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Taking stock of accumulated knowledge in projection studies from Systemic Functional Linguistics: a research synthesis

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Abstract

This paper synthesized 66 studies both in English and Chinese concerning projection in Systemic Functional Linguistics with a meta-analysis and synthesis approach. Our data show that projection in Systemic Functional Linguistics (hereafter SFL) is a burgeoning field with expanding focused areas from different settings after several decades of development. Five major domains of research have been identified, namely, theoretical discussions, language description, language education, translation studies, and professional communication. Studies in these areas demonstrate that the notion of projection is of great theoretical significance. It is also a useful analytical tool in investigating both written and spoken discourse. However, it is found that interpersonal projection remains an elusive concept, and projection below the clause rank has just begun to gain attention. Projection in professional communication, translation studies and multimodality is under-investigated.

Keywords: Systemic Functional Linguistics, Projection, Research synthesis

Introduction

Projection is a concept used in Systemic Functional Linguistics (SFL hereafter) to refer to quoting and reporting of saying and thinking, which is discussed with the terms such as speech reporting, speech presentation, discourse presentation, citation, quotation in other linguistic traditions (see the summary in Buchstaller and Alphen 2012: XIX-XX). Halliday (1977) first introduced the term projection as a type of logico-semantic relationship, alongside with expansion, between two clauses. A formal definition of projection is offered in Halliday (1985) as follows:

- (1) Expansion: the secondary clause expands the primary clause, by (a) elaborating it, (b) extending it and (c) enhancing it.
- (2) Projection: the secondary clause is projected through the primary clause, which initiates it as (a) a locution or (b) an idea.

Projection is typically realized as a clause complex consisting of a projecting clause and a projected clause. For example, in *he said he would go*, the projecting clause is '*he said*' whereas the projected clause is '*he would go*'. The notion of projection, however, is distinctive in the sense that it is a semantic category that is general enough to cover

all grammatical items bearing relationship of first-order reality (direct representation of experience) and second-order reality (a representation of a linguistic representation) (see e.g. Halliday and Matthiessen 1999). Halliday and Matthiessen (2014) conceptualize projection as a semantic domain that could be diversely manifested in a range of grammatical environments including clause nexuses, verbal groups, nominal groups, adjuncts. For instance:

- (1a) He says he will come. (clause complex)
- (1b) He wants to come. (verbal group complex)
- (1c) According to him, he will come. (adjunct)
- (1d) He talks about coming. (adjunct)
- (1e) He will probably come. (adjunct)
- (1f) It is possible that he will come. (nominal group)
- (1g) I love the fact that he will come. (nominal group)

Examples (1a) and (1b) represent projection realized through complexing, one of the logical resources in language. Examples (1c) and (1d) belong to what is called “projecting circumstance”, forming a relationship between the main clause and the mini-clause (prepositional phrase). The modal adjunct *probably* in example (1e) realizes interpersonal projection, which serves to enact the speaker’s opinion. Examples (1f) and (1g) demonstrate Fact projection in the form of embedding or rankshift. Hence, the notion of projection greatly enriches the traditional view of quoting and reporting. The research on projection distinguishes itself from studies on reporting in other linguistic paradigms because it reveals how the meaning of quoting and reporting could spread across varied grammatical units. Hence, it generates a good body of literature which falls into different domains of studies such as language descriptions, language education, professional communication, translation studies and others. Given this large collection of works on projection over the past four decades, it is time to ask: How far have the projection studies come? What are the research trends in this area? What are the research gaps left in projection studies?

In order to answer the questions above, this paper will take stock of all projection studies with the methodology of synthesis (Norris and Ortega 2001). The methodology of synthesis was introduced to language studies by Norris and Ortega 2001 from social science, which is widely utilized in language studies in recent years, especially in applied linguistics (Plonsky 2014). While traditional review may only focus on some major studies and draw the idiosyncratic claim, research synthesis reviews a field systematically based on exhaustive analysis of all the publications retrieved. It is a data-driven review and usually covers every aspect of a study from methodology to findings and so on. This methodology of review has been widely used in recent years in applied languages studies (Plonsky 2014; Norris and Ortega 2001).

The structure of the paper is as follows: (i) part two sets forth research questions that guide this synthesis; (ii) part three clarifies how we operationalize this research by adopting research synthesis methodology; (iii) part four presents findings from our synthesis; (iv) part five discusses methodological and theoretical issues in projection studies and points out future research directions.

Research questions

The following research questions guide the present synthesis:

RQ1: What trends can be identified across studies on projection in terms of publication, and methodology?

RQ2: How have trends of projection studies developed in terms of research sub-domains? And what have the studies in each sub-domain found?

RQ3: What research issues and future research gaps can we identify based on the above observations?

Methodology

Data retrieval

To answer the research questions set forth in this synthesis, we conducted an exhaustive search of studies related to SFL projection since Halliday (1977) developed this concept. We used the term “*projection*”, “*systemic functional linguistics*”, “*verbal projection*”, “*mental projection*”, “*verbal process*”, “*mental process*”, “*speech and thought representation*” and “*direct and indirect speech*” to search the title, abstract and summary of articles, book chapters, books, conference proceedings and dissertations published in both English and Chinese. We used databases in universities from both Mainland China and Hong Kong to conduct the data retrieval, such as CNKI, One Search, Web of Science, ProQuest Dissertations and Theses, Language Behavior Educational Resource Information Center. We also used Google Scholar to do data retrieval to complement these databases from university libraries. In addition to databases searches, we also wrote email messages to those SFL professors who have worked on projection to ask for more hidden publications. Finally, we went back to the reference list in those key publications in the field to find relevant studies. This data retrieval yielded 91 studies.

Inclusion criteria

Of the 91 studies we have gathered, we selected those studies for further synthesis based on the following criteria (c.f. Norris and Ortega 2001):

1. Publications came out since 1977 under the framework of SFL.
2. Publications published in English and Chinese. We actually retrieved more studies from other languages when we did the data collection, such as, Spanish, Japanese, and Vietnamese. Due to our language limitations of the two authors, we could not conduct such an exhaustive retrieval, including every language.
3. We excluded studies in the following format, such as conference presentations, unpublished dissertations, and in-preparing manuscripts as those studies are not yet published.
4. We excluded projection mentioned in the workbooks too, since they are not research but exercise books (e.g. Martin et al. 2010; Thompson 2014, etc.).

After applying the inclusion and exclusion criteria to the 91 publications we have gathered, a total number of 66 studies were retained for the final synthesis.

Coding book development

In order to answer the research questions, we coded the studies according to the following categories: substantive information of the publication, methodological information, focused areas and findings from the focused areas.

Coding categories are classified into two major types, which are low-inference and high-inference categories (Norris and Ortega 2001). Low-inference categories are concrete categories that are easy to code and identify, while high-inference categories are abstract and not crystal-clear items that we can identify easily. In the present coding, type of publication, country of publication, year of publication, institute of author, type of data are recognized as low-inference categories. Findings from different focused areas belong to high-inference categories. The coding differences for the present study were reconciled by discussion by the authors. All of the 66 studies were coded in the present study.

For the category of substantive information of the study, we developed the following coding: The authors for the publications are coded for the purpose of generating the most prominent writer or researcher in the field; Type of publication includes book, book chapter, research article, dissertation, conference proceeding and monograph. Year of publication is coded for the chronological development of the field; Country of publication is coded for the distribution of studies and the affiliated institutions around the world.

About the category of the methodological information, we developed the following coding. Design of the study focuses on whether the studies belong to descriptive, empirical, or theoretical study. Analytical approaches of studies focus on whether the studies belong to qualitative, quantitative, or mixed approach. Type of data refers to the nature of the data, for example, written or spoken. Size of the data is used to code how big the database is or the unit of the data. In addition, we also coded the text type being investigated for the studies we have collected. We adopted Matthiessen, Teruya and Lam's (2010) field of activities to explore the text type, for example, doing, sharing, exploring, expounding, etc. Doing here means we use language or other semiotics to do things, such as GPS directing. Expounding means we use language or other semiotics to explain theories or knowledge to our audience. Reporting means we use language or other semiotics to document events or happenings so that people can understand the specific topic with details. Sharing means we use language or other semiotics to share our experience or stories, such as Facebook post. Enabling means we use language or other semiotics to regulate our behaviors or to guide us to do something. Recommending means we use language or other semiotic resources to promote or recommend something. Exploring means we use language or other semiotics to argue or illustrate our points of view in some topics, such as writing an argument.

The category of focused areas is developed based on the data and the aim of the study. After exploring and discussing, we have categorized all the 66 studies into 6 research sub-domains, which are language description, professional communication, language education, translation studies, theoretical discussions, and others. Only the former five areas will be reported in the present paper.

The last category, which is high-inference one, focuses on the findings from the aforementioned five focused areas. We read all the publications and concentrated on the findings and results part. We then summarized and reconstructed the information

presented in this part and we collected all the findings and synthesized them in the end.

Coding procedures

Based on the categories mentioned above, we first chose 10 studies randomly from the list. We coded these 10 studies separately. After the pilot coding, we shared our coding and checked it for each other. Then, we found out the discrepancies from our coding. We discussed those discrepancies and reached agreement on how to adjust our coding in order to make our coding consistent. Our coding reliability is 93%. After solving all these coding discrepancies, we then conducted the massive coding. Before finalizing all the coding for generation of results, we sat down and discussed issues and problems arising from our massive coding. Everything was solved and consistent. We then generated the statistical part of the data for the present synthesis.

Results and findings

General features of the studies

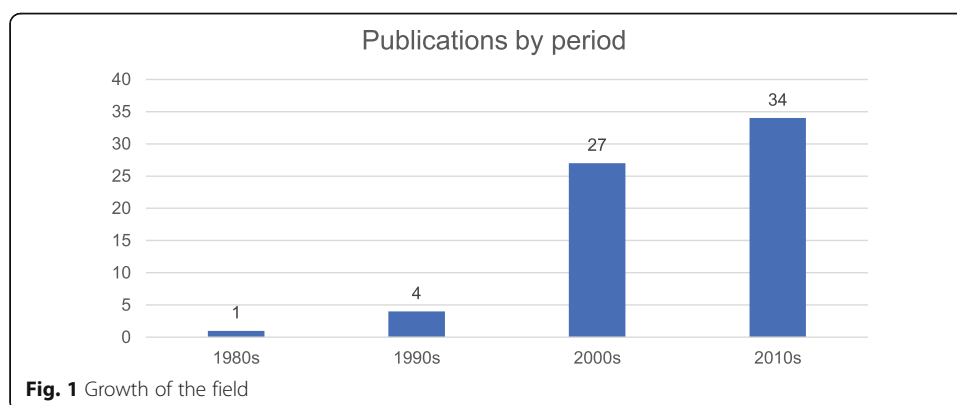
Growth of the field

Figure 1 shows the development of the field of projection in SFL. Over the past several decades, we have seen great leaps in the field. Starting from 1970s and 1980s, there was only 1 study. There were 4 in 1990s. During 2000s, the number of the studies increased sharply to 27. The number of studies peaked during 2010s, which were 34.

Methodological features

We have also explored text type of the used data for the present synthesis. Our findings show that 67% of the studies didn't report the text type they have investigated. These studies tend to observe projection from the system end. Among the eight text types, the most investigated text type is expounding, which takes 14%. The texts for these studies are basically from the domain of language education. The second most investigated text type is reporting, which covers 11%. The reporting data are mainly from the field of journalism.

In terms of analytical approach, most of the studies belong to qualitative study, covering 63% of all the published studies. Only 14% of the studies take the quantitative



approach and 17% of the studies belong to mixed methods, a combination of qualitative and quantitative approaches.

On the size of data used, 68% of the studies chose not to report the size of the data used. The reporting unit of the data is also very different, from one novel to 30 papers to a corpus etc.

Findings in different domains

Based on the findings of the present synthesis, five emerging domains have been identified, which are theoretical discussions (29 studies¹), language description (15 studies), language education (12 studies), translation studies (4 studies), professional communication (6 studies) and others (1 study). The numbers of studies in these domains add up to 67, more than the total number of 66 because the reference Halliday and Matthiessen (2014) occurs in two sub-domains, namely, theoretical discussion and language description. The following section will focus on reporting findings from each domain, aiming to provide more insights and details from the field.

Theoretical discussion

Studies that offer theoretical discussion on projection could be categorized into seven dimensions: (1) system network, (2) cognitive interpretation (3) metafunctional considerations, (4) discourse features, (5) syntax, (6) grammatical metaphor, and (7) multimodality.

(1) Systemic Functional Linguistics, as the name implies, emphasizes meaning as choices which cluster into systems. However, the system network of projection has not been formally provided in the earlier versions of IFG (Halliday 1985, 1994). It was in the third edition of IFG (Halliday and Matthiessen 2004) that the system network of projection began to occur and the network remained the same in the fourth edition (Halliday and Matthiessen 2014). Matthiessen's contribution to the network could be clearly seen because right before he was involved in revising Halliday's IFG, Matthiessen (1995) already outlined two system networks of projection, one in the environment of verbal group complex (718), and the other in that of clause complex (139, 142) with considerations of systemic probabilities and ordering of clauses. Matthiessen (2002) further substantiates the probabilities of the network in relation to various registers (text types). For example, the type of projection of ideas is particularly common in chat, gossip and interviews (257). Thus, like all other systems, the system of clause complexing is probabilistic in nature (as evidenced in Nesbitt and Plum 1988).

The projection system network has been enriched by a few Chinese scholars took up that challenge. Ding (2000) builds up three daughter systems of projection, namely, hypotactic, paratactic and embedded systems. It is the first attempt to draw a network of projection in China before e.g. Halliday and Matthiessen (2004). The embedded system is worth noticing. He argues that embedded projection is of two types: head (e.g. it is said that ...) and postmodifier (the report that ...). Later, Zeng and Liang (2012), Liang (2015) offer a more delicate system network of embedded projection (or Fact projection) according to the process types with which the fact clause occurs, and related

¹Several editions of one book are not considered as separate studies. For example, Halliday (1985, 1994) and Halliday and Matthiessen (2004, 2014) have been counted as one study.

interpersonal and textual functions (see Fig. 2). Zeng (2016) takes one step further to look at projection beyond the clause, viz. projection text. Based on observations on *Lunyu* (The Analects of Confucius), she posits that “in real texts there exist not only projection clause nexuses but also projection paragraphs or projection texts.” A model of projection text highlighting the choices of hyper-clause complex projection, paragraph projection, cross-paragraph projection, and complex group projection, is proposed and applied to the analysis of the functional equivalence of projection in *Lunyu* and its English version.

(2) The second area of research is cognitive interpretation of projection. This theoretical endeavor is vital in the sense that it spells out why it is necessary to coin the umbrella term projection which is different from those traditional labels such as reported speech, represented discourse, etc. Halliday and Matthiessen (1999) explain projection as such:

Throughout the semantic construal of human experience, there is a differentiation between two orders of reality: between the everyday reality of our material existence on the one hand and on the other hand the second-order reality that is brought into existence only by the system of language...This differentiation is embodied in relations of sequence in the following way. Either a sequential relation expands one figure by adding another one to it, the two still remaining at the same phenomenal level; or the sequential relation projects one of the two figures onto the plane of second-order, semiotic phenomena, so that it enters the realm of metaphenomena (meanings or wordings). (106).

Projection thus represents relationships between first-order and second-order realities construed as human experience in language. Following this cognitive approach, Liang (2004) tries to explain grammatical behaviors of the projecting clause complex, embedded projection and trans-phenomena (or projecting circumstance, e.g. according to ...). Within the same framework, Li (2007) examines projection on the levels of sequence, figure and element respectively.

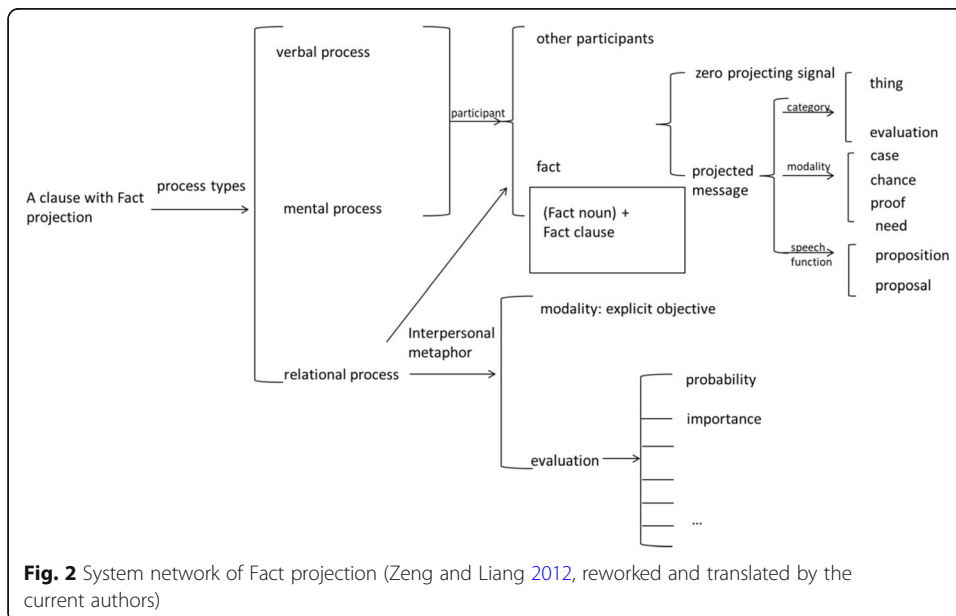


Fig. 2 System network of Fact projection (Zeng and Liang 2012, reworked and translated by the current authors)

(3) As for the metafunctional considerations of projection, Halliday and Matthiessen's (1999) cognitive approach reveals experiential function of projection. Matthiessen (1995, 154–158) gives textual considerations of projection in terms of how the projecting clause may precede or follow the projected clause. This is related to the thematic status or information flow of the clause complex. For instance, when the projecting clause follows, the Sayer/ Subject or Senser/ Subject can be given the status of Culminative (e.g. *said Henry*). Thompson (2005) proposes a three dimensional (functional) classification of conjunction, including projection as one type of conjunction. He argues in his paper for the distinction between experiential projection and interpersonal projection. The former “projects a meta-representation through a representation of speech or thought” whereas the latter “frames a proposition in terms of attitude or speech act.” In a book chapter (Thompson and Thompson 2009), they argue that the projecting clause that occurs initially in the clause complex should be analyzed as interpersonal theme. Xin and Huang (2010) accept the dual function of projection and investigate how projection realizes interpersonal and experiential meanings dynamically in certain contexts. They single out explicit and implicit triggers for the switch between the two functions such as the source of projection (*I think vs He thinks*), tense (*I think vs I thought*), mood tag (*hasn't it vs don't you*) and text types (*news reporting vs academic writing*). Zeng and Yu (2005) draw up the interpersonal modality scale in projection based on the system of modality in IFG (e.g. Halliday and Matthiessen 2004). Interpretation of projection in terms of all three metafunctions can be found in Zeng (2006b), which is based on her doctoral thesis. This work generates a good body of research on projection in China. For example, Chen (2017) examines the interpersonal function of Angle, extending the research into projecting circumstance.

(4) Projection is also discussed in relation to discourse features (or texture) in general. Thompson (2005), as mentioned above, outlines two types of projection as part of conjunction framework to reveal how texts are organized. Thompson and Thompson (2009) investigate the relationship between theme, projection and unfolding of texts. Xin (2011) offers an analytical framework of intersubjectivity-constructing projecting clauses, taking into account of the visibility of the interactant in the projecting clause. Yang (2010) recognizes four types of intertextuality based on observations on projection, namely, affirmative intertextuality, negative intertextuality, inverted intertextuality and relativistic intertextuality. Zeng (2000a) discusses the relation between projection and discourse analysis in general. Zeng (2006a) also analyzes interpersonal and textual meanings of code-switching (a discourse strategy when a speaker alternates between two or more languages). She points out that code-switching is particularly important in constructing a marked interpersonal scale and cohesion of projected message.

(5) SFG adopts a trinocular perspective on grammatical analysis in which the top-down semantic interpretation is prioritized. Thus, projection, a semantic category, is also a useful concept for syntactical descriptions. The hypotactic and paratactic taxis of projection clause complex as illustrated in e.g. Halliday and Matthiessen (2014) differs from the traditional approach where the projected clause is treated as complement of the projecting clause. Similarly, in the environment of verbal group, projecting verbal complex is found (e.g. *he wants to go*). However, the fundamental notion of tactical relationship in projection raises some disputes

even within SFL communities. Fawcett (1981, 2000:271), for example, argues that the notion of hypotaxis should be replaced with embedding. Liao (2006) accepts the Hallidayan approach, arguing that the Infinitival Perception Verb Complements (e.g. *I saw Mary come in*) should be analyzed as secondary projected clause. In a similar vein, Qi (2009) suggests that causative constructions (e.g. *A performance such as this persuades us that ...*) should be analyzed as projection. Lauranto (2017) considers the projected directive construction (PDC) in Finnish as a combination of both projection and causation features. It is found that PDC could be categorized as projection-focused type and causation-focused type.

Wang (2014) and Jia and Zhang (2015) focus on rankshift and embedding in projection. Wang (2014) elaborates on the relationship between rankshift and grammatical metaphor. Interestingly, she posits that projection involving interpersonal metaphor moves up the rank (e.g. 'probably' → 'I think') while projection involving ideational metaphor moves down the rank (e.g. "the fact that ... is important" → "the importance of ..."). Jia and Zhang (2015), on the other hand, follow Fawcett's approach, considering the relationship of between the projecting and the projected elements as embedding. This relationship is called intrinsic recursiveness in contrast with extrinsic recursiveness in which there are two or more projection structures repeated either in a linear or an embedded way (e.g. *He said that she said ...*).

Chen (2015) attempts to explain the sequence of adjuncts from the perspective of projection. He categorizes adjuncts into five types: projection source adjunct (e.g. *for my part*), projection process adjunct (e.g. *reportedly*), projection circumstance adjunct (e.g. *frankly*), fact projection adjunct (e.g. *possibly*) and non-projection adjunct (e.g. *calmly*). The sequence of the five types of adjuncts that co-occur in a clause is semantically motivated.

(6) As for grammatical metaphor, the interpersonal metaphor involving projecting clauses (e.g. *I think*) is the major finding in foundational works such as Halliday (1985, 1994), Matthiessen (1995), Halliday and Matthiessen (1999, 2004, 2014). It should be noted that Halliday and Matthiessen (2004, 2014) add a new concept of semantic domain, as a complementary perspective to the notion of grammatical metaphor, to emphasize the fractal nature of projection. Projection, they argue, is diversely manifested in different grammatical environments. Zeng (2003) examines the ideational metaphor of projection (e.g. *I think*). But it is referred to as interpersonal projection (e.g. Thompson 2005; Xin and Huang 2010) or interpersonal metaphor (e.g. Thompson 2014: 248) elsewhere. The terms that derive from notions of projection, metafunction and grammatical metaphor are somewhat confusing in this area of studies.

(7) Recently, Zeng and Yang (2016a, b) extend the projection research into the field of multimodality. Zeng and Yang (2016b) construct an analytical framework of projection in the multimodal discourse that contains texts and images. The framework outlines the choices of projecting signal, projected message and sayer/senser. More specifically, the projecting signal could be realized by speech/thought posture and speech bubbles. The projected message could be realized by zero symbol, text or image. The sayer/senser could realized by zero symbol, animated human-beings/objects or unanimated human-beings/objects.

Language description

Projection studies that are devoted to language description fall into three trends: (i) elaboration on one language, (ii) a contrastive analysis on two languages, and (iii) typological description of multiple languages.

Based on the comprehensive description of projection in English provided in IFG (e.g. Halliday and Matthiessen 2014), Holsting (2008), Patpon (2009), Teruya (2009), Xiao (2001), Yang (2017) summarize realizations of projection in German, Thai, Japanese, Russian and Chinese respectively. Most notably, Holsting (2008) points out Subjunctive Mood as a possible realization of projection in German, a strategy not found in other languages mentioned here. Matthiessen and Teruya (2013) explore further choices of quoting in English, namely, implicit and explicit quoting.

As for languages in contrast, Zeng (2000b) is the earliest attempt to analyze English and Chinese projection clause complex. Chen (2016a) focuses on Angle of the two languages and argues that Chinese Angle tends to be 'explicit' than English one. Angle is a type of projecting circumstance, usually realized as prepositional phrases to show information sources as in according to him, in my opinion, etc. Chinese angle is explicit in the sense that the projecting verb '*shuo*' tends to occur in all forms of Angle as in *ju ta shuo* (according to he say). Hita (2018) offers a comprehensive comparison between English and Spanish projection from the clause rank to the group rank.

Investigations on multiple languages can be seen in what is known as functional typological studies. Matthiessen (2004), drawing on references on various languages, summarizes different possible manifestations of projection. Arus-Hita et al. (2018) compare six languages including Arabic, English, Dagaare, Hindi, Spanish and Japanese in terms of realizations of quoting and reporting. They propose that the distinction between quoting and reporting is a valid typological parameter that helps specify the features of one language.

Language and education

There are three sub-domains of studies in projection based on the literature we have retrieved, which are exploring projection from the perspective of lexico-grammar, grammatical metaphor, and appraisal.

From the perspective of lexico-grammar, Thompson and Ye (1991) summarizes different types of reporting verbs together with their evaluative meanings. They propose a model called "layers of report" for L2 learners to choose reporting verbs when they write. Similarly, Ignatieva (2011) and Ignatieva and Rodríguez-Vergara (2015) find that the use of verbal process is generically different, which is based on different text types, topics and the writer's academic writing experience. Tang (2004) analyzes reporting practice in academic texts and she summarizes the types of reporting verbs, reporting tenses and voices, and motivations of reporting. She concludes that reporting is a skillful academic skill that is of great importance in academic writing. In another study, De Oliveira and Pagano (2006) conclude that the more unequal the relationship between the author and writer in projection, the higher chances that the writer will use paratactic projection. Forey (2009) studies the interpersonal aspect of projection in business texts and finds that projecting clauses show writer's identity and power. She recommends that the teaching of projection at the workplace is essential to the professionals

in the field, making linguistic resources explicit to the professional to improve their communication at work.

From the perspective of grammatical metaphor, Zeng and Liang (2007) mention that authors will use metaphorical projection in academic writing for most of the circumstances instead of congruent type. In addition, the use of metaphorical projection is a discourse strategy in academic writing. Zeng (2007) adds that the use of GM in projection will facilitate the realization of meaning potential of academic writing, especially in expressing more sophisticated and complexed meaning.

The third sub-domain is appraisal framework, which was popularized after Hood's (2010) study. Her study suggests that using projection can make academic writing more scientific and persuasive. Zhao (2014) proposes that academic writing should not only focus the teaching of generic structure, cohesion and coherence but also introduce the concept of appraisal, especially voices in projection. However, since most of the academic writing training in China is still laying emphasis on language proficiency, Zhou and Liu (2014) find that L2 learners are not sophisticated in utilizing appraisal resources in projection, such as, stances and engagement. In addition, L2 learners use more projection than their L1 cohort does.

Professional communication

There are three sub-domains in the section of professional communication, which are projection framework, ideology, and appraisal.

Jia and Zhang (2015) enrich the system of projection by analyzing texts from news reporting. They include projector, projecting source, projecting clause and projected clause in the system of projection, making the application of projection to the analysis of news more comprehensive and detailed. The construction of ideologies in hard news could also be seen by utilizing the framework of projection. For example, Hao and Li (2015) suggest that the use of clause complexing in projection could be an indicator to study the ideologies represented from the hard news report. In terms of appraisal analysis, Ochi (2006) shows that the use of trinocular perspective to investigate reporter's values or assessment in news reporting is important. She recommends that the trinocular model could be applied to analyze news written by other languages. In another study, Ochi (2008) finds that 'paratactic: projection: locution' is dominant in Japanese news reports, which makes it easy for reporters to show their explanations and evaluation in news reporting. In addition, the use of 'paratactic: projection: locution' makes the news more objective and factual.

Qiu (2007) finds that scare quotes are very rich in terms of appraisal meanings in news reports, in which the use of scare quotes is usually for the purpose of avoiding or shouldering responsibilities.

Translation studies

Under the domain of translation studies, studies mainly focus on the quality of translation, translation skills and the translation shift.

Functional equivalence is emphasized from the perspective of SFL tradition. For example, Zeng and Hu (2015) investigate the translation of *Lunyu* (The Analects of Confucius) and conclude that the translation of projection in *Lunyu* has achieved

functional equivalence through which, the Chinese culture embedded in *Lunyu* has been translated successfully, facilitating readers of English to understand the texts and the meanings. Translation skills on how to make sure the translation achieve functional equivalence are also discussed in the literature.

Translation shift is also examined in translation. For example, Chen (2017) analyzes the translation of angle used in the novel *A dream of red mansion*. His results show that angle covers three areas of interpersonal meaning potential, which are subjective modality, appraisal adjustment and speech inference. In another study, Wang (2015) investigates the translation of verbal projection in English detective novels written by Conan Doyle and their two Chinese translated versions. She explores the linguistic practices used in translating verbal process by different translators from different periods utilizing the trinocular perspective in SFL. Her findings show that the most commonly used words of saying are “曰” “说”. The most dominant logico-semantic relation is paratactic quoting. In addition, the two versions of translation from different periods show significant differences in terms of diction, styles and culture.

Discussion

Methodological issues

From our analysis, we can see that most of the studies chose not to report the text type of the data they used (e.g. Zeng 2016; Chen 2017; Thompson 1996;). It is recommended that researchers shall include this piece of information in their writing in order to facilitate readers or researchers to contextualize their studies. In order to provide more replicable methodology from one's study, it is imperative to report the analytical unit of the data in the future studies.

One of the dominant features of the field is the study design. More than 90% of the studies we have synthesized belong to descriptive and qualitative type (e.g. Thompson 2005; Matthiessen and Teruya 2013). Methodologies for language studies have changed drastically in the past few years with the development of corpus and various big data and computational tools. Unfortunately, we have not seen any study adopt such an approach in the present synthesis. Therefore, it is imperative for us to borrow such data processing approaches from other fields, such as corpus linguistics or computational linguistics to deal with the data used in projection study, making the design more objective and scientific.

Theoretical issues

One theoretical issue that is worth noticing is that the notion of 'interpersonal projection' is not used in the same sense in different studies. Some scholars (e.g. Thompson 2005; Xin and Huang 2010) consider it as interpersonal meaning or function of projection. In this sense, the term covers manifestations of projection including clause nexuses (e.g. *I think that*) and adjuncts (e.g. *probably, in my opinion*). In the description of projection semantic domain, Halliday and Matthiessen (2014) uses the term "interpersonal" to refer to the interpersonal manifestations of projection. In this sense, interpersonal projection may include only modality, polarity and comment adjunct, thus excluding clause nexuses, processes and circumstances. It becomes more confusing when the same projecting clause (e.g. *I think*) is discussed with the notion of

ideational metaphor (Zeng 2003) or interpersonal metaphor (Thompson 2014: 248). It is therefore suggested that the term “interpersonal projection” should be defined more rigidly as “manifestations of projection through interpersonal resources in lexicogrammar” paralleled with logical projection and experiential projection. Provided this definition, the logical projection (e.g. *I think*) should be viewed as interpersonal metaphor because it is modality realized by logical resources.

Literature shows that only the system networks of projection clause complex and verbal group complex have been outlined so far (Matthiessen 1995: 718; Halliday and Matthiessen 2014: 511). It is also necessary to develop system networks of projection at the verbal/phrase rank and at the semantic level (or beyond the clause rank). For example, networks of projecting circumstance and other grammatical constructions such as projection-related causation (see e.g. Holsting 2008) should be explored. Fact/Embedded projection is another area that needs more thoughts. Zeng and Liang (2012) offer a tentative network of this kind. The model, however, is not based on substantial amount of data. The system network of projection in text-image discourse as proposed in Zeng and Yang (2016b) shows similar problems. First, it is not formulated out of enough data. Second, attention is given to logical projection with a lack of considerations on projection in other functional modes (e.g. interpersonal projection).

A more challenging issue is that Thompson (2005) proposes to regard projection as one type of conjunction. This view has not been widely taken up in other research. However, the relationship between projection and conjunction is more intricate than it seems. It might lead to theoretical considerations of textual projection, which is not found in the framework of projection semantic domain in Halliday and Matthiessen (2014: 676). Projection might be realized in the grammatical environments of conjunction as evidenced in some Chinese connectives (see e.g. Chen 2016b). It is hoped that this line of thought will generate more discussion.

Registerial synthesis

Our coding of text types of data used in the studies makes it possible to consider the relationship between register and context of situation.

As Nesbitt and Plum (1988: 33) suggest, register and genre “capture the systematic patterns of variation of language functioning in context”. In the current synthesis, various functions of projection are found in relations to varied text types (see Table 1). In expounding texts, projection is used to negotiate distance among writers and authors, and establish layers of relations among different research fields. Projection is often de-personalized to show objectivity of science. In reporting texts, journalists use projection to manipulate degrees of objectivity and styles of the newspapers. In recreating texts, projection is employed to construct personalities and mental world of characters. Angles are used mainly for interpersonal purposes in dialogues. In doing texts, projection is used to show our manners such as sincerity and objectivity. These findings as a whole support the hypothesis of register theory. However, most of the studies in this synthesis highlight the interpersonal aspects of projection which, according to the metafunctional hook-up hypothesis, should be more related to tenor rather than field of the context. In the ideational sense, we recommend more research on how projection comes to depict

Table 1 Functions of projection in relation to field of activities

field of activities	functions of projection	manifestations in focus
expounding	negotiation of discursive distance, constructing relationship between research fields as projection, showing writing's attitude and identity, ...	logical projection, interpersonal projection, impersonal projection, verbal process (e.g. De Oliveira and Pagano 2006; Thompson and Ye 1991)
reporting	manipulating the style of reports, showing reporter's attitude, ...	logical projection, verbal process (e.g. Hao and Li 2015; Sellami-Baklouti 2012s)
recreating	constructing personalities and mental world of the characters	logical projection, verbal process, explicit and implicit quotes, angles (e.g. Ding and Shu 2013; Matthiessen and Teruya 2013)
doing	rich interpersonal meaning such as showing sincere or objective manner	logical and interpersonal projection as extended theme (Siahaan 2013)
sharing	n/a	logical projection (Nesbitt and Plum 1988)

the world and on the variations of frequencies of projection in texts of different types (e.g. Nesbitt and Plum 1988; Ignatieva and Rodríguez-Vergara 2015).

Understanding quoting and reporting from the perspective of projection

As mentioned in the beginning of the paper, SFL proposes the concept of projection to refer to the language of quoting and reporting. The new term has theoretical significance because it has enriched our understanding of the relevant linguistic phenomena. First, the distinction between quoting and reporting, according to Arus-Hita et al. (2018), is not always clear across languages. Thus, a covering term like projection is more appropriate for language description. Second, projection has been modeled as a kind of logico-semantic relationship at the semantic level which could be diversely realized by a wide range of grammatical units at different ranks. This line of thought inspires some linguists to think of some group level units in terms of quoting and reporting. As shown in our literature, quoting and reporting might motivate some local syntactic behaviors such as certain constructions (e.g. Liao 2006; Chen 2016b; Lauranto 2017) or the sequence of adverbs (Chen 2015). Furthermore, the notion of projection has triggered metafunctional considerations of quoting and reporting. This line of research has been greatly expanded in the past decade (e.g. Thompson 2005; Thompson and Thompson 2009; Xin and Huang 2010; Zeng and Yu 2005; Chen 2017; Zeng 2006a, b). To round this up, experientially speaking, quoting and reporting represent a second-order reality. Interpersonally speaking, quoting and reporting enact one's viewpoint and attitude. Textually speaking, quoting and reporting organize clauses into clause complex and paragraphs into paragraph complex. Functional interpretations could be further complicated by the notion of grammatical metaphor. That means quoting and reporting could be used in disguise. For example, expressions like '*if you ask me*' and '*if I were you*' are used to report one's viewpoint rather than signaling a condition (c.f. Chen 2017). Therefore, the notion of projection and its research have offered important insight into the language of quoting and reporting.

Future directions

Studies so far have covered most of the manifestations of projection including logical, experiential and interpersonal components. However, the experiential unit matter has

not received enough attention. Matter refers to one type of projecting Circumstance realized as prepositional phrases showing what is said as *in about ...*, *concerning ...*, *with reference to ...*, etc. Matthiessen's (1995) categorization of Theme Matter and Matter reveals the complication of this unit. A possible study in this direction is to use large-scale corpora to unravel lexicogrammatical patterns of matters realized by different prepositions such as *about*, *with respect to*, *concerning*, and so on. The unit of matter may generate much research in the domains of studies mentioned herein.

Research like Lauranto (2017) suggests that there might be some borderline cases in which expansion and projection cannot be clear-cut. It is often closely related to syntactical issues and may be of great values in explaining peculiar grammatical behaviors. Hence, more research is needed to shed light on the atypical manifestations of projection at the level below the clause ranks such as verbal group complexes, phrases, morphemes, grammatical markers, idioms (e.g. *if you ask me*) and other constructions.

Based on findings in the domain of education, we can see that the utilization of the system of projection in these studies is quite diverse. Some perceive projection at the lexico-grammatical level, while others think of it at the semantic level. For instance, Thompson and Ye (1991) choose to look at the process types students used in ESL academic writing, while Forey (2009) looks at the interpersonal meanings from the projecting clauses writers use in business communication. Most of these studies only focused on a small aspect of the projection system in their studies, such as mental projection, projecting clause, projection and appraisal etc. However, we haven't seen any study turn SFL into a real pedagogical grammar in terms of projection. It is important for language educationists or instructors to have this awareness since SFL is claimed to be applicable linguistics (Halliday 2008). In other words, we can include the concept of system of projection into the curriculum and make things explicit to the learners. Only this way, can we pass the whole system to the learners, facilitating their language learning and meaning-making (e.g. Xuan and Huang 2017; Xuan 2018). Their findings have shown how the system of modality and process types could be utilized in L2 teaching and learning. Otherwise, L2 learners will not have this kind of awareness and will have partial mastery of the linguistic resources which limit their meaning-making abilities.

The findings of the different sub-domains show that theoretical discussions and language education take up most of the studies. However, there are some areas that are under-explored, such as professional communication and translation studies. Take professional communication as an example, most of the studies under this sub-domain belong to the sector of journalism. To be more specific, they are news reports. We strongly believe that the application of the system of projection could be more diverse. It is highly recommended that we could apply projection to the study of other areas in professional communication such as business communication, public relations and legal texts etc.

Conclusion

Forty years passed after Halliday introduced the concept of projection, the field has developed and become more mature, theoretically, methodologically and epistemologically. The present synthesis shows that the field has been expanding rapidly in the past decades, attracting more and more research attention. Among this, the influence of Chinese scholars is obvious. More and more Chinese scholars are conducting research

in projection and exerting more impacts in the field around the world. However, while we have seen the exponential growth of the field in the past decades, yet the methodology of researching projection has not been changed much ever since 1977. The present synthesis shows that most of the studies belong to descriptive and qualitative type, which takes up more than 90% of the studies we have synthesized. Given such a circumstance, we call for inclusion of other data processing approaches into the field, making the design and findings more persuasive and scientific. In addition, the present synthesis also shows that the system of projection is a useful analytical tool in investigating both written and spoken discourse from different areas, such as language education, professional communication, translation studies, language description, etc. Findings from these domains also further confirm Halliday's (2008) statement of SFL as an applicable linguistics. Therefore, the system of projection could be utilized to serve different purposes in the study of discourse. For instance, it is of great use for language teachers to transform SFL projection into pedagogical grammar and include it into the language teaching and learning curriculum. Epistemologically, we have deepened our understanding of the system of projection in the past decades too. From merely direct and indirect speeches and thoughts to the understanding of projection as logico-semantic relations, we have seen different theoretical discussions and enrichments in the field too. Such a big leap has finetuned the system network of projection and has made it more user-friendly. However, there are some misunderstandings of interpersonal projection. Some researchers are still not clear on what is interpersonal projection as mentioned in the discussion. Furthermore, the studies of projection at different ranks and levels are also unevenly distributed. It is essential for us to pay more attention to the level of phrase/group since there are not many studies at this level and the understanding of projection at this level is still relatively limited.

There are some cautions and limitations that should be noted. First, due to the linguistic limitations, we can't synthesize other publications from other languages than English and Chinese, such as Spanish, Japanese. Therefore, findings from those publications are not included, which will influence the accuracy of the present study. Second, the development of the coding book is not mature. There may be room for finetuning the development of the coding book in order to reap more comprehensive and insightful findings. Third, the search of literature may not be exhaustive. Due to the use of key words or the database, we may miss some studies in the field.

Acknowledgements

Not applicable.

Authors contributions

WWH conceived of the synthesis methodology and SK proposed a review of projection studies with such an approach. The two authors collected the works and papers and filled the coding book together. WWH wrote the introduction (section 1), research question (section 2) and methodology (section 3). SK wrote the result and finding (section 4). In Findings in different domains (section 5), SK contributed to language description, theoretical discussion and translation studies. WWH contributed to language and education and professional communication. In Discussion (section 6), WWH wrote methodological issues and future directions while SK was responsible for theoretical issues, registerial synthesis and 6.4 Understanding quoting and reporting from the perspective of projection. The conclusion (section 7) was written by SK. Both authors read and approved the final manuscript.

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Funding

No source of funding for this article.

Availability of data and materials

All data could be sent upon request.

Competing interests

The authors declare that they have no competing interests.

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Received: 15 July 2019 Accepted: 30 December 2019

Published online: 14 January 2020

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