A Multimodal Discourse Analysis of How Digital Representational Tools Function as Meaning-making Instruments in MOOCs: A Case Study on PowerPoint Design

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Abstract

With the development of information technology, people of all ages have realized that they should take online courses to boost their competitiveness. In China, English courses are particularly under demand because of the globalization trend. In this background, MOOC has become a popular product since it emerged in 2008. Nevertheless, MOOC is still at an early stage. To fill the two research gaps: (i) few studies have defined what kinds of slides are efficient for accomplishing the teaching goals, and (ii) the slide makers have changed their roles while this phenomenon requires enhancement. This paper gives a representative case study in which a MOOC course on spoken English is thrown into a multimodal discourse analysis. The data analysis part sees its basis in Systemic Functional Grammar and Visual Grammar. We use this to explore how different elements in a set of slides function separately and how they are combined to affect students' engagement better. The findings indicate that (a) the language part and the image part function independently to articulate the meaning potential, and (b) cohesion and coherence can be realized merely because of their limitation in specific topics. Finally, this paper categorizes different elements' particular functions and suggests that MOOC producers should rely more on the meanings and combine the aspects efficiently to present key points.

Keywords

MOOCs for English Learning; Powerpoint Slides Design; Multimodal Discourse Analysis; Visual Grammar.

1. Introduction

We can easily notice tremendous changes from various new media in the education landscape. For instance, teaching tools have changed from chalks and blackboards to multimedia [1, 2, 3]. Another obvious instance is that the forms of classrooms have changed from traditional ones to online, virtual, or flipped ones [4, 5, 6]. The switched roles of teachers and students tell us the change, too (from teacher-oriented to student-oriented) [2, 7]. Worldwide, students of all ages are increasingly getting used to learning online [8, 9]. Nevertheless, some supporters of traditional courses doubt the efficiency of this kind of learning process. For instance, Strayer argues that traditional approaches should play a dominant or slightly more important role for young students, and online courses should merely act as attached learning methods. Besides, what tools should they choose or what platforms can they access still confuse many students seeking high-quality online courses [6].

In this background, MOOC (Massive Open Online Course) has undoubtedly been a superstar since its emergence in 2008. It has been merited as one of the most knockout and popular products in 2012 [10]. As a new platform of learning resources with support from digital devices and the Internet, the MOOC model has significantly influenced traditional teaching/learning activities. Although, during the past few years, we have witnessed numerous

changes in the forms of MOOCs, it should be noted that MOOCs are still at the early stage [11]. Based on observation, most MOOCs still follow a classic pattern of multimedia teaching method, of which the widely used new media (e.g., PowerPoint slides, projectors, and whiteboards) are the typical symbols. Mazuoe studies this kind of pedagogical approach and concludes that it helps many social members in two aspects [12].

On the one hand, for learners, the MOOC platforms on websites provide much easier access to any disciplines they are interested in; meanwhile, they are no longer constrained by geography and time, which significantly reduces the economic and time costs of diverse teaching resources. On the other hand, the help of instructors can be effectively used since it is typical for thousands of students of all ages from all over the world to register for the same courses. Moreover, instructors' time can be saved to do other work and provide more MOOCs if they like, which significantly contributes to forming a virtuous circle. So, to maximize efficiency, it is essential to delve into the designs of MOOCs further.

2. Literature Review

2.1. Multimodality in Social Semiotics

As Murray points out, Multimodality in the landscape of social semiotics is a term to "describe communication practices in terms of the textual, aural, linguistic, spatial, and visual resources- or modes-used to compose messages" [13]. Since it came into being, studies from various perspectives, such as multiliteracies proposed by the so-called New London Group, have engaged in them for decades [14, 15, 16, 17, 18]. Specifically, Kress argues that new classroom textbooks should "be designed to configure both communicative resources and social interaction" [16]. Moreover, there are two primary aims of the latest designs, as Jewitt notes, "on the one hand, to better understand and connect with students' literacy worlds and mediascapes and, on the other hand, to build on these to develop students' explicit understanding of a broad range of multimodal systems and their design" [18]. The world becomes more connected with the help of new technologies of tremendous convenience. Consequently, social members are exposed to more approaches to communicating with each other from different backgrounds.

Under this circumstance, educators ought to be responsible for using multimodal inputs, such as multiliteracies, for teaching in new ways. This will make their students more competitive in the future. For example, based on the "eight primary fields of activities" cited in Matthiessen's work, Guo and Feng designed an experiment to test the effectiveness of multimodal semiotics in textbooks for Hong Kong students of different ages [16, 19]. They obtained quantitative and qualitative results and observed a significant ontogenetic shift in students' cognitive ability.

Multimodality, of course, is much broader than multiliteracies. Many scholars yield their theories to enhance students' competence in communicating interculturally with the help of some advanced instruments. For instance, a study of the interactions using text chat and audio modalities within the L2 communication in a synthetic (virtual) world has observed whether the text chat modality was used for corrective feedback [9]. Besides, by analyzing the popularity of translated comic books among young students, Inose found that scanners increase students' learning motivation and efficiency in mastering non-native languages [20]. He yields a new teaching/learning method, namely, "scanlation," to define the unique formation of learning materials which is realized by "scan" and "translation." Valero-Porras and Cassany also advocated and promoted multimodal learning methods [21]. They further emphasized the importance of "promoting foreign students' awareness of the culturally situated nature."

2.2.   Systemic Functional Multimodal Discourse Analysis (SF-MDA)

Over the past few decades, abundant and insightful studies have emerged on language communication. Along with the development of science and technology, discourse analysis has undergone a series of significant changes. However, the meanings constructed by languages alone are not enough to meet the needs of new forms of communication. By languages alone, it is difficult to comprehensively analyze different aspects such as sound, image, gesture, etc. Under such circumstances, multimodal discourse analysis is heralded. Since it is necessary to understand how various social semiotics interact with others to convey several levels of meanings, some researchers try to explore the multimodal discourse analysis, much of whose studies draw from Halliday's social semiotic approach to language (Systemic Functional Grammar). According to his SFG, language can be taken as a strategic resource in the process of meaning construction [22]. Then, systemic functional multimodal discourse analysis (SF-MDA) becomes a particular but prominent branch of the discourse analysis family.

In the 1990s, SF-MDA came into being and developed rapidly. It helped to combine the analysis of language structures with other modals of language expressions like images, sounds, videos, flashes, etc. Two of the earliest and most influential masterworks on SF-MDA are *The Language of Displayed Art*, which applies the theory of functional linguistics to art analysis, and *Reading Images*, which introduces a systematic and comprehensive grammar of visual design [23, 24, 25]. It also provides integrated details of Kress & van Leeuwen's theory and has profoundly influenced the SF-MDA research.

Kress and van Leeuwen investigated in *Reading Image* the formal elements and structures of visual designs as composition, gaze, perspective, framing, and color, and hence have managed to see how images convey meaning [24, 25]. Besides, both Kress and van Leeuwen have raised a wide range of examples independently to demonstrate the differences and similarities between the grammar of a language and certain visual communication [26, 27]. These examples are not limited to children's drawings, textbook illustrations, news reports, photojournalism, advertisement, fine art, and three-dimensional forms [28, 29].

Since the two books mentioned above are regarded as pioneering works in the 1990s, Multimodality has been quickly developed and applied to different research areas. Language learning, teaching, media of languages, and so forth are some of the fruits of the application of Multimodality. SF-MDA maintains that as society and technology develop, the broad application of the Internet, multimedia technology, and multi-communication becomes the trend of the contemporary world. Visual semiotics and other "paralanguage semiotics" like image, music, gesture, video, etc., play significant roles. The semiotic is no longer a form of communication but a way of expression.

2.3.   Social Semiotic Studies on MOOCs and PowerPoint Slides

There are three levels of significance of investigating MOOCs and their slides using the theories above from a social semiotic point of view. First of all, it is evident that as instruments for teaching and learning, digital presentational tools like PowerPoint, Google slides, Keynotes, and so forth "increasingly find their ways to school classrooms, conference podiums and lecture halls" [30]. Meanwhile, instructors of MOOCs usually rely on these tools to present critical concepts when teaching. In China, specifically, "centralized purchasing" has been one of the main purchasing methods in public schools over the past few decades, so most classrooms (in well-developed regions) are similar: equipped with overhead projectors and whiteboards, showing multimedia teaching materials, typically adopting PowerPoint slides [31]. Secondly, PowerPoint slides benefit both teachers and students in a teaching context. Since textbooks (or other learning materials) are increasingly multimodal, combining visual, audio, linguistic, gestural, and spatial modes to convey meanings in much more productive ways, PowerPoint slides can efficiently combine them with slight effort [31]. To put it in more detail, on the one

hand, they can enhance students' learning approaches with sophisticated, preprogrammed designs; on the other, they help teachers explain the essential or confusing knowledge more clearly, precisely, vividly, and rapidly by using photographs, charts, film clips, and web pages [30]. Thirdly, it is evident that PowerPoint slides are not panaceas that are efficient overwhelmingly. For example, Young surveyed students' attitudes toward PowerPoint slides and concluded that undergraduate students in the US are significantly unhappy (sometimes even annoyed) with slides in lecture halls [32]. Moreover, Tufte argues that from the perspective of visual communications, the format of slides is inconsistent with students' cognitive development, especially students of undergraduate level or higher. Therefore, their pros and cons need further exploration [33].

2.4. Research Gaps and Research Questions

Abundant studies have focused on the effectiveness of PowerPoint slides in a pedagogical context, such as students' attitudes toward those slides, teachers' new teaching methods, and whether or not slides can strengthen students' understanding and improve their cognitive development. To illustrate, Adams adopts a pedagogical way to see "how PowerPoint invites and seduces educators to reshape knowledge in particular ways, and subsequently, how this knowledge is presented to students in the classroom" [30]. The study concludes that PowerPoint slides significantly influence how knowledge is being formed and presented across all subjects, whether STEM courses (Science, Technology, Engineering, and Mathematics) or Arts (e.g., Literature, Languages, Fine arts, and so forth). Bruff et al. conducted a case study on a machine learning MOOC to see students' evaluation of the courses in which they registered [34]. Their study confirmed that students described the MOOC as "generally useful for self-paced learning." Although videos and PowerPoint slides/keynotes are "designed effectively, presented clearly, and informative," students do not engage actively in the courses. Many registered students quit those courses for various reasons, such as boredom, excessive workload, time, etc. Based on ethnographic data, Knight et al. found that PowerPoint slides can be designed to help "tackle complex issues, and those who craft and edit PowerPoint slides strongly influence the direction of the strategy" [35]. The skillful use of PowerPoint is crucial in allowing designers to shape the nature and speed of strategy engagements. They finally concluded with the three visual mechanisms: depiction, juxtaposition, and salience. Recently, a meta-analysis of 48 studies was conducted by Barker et al. to explore whether or not students learn more when taught the same material using PowerPoint rather than traditional instruction [36]. The results revealed that K-12 (from kindergarten to twelfth grade) students' cognitive learning "increased due to PowerPoint instruction." Whereas, few studies have systemically illustrated or defined what precisely an efficient set of PowerPoint slides is and how different multimodal elements in these slides function when it comes to consolidating students' knowledge. Though there are some valuable tips like "highlighted topics," "well-designed background," "succinct words," "multimodality," etc., the quality of slides still suffers from individual performances.

Thus, below every independent element in a set of PowerPoint slides should be analyzed to determine their homonymous or variant relations. From above, the part-whole hyponymous relations should be explored so that each element's functions can be displayed, and the designs of slides will be much more understandable and practical. Finally, from a roundabout, the social contexts of MOOCs should also be considered; for instance, from the aspect of competence, since there are thousands of MOOCs on different platforms and most of these courses are produced by an individual university/institution, the quality of MOOCs represents the "soft power" of the producers. So, it is reasonable that designers put much effort into those slides. Unfortunately, though "designer equals teacher" has unconsciously become common sense in previous studies, this kind of role-switching will inevitably add extra meanings to MOOCs' PowerPoint slides

compared with those in traditional classrooms. Then, in order to partially fill the research gaps, the following research questions are taken to get addressed:

i) How do these keywords in MOOCs' PowerPoint slides realize the three metafunctions (ideational metafunction, interpersonal metafunction, and textual metafunction) proposed by Halliday?

ii) How do other elements (such as videos, images, backgrounds, etc.) realize the representational meaning, the interactive meaning, and the compositional meaning proposed by Kress and van Leeuwen?

iii) How do designers implement the social functions to promote their courses with the help of well-designed PowerPoint slides in MOOCs?

3. Methodology

This paper conducts a representative case study because a case study is "a detailed examination of one setting, or a single subject, a single depository of documents, or one particular event" [37]. When analyzing the deep meanings of MOOCs, a quantitative research method somewhat needs to be more thorough. It is very tough to quantify the features of PowerPoint slides. In this case, choosing a qualitative research method seems to be a wise choice. What is more, there are thousands of MOOCs on various platforms worldwide; however, most MOOCs share similar patterns, as mentioned above, adopting digital presentational tools. So, a representative case falls right into this (as illustrated in Figure 1 below).
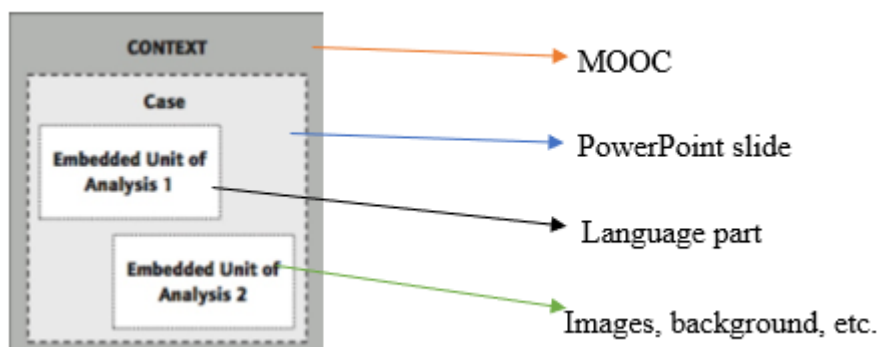

Figure 1. A representative case study on MOOC

3.1. Data Collection

This study selects a MOOC named *College English (Spoken English)* from a commonly used MOOC platform among Chinese universities (*www.icourse163.org*).

Here are two reasons for this choice:

a) Chinese college students are enthusiastic about learning English. This obviously has an increasing trend. Nevertheless, traditional English courses, especially for non-English majors, focus little on improving students' spoken English. So, many students turn to MOOCs.

b) The course *College English (Spoken English)* is produced by a well-recognized university in China, and each issue in the past two years observed participation of over 50,000 students.

3.2. Define Types of PowerPoint Slides

Generally, there are three types of PowerPoint slides (language-oriented, image-oriented, and mixed) in this study, and their boundaries will be distinguished clearly in this section. Apart from the background and the bottom subtitles, when a set of PowerPoint slides only has the

language parts (topic sentences, keynotes, punctuation marks, etc.) or the image parts alone (paintings, photographs, cartoon characters, etc.), it is called language-oriented one or image-oriented respectively (see Figure 2 and Figure 3 for illustration). Nevertheless, things are not so clear in mixed slides, which needs further clarification.

See Figure 4; it is a typical mixed kind of slide that includes both the language part (keynotes) and the image part (a photograph). However, although Figure 5 contains both the language part and the image part, it is not a mixed one. The main reason might be that the topic sentence "where do they come from" here only acts as an indicator, which consists of the previous and later slides, to maintain cohesion and coherence. It just plays a role like background and does not present any new elements.
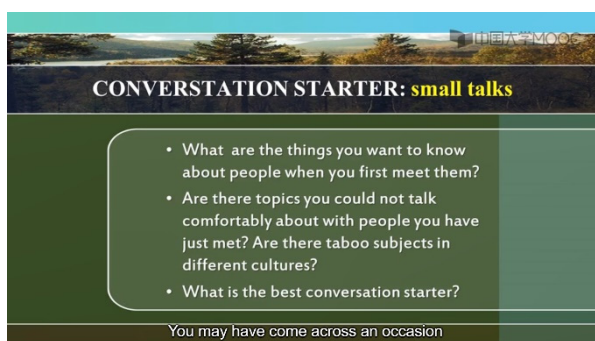

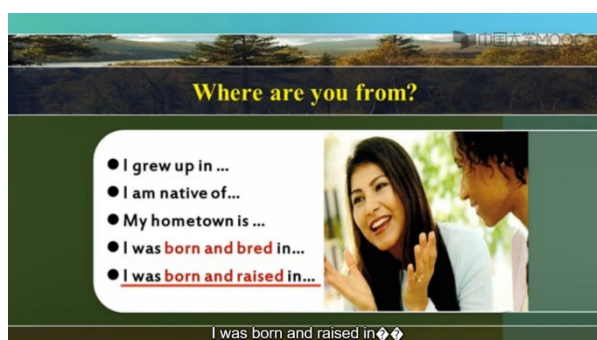**Figure 2.** Sample slide I

Figure 3. Sample slide II

Figure 4. Sample slide III

Figure 5. Sample slide IV

3.3. Procedures

Following Yin's instructions on the case study, a sequence of exploration (to identify questions, hypotheses, or procedures to be used in subsequent research), explanation (to answer "how" and "why" questions), description (to answer "what" questions by describing a phenomenon in its real-world context), and evaluation (to answer the question of "what happened?" to evaluate a program) will be adopted to do this research [38]. The first step is to avoid all the PowerPoint slides presented in the MOOC after addressing essential issues. The second step is coding, classifying those slides into different groups: language-oriented, image-oriented, and mixed. Afterward, based on theoretical frameworks (which will be discussed in the next section), features of coded data will be analyzed and then compared and matched with each other. Finally, the researcher will contextualize the study, select representative evidence, and report the findings.

3.4.   Theoretical Frameworks for Data Analysis

3.4.1. Systemic Functional Grammar

The first critical framework adopted in this thesis is Systemic Functional Grammar (SFG), proposed by Halliday. He pointed out that SFG aims to describe texts rather than sentences, which indicates its enormous potential for discourse analysis. SFG has become one of the research paradigms in discourse analysis over the past few decades [39, 40, 41, 42, 43]. In SFG, there are three types of metafunctions: ideational, interpersonal, and textual metafunctions. Based on these metafunctions, various subsystems can be established in fields like discourse analysis-information structure, theme analysis and thematic progression, and cohesion and coherence. SFG is such an extensive system that few projects can fully use it. So, in this thesis, only three aspects of SFG will be employed for language discourse analysis. They are, respectively, clauses as message-theme analysis and thematic progression; clauses as exchange-mood type analysis; clauses as representation-transitivity analysis, combined with register analysis (field, tenor, and mode) for examining cohesion and coherence in the text [44, 45].

3.4.2. Visual Grammar

Visual grammar is another promising framework to delve into analyzing images. It is the dominant framework adopted in this thesis. So, in this section, its information will be discussed step by step.

Inspired by Halliday's Systemic Functional Grammar, Kress and van Leeuwen modified and extended the social semiotic approach of analyzing a language itself to being able to explore patterns in visual image resources. According to their theory, images, colors, different typographies, and other visual resources are homogeneous to language in its narrow definition. The theories can be explained by the three metafunctions: ideational metafunction, interpersonal metafunction, and textual metafunction. In their seminal work *Reading Image: The Grammar of Visual Design*, images, as one of the social semiotics, compromise three meanings: representational meaning, interactive meaning, and compositional meaning, and these correspond to the three metafunctions (see Figure 6 below) [24, 25].
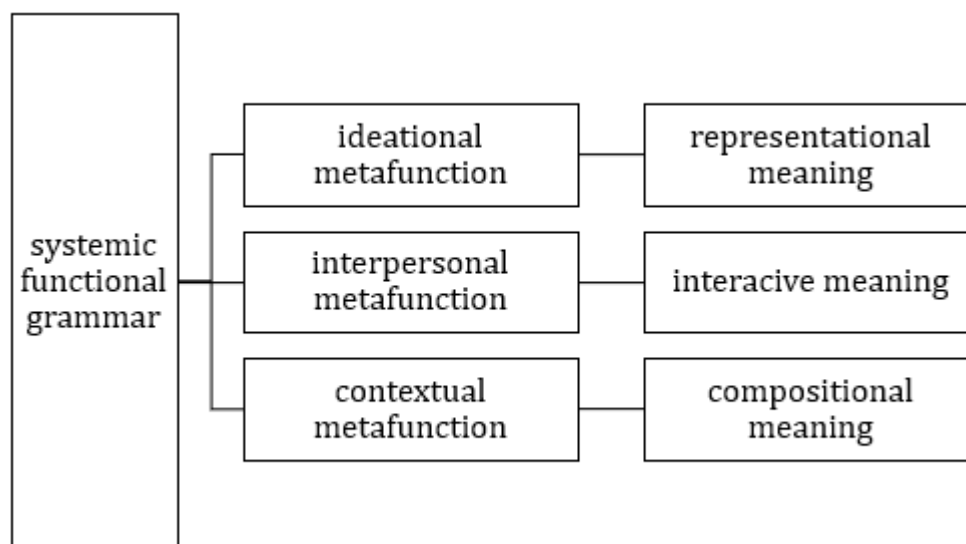

Figure 6. The relationship between three metafunctions and visual grammar

4. Findings & Discussions

4.1. Major Findings

Table 1. Classification of all slides presented in the MOOC

	Language-oriented	Image-oriented	Mixed	Total
Number	130	23	72	225
Ratio	57.78%	10.22%	32%	100%

Notes: Among the 95 slides which contain images, there are a total of 177 images; among the 202 slides which contain clauses (exclude topics, short phrases, and keywords in the backgrounds), there are a total of 356 clauses for 18 units in the spoken English MOOC.

Table 2. Theme analysis

	Textual Theme	Interpersonal Theme	Topical Theme (marked)	Topical Theme (unmarked)
Number	28	205	3	148
Ratio	7.9%	57.58%	0.84%	41.57%

Notes: Textual Themes usually come up with other types of Themes, so, in some clauses, two Themes are counted.

Table 3. Thematic progression

	Thematic progression with a constant Theme	Simple linear thematic progression	Thematic progression with a constant Rheme	Progression with derived Themes	Total
Number	3	0	0	43	46
Ratio	6.52%	0	0	93.48%	100%

Notes: (1) Each clause belongs to a specific topic, which can be seen as a macro-Theme or hyper-Theme (Martin, 2005). So, if any slides match the first three types of Thematic progression, they will be given priority to be concluded in the boxes; if no matches are seen, they will be regarded as the fourth type- "Progression with derived Themes." (2) Not all language-oriented slides and mixed slides contain a group of clauses (at least three clauses related to the same topic) which match the four types of Thematic progression. On the contrary, these good matching groups are relatively rare: only 46 groups can be found within the 202 language-oriented slides and mixed slides. The primary purpose of this analysis is to see how groups of clauses in the specific PowerPoint slides realize the cohesion and coherence by textual metafunction, which supplements the Theme analysis in Table 2.

Table 4. Mood analysis

	Declarative	Interrogative	Imperative	Total
Number	142	156	58	356
Ratio	39.89%	43.82%	16.29%	100%

Table 5. Transitivity analysis

	Material	Behavior	Mental	Verbal	Relational	Existential	Total
Number	93	20	38	40	136	29	356
Ratio	26.12%	5.62%	10.67%	11.24%	38.20%	8.15%	100%

Table 6. Image analysis

Visual Grammar			Number	Ratio
Representational meanings	Narrative process	actional	43	24.29%
	Conceptual process	classificational	124	70.06%
		symbolic	10	5.65%
Interactive meanings	Contact	demand	18	10.17%
		offer	159	89.83%
	Social distance	personal	16	9.04%
		social	156	88.14%
		impersonal	5	2.82%
	Camera angle	high	12	6.78%
		frontal	165	93.22%
		low	0	0
Compositional meanings	Information value	given-new	17	9.61%
		ideal-real	3	1.69%
		central-marginal	157	88.70%
	Framing	segregation	0	0
		separation	177	100%
		overlap	0	0

Notes: It should be mentioned that all images are separated from other images. In some slides, they have the "overlap" relationship with the language parts (the number is 12, and the proportion is 6.78%).

4.2. Discussion of SFG Analysis

Both qualitative findings (primary) and quantitative findings (minor) show that the three metafunctions (the textual, the interpersonal, and the ideational metafunction) can be thoroughly realized in complex meaning-making resources like PowerPoint slides.

First of all, in terms of textual metafunction, see Table 2 and Table 3, the interpersonal Themes and the unmarked topical Themes take the dominant place, accounting for 57.58% and 41.57%, respectively. It is not uncommon for clauses in presentational tools to use a large amount of "wh-elements" like "what," "where," "when," and "why" to ask viewers questions related to those topics. Furthermore, these "wh-elements" are usually used under interpersonal themes, except for substantive clauses where "what" and "which" may mainly appear in sentences of topical Themes. Similarly, many slides present examples, usually starting with subjects like "I," "He/She," "It," or "They," in order to make sure those slides are comprehensible and manageable for students. So, there are also many Themes used as topical ones.

Moreover, a marked topical theme usually consists of circumstances like "time," "place," and so on, but the most significant part is the Rheme part. Designers will not want students to pay too much attention to the Theme part, resulting in the unbalanced distribution of marked topical themes (0.84%) and unmarked topical themes (41.57%). Sometimes, designers also present a group of clauses in one PowerPoint slide. Then thematic progression occurs. In most cases, designers do not present those clauses in a specific type of thematic progression, though the clauses still correlate to their topic. Moreover, this kind of unconsciousness causes "Progression with derived Themes" to take up 93.48% of all types of progressions.

In Table 4, as discussed above, since there are many wh-questions in slides, it is natural that interrogative clauses play a leading role, occupying a proportion of 43.82% among all clauses in the slides. Imperative clauses (16.29%) here usually claim the requests of a task in a course section, informing students what they should do and how they will be marked. Because of their particular functions, imperative clauses mainly appear at the top of the slides. The declarative

clauses (39.89%) are also essential to present keynotes in slides, emphasizing the critical knowledge for students to learn or memorize.

Next, from the perspective of ideational metafunction, as shown in Table 5, PowerPoint slides are very important - all kinds of processes (material, behavior, mental, verbal, relational, and existential) proposed in Halliday's SFG can be realized in a small slide. However, in the context of MOOCs, material processes (26.12%) and relational processes (38.20%) are mainly adopted to present the main features of those specific topics, the definitions of some materials/activities, and the characteristics of those activities.

Finally, when delving into the cohesion and coherence of registers (field, tenor, and mode) in those clauses, since they all correspond with the particular topics, the details will not unfold in this paper. Generally speaking, this representative case study focuses on a spoken English MOOC, so the activity field usually shares "personal experience" and the field of discourse, of course, the "educational environment." As for the tenor analysis, the case study depends on the relationships between speakers. To illustrate, the speakers are generally classmates (though they are not very familiar with each other and they want to know more about others; otherwise, the conversations will not happen), so the institutional role is usually "student-student" or, more roughly, "speaker-audience." In this case, the role of power is very often "equal," and the effect-value system is "neutral" or "positive." Lastly, as for the mode, there are multiple choices. The medium can be "spoken" or "written" or both, the channel can be "oral-phonic" or "visual-graphic," and the turn can be "monologic" or "dialogic." In PowerPoint slides, the division of labor is always "language and image complementing each other."

4.3. Discussion of VG Analysis

Now, images' patterns can be found in the spoken English MOOC. To begin with, regarding representational meanings, there are very few symbolic images. That is, except for deliberately presenting symbolic images for specific purposes, what images represent should be as straightforward as possible so that viewers can quickly grasp the topic at first glance. Besides, actional processes in PowerPoint slides of this MOOC are much fewer than classificational processes. To address this phenomenon, we give two reasons. On the one hand, the MOOC is a spoken English course, meaning that conversation will be arranged in the dominant place. So, there is no need to remind viewers of what those participants are doing continuously. While it is still necessary to present the key features of elements, classificational processes fall right into place to solve the problem. On the other hand, commonly, if instructors want to emphasize the actional processes, PowerPoint can provide dynamic elements, such as film clips, animation videos, and flashes.

Secondly, from the perspective of interactive meanings, a friendly atmosphere and equal relationships are established regarding contact, social distance, and camera angles. In this case, viewers can feel free to express whatever they want to say without knowing the appropriateness. Thus, following the MOOC, viewers can get sufficient exercise to improve their spoken English. It should also be noted that there are no low-angle shots, which can convey more of the participants' power, while a few high-angle ones exist, making the viewers seem powerful. This interesting regularity shows that this MOOC is generally student-oriented, corresponding with the roles' changes in different classroom forms as discussed in Chapter 1; in other words, registers for this MOOC do not need to act like in a traditional classroom. Most elements in images offer information, while viewers can make up their own choices whether or not to accept the information/knowledge. Summarily, students should feel free and equal when watching a MOOC video; elements like keywords, images, and figures in PowerPoint slides should be clear, well-informed, comprehensive, and friendly for students' access.

Last but not least, as for the compositional meanings, the spatial designs of these slides, especially the placement of keywords and images, still need improving. For instance, images in

the slides are always placed separately from each other (100%). Therefore, although these images contain the same topic, which partially realizes cohesion and coherence, they fail to collaborate to establish the "1+1>2" effect. If so, images here merely function as decoration rather than the keywords of different formats. What is worse, just as Tufte's findings indicate, images in PowerPoint slides negatively affect students' cognitive development in this case [33]. Additionally, according to Kress and van Leeuwen's definition of informational value, vertical value (given-new) and horizontal value (real-ideal) seem not to work very well to distinguish those images from each other [24,25]. Only the central-marginal value can efficiently figure out the theme and residue of a specific image, so the pattern is monotonous: the highlighted elements should be placed in the center, and the other elements should be set in around. However, new patterns emerge if we view a set of PowerPoint slides as a whole. In the 72 mixed PowerPoint slides, it is clauses that act as the topic sentences, which are the maximum salience to attract viewers' attention first. Henceforth, the vertical value and the horizontal value work.

5. Conclusion

In conclusion, with the help of the two frameworks (SFG and VG), major patterns of these designs can be found. For the first and second research questions, elements of PowerPoint slides in MOOCs can realize both metafunctions (ideational, interpersonal, and textual metafunctions) and visual meanings (representational, interactive, and compositional meanings). Namely, under such circumstances, these slides are still powerful enough to provide multimodal information to broaden students' learning approach, enhance their understanding of a specific topic to practice their spoken English, and help them improve their English language performance. For the third research question, in MOOCs, each element in slides plays its role; in other words, these elements are organized very well when combined rather than separated. In other words, designers focus too much on making slides beautiful and eye-catching rather than making them more effective. This is the negative influence of the transformation of the designers' role- from teachers/individuals to groups (usually containing some commercial purposes).

By analyzing the functional meanings of these slides, this study implicates different elements should complement each other rather than present the same things in different ways. Halliday views languages as meaning potentials; in multimodal discourses, if clauses and images represent the same meanings, redundancies emerge, which may negatively influence students' understandings. So, this study excludes one wrong way to make PowerPoint slides and calls on designers to thoroughly consider the functions of each element before combing them together. Additionally, it must be admitted that this research still needs further extensions. Because to obtain a more effective set of PowerPoint slides, more exploration is awaiting.

However, due to the common drawbacks of case study, this thesis initially lacks breadth, for only spoken English courses have been analyzed in detail. The outcomes may vary from one course to another—for instance, MOOCs for English writing/listening/reading or MOOCs for any other disciplines. Secondly, this study has abundant repeated analysis, which is very time-consuming and bores the researchers. Limited by the scale of the data, this study finds that horizontal and vertical informational values do not work very well when people are analyzing images in this study. Furthermore, this phenomenon leads to the inability to identify each image type clearly. This finally weakens the reliability of the method of defining the specification of the types. What is more, the classification of the elements is more or less not strictly objective since there are some personal considerations. The results and the interpretation of the findings can, to some extent, need further filtration.

Finally, for suggestions for further exploration, since MOOCs are still at an early stage while the general trend is that online learning has become increasingly popular, it is necessary to keep

following this particular learning mode. As for slides for this kind of course, the development will be seen as the information technology advances. The choices made by designers will keep changing accordingly. In this case, the investigation into presentational tools like PowerPoint should continue. Meanwhile, the definitions of the efficiency of slides should also be updated from time to time, according to the actual situation (e.g., students' social identities, needs, time consumption according to their wills, and so forth). Last but not least, various new theoretical frameworks may also come into being and constantly supplement or complete these existing theories like SFG and VG to help the multimodal discourse analysis go further.

Acknowledgments

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