整 zheng3"make"
抓 zhua1"seize"	撞 zhuang4"crash"	做 zuo4 "do"	搬 ban1 "move"
绊 ban4 "stumble"	蹦 beng4 "jump"	踩 cai3 "step on"	唱 chang4 "sing"
吵 chao3 "noisy"	冲 chong1 "flush"	戳 chuo1 "poke"	逮 dai3 "capture"
戴 dai4 "wear"	弹 tan2 "flick"	钓 diao4"fish"	盖 gai4 "build"
擀 gan3 "roll"	糊 hu1 "paste"	画 hua4 "draw"	挤 ji3 "squeeze"
卡 ka3 "stop"	砍 kan3"chop"	靠 kao4"lean"	磕 ke1 "knock"
扣 kou4 "button up"	勒 le4"halt"	抹 mo3 "apply"	念 nian4 "read"
捏 nie1 "pinch"	跑 pao3"run"	骑 qi2 "ride"	烧 shao1 "burn"
睡 shui4"sleep"	抬 tai2 "lift"	跳 tiao4 "jump"	图 tu2 "draw"

吞 tun1 “swallow”	想 xiang3 “think”	修 xiu1 “fix”	绣 xiu4 “embroider”
学 xue2 “learn”	压 ya1 “press”	舀 yao3 “spoon”	蘸 zhan4 “dip in”
张 zhang1“open”	坐 zuo4 “sit”	轧 ya4 “crush”	甩 shuai3 “swing”
长 zhang3 “grow”			

Appendix P: Corpus-based the Least Prototypical V1s (N=160)

揉 rou2 “knead”	疼 teng2 “ache”	搭 da1 “put up”	捅 tong3 “poke”
跪 gui4 “kneel”	缠 chan2 “wind”	捞 lao4 “drag”	卖 mai4 “sell”
砍 kan3 “cut”	夹 jia1“clip”	扣 kou4 “button”	淹 yan1 “inundate”
装 zhuang1 “load”	抬 tai2 “raise”	关 guan1 “close”	解 jie3 “untie”
弹 tan2 “play”	踏 ta4 “stamp”	烫 tang4“scald”	扭 niu3 “twist”
挂 gua4 “hang”	逼 bi1 “urge”	扔 reng1 “throw”	订 ding4 “order”
淋 lin2 “shower”	铺 pu1 “pave”	混 hun4 “mix”	跟 gen1 “follow”，
花 hua1 “spend”，	举 jv3 “lift”	擦 ca1 “rub”	爬 pa2 “crawl”
喊 han3 “shout”，	铲 chan3 “shovel”	给 gei3 “give”	理 li3 “crop”
搬 ban1 “move”	浇 jiao1 “water”	割 ge1 “cut”	捧 peng3 “hold”
拆 chai1 “dismantle”	飞 fei1 “fly”	配 pei4 “match”	站 zhan4 “stand”
回 hui2 “return”	缩 suo1 “shrink”	抛 pao1 “throw”	塞 sai1 “block”
卷 juan3 “roll”	办 ban4 “deal with”	照 zhao4 “illuminate”	蹦 beng4 “jump”
掘 jue2 “dig”	运 yun4 “transport”	养 yang3 “feed”	轧 ya4 “roll”
干 gan4 “do”	动 dong4 “move”	记 ji4 “remember”	抽 chou1 “pump”

选 xuan3 “select” 涂 tu2 “paint” 生 sheng1 “bear” 化 hua4 “melt”

讨 tao3 “want” 杀 sha1 “kill” 上 shang4 “get on” 落 luo4 “fall”

扑 pu1 “attack” 拼 pin1 “put together” 翻 fan1 “turn” 骑 qi2 “ride”

捡 jian3 “pick” 骗 pian4 “cheat”， 去 qu4 “go” 绣 xiu4 “embroider”

吻 wen3“kiss” 催 cui1 “urge” 接 jie1 “meet” 熬 ao2 “boil”

比 bi3 “compare” 采 cai3 “pick” 滴 di1“drip” 褪 tui4 “faint”

闭 bi4 “close” 缴 jiao3 “pay” 堵 du3 “block” 减 jian3 “subtract”

烤 kao3 “roast” 背 bei4 “recite” 钓 diao4 “fish” 立 li4 “erect”

测 ce4 “measure” 剃 ti4 “shave” 差 cha1 “fall short of” 嚷 rang3 “shout”

种 zhong4 “plant” 扎 zha1 “prick” 划 hua2 “paddle” 拧 ning3 “twist”

煮 zhu3 “boil”， 评 ping2 “assess” 招 zhao1 “recruit” 捣 dao3 “pound”

指 zhi3 “point” 住 zhu4 “live” 罚 fa2 “fine” 合 he2 “close”

炸 zha4 “explode”， 谈 tan2 “discuss” 拨 bo1 “finger” 贴 tie1 “paste”

死 si3 “die” 分 fen1 “separate” 作 zuo4 “make” 驮 tuo2 “carry”

掸 dan3 “dust” 起 qi3 “rise” 和 he2 “gentle” 抢 qiang3 “rob”

追 zhui1 “chase” 搅 jiao3 “stir” 换 huan4 “change” 请 qing3 “invite”

除 chu2“rid” 定 ding4 “decide” 筛 shai1 “sift” 通 tong1 “unblock”

叮 ding1 “sting” 还 huan1 “return” 防 fang2 “prevent” 帮 bang1 “help”

哭 ku1 “cry”	扫 sao3 “sweep”	抄 chao1“copy”	炒 chao3 “fry”
亲 qin1 “kiss”	挑 tiao1 “pick”	炼 lian4 “smelt”	摸 mo1 “feel”，
碰 peng4 “touch”	砸 za2 “smash”	扯 che3 “pull”	敲 qiao1 “knock”
骂 ma4 “scold”	惊 jing1 “frighten”，	挖 wa1 “scoop”	拍 pai1 “pat”
摇 yao2 “shake”	摔 shuai1 “fall off”	拖 tuo1 “drag”	刷 shua1 “brush”
画 hua4 “draw”	热 re4 “hot”	咬 yao3 “bite”	闹 nao4 “disturb”
磨 mo2 “grind”	叫 jiao4 “cry”	挤 ji3 “squeeze”	写 xie3 “write”

Appendix Q: Corpus-based the Less Prototypical V1s (N=92)

弄 nong4 “make”	变 bian4 “change”	打 da3 “beat”	搞 gao3 “make”
看 kan4 “look”	说 shuo1 “say”	转 zhuan3/4 “turn”	笑 xiao4 “smile”
压 ya1 “press”	唱 chang4 “sing”	跑 pao3”run”	玩 wan2 “play”
开 kai1 “open”	走 zou3 “walk”	吹 chui1 “blow”	冲 chong1 “rush”
踢 ti1 “kick”	踩 cai3 “step on”	穿 chuan1 “wear”	撞 zhuang4 “bump”
读 du2 “read”	洗 xi3 “wash”	推 tui1 “push”	捏 nie1 “pinch”
刮 gua1 “scrape”	买 mai3 “buy”	累 lei4 “tired”	吓 xia4 “frighten”
气 qi4 “irritate”	带 dai4 “bring”	拉 la1 “pull”	考 kao3 “test”
排 pai2 “arrange”	吸 xi1 “suck”	问 wen4 “ask”	调 diao4/tiao2 “adjust”，
收 shou1 “collect”	找 zhao3 “look for”	加 jia1 “add”	输 shu1 “lose”
抹 mo3 “apply”	讲 jiang3 “speak”	点 dian3 “point”	听 jin1 “listen”
喝 he1 “drink”	抱 bao4 “embrace”	喂 wei4 “feed”	吵 chao3 “make a noise”
烧 shao1 “burn”	投 tou2 “throw”	饿 e4 “hungry”	提 ti2 “lift”
修 xiu1 “fix”	喷 peng1 “spray”	使 shi3 “use”	等 deng3 “wait”
放 fang4 “put”	剪 jian3 “cut”	管 guan3 “manage”	传 chuan2 “pass”
发 fa1 “distribute”	游 you2 “travel”	留 liu2 “leave”	改 gai3 “change”

流 liu2 “flow”	停 ting2 “stop”	磕 ke1 “knock”	过 guo4 “pass”
倒 dao3 “discharge”	戴 dai4 “wear”	填 tian2 “fill”	吃 chi1 “eat”
包 bao1 “wrap”	念 nian4 “read”	做 zuo4 “do”	对 dui4 “check”
用 yong4 “use”	治 zhi4 “cure”	当 dang1 “act as”	长 zhang3 “grow”
存 cun2 “deposit”	出 chu1 “show”	吐 tu3 “emit”	愁 chou2 “worry”
下 xia4 “get off”	取 qu3 “fetch”	安 an1 “install”	造 zao4 “make”
让 rang4 “make”	蘸 zhan4 “dip into”	要 yao4 “want”	着 zhao2 “attach”

Appendix R: Intuition-based the Most Prototypical V1 in CSL/CFL Learners' Production

看 kan4 "look"	打 da3 "beat"	写 xie3 "write"	坐 zuo4 "sit"
进 jin4 "enter"	提 ti2 "lift"	弄 nong4 "do"	说 shuo1 "speak"
拿 na2 "take"	想 xiang3 "think"	累 lei4 "tired"	跑 pao3 "run"
起 qi3 "rise"	出 chu1 "go out"	读 du2 "read"	变 bian4 "change"
带 dai4 "bring"	认 ren4 "recognize"	加 jia1 "add"	爱 ai4 "love"
饿 e4 "hungry"	长 zhang3 "grow"	改 gai3 "change"	玩 wan2 "play"
听 ting1 "listen"	学 xue2 "learn"	停 ting2 "stop"	卖 mai4 "sell"
爬 pa2 "crawl"	录 lu4 "record"	笑 xiao4 "smile"	跳 tiao4 "jump"
开 kai1 "open"	付 fu4 "pay"	破 po4 "broken"	摔 shuai1 "cast"
攻 gong1 "attack"	扯 che3 "pull"	剪 jian3 "cut"	忙 mang2 "busy"
烦 fan2 "annoy"	输 shu4 "lose"	捅 tong3 "poke"	补 bu3 "mend"
投 tou2 "throw"	收 shou1 "put away"	使 shi3 "use"	走 zou3 "walk"

Appendix S: Intuition-based the Less Prototypical V1s in CSL/CFL Learners' Production

说 shuo1 “speak”	看 kan4 “look”	听 ting1 “listen”	做 zuo4 “do”
拿 na2 “hold”	走 zou3 “walk”	写 xie3 “write”	吃 chi1 “eat”
打 da3 “beat”	读 du2 “read”	喝 he1 “drink”	学 xue2 “learn”
弄 nong “make”	搞 gao3 “make”	投 tou2 “throw”	想 xiang3 “think”
杀 sha1 “kill”	跑 pao3 “run”	切 qie1 “cut”	提 ti2 “lift”
放 fang4 “put”	飞 fei1 “fly”	倒 dao4 “overthrown”	冲 chong1 “dash”
指 zhi3 “point”	露 lou4 “expose”	坐 zuo4 “sit”	认 ren4 “recognize”
选 xuan3 “select”	吓 xia4 “frighten”	骂 ma4 “scold”	突 tu1 “protrude”
踢 ti1 “kick”	起 qi3 “rise”	出 chu1 “exit”	过 guo4 “live”
割 ge1 “cut”	截 jie2 “cut”	隔 ge2 “separate”	爱 ai4 “love”
笑 xiao4 “smile”	烧 shao1 “burn”	咬 yao3 “bite”	惯 guan4 “indulge”
使 shi3 “use”	跳 tiao4 “jump”	输 shu1 “lose”	招 zhao1 “attract”
抛 pao1 “throw”	收 shou1 “collect”	花 hua1 “spend”	用 yong4 “use”
换 huan4 “exchange”	制 zhi4 “make”	完 wan2 “finish”	算 suan4 “compute”
加 jia1 “add”	堵 du3 “block”		

Appendix T: Highly Frequent RCs in the BCC Corpus (N=80)

乐 le4 “happy”	对 dui4 “right”	会 hui4 “understand”	到 dao4 “arrive”
上 shang4 “up”	好 hao3 “well”	去 qu4 “go”	来 lai2 “come”
过 guo4 “over”	多 duo1 “much”	没 mei2 “none”	为 wei2“become
着 zhao2	大 da4 “big”	下 xia4 “down”	分 fen1 “separate”
高 gao1 “high”	少 shao3 “less”	死 si3 “die”	小 xiao3“small”
贵 gui4 “expensive”	真 zhen1 “real”	难 nan2 “difficult”	长 chang2 “long”
出 chu1 “out”	成 cheng2 “become”	病 bing4 “ill”	新 xin1“new”
起 qi3 “rise”	活 huo2 “alive”	坏 huai4“bad”	快 kuai4“quick”
走 zou3 “walk”	发 fa1 “flourish”	忙 mang2 “busy”	老 lao3 “old”
完 wan2 “finish”	住 zhu4 “stop”	开 kai1 “open”	苦 ku3 “bitter”
回 hui2 “return”	抽 chou1 “shrink”	变 bian4 “change”	进 jin4 “enter”
懂 dong3 “understand”	见 jian4 “see”	亲 qin1 “beloved”	结 jie2 “knot”
强 qiang2 “strong”	干 gan1 “dry”	哭 ku1 “cry”	尽 jin4 “exhaust”
至 zhi4 “arrive”	花 hua1 “spend”	绿 lv4 “green”	流 liu2 “flow”
实 shi2 “solid”	动 dong4 “move”	合 he2 “close”	杀 sha1 “kill”
久 jiu3 “long”	关 guan1 “close”	离 li2 “apart”	错 cuo4“wrong”

通 tong1 “through” 深 shen1 “deep” 正 zheng4 “straight” 定 ding4 “determine”

怕 pai4 “afraid” 早 zao3 “early” 饱 bao3 “full” 短 duan3 “short”

全 quan2 “complete 累 lei4 “tired” 忘 wang4 “forget” 掉 diao4“drop”

差 cha1 “bad” 重 zhong4/chong2 “heavy/overlap”

Appendix U: Highly Frequent RCs in HSK Corpus (N=43)

乐 le4 “happy”	对 dui4 “right”	会 hui4 “understand”	到 dao4 “arrive”
上 shang4 “up”	好 hao3 “well”	去 qu4 “go”	来 lai2 “come”
过 guo4 “over”	多 duo1 “more”	没 mei2 “none”	为 wei2“as”
着 zhao2 “succeed”	大 da4 “big”	下 xia4 “down”	分 fen1 “separated”
高 gao1 “high”	少 shao3 “less”	死 si3 “die”	小 xiao3 “small”
贵 gui4 “expensive”	真 zhen1 “real”	难 nan2 “difficult”	长 chang2 “long”
出 chu1 “out”	成 cheng2 “become”	病 bing4 “ill”	新 xin1 “new”
起 qi3 “rise”	活 huo2 “alive”	坏 huai4 “bad”	快 kuai4 “quick”
变 bian4“change”	走 zou3 “walk”	发 fa1 “flourish”	忙 mang2 “busy”
老 lao3 “old”	完 wan2 “finish”	住 zhu4 “stop”	开 kai1 “open”
苦 ku3 “bitter”	回 hui2 “back”	抽 chou1 “shrink”	

Appendix V: Highly Productive RCs in the BCC Corpus (114)

完 wan2 “finish”	出 chu1 “out”	好 hao2 “well”	成 cheng2 “become”
到 dao4 “arrive”	死 si3 “die”	多 duo1 “more”	入 ru4 “into”
满 man3 “full”	回 hui2 “back”	进 jin4 “enter”	错 cuo4 “wrong”
掉 diao4 “drop”	坏 huai4 “bad”	累 lei4 “tired”	够 gou4 “enough”
尽 jin4 “all”	破 po4 “broken”	足 zu2 “enough”	光 guang1 “use up”
没 mei2 “none”	左 zuo3 “left”	大 da4 “big”	住 zhu4 “stop”
下 xia4 “down”	定 ding4 “determined”	紧 jin3 “tense”	断 duan4 “broken”
开 kai1 “open”	倒 dao3 “collapse”	走 zou3 “walk”	对 dui4 “right”
翻 fan1 “overturn”	少 shao3 “less”	烂 lan4 “rotten”	落 luo4 “drop”
红 hong2 “red”	齐 qi2 “level”	高 gao1 “high”	透 tou4 “through”
爆 bao4 “explode”	散 san3 “loose”	久 jiu3 “long”	遍 bian4 “all over”
平 ping2 “even”	碎 sui4 “crash”	上 shang4 “up”	准 zhun3 “accurate”
空 kong1 “empty”	净 jing4 “clean”	近 jin4 “near”	乱 luan4 “messy”
伤 shang1 “hurt”	傻 sha3 “silly”	歪 wai1 “askew”	清 qing1 “clear”
醒 xing3 “awake”	痛 tong4 “hurt”	正 zheng4 “straight”	动 dong4 “move”
干 gan1 “dry”	低 di1“low”	活 huo2 “alive”	疼 teng2“ache”

疯 feng1 “crazy”	早 zao3 “early”	惯 guan4 “habitual”	全 quan2 “complete”
去 qu4 “go”	快 kuai4 “quick”	晕 yun1 “dizzy”	起 qi3 “rise”
实 shi2 “solid”	直 zhi2 “straight”	漏 lou4 “leaky”	离 li2 “separate”
远 yuan3 “far”	小 xiao3 “small”	急 ji2 “urgent”	惨 can3 “misery”
稳 wen3 “steady”	通 tong1 “through”	妥 tuo3 “ready”	丢 diu1 “lost”
哭 ku1 “cry”	穿 chu1 “through”	反 fan3 “opposite”	跑 pao3 “run”
熟 shu2 “cooked”	牢 lao2 “solid”	晚 wan3 “late”	白 bai2 “white”
飞 fei1 “fly”	烦 fan2 “annoyed”	偏 pian1 “askew”	深 shen1 “deep”
怕 pa4 “afraid”	热 re4 “hot”	长 chang2 “long”	黑 hei1 “black”
湿 shi1 “wet”	劈 pi1 “split”	灭 mie4 “put out”	罢 ba4 “finish”
软 ruan3 “soft”	重 zhong4 “heavy”	响 xiang3 “loud”	松 song1 “loose”
亮 liang4 “bright”	昏 hun1 “dark”	细 xi4 “thin”	残 can2 “disabled”
慢 man4 “slow”			

Appendix W: Corpus-based the Least Prototypical RCs (N=77)

劈 pi1 “cloven”	惯 guan4 “habitual”	歪 wai1 “askew”	妥 tuo3 “ready”
紧 jin3 “tense”	脏 zang1 “dirty”	醉 zui4 “drunken”	漏 lou4 “leaky”
牢 lao2 “solid”	罢 ba4 “stop”	饱 bao3 “full”	惨 can3 “miserable”
灭 mie4 “put out”	净 jing4 “clean”	饿 e4 “hungry”	遍 bian4 “all over”
湿 shi1 “wet”	烦 fan2 “annoyed”	够 gou4 “enough”	齐 qi2 “orderly”
疯 feng1 “crazy”	松 song1 “loose”	响 xiang3 “loud”	贵 gui4 “expensive”
断 duan4 “broken”	偏 pian1 “partial”	忙 mang2 “busy”	怕 pa4 “afraid”
散 san3 “loose”	爆 bao4 “explode”	久 jiu3 “long”	透 tou4 “through”
累 lei4 “tired”	慢 man4 “slow”	软 ruan3 “soft”	哭 ku1 “cry”
苦 ku3 “bitter”	乐 le4 “happy”	抽 chou1 “shrink”	跑 pao3 “run”
翻 fan1 “turn over”	足 zu2 “enough”	急 ji2 “urgent”	稳 wen3 “steady”
痛 tong4 “painful”	远 yuan3 “far”	穿 chuan1 “through”	飞 fei1 “fly”
尽 jin4 “exhaust”	落 luo4 “drop”	准 zhun3 “on time”	定 ding4 “determined”
离 li2 “apart”	黑 hei1 “black”	满 man3 “full”	细 xi4 “thin”
入 ru4 “enter”	空 kong1 “empty”	失 shi1 “lost”	花 hua1 “dim”
亲 qin1 “intimate”	超 chao1 “over”	睡 shui4 “sleep”	严 yan2 “strict”

流 liu2 “flow”　至 zhi4 “arrive”　神 shen2 “holly”　服 fu2 “convinced”

见 jian4 “see”　精 jing1 “cute”　强 qiang2 “strong”　转 zhuan3 “turn”

合 he2 “close”　明 ming2 “bright”　关 guan1 “closed”　结 jie2 “knit”

没 mei2 “end”