

AI-Assisted Development of a Systemic Functional Linguistics-Based Framework for Analyzing Chinese as a Foreign Language (CFL) Textbooks--Taking HSK3 textbooks as an example

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Abstract. Using the theoretical framework of a language theory called SFL, this study looks at HSK Level 3 materials. The research explores how well these materials help students develop practical communication skills. The study starts with three main uses of language. The first is the “conceptual function”. The second is the “interpersonal function”. The third is the “textual function”. The analysis found that the current textbook is quite systematic. It covers vocabulary, grammar, and sentence patterns well. It includes the daily language needed for the HSK Level 3 exam. Especially for interpersonal skills, the textbook does a good job. It offers a wide variety of exercises. These include work on tones, polite phrases, and dialogue practice, which helps students learn basic social communication. However, a weakness was found. The design of the situations in the textbook is not strong. It limits students’ ability to use the language flexibly in real life. To solve these problems, the study suggests that textbook writing should move away from the old “structure–function” model. It should move toward a more practical “task–story” model. This study provides linguistic theory for teaching Chinese and suggests clear and practical ways to improve future textbooks.

1 Introduction

Systemic Functional Linguistics (SFL) is a theory about language. It believes that language is not just grammar and vocabulary. It is also a tool for doing things in social life. This theory pays special attention to three main jobs language does. The first is the "ideational function." This is for talking about our experiences and thoughts. The second is the "interpersonal function." This is for building relationships and showing the speaker's attitude. The third is

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the "textual function." This is for organizing sentences and texts to make them flow well. This theory is very useful for language teaching and for writing textbooks. It helps us see how language is used to do real communication tasks in real situations.

SFL has been used a lot to study textbooks for other languages. But it has been used less for Chinese as a Foreign Language (CFL) textbooks. There is not much research checking if the situations in these books are real, natural, and interactive. As more people around the world learn Chinese, having good textbooks is very important. Textbooks are a key tool for classroom learning. Their quality directly affects whether students can truly learn to communicate well.

A widely used textbook is the HSK Standard Course 3. It is based on the HSK exam. However, old ways of checking textbooks often only look at vocabulary and grammar. Sometimes they just rely on teachers' personal feelings. They lack a clear and scientific method for analysis. This makes it hard to know if the textbooks really help students learn to make meaning and build communication skills in practice.

To solve this, the study suggests a new way to analyze textbooks. This method is based on SFL. We will use it to look at the HSK Standard Course 3. We will also use Artificial Intelligence (AI) to help with the analysis. Using AI makes the work faster and more objective. The AI will help us study the book's content from three angles: the ideational, interpersonal, and textual functions. We will focus on how the book helps students move from simple "survival" communication. This includes things like asking questions or ordering food. The goal is to move to more complex "social" communication, like sharing opinions or making inquiries is good at finding patterns. It can help find the textbook's strengths, like the logical connections or emotional expressions. It can also find deeper problems. These might include situations that are not realistic, conversations that feel mechanical, or a lack of real information exchange. This study has three research questions. The first question is how the Interpersonal Metafunction can be systematically analyzed in CFL reading textbooks using SFL? The second question is what the current limitations are in the representation of interpersonal meaning in existing CFL reading textbooks? The third question is how an SFL-informed framework contributes to the redesign and innovation of CFL textbook compilation.

The goals of the research are: (1) To build a clear and useful SFL-based method for evaluating Chinese textbooks. (2) To find the specific flaws in how current textbooks design their practice situations. (3) To suggest practical ideas for improving future textbooks. We want to help make textbooks more realistic, more interactive, and better at teaching real communication skills.

2 Literature review of SFL

SFL belongs to the functionalist school of linguistics, emphasizing the social and functional aspects of language. It holds that the structure of language is shaped by the functions it performs in social communication [1]. SFL can help students deal with frequent translation choices through meta-functional transformation, providing practical methods for classroom practice and integrating the normative and descriptive approaches of translation studies [2]. SFL also plays a role in the teaching of English reading in colleges and universities in the Chinese context, and the SFL genre teaching method can make students interested in reading articles of different genres, help students establish genre awareness, and improve students' reading speed, reading level and discourse analysis ability [3]. In addition to English reading teaching in a Chinese context, SFL-based reading comprehension teaching also has a great impact on the reading comprehension of Iranian TEFL students [4]. Meanwhile, the framework based on SFL is helpful for teachers to select textbooks and provides suggestions for re-designing the textbooks for compilation [5]. Regarding the relationship between AI and SFL, studies have shown that AI tools designed with SFL principles can enhance ESL

writing instruction by fostering more coherent, engaging, and accurate written communication. When the AI feedback aligns with the SFL principles, it can significantly assist ESL learners in improving their writing [6]. However, Accurso, K. and Gebhard, M analyzed the impact of SFL on teacher education in the United States and found that most of the intervention measures focused on introducing functional meta-language and text analysis to teachers, while paying less attention to multimodal analysis [7].

In Systemic Functional Linguistics, the Interpersonal Metafunction (IM) is one of the three major metafunctions of language. It focuses on how language is used to establish and maintain social relationships, express the speaker's attitudes, positions, and judgments, as well as negotiate the roles in communication. The core language system for realizing IM is the mood system and the modality system [8]. Unlike formal and non-SFL language models, SFL not only regards the metafunctions of language as “the purpose of language” but also considers it as a fundamental attribute of language itself, which can help learners understand the essence of language as a meta-functional system [9].

Systemic functional linguistics is also applicable to literary expression. Literature also follows the basic principles of systemic functional linguistics, which regards language as a social symbol system, and this usage process is the process of selecting meanings from the language system. The interpersonal metafunction plays an important role in this basis in the literary context [10].

3 Interpersonal metafunction in CFL reading textbooks using SFL research objectives and measures

This section will analyse the chosen textbook from three perspectives, including conceptual function analysis, interpersonal function analysis and textual function analysis.

3.1 Conceptual function analysis

Regarding the expression of experience, the textbook's vocabulary and grammar exercises closely correspond to the daily “language context” and the HSK3 syllabus. By learning certain verbs (like “improve, plan, solve”), nouns (like “environment, passport, sequence”), and adjectives (like “careless, serious, simple”), learners build an experiential world regarding social interactions and personal life.

As for logical relationships, more intricate logical connectives are included in this textbook, emphasising the abstract connections between various objects. Compared to the first two HSK textbook levels, this is a big step forward, such as parallelism and cohesion words-also, again, then; adversative words-but, however; cause and effect words-because...so, therefore; conditional words-if...will..., as long as...; words expressing purpose-in order to. With the use of these conjunctions, students can progress from using basic sentences to articulating intricate logical concepts.

3.2 Interpersonal function analysis

Each conversation of this textbook clearly demonstrates language communication purpose, in which the primary function-ask and answer is reflected in these various questions: general question ‘吗’; ‘yes or no’ question, special questions (who, what, where, how much), to name just a few. What is more, through the verbs want, would like and plan to express aspiration. By utilizing can and be able to to express ability and permission. As regards putting forward suggestions and requests, using the structure ‘...吧’ (我们去吧), which means Let's go there; using ‘可以吗’(你帮我一下, 可以吗), which means You help me, is it ok? With respect to

the expressions of assessment and attitude, learners will learn adjectives and adverbs to convey preference (‘我喜欢...’, which means ‘I like...’), assessment (‘太好了’, which means ‘great’; ‘真漂亮’, meaning ‘really beautiful’) and judgement (‘我觉得...’, meaning ‘I think...’)

The foundation of interpersonal functions is the study of modal words. The HSK3 textbook has placed special emphasis on this element. For instance, necessity modal words ‘should, must, will’ (You should go to the hospital.) and modal verbs of ability/permission ‘can, may, will’ (May I use your pen?). These words improve the language’s negotiability and civility by preventing the expression from being entirely black or white.

3.3 Textual function analysis

Conversations in this textbook are coherent. The dialogues in the textbook are mini-paragraphs with a beginning and an end rather than single sentences. For example, a dialogue often starts with a greeting, moves on to questions and answers about a main topic, advances the discourse with conjunctions, and concludes with a summary or farewell. This instructs students on how to join and maintain a discussion.

The study of brief passages follows conversations in this textbook. Short narrative or illustrative paragraphs (like those found in the “Reading” section) start to appear in the HSK3 textbook. This advances the training of text functions by requiring students to comprehend the text’s general meaning in addition to its individual sentences.

3.4 A functional framework for analyzing interpersonal meaning in CFL textbooks.

As an intermediate beginner textbook, the core goal of the interpersonal meaning framework of HSK3 is to enable learners to transition from “survival” communication (HSK1-2) to “social” communication, and be able to establish and maintain simple but effective interpersonal relationships. Its functional framework is mainly reflected in the Mood System, Modality System, Evaluation System, Person and Interaction System, as well as Interpersonal Meaning in Cultural Context.

In terms of language form, the HSK3 textbooks introduce the aspect of mood and modality, enabling learners to progress from simply making statements and asking questions to expressing attitudes, intentions, possibilities, and engaging in polite negotiations. The mood system is the most direct way to convey interpersonal meanings. The HSK3 textbooks focus on constructing three types of moods: declarative mood, interrogative mood, and imperative mood. The Declarative Mood is used to provide information, state facts and viewpoints, establish the speaker’s role as an “information provider”, lay the foundation for communication, and is the most basic and extensively used mood in this textbook. For example, in the second unit “When will he come back”, in the scenario of a phone conversation, the secretary’s reply is: “Mr Zhou is out and not in the office”. The interrogative mood is used to seek information, initiate conversations, express concern, and transform the speaker’s role into an “information seeker” or a “negotiator”. It is a key means for driving conversations and expressing concern. For example, in Unit 3, “There are plenty of drinks on the table”, Xiaogang asks Xiaoli: “What kind of tea do you like to drink?”. The imperative mood is generally used to issue instructions, make suggestions or make requests, establishing a “proposer-receiver” role relationship, and expressing consideration for the listener’s dignity through a tactful form. It is an important manifestation of social communication skills. The imperative sentences used in this textbook place great emphasis on politeness and tactfulness. For example, in the sixth unit, “Why are they suddenly

missing?” Mrs Zhou told Zhou Ming, “You’d better have a cup of milk. It will help you sleep better.”

The modality system is the core of interpersonal meaning, expressing the speaker’s judgment of the possibility of a proposition or the inclination towards obligation and intention of a proposal. HSK3 introduces key modal expressions: Modal Verbs and adverbial modal expressions. Among the modal verbs, words such as “can”, “will”, “must”, and “should” are frequently used, transforming the expression from an absolute factual statement (“I go”) into a negotiable expression that incorporates personal attitude and judgment (“I should go”), significantly enriching the levels of interpersonal communication. Adverbial modal expressions use words such as “possible”, “probably”, and “certainly” to regulate the degree of certainty of the proposition, reflecting the speaker’s assessment of the reliability of the information and the interaction with the listener.

At the content level, HKS3 enables learners to share their feelings, evaluate things and people through a large amount of input from the evaluation system, thus facilitating deeper and more personalized communication. The textbooks frequently feature words such as “happy”, “like”, “love”, “worried”, “angry”, “disappointed”, “satisfied” to express personal emotions; a series of adjectives like “clever”, “hardworking”, “polite”, “serious”, “careless” are used to judge whether someone’s behavior conforms to social norms; when evaluating the value and appearance of things, a series of appreciation words such as “beautiful”, “delicious”, “convenient”, “important”, “interesting” are employed.

In terms of social functions, HSK3, by simulating real scenarios and solidifying interaction expressions, cultivates learners’ social language skills, enabling them not only to “say it correctly” but also to “say it well”, in line with the social norms of the target language culture. For instance, proficient use of “I”, “you”, “he/she”, “we”, “you all”, “they” and the pronoun “we” (including the listener) clarifies the roles and relationships among the participants in the conversation, and “we” particularly reflects unity and intimacy.

4 Identification of limitations in current textbook designs regarding dynamic context

4.1 The context of the HSK3 textbooks lacks authenticity and coherence

The dialogues and texts in the HSK3 textbooks are contextualized, but these contexts are overly “textbook-like”, being “constructed” to explain specific grammar points. The content of the dialogues is highly predictable and lacks hesitation, repetition, interruptions, omissions, and impromptu responses in real conversations. On the second page of the book, in the conversation between Xiaoli and Xiaogang, Xiaoli asked Xiaogang about his weekend plans. Xiaogang said he would invite Xiaoli to have dinner and watch a movie, and he had already bought the tickets, but Xiaoli said she hadn’t agreed yet. This dialogue is clearly not realistic. A normal invitation should be an active offer, and only after the recipient agrees will the subsequent ticket purchase procedures be carried out.

4.2 The contexts are fragmented and lack narrative drive

There are few contextual connections between each unit. Today, learners study “interpersonal relationships”, tomorrow they study “asking for directions”, and the day after they study “Chinese culture”. There is no continuous character or storyline that runs through all these scenarios. In this textbook, the first unit discusses weekend plans, the second unit suddenly jumps to a dialogue about when the characters will return, and the third unit shifts to a static

description of the arrangement of items in a room. There is no overarching thread that connects these three themes, and each new unit resets with the change of the theme.

4.3 The interactivity is static

The majority of the exercise designs in the HSK3 textbooks are “static”. Even role-playing is usually a simple imitation or substitution practice based on the dialogues in the text, lacking information differences, viewpoint differences, and task goals. Learners are more “performing” the dialogues rather than “creating” them. They cannot experience the sense of achievement of using language to solve practical problems, and their communication skills and strategies cannot be effectively exercised. In the post-class exercises of Unit 4, the group activity requires introducing the people in the photo using the structure “V-ing”. The exercise already provides an example sentence: The person who is smiling and standing beside the table is Xiaoli. This is a typical “static” interaction. The students' conversation is completely restricted to the sentence pattern “The person who is _____ and _____ is _____.” They do not need to negotiate, do not need to solve any problems, they just need to replace the underlined parts.

5 Practical suggestions for innovating textbook compilation to enhance functional language teaching

5.1 Reconstructing the teaching material design concept: From “structure-function” to “task-narrative” driven

Firstly, the editor can create key characters and plotlines, with HSK 3-level characters as the main protagonists, such as international students in China, expatriate employees, etc. Secondly, the editor can create a complete narrative, with each unit centered around completing a storyline task. The language usage can be promoted through scenarios. For instance, the entire textbook could be centered around “David’s Learning Experience in Beijing”, with each unit serving as a chapter of the story. The design could include scenarios such as entering school, making friends, renting a house, seeking employment, experiencing cultural shock, and celebrating festivals. In the first chapter, when discussing the weekend plan, one can focus on the communication between David and his new classmates when he first started school. Through their conversations, the arrangement for the weekend can be explored. Chapter Two can be centered around David's situation of renting a house and finding a part-time job. Through dialogues such as “I’m going to take the subway to Haidian District to visit new houses” and “I’m going to ride a bike to hand out flyers”, students can learn simple complements of direction. In addition, the editor can also incorporate task-based learning. The core of each unit is not “learning ten new words and three grammar rules”, but “completing an ultimate task”, providing students with a strong purpose and contextual authenticity for language learning.

5.2 Deepen dynamic context design: Create “information gaps” and “choice points”

The textbook editors can incorporate “information gap” activities when designing the textbooks, which is the core of the communicative approach. For example, students A and B each hold a weekend activity list that is not completely identical. They need to have a conversation to find common free time and agree on an activity that both like. At the same time, introduce “branching choices” dialogues: In textbook dialogue exercises, set key

“choice points” to allow students different dialogue branches and endings depending on their different choices.

6 Conclusion

This study uses the framework of Systemic Functional Linguistics (SFL). It analyzes a Chinese as a Foreign Language (CFL) reading textbook (HSK Level 3). The focus is on how the textbook realizes interpersonal meaning. The study also provides innovative suggestions for textbook design.

The paper analyzes the textbook from three perspectives: ideational, interpersonal, and textual functions. The analysis shows that the textbook’s ideational function links to daily life and the HSK3 syllabus. It uses specific vocabulary and logical connectors. This helps students build an experiential world and express complex logic. For the interpersonal function, the textbook uses questions, modal verbs, suggestion structures (like “...吧”), and evaluative words. The goal is to develop students’ social communication skills. Its core framework includes mood, modality, and appraisal systems, through which learners move from basic survival communication to social communication. For the textual function, the textbook uses coherent dialogues and short narrative passages. This trains students to understand and use complete texts.

However, the study also identifies limitations in the textbook’s dynamic context design. The context lacks authenticity and coherence. And the contexts are fragmented. It also suggests deepening dynamic context design. Textbook activities should include “information gaps”.

In conclusion, this study provides a framework for analyzing interpersonal meaning in CFL textbooks. It points out current weaknesses. Moreover, it also offers clear directions for innovation. The goal is to improve functional language teaching. This will help learners develop better communication skills.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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