

**A MULTIMODAL DISCOURSE
ANALYSIS OF MEANING CONSTRUCTION
THROUGH VERBAL AND NON-VERBAL MODES
IN SELECTED TED PUBLIC SPEECHES ON
CLIMATE CHANGE**

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UNIVERSITI SAINS MALAYSIA

2024

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by

ZHANG WENNA

**Thesis submitted in fulfilment of the requirements
for the degree of
Doctor of Philosophy**

May 2024

ACKNOWLEDGEMENT

I would like to present my sincere thanks and appreciation to all who helped me make this study, including but not certainly limited to the following. First, I would like to express my special thanks and sincere gratitude to my main supervisors, Dr. Marlina Jamal and co-supervisor, Dr. Omer Hassan Ali Mahfoodh, for their supervision, encouragement, and invaluable feedback throughout my studies. This thesis would not have been possible without their constructive comments and support. My warmest thanks go to the university I work, which gives me financial support, and my colleagues who undertake a great deal of work for me during my Ph.D. period. I am particularly indebted to my family; words cannot describe my gratitude. I would like to extend my appreciation to my mother, my husband, and my children for their endless love and support, through which I can exert every effort to realise my dream in academic pursuits.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	viii
LIST OF FIGURES	xi
LIST OF APPENDICES	xv
ABSTRAK	xvi
ABSTRACT	xix
CHAPTER 1 INTRODUCTION	1
1.1 Chapter Introduction	1
1.2 Background of the Study	1
1.3 Statement of Problem	5
1.4 Research Objectives	12
1.5 Research Questions	12
1.6 Significance of the Study	13
1.7 Limitations of the Study	15
1.8 Definition of Key Terms	16
1.9 Organisation of the Study	20
1.10 Chapter Summary	20
CHAPTER 2 LITERATURE REVIEW	22

2.1	General Introduction	22
2.2	Technology, Entertainment and Design	22
2.2.1	Introduction to TED	22
2.2.2	Previous Studies on TED	24
2.3	Systemic Functional Linguistics	32
2.3.1	Introduction to Systemic Functional Linguistics	32
2.3.2	Application of Systemic Functional Linguistics	38
2.3.3	Meta-functions	40
2.3.4	Ideational Meaning	42
2.3.5	Interpersonal Meaning	47
2.3.6	Textual Function	52
2.4	Multimodal Discourse Analysis	56
2.4.1	Definition of MDA	56
2.4.2	Approaches to MDA	58
2.5	Visual Grammar	62
2.5.1	Introduction to Visual Grammar	62
2.5.2	Application of VG	64
2.5.3	Representational Meaning	67
2.5.4	Interactive Meaning	69
2.5.5	Compositional Meaning	72
2.6	Image-text Relation Theory	75
2.7	Previous Studies on MDA	80

2.8	Theoretical Framework	87
2.9	Chapter Summary	90
CHAPTER 3 RESEARCH METHODOLOGY		91
3.1	General Introduction	91
3.2	Research Design	91
3.3	Corpus Collection	96
3.4	Research Procedure	103
3.5	Answering the Research Questions	110
3.6	Ethical Considerations	113
3.7	Chapter Summary	113
CHAPTER 4 FINDINGS		115
4.1	Introduction	115
4.2	Findings of Research Question One	115
4.3	Findings of Research Question Two	123
4.3.1	Transitivity	123
4.3.2	Mood, Modality and Personal Pronoun	137
4.3.2(a)	Mood	137
4.3.2(b)	Modality	140
4.3.2(c)	Personal Pronouns	143
4.3.3	Theme	147
4.3.3(a)	Marked Theme and Unmarked Theme	147
4.3.3(b)	Simple Theme and Multiple Theme	149

4.4	Findings of Research Question Three	151
4.4.1	Gesture	151
4.4.1(a)	Deictic Gesture	152
4.4.1(b)	Iconic Gesture	154
4.4.1(c)	Metaphorical Gesture	156
4.4.1(d)	Beat Gesture	157
4.4.2	Eye-contact	158
4.4.3	Slide	161
4.4.3(a)	Classification Process	162
4.4.3(b)	Modality	163
4.4.3(c)	Salience	164
4.4.3(d)	Framing	165
4.4.4	Video	166
4.4.4(a)	Social Distance	166
4.4.4(b)	Attitude	169
4.4.4(c)	Information Value	171
4.5	Findings of Research Question Four	173
4.5.1	Verbal Mode and Gesture	173
4.5.2	Verbal Mode and Eye-contact	179
4.5.3	Verbal Mode and Slide	181
4.5.3(a)	“Status”	181
4.5.3(b)	“Logico-Semantic”	190

4.5.4	Verbal Mode and Nonverbal Mode Simultaneously	194
4.6	Chapter Summary	211
CHAPTER 5 DISCUSSION AND CONCLUSION		213
5.1	Introduction	213
5.2	Overview of the Study	213
5.3	Discussions of the Findings	214
5.3.1	Discussions of Answers to Research Question One	214
5.3.2	Discussions of Answers to Research Question Two	217
5.3.3	Discussions of Answers to Research Question Three	222
5.3.4	Discussions of Answers to Research Question Four	227
5.4	Implications of the Research	233
5.5	Recommendations for Future Research	235
5.6	Conclusion	236
REFERENCES		239
APPENDICES		
LIST OF PUBLICATIONS		

LIST OF TABLES

	Page
Table 2.1 Material Process	44
Table 2.2 Relational Processes 1	44
Table 2.3 Relational Processes 2	44
Table 2.4 Mental Processes	45
Table 2.5 Verbs Serving as a Process in Mental Clauses	45
Table 2.6 Verbal Process	46
Table 2.7 Existential Process	46
Table 2.8 Behavioural Process	46
Table 2.9 Transitivity Classification	47
Table 2.10 Correlation Between Speech Roles and Speech Functions	48
Table 2.11 Declarative Mood: Subject+Finite	49
Table 2.12 Interrogative Mood: Finite+Subject	49
Table 2.13 Imperative Mood: No Subject or Finite, Residue Only	49
Table 2.14 Residue	49
Table 2.15 Types of Modality	50
Table 2.16 Types of Modal Operators	50
Table 2.17 Personal Pronoun	52
Table 2.18 Unmarked and Marked Theme	54
Table 2.19 Simple Theme	54
Table 2.20 Multiple Themes	55
Table 2.21 Clausal Theme	55

Table 2.22	Systemic Functional Grammar and Visual Grammar	63
Table 2.23	Representational Meaning	69
Table 2.24	Interactional Meaning	71
Table 2.25	Compositional Meaning	73
Table 2.26	Visual Grammar	74
Table 2.27	Network of Combined Status and Logical–semantic	77
Table 2.28	Multimodal Discourse Analysis of TED	88
Table 3.1	TED Talks Obtained from www.TED.com	101
Table 3.2	Steps of Analysis	103
Table 3.3	Sample Analysis of Verbal Mode	107
Table 3.4	Sample Analysis of Non-verbal Mode	108
Table 3.5	Sample Analysis of Image-Text Relationship	109
Table 3.6	Steps to be Undertaken in Solving the Research Questions	112
Table 4.1	Theme Analysis of S1	116
Table 4.2	Theme Analysis of S2	118
Table 4.3	Theme Analysis of S3	118
Table 4.4	Major Themes and Sub-themes of TED Corpus	121
Table 4.5	Distribution of Transitivity in TED Corpus	123
Table 4.6	Realisation of the processes in Excerpt 1	125
Table 4.7	Realisation of the processes in Excerpt 2	130
Table 4.8	Distribution of Mood in TED Corpus	137
Table 4.9	Realisation of Mood in Excerpt 3	138
Table 4.10	Distribution of Modality in TED Corpus	140
Table 4.11	Distribution of Different Person Systems	143

Table 4.12	Distribution of Marked and Unmarked Theme in TED Corpus	147
Table 4.13	Distribution of Simple and Multiple Themes in TED Speech	149
Table 4.14	Distribution of Status in TED Corpus	181

LIST OF FIGURES

	Page
Figure 2.1 Framework of Analysis of TED Talks	89
Figure 4.1 Deictic Gesture 1 in S1	153
Figure 4.2 Deictic Gesture 2 in S12	153
Figure 4.3 Deictic Gesture 3 in S13	154
Figure 4.4 Iconic Gesture 1 in S18.....	155
Figure 4.5 Iconic Gesture 2 in S13	155
Figure 4.6 Iconic Gesture 3 in S13	156
Figure 4.7 Metaphorical Gesture in S15	157
Figure 4.8 Beat Gesture in S12	158
Figure 4.9 Eye Contact 1 in S2	159
Figure 4.10 Eye Contact 2 in S18.....	160
Figure 4.11 Eye Contact 3 in S4.....	160
Figure 4.12 Eye Contact 4 in S2	161
Figure 4.13 Classification Process of Slides in S15.....	163
Figure 4.14 Modality of Slide 1 in S5	163
Figure 4.15 Modality of Slide 2 in S1	164
Figure 4.16 Salience of Slide 1 in S4.....	165
Figure 4.17 Salience of Slide 2 in S20.....	165
Figure 4.18 Framing of Slide in S4.....	166
Figure 4.19 Social Distance of the Video Snapshot 1 in S6.....	167
Figure 4.20 Social Distance of Video Snapshot 2 in S10.....	168

Figure 4.21	Social Distance of Video Snapshot 3 in S19	169
Figure 4.22	Attitude of Video Snapshot 1 in S19	169
Figure 4.23	Attitude of Video Snapshot 2 in S11	170
Figure 4.24	Attitude of Video Snapshot 3 in S1	170
Figure 4.25	Information Value of Video Snapshot 1 in S2	171
Figure 4.26	Information Value of Video Snapshot 2 in S1	171
Figure 4.27	Information Value of Video Snapshot 3 in S17	172
Figure 4.28	Verbal Mode and Gesture 1 in S19	173
Figure 4.29	Verbal Mode and Gesture 2 in S15	174
Figure 4.30	Verbal Mode and Gesture 3 in S19	175
Figure 4.31	Verbal Mode and Gesture 4 in S10	175
Figure 4.32	Verbal Mode and Gesture 5 in S13	176
Figure 4.33	Verbal Mode and Gesture 6 in S13	177
Figure 4.34	Verbal Mode and Gesture 7 in S13	177
Figure 4.35	Verbal Mode and Gesture 8 in S15	178
Figure 4.36	Verbal Mode and Gesture 9 in S14	178
Figure 4.37	Verbal Mode and Gesture 10 in S14	179
Figure 4.38	Verbal Mode and Eye-contact 1 in S5	180
Figure 4.39	Verbal Mode and Eye-contact 2 in S18	180
Figure 4.40	Verbal Mode and Eye-contact 3 in S3	181
Figure 4.41	Complementary Relation 1 in S8	183
Figure 4.42	Complementary Relation 2 in S19	183
Figure 4.43	Complementary Relation 3 in S18	184
Figure 4.44	Independent Relation 1 in S9	185

Figure 4.45	Independent Relation 2 in S11	186
Figure 4.46	Independent Relation 3 in S14	186
Figure 4.47	Independent Relation 4 in S14	187
Figure 4.48	Text Subordinate to Image Relation 1 in S18	188
Figure 4.49	Text Subordinate to Image Relation 2 in S1	188
Figure 4.50	Text Subordinate to Image Relation 3 in S4	189
Figure 4.51	Image Subordinate to Text Relation 1 in S11	189
Figure 4.52	Image Subordinate to Text Relation 2 in S10	190
Figure 4.53	Elaboration Relationship 1 in S8	191
Figure 4.54	Enhancement Relationship 1 in S7	192
Figure 4.55	Enhancement Relationship 2 in S19	192
Figure 4.56	Locution Relationship in S5	193
Figure 4.57	Idea Relationship in S5	194
Figure 4.58	Meaning Construction of Verbal and Nonverbal Mode 1 in S12	195
Figure 4.59	Meaning Construction of Verbal and Nonverbal Mode 2 in S12	197
Figure 4.60	Meaning Construction of Verbal and Nonverbal Mode 3 in S12	197
Figure 4.61	Meaning Construction of Verbal and Nonverbal Mode 4 in S18	200
Figure 4.62	Meaning Construction of Verbal and Nonverbal Mode 5 in S18	200
Figure 4.63	Meaning Construction of Verbal and Nonverbal Mode 6 in S18	200
Figure 4.64	Meaning Construction of Verbal and Nonverbal Mode 7 in S18	201
Figure 4.65	Meaning Construction Verbal and Nonverbal Mode 8 in S14	203
Figure 4.66	Meaning Construction of Verbal and Nonverbal Mode 9 in S14	203
Figure 4.67	Meaning Construction of Verbal and Nonverbal Mode 10 in S14	203
Figure 4.68	Meaning Construction of Verbal and Nonverbal Mode 11 in S16	205

Figure 4.69	Meaning Construction of Verbal and Nonverbal Mode 12 in S16	205
Figure 4.70	Meaning Construction of Verbal and Nonverbal Mode 13 in S16	205
Figure 4.71	Meaning Construction of Verbal and Nonverbal Mode 14 in S16	206
Figure 4.72	Meaning Construction of Verbal and Nonverbal Mode 15 in S16	206
Figure 4.73	Meaning Construction of Verbal and Nonverbal Mode 16 in S16	206
Figure 4.74	Meaning Construction of Verbal and Nonverbal Mode 17 in S20	209
Figure 4.75	Meaning Construction of Verbal and Nonverbal Mode 18 in S20	209
Figure 4.76	Meaning Construction of Verbal and Nonverbal Mode 19 in S20	210
Figure 4.77	Meaning Construction of Verbal and Nonverbal Mode 20 in S20	210

LIST OF APPENDICES

- Appendix A Links to Twenty TED Videos
- Appendix B Links to the Transcript of Twenty TED Talks

**ANALISIS WACANA MULTIMODAL DALAM PEMBENTUKAN MAKNA
MELALUI MOD LISAN DAN BUKAN-LISAN DALAM UCAPAN AWAM
TERPILIH TED TENTANG PERUBAHAN IKLIM**

ABSTRAK

Kajian ini mengeksplorasi bagaimana pelbagai sumber simbolik yang terwujud dalam perbualan TED menyumbang kepada pembentukan unit yang bermakna. Penyelidikan ini menggunakan pemilihan sampel dengan tujuan untuk memilih dua puluh perbualan TED mengenai perubahan iklim dari tahun 2019 hingga 2022, menyelidiki elemen verbal dan bukan verbal berdasarkan analisis wacana multimodal. Kaedah kualitatif dan analisis teks digunakan dalam kajian ini untuk menyiasat tema dominan, pembinaan makna melalui mod verbal dan bukan verbal, serta interaksi antara dua mod ini dalam perbualan TED terpilih mengenai perubahan iklim. Bagi mencapai objektif kajian ini, kajian ini menggabungkan kerangka teori berikut: 1) Linguistik Fungsional Sistemik Halliday (2004) untuk membincangkan mod verbal dan bertumpu kepada aspek transitiviti, mod, modaliti, kata ganti peribadi, dan struktur tematik; 2) Tatabahasa Visual Kress dan Van Leeuwen (1996) untuk meneroka mod bukan verbal seperti Gerakan tangan, hubungan mata, slaid, dan video; 3) Teori Hubungan Teks-Imej Martinec dan Salway untuk menganalisis interaksi antara mod verbal dan slaid. Hasil kajian meneliti ciri-ciri mod verbal dan bukan verbal serta menjelaskan bagaimana mereka menyumbang kepada penguatan mesej pembicara dalam perbualan TED. Secara amnya, perbualan

TED tentang perubahan iklim lebih menekankan kepada aspek penyelesaian seperti menggunakan pelbagai teknologi canggih, lautan dan hutan, dan bukannya isu yang disebabkan oleh perubahan iklim. Selain tema, proses material dan klausa deklaratif mendominasi Ceramah TED yang dipilih, dengan kata kerja modal "boleh" antara yang paling kerap digunakan. Sementara itu, penceramah menggunakan gerak isyarat yang berbeza dalam situasi yang berbeza, memanfaatkan kuasa penglibatan penonton melalui hubungan mata dan menyampaikan maklumat dengan merujuk kepada slaid. Digabungkan dengan gerak isyarat, mod lisan membina hubungan kontekstual, menarik perhatian penonton dan menekankan perkara utama. Selain itu, perbualan TED menunjukkan hubungan pelengkap antara imej dan teks, kerana gabungan teks dan imej mencapai syntagma yang lebih luas pada tahap yang tinggi. Secara keseluruhannya, kajian ini menunjukkan bahawa mod yang berbeza dalam perbualan TED menekankan, meningkatkan atau memperkukuh makna. Mengenai kepentingan penyelidikan ini, modaliti yang berbeza meningkatkan input maklumat supaya penceramah mengetahui mod yang berkesan dari aspek praktikal. Secara teorinya, penyelidikan ini meluaskan kebolegunaan Tatabahasa Fungsian Sistemik, Tatabahasa Visual dan Teori Hubungan Imej-teks dalam analisis wacana pelbagai modal. Dari segi metodologi, penyelidikan ini menyumbang kepada literatur yang semakin berkembang dengan MDA berbantuan korpus dan mencadangkan rangka kerja yang lebih bersepadu untuk menunjukkan interaksi antara mod yang berbeza dalam domain TED. Dengan menjalankan analisis menyeluruh mod lisan, mod bukan lisan, dan interaksi mereka, kajian ini menawarkan perspektif baru tentang

ciri-ciri perbualan TED.

**A MULTIMODAL DISCOURSE ANALYSIS OF MEANING
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ABSTRACT

This study explores how various symbolic resources embodied in TED talks contribute to forming meaningful units. The purposive sampling was employed to select twenty TED talks on climate change from 2019 to 2022, examining verbal and nonverbal elements based on multimodal discourse analysis. In addition, the qualitative method and textual analysis were utilised in this study to investigate the dominant themes, meaning construction through verbal and non-verbal modes and the interplay between these two modes in selected TED talks on climate change. To achieve these research objectives, the study combines the following theoretical framework: 1) Halliday's Systemic Functional Linguistics (2004) is utilised to discuss the verbal mode, focusing on transitivity, mode, modality, personal pronoun, and thematic structure; 2) Kress and Van Leeuwen's Visual Grammar (1996) is applied to explore nonverbal modes such as gesture, eye contact, slide, and videos; 3) Martinec and Salway's Text-Image Relation Theory is used to analyse the interaction between the verbal mode and slides. The study's findings examine the characteristics of verbal and nonverbal modes and elucidate how they contribute to reinforcing speakers' messages in TED talks. Above all, TED talks on climate change prioritize solutions over highlighting the issues caused by climate change. The emphasis lies in

leveraging advanced technologies, oceans, and forests to address the challenges. The selected TED Talks predominantly feature themes, material processes and declarative clauses, with the modal verb “can” being frequently utilized. In the meantime, speakers skillfully employ various gestures to enhance the audience’s engagement, utilising eye contact and effectively presenting information with the support of slides in different situations. Integrating gestures with the verbal mode establishes contextual relations, capturing the audience’s attention and emphasizing key points. Additionally, TED speeches demonstrate a complementary relationship between image and text, as the combination of text and image achieves a broader syntagm at a high level. Overall, this study demonstrates that different modes in TED Talks emphasise, enhance, or reinforce the meaning of another. As to the significance of this research, different modalities enhance information input so speakers should be aware of effective modes practically. Theoretically, this research extended the applicability of Systemic Functional Grammar, Visual Grammar and Image-text Relation Theory in multimodal discourse analysis. On the other hand, this research contributes to the growing literature on corpus-assisted MDA. It proposes a more integrated framework to demonstrate the interplay among different modes in the domain of TED methodologically. By conducting a comprehensive analysis of verbal mode, nonverbal mode, and their interplay, this study offers a novel perspective on the characteristics of TED talks.

CHAPTER 1

INTRODUCTION

1.1 Chapter Introduction

The chapter commences by providing the background of the study, followed by a elaboration on the statement of the problem to point out the research gap. In the following part, the research objectives and research questions were put forwarded. In addition, the researcher discusses the significance of the study. The chapter then culminates by setting forth the research limitations, discussing the definition of key terms, and outlining the organisation of the study.

1.2 Background of the Study

Public speaking enables individuals to circulate ideas, share inner thoughts on specific issues, disseminate information, or influence others through spoken language (Lucas, 2004). In today's globalised society, online meetings and face-to-face interactions with people from diverse backgrounds, including English-speaking countries and other countries, have become commonplace (Fuyuno et al., 2015). It carries special significance as public speaking in today's society has become an increasingly influential mass media communication in various fields, such as government, law, business, education, science, and technology (Chen & Zhao, 2019). Public speech promotes personal growth, fosters good relationships, shows talent and contributes to society.

Good public speaking skills and presentation ability can enhance one's achievement and are indispensable for one's career. Demands for academic disciplines, versatility, and competitiveness in the job market have motivated scholars, educators, and researchers to stress the necessity of mastering oral communication skills and public speaking abilities (Al-Tamimi & Shuib, 2016). When a speaker intends to convey a communicative message, he or she starts conceptual preparation by arranging his or her statement. Then he or she formulates a detailed linguistic plan, including selecting the lexicon and developing content grammatical frames (Liao, 2020). As a result, the speaker should focus on grammatical and semantic principles and the language usage of native speakers in the structured interpersonal exchange (Shumin, 2002). According to Lucas (2004), most speeches are prepared beforehand, and the content should be well-organised and coherent. The speaker must delineate the theme of the discourse, guarantee the content's fluency, and emphasise expression and body language to enhance the captivation of the presentation.

Communication occurs in various modalities, with language playing a vital role. Among different modalities, the importance of the non-verbal mode, as an integral component of speech, can not be underestimated in conveying meaning. So, speakers should recognise the value of non-verbal modes and actively utilise them to enrich the speech. Thus, in a multimodal text, comprehending meaning necessitates examining language and additional semiotic resources such as images, gestures, and sounds that operate independently and interdependently on different levels (Lim,

2007). These multiple modes in public speeches have shown that meaning is grasped via verbal communication and integrating a diverse set of verbal and nonverbal semiotic resources (Elsanhoury et al., 2020). Sometimes, “it appears that having the ability to orchestrate semiotic resources or modes such as images, writing, layout, sound, gesture, speech, and 3D objects may be more important than having a good command of the spoken language or verbal mode” (Morell, 2015, p137). As Kaindl (2004) also states:

Non-verbal elements in multimodal texts not only illustrate the linguistic part of the text but also play an integral role in the constitution of meaning, whether through interaction with the linguistic elements or as an independent semiotic system. (p.176)

In addition, as science and technology advance, mainly digital technology, human communication has evolved from a single language mode to a complex media composed of language, image, sound and other elements. Therefore, all nonverbal symbols should be incorporated into interpreting meaning (Jewitt, 2009).

As a result, the combination of verbal and nonverbal modes is essential for a comprehensive understanding of public speaking. Different semiotic modes might play a determining role in providing meaning to the content of the speaker’s views and influencing the audience (Lakoff, 1982; Perloff, 2003). As humans use words and body language, prosodic features, facial expressions, and other signals to carry important information in terms of meaning construction and comprehension (Vigliocco et al., 2014), human communication has been described as intrinsically

multimodal (McNeill, 1992). As spoken and written language functions in interactions with other semiotic modes: gesture, image, colour, texture, shape, or spatial layout and configuration, multimodality has become a distinguishing feature of communication (Ivascu & Handeland, 2014). Consequently, communication has become multimodal across various contexts because texts include different semiotic modes used to create meaning, leading to the study of Multimodal Discourse Analysis (MDA) (Elsanhoury et al., 2020). Multimodal discourse integrates text, sound, image, and other modes of communication to convey information (Kress & Van Leeuwen, 2001). Kress and Van Leeuwen (2001) stress that multimodality is an essential feature of discourse in communication. With people's growing awareness of the intrinsic multimodal nature of public speech, traditional discourse analysis no longer serves the research demand, which further accounts for the emergence of multimodal analysis as a new perspective for studying English public speaking.

TED, short for technology, entertainment and design, is one of the most popular public speaking platforms, presenting the mixed characteristics of scientific, lecture and pedagogical discourse to spread valuable ideas to a non-specialist audience (Caliendo, 2014). Meanwhile, it is one of the most remarkable ways of spreading science (Sugimoto & Thelwall, 2013). As a platform, TED positively impacts the world by disseminating knowledge, sparking reflection, and encouraging innovation. It has become a global force in knowledge and idea exchange, driving progress in society and culture. The conference hosts several lectures each year, distinguished by uncomplicated professional lectures and unique ideas. The wise use

of different modality resources, including slides, videos, and gestures to engage the audience, is a defining feature of TED (Anderson, 2016). Furthermore, visuals can arrange the talk to offer information, thus capturing the audience's imagination. The presenter of TED is encouraged to utilise visual aids, body languages, facial expressions and tones, such as slides, gestures, voice, intonation and videos. Accordingly, TED talks combine different modes "to produce a greater meaning than either mode could on its own" (Rowsell, 2013, p.147).

Given the inherent verbal and nonverbal features of public speaking and the uniqueness and significance of TED public speaking, the researcher will examine TED public speaking from the multimodal perspective to understand the meaning construction of both verbal and non-verbal modes.

1.3 Statement of Problem

It is vital to investigate spoken data because it allows people to circulate ideas, enabling them to share their inner views about specific issues, disseminate information, or influence others through spoken language (Lucas, 2004). With the innovation of technology, communication methods have also changed rapidly. Traditional language is no longer the only way for people to communicate, but a variety of modes, such as space, gesture, image and sound are utilised together (Baldry, 2006). These changes reshape the multi-sensory experience and will change the relationship among words, visuals, sounds and so on. Therefore, in pursuing a comprehensive meaning of TED talks, it is imperative to investigate the synergistic

relationship and integration of meaning expression. This necessitates thoroughly examining the interplay among themes, the verbal and the non-verbal modes.

Considerable research efforts have been devoted to linguistic features of public speeches (Morton, 2009; Dunn, 2010; Han, 2011; Scotto, 2013; Jiang, 2017; Mattiello, 2017; Fan, 2019; Liao & Yu, 2020; Wang et al., 2020). Given the growing recognition of the significance of nonverbal semiotics, language alone is insufficient to comprehend communication, as Ventola et al. noted(2004). Particularly in public speaking and presentations, nonverbal communication is crucial (Quianthy & Hefferin, 1999; Van et al., 2015) and multimodal discourse analysis is a comprehensive spoken discourse analysis (Thibault & Baldry, 2006). As for public speech, TED has set a benchmark in modern public speaking with its multimodal presentation style, enhancing the effectiveness and appeal of speeches. However, less attention has been paid to TED's multimodality and its multimodal features demand additional attention (Petukhova et al., 2017). As a result, the present study adopts a Multimodal Discourse Analysis approach to evaluate TED talks.

As for the verbal mode, particular emphasis has been placed on the examination of macro and micro interpersonal interaction strategies, as well as the cultivation of intimate relationships with audiences. Scotto di Carlo (2015, 2018) comprehensively analyzed speakers' discourse strategies, encompassing proximity, adjectives, story-telling, and personal pronouns. For example, Scotto di Carlo (2018) found that speakers were inclined to use the inclusive pronoun “we” instead of “you” and “I”, which was more accessible for the audience to accept the shared knowledge.

He believed that TED breaks the “expert-middleman-audience” pattern, trying to weaken the identity of experts, close the distance and establish a direct emotional connection with the audience. Significant progress has been made in this field; however, the studies mentioned above focus on the interpersonal function of systemic functional grammar, paying no attention to ideational and textual functions. In light of the fact that any discourse is the comprehensive embodiment of the three meta-functions, further effort is required to incorporate these three dimensions for a more thorough comprehension of meaning.

Regarding non-verbal mode, Chen and Zhao (2019) demonstrated the pivotal role of gestures in facilitating the co-construction of cohesive rhetorical behaviour and language. Furthermore, some research highlights the co-deployment of adjectives with metaphoric gestures and visuals (Masi, 2020b). Masi (2020a) reported in a recent study that gestures in TED Talks contribute to ideational, interpersonal, and textual meta-functions and play an essential role in delivering speeches. However, the above studies should have addressed the impact of other visuals such as slides on meaning-making. As Kress and Van Leeuwen (1996, p.40) put it, “the visual, like all semiotic modes, has to serve communicative requirement, to function as a full system of communication.” Nonverbal resources may co-occur with verbal resources to express meaning in communication since nonverbal elements have the same ideational, interpersonal and textual functions as verbal elements, which have meaning potential (Jewitt, 2009). Hyland (2009) also states that visuals fulfil three meta-functions that Systemic Functional Linguistics

establishes. Under the social semiotic theory, modes such as image and action are complete ideograph systems that are capable of realizing all three meta-functions as linguistic modes (Wang & Qu, 2020). Since the integration of three meta-functions makes non-verbal modes a rich and influential means of communication, few studies have been carried out on it. Therefore, this research employs Visual Grammar to investigate gestures, eye contact, slides and video in TED Talks based on three meta-functions.

Some studies on public speaking have investigated multimodality from the perspective of multimodal discourse analysis. Dimitrova et al. (2016) propose that beat gesture fulfils a focusing function in multimodal speech discourse when combined with information structure. In addition, Elsanhoury et al. (2020) analysed how verbal and nonverbal resources interact intersemiotically from the theoretical framework of Systemic Functional Linguistics. However, the studies reviewed above have mainly focused on formal academic or political conferences rather than TED talks. Moreover, previous research (e.g., Chen & Zhao, 2019; Masi, 2020a, b) only investigated nonverbal modes in TED talk such as gestures, paying no attention to other modes of communication. TED is abundant in various resources (e.g., language, gesture, body language, voice, intonation, visuals, and videos) “to produce a greater meaning than either mode could on its own” (Rowse, 2013, p.147). Consequently, TED is particularly remarkable due to its abundant resources, which assist the study in finding out something lacking in other data. Therefore, TED was chosen as the data source in this present study to analyse multimodal resources in TED speeches.

Specifically, this research investigates the meaning construction of gesture, eye contact, slide and video, as well as their interplay with verbal mode.

Since the middle of the 20th century, with the global economy's rapid development and population growth, the adverse effects caused by abnormal climate change have become increasingly prominent. Ecological crisis events such as global warming, glacier melting, extreme weather, drought, and flood frequently occur, posing threats to humans' living environment. Therefore, addressing climate change mandates a concerted global effort to secure sustainable development and a viable environment for succeeding generations. They are recognized as a ubiquitous challenge confronting humanity (Jamieson, 2007), economics (Nordhaus, 2019) and ecosystems (Pascual et al., 2022) since it is the preeminent global concern of our era with irretrievable consequences (Markowitz & Bailenson, 2021). Climate change arouses many people's interest and is the subject of constant debate on scientific, political, economic and social issues (Carvalho, 2007). Concerning the related study on climate change, Zhumadilova (2020) found that the appropriate use of conceptual metaphors made speech more persuasive and unique. However, some TED talk research was conducted mainly on AI or education (e.g., Chen & Zhao, 2019), and very little information is available on climate change. According to the above literature review, the TED talk on climate change still needs further investigation. Consequently, this research conducted a study on climate change in TED talks.

Although previous studies identified the significant contribution of verbal and nonverbal modes, they have yet to explore the interplay between them further. For

example, Garcia and Pallejá (2018) only focused on verbal and nonverbal modes (body, graphs, animation, video, illustrations) to capture and convince their audience significantly. As Zeng (2010) proposes, Martinec and Salway (2005) explain the image-text link from two systematic layers of logical semantics and status relations, clearly outlining the image-text pattern. On the other hand, Martinec and Salway (2005) offer a more detailed and precise characterisation of the image-text relationship. The image-text relation theory of Martinec and Salway (2005) has been applied to a variety of studies of multimodal relations, including advertising, cartoon books, museum design and others (Jewitt, 2009; Ventola & Moya, 2009; Bednarek & Martin, 2010; Xi & Shi, 2017). Nevertheless, it has yet to be used in TED talks to analyse the relationship between images and spoken language in videos and slides. Therefore, the logical semantic framework of the image-text theory of Martinec and Salway (2005) is adopted in this research.

A review of past literature shows that studies conducted on the analyses of public speaking from a multimodal perspective are still limited in number. It has been argued that verbal resources are not investigated from the perspective of meta-functions, while “relatively little attention has been devoted to non-verbal resources” (Masi, 2020, p. 155). Wu and Qu (2018, p.242) claim that “there is also a paucity of research on the interplay between verbal and nonverbal presentation techniques.” Although many investigations have been conducted on multimodal discourse analysis as mentioned above, its multimodal features demand additional attention (Petukhova, et al., 2017). Marissa, O’Halloran, and Judd (2011, p.579) hold that “a

multimodal approach, involving the study of language with other resources, is necessary to analyse contemporary discourse practices fully.” Consequently, the TED Talk as a complex system awaits further study (Simon, 2021), particularly visuals, and requires a more fine-grained analysis (Silvia, 2020), such as their details and connotations (Ledin & Machin, 2018). Even more important is the absence of comprehensive research scrutinizing the verbal and non-verbal modes of TED talks through the lens of the three meta-functions posited by Systemic Functional Linguistics. There is an urgent need but it is still a significant challenge to systematically analyze TED talks within the framework of the three meta-functions governing verbal and non-verbal modes.

The extant literature underscored a notable gap in the analysis of TED talks on “climate change” from the Systemic Functional-Multimodal Discourse Analysis approach. As a result, this research endeavored to address a SF-MDA approach to examining TED talks. This study analysed TED talks on “climate change” and delved into their dominant themes and major concerns around which the speaker expresses meaning. Meanwhile, the verbal mode was analyzed using Systemic Functional Linguistics (2004), while the nonverbal mode was analysed with Visual Grammar developed by Kress, G. & Van Leeuwen (1996). In detail, this research explored verbal mood in terms of transitivity, mode, modality, personal pronoun, thematic structure and its interaction with a nonverbal mode such as gesture, eye contact, slide and video in more depth. In addition, the meaning of co-construction of the interplay between verbal and nonverbal modes was explored. To this end,

Martinec and Salway's Text-Image relation theory was employed to analyse the relationship between verbal mood and slide.

1.4 Research Objectives

This research addresses the following research objectives:

1. To analyse the dominant themes of the TED public speeches on "climate change".
2. To investigate how meaning is constructed through verbal modes in terms of transitivity, mood, modality, personal pronoun, and thematic structure of TED public speeches.
3. To analyse how meaning is constructed through non-verbal modes in terms of gesture, eye contact, slide and video of TED public speeches.
4. To investigate how verbal and nonverbal modes interplay to co-construct the meaning of TED public speeches.

1.5 Research Questions

This research mainly has the following research questions:

1. What are the dominant themes of the TED public speeches on "climate change"?
2. How does the verbal mode construct meaning through transitivity, mood, modality and personal pronoun, and thematic structure of TED public speech?
3. How does the nonverbal mode construct meaning in terms of gesture, eye contact, slide and video of TED public speech?

4. How do verbal and nonverbal modes interplay to co-construct the meaning of TED public speech?

1.6 Significance of the Study

This study aims to continue the past studies conducted in public speaking from MDA to excavate how verbal and nonverbal modes construct meaning. This research has both theoretical and practical significance.

Its practical value lies in that this study sheds light on the characteristics of TED talks from both verbal and nonverbal perspectives. It can assist audiences' recognition and understanding of the interactive meaning by employing a comprehensive analysis of various modalities, providing a new view of the appreciation of TED talks.

In addition, this study seeks the feature and realisation of the verbal element in terms of linguistic features such as transitivity, mode, modality, personal pronoun and thematic structure in creating meaning in context, which play an essential part in determining message delivery. Furthermore, this study also intends to explore the characteristics and realisation of nonverbal elements in visual grammar. As a result, it is essential to determine how the verbal conjoins the nonverbal element to implement meaning construction.

On top of that, the study assists speakers in improving their speeches and utilizing different semiotic modes such as gesture, gaze, slide and video apart from linguistics. So, this research would shed some light on the presentation of public

speaking with the application of different semiotic modes to transmit meaning better and persuade the audience.

Its theoretical value lies in the following aspects. First, it complements past research and enriches research results by further clarifying the nature of the language phenomenon and is conducive to enhancing the theoretical connotations. This study is an exploration of multimodal discourse analysis in the dynamic multimodal discourse field, testifying to the applicability of theories of Multimodal Discourse Analysis, expanding the application of Systemic Functional Linguistics, Visual Grammar and Image-text relation theory in the field of multimodal discourse analysis.

Second, incorporating these resources illustrates how a multimodal ensemble of meaning-making resources is exhibited in selected public speeches under study. It also enriches the research scope of English public speech, deepening the understanding of its language features and other modes and providing a valuable supplement to studying it.

Third, a corpus-based approach to studying public speech discourse contributes to the growing literature of corpus-assisted MDA in the “climate change” domain in TED talks by proposing an analytical framework. The scientific corpus tool in this research is utilised to collect data and analyse samples, ensuring the objectivity of the present study. Moreover, this research aims to enlighten and raise awareness of other semiotics in communication apart from linguistics and its application and will pave the way for future research on public speaking. Ultimately, the results of this research would be enlightening in laying a foundation for further

study, showing some hints and inspirations on the multimodal discourse analysis of public speech.

1.7 Limitations of the Study

There are three limitations from different aspects of this study:

The first limitation is the objective of the study. This study mainly focuses on the TED talks on “climate change” with slides that are relatively homogeneous and relatively less. On the other hand, the discourse of TED talks belongs to social life, distinguished from political and academic speeches. So, the generalisation of the analytical framework cannot be guaranteed entirely and the research findings of this study cannot be generalised to all public speeches.

The second involves variables of the study. This study examines verbal mode from the perspective of three meta-functions of Systemic Functional linguistics but does not involve other aspects of language, such as pronunciation and intonation. The nonverbal mode focuses on gestures, eye contact, and slides but not on different elements of speech. In addition, this study focuses on how speakers use verbal and nonverbal modes to express meaning without paying attention to other aspects, such as their influence on teaching.

Lastly, the limitation is the research method. This study uses multimodal discourse analysis rather than critical discourse analysis or critical multimodal discourse analysis. Climate change constitutes a pervasive ecological challenge of global proportions, intricately intertwined with nations' social and economic

development trajectories. The unequal level of development among countries is related to the emission responsibilities of different countries in global climate, abilities to resist risks and the pressure of governance, which reflects the relationship between climate change and international politics. On the other hand, climate change has emerged as a dynamic catalyst significantly shaping the contours of the global geopolitical landscape. So, making a critical discourse analysis of climate change in TED talks unveils the ideologies and power relations embedded in the multimodal discourse. Therefore, it makes sense to use critical multimodal discourse analysis for this global issue.

1.8 Definition of Key Terms

In this research, the following keywords are defined:

1. Meta-functions

As a tool of social communication, language has many functions. The meaning of meta-function is a highly abstract and generalised function. In summary, Halliday & Matthiessen (2004) emphasise that meta-function consists of three kinds of meta-functions: ideational function, interpersonal function, and textual function. Ideational function refers to that one construes experience of our outer and inner reality as well as logical relations between phenomena. Interpersonal meta-function embodies the ability of language to negotiate social roles and attitudes. It can be analysed through mood, modality, and personal pronouns. Last but not least, the textual function is language's ability to create a discourse that entails theme and rhyme and cohesive devices at both lexical and grammatical levels.

2. Multimodal Discourse Analysis (MDA)

Multimodal discourse analysis analyses multiple semiotic modes in one discourse or communicative event (Kress & Van Leeuwen, 2006, p.19). Multimodal discourse analysis is an approach that looks at multiple modes of communication such as text, colour, and images. It is a method of discursive analysis that looks at how individual modes communicate and interact to create semiotic meaning.

3. Public Speaking

Public speaking is disseminating one's ideas, sharing them with others, and shaping their opinions. Public speaking provides a way to circulate ideas, enabling people to share their thoughts about specific topics, disseminate information, or influence others with oral words (Lucas, 2004). Public speaking is more intentional and better planned, using more formal language. In addition, public speaking requires a different method of delivery. The speaker integrates verbal with nonverbal messages to convey meanings and establish a relationship with the audience.

4. Systemic Functional Linguistics

SFL, according to Halliday and Matthiessen (2004), is a broad term that covers various types of analyses, including the investigations of expression (phonetics and phonology), the studies of content (lexical grammar and semantics) and the analyses of context. In analyzing a text, one should begin with its context and type (register and genre). Functionalism signifies that language evolved under the pressure of the functions the language system must serve. Functions are taken to have left their mark on the structure and organisation of language at all levels, which

is achieved via metafunctions. Meta-function is uniquely defined in SFL as the “organisation of the functional framework around systems.”

5. TED

Short for Technology, Entertainment and Design, TED is one of the most popular public speeches and was formed to disseminate “ideas worth spreading.” As a famous speech program founded by Richard Vennman and Harry Marx, aiming to communicate and spread ideas, TED is usually short, powerful talks. The agenda of TED is to make great ideas accessible and spark conversation to change attitudes, lives and, subsequently, the whole world. In addition, the speakers in TED are encouraged to use effective body language and TED is abundant in both verbal and non-verbal modes.

6. Visual Grammar

Visual Grammar (VG) broadens Halliday’s meta-functional hypothesis about language and extends the theory to other non-linguistic semiotic modes (Hailong & Xiangjin, 2013). Based on the three meta-functions realised by language, some social semioticians believe that other semiotic resources can also realise the same responsibility (O’Toole, 1994; Kress & Van Leeuwen, 2006). Consequently, they extended three of the meta-functions of Halliday’s language symbols to image symbols and developed a theoretical framework of Visual Grammar that focuses on representational meaning, interactive meaning and compositional meaning.

7. PPT Slides

PPT is counted as an abbreviation for “PowerPoint,” which is a graphical

presentation software launched by Microsoft Corporation. The materials used in a complete set of PPT files generally include text, charts, pictures, pages, sound, film, etc. It is usually used in conjunction with the “projector” and is commonly used in training and conference settings.

8. Gesture

The gesture is the meaningful action of the hand, body, and face during communication, intentionally expressed with a spoken utterance (Kendon, 2004). The gesture manifests itself in terms of form and meaning as well as different functions in communication (McNeill, 2005). In this research, gesture mainly focuses on the hand, which can be divided into four categories: deictic, iconic, metaphoric, and beat. The first, deictic gesture means pointing at an object with body movements. The second iconic gesture mimics a particular thing or action. The third metaphoric gesture expresses abstract concepts or actions. The last beat gesture means the hand rhythmically up and down or back and forth.

9. Eye contact

Eye contact is the gaze towards an exact location. Eye contact is a non-verbal communication behaviour characterised by two or more individuals looking directly into each other’s eyes during an interaction. It is a crucial element of human communication that conveys various meanings, emotions, intentions, and messages (Knapp & Horgan, 2013).

1.9 Organisation of the Study

In terms of organisation, this thesis has five chapters. In the following paragraphs, an overview of the content and focus of each chapter are presented.

Chapter one sketches the background of the study and then follows the problem statement. The research questions and objectives, limitations of the study, the significance of the research and the definition of key terms are outlined. Chapter two presents a literature review regarding English public speaking and multimodal discourse analysis of the past in a global view, through which the basic information about these two fields can be grasped. In addition, Halliday's systemic functional linguistics (SFL) (2004), Kress & Van Leeuwen's visual grammar (VG) (2016), and Martinec and Salway's image-text relation theory (2005) referenced in this study will also be provided. Chapter three focuses on the research methodology of this study, in which research design, theoretical framework, the step of data collection, instruments, and process of analysis are proposed. Chapter four provides the findings of the study. Chapter five concludes the study by presenting the significant findings and discussing the findings with reference to research questions. Implications and limitations of the study as well as recommendations for future research are also provided in this chapter.

1.10 Chapter Summary

This chapter begins with the background and introduction to the study. Then the succeeding section directs attention towards the statement of the problem.

Concurrently, the research objectives as well as research questions are systematically presented. Based on the above points, this chapter elucidates the study's significance and research limitations. In the end, this chapter proposes the definition of critical terms and the structure of the entire thesis is provided.

CHAPTER 2

LITERATURE REVIEW

2.1 General Introduction

This chapter presents a review of the literature related to this research. Over the past decades, research in public speech has evolved from various theories and research fields. This chapter starts with describing different approaches to research on TED public speech. Following this, it reviews approaches to MDA and discusses relevant studies. Besides that, the theoretical framework for the current research is presented.

2.2 Technology, Entertainment and Design

2.2.1 Introduction to TED

Short for Technology, Entertainment and Design, TED is one of the most popular public speeches and was formed to disseminate “ideas worth spreading.” As a famous speech program founded by Richard Vennman and Harry Marx, aiming to communicate and spread ideas, TED is usually short, powerful talks. It began in 1984 as a conference, and the annual conference started in 1990 in Monterey, California. TED, which originates in Silicon Valley, focuses on technology and design early, then extends to Technology, Entertainment and Design.

TED events are held worldwide, including in the United States, Europe and Asia with live talks, so the “Internet + speech” mode has become an essential form of communication. In 2006, they founded the official TED official website and released

many videos of speeches on the web for people to spread freely. By 2009, they were viewed more than 50 million times. In 2011, the number of people watching TED Talks surpassed 500 million, and in 2012, TED Talks were considered more than one billion times worldwide, indicating that the global audience is constantly increasing. At the same time, the organisation has developed from a club of about one thousand people to a community with more than 100 thousand visitors daily (<https://www.ted.com/about/our-organisation/history-of-ted>).

Since then, the influence of TED speeches has grown exponentially. The world's most fascinating thinkers and doers are invited to the yearly conference to discuss their experiences. They address a wide range of topics within the research and practice of science and culture, ranging from science to business to global issues. The speakers have at least four and a maximum of eighteen minutes to express their ideas creatively and engagingly.

TED presents the mixed characteristics of scientific, lecture and pedagogical discourse to spread valuable ideas to a non-specialist audience (Caliendo & Compagnone, 2014). Known as one of the most remarkable ways of widespread science dissemination, its speakers disseminate new ideas to the public through Internet media, accompanied by infotainment and edutainment (Sugimoto & Thelwall, 2013).

The high-quality TED videos also spread worldwide; thus, they have caught much attention from researchers. Since the speeches' contents and ideas are usually difficult, novel and professional for people to understand, the speaker usually

chooses multiple modes to present his ideas. So this paper will study how verbal and nonverbal modes in TED speech cooperate to construct the whole meaning of the speakers and make the content more straightforward for the audience to understand.

2.2.2 Previous Studies on TED

Discourse analysis is a crucial perspective that attracts great attention from many scholars. As for discourse analysis on TED talks, some studies focus on verbal modes, such as lexical density and rhetorical use (Lee, 2017; Mattiello, 2019; García, 2021; Wang, 2021), while other studies centre on ideational, interpersonal and textual functions from a systemic functional linguistic perspective (Scotto, 2018; Zhao & Qu, 2020; Hastuti et al., 2021). In addition to verbal modes, some studies pay attention to nonverbal modes such as gestures and visuals (Shattuck-Hufnagel & Prieto, 2019; Xia, 2023). As the research progressed, the significance of the joint role of verbal and nonverbal modes was recognised and conducted in-depth discussions (Masi, 2020; Harrison, 2021).

Some studies focused on the linguistic features of TED talks. Kravvaris and Kermanidis (2014) compared language characteristics within more popular and less popular TED talks, finding that a faster pace and higher sentence complexity characterise popular ones. Compagnone (2015) highlighted the communicative intention and participant relationship of TED talks by comparing them with similar genres and argued that TED talks had family similarities with other genres. Wingrove (2017) reported significant differences in the presentation of academic vocabularies, vocabulary density and speed among three TED categories: technology,