

Willingness to Communicate and Second Language Speech Fluency:  
A Complex Dynamic Systems Perspective

By  
Shahin Nematizadeh

A thesis submitted to the Faculty of Graduate and Postdoctoral Affairs  
in partial fulfilment of the requirements for the degree of

Doctor of Philosophy  
in  
Applied Linguistics and Discourse Studies

Carleton University  
Ottawa, Ontario

© 2019  
Shahin Nematizadeh

## Abstract

The application of complex dynamic systems theory (CDST) in second language (L2) research has recently gained ground, instigating a growing series of studies investigating the complex and dynamic nature of individual difference (ID) variables, such as WTC (willingness to communicate). Fewer dynamically informed investigations, however, have targeted L2 performance constructs, like speech fluency. Both WTC and L2 fluency presumably influence communications in a L2 and have been argued to retain cognitive and affective bases (Nematizadeh & Wood, 2019), rendering them likely to interact and influence each other during communicative events. Despite these, little has been done to address such dynamics, particularly from a complex dynamic systems (CDS) perspective. To bridge this gap, the present exploratory study employed an idiodynamic methodology, informed by CDST, to monitor WTC and fluency changes during three-minute, mainly monologic speaking tasks, with an emphasis on the dynamics of change in interaction with temporal measures of speech, including mean length of runs (MLRs), speech rate (SR), and pause phenomena. An investigation of 882 cases of interplay between WTC changes and fluent/dysfluent speech samples revealed an existing interaction, which took on four different forms. Results also indicated that the interaction is of a dynamic one, and is mostly two-way, direct and indirect, unpredictable, and interdependently multi-layered. Further, both variables as well as their interplay shared and exhibited such properties as dynamicity, nonlinearity, interconnectedness, and formation of attractor states, all of which are characteristic of complex dynamic systems.

Dedicated to

*My gorgeous, patient, supportive, and adventurous wife, Dr. Neda Nabavi  
and  
our little angel, Avarose.*

## Acknowledgment

What is before you is a culmination of years of work, which would have been impossible without the invaluable support I received from my professors, family, and friends.

My most sincere and heartfelt gratitude goes to my thesis supervisor, Dr. David Wood, who went beyond his role as a supervisor, opened my eyes to the basics of education and realities of research, walked with me every step of the way, provided unswerving and generous support throughout the whole journey, was always there whenever I needed help (Christmas day, New Year's Eve, his sabbatical, etc.), and believed in my potential and the work I did. David, you made this journey a real pleasure, and I am grateful for working with you. I researched WTC and found many factors that trigger it, but I have now learned that a mentor can play an important part.

I owe much gratitude to Dr. Michael Rogers and Dr. Peter MacIntyre for agreeing to be on my advisory committee for the past three years, always providing insightful comments, and opening my eyes to what I seemed to miss. Your detailed and specific feedback helped me advance my work.

I am grateful to Dr. Nikolay Slavkov and Dr. Robert Coplan for agreeing to be my thesis examiners, for patiently reading my dissertation with enthusiasm, and for their thought-provoking and eye-opening questions during the defence.

I am greatly indebted to and sincerely thank Dr. Janna Fox and Dr. Natasha Artemeva for challenging my views on my research and teaching me how to think critically.

I would also like to thank Don Myles, Peggy Hartwick, Mike Barker, Mike Murphy, and my other colleagues at the ESLA program at Carleton University for providing constant emotional support while I was writing this dissertation. I should also thank Joan Grant, our program administrator, for being very supportive and helpful through these years, and making things look easy!

Very special thanks go to my beloved family back in Iran for the positive energy and unconditional help throughout this journey: my parents, who sent me constant support and encouragement, thanks mom for helping with the project; my mother-in-law, who travelled all the way to help us with our newborn, giving me time to work on my project, it was an incredible and unforgettable support; my father-in-law, for his keen interest in my work; my sister, Shirin, and brother-in-law, Farid, who helped with and facilitated some parts of my project.

Last but not least, my sincerest thanks go to Neda, my wife, who is the reason I was able to complete this program. Thanks for encouraging me to embark on my graduate studies, being the source of inspiration and positive energy throughout this entire journey, single-handedly facing the challenges of raising a newborn, and supporting me through all these years. Of course, now, you are no longer the only Doctor in the house, but I know you love that, too.

## Table of Contents

Abstract.....	ii
Acknowledgment.....	iv
Table of Contents.....	vi
List of Tables.....	ix
List of Figures.....	x
List of Appendices.....	xii
List of Abbreviations.....	xiii
<b>Chapter 1: Introduction.....</b>	<b>1</b>
Background: Putting Things into Perspective.....	1
Identifying the Gap and the Present Investigation.....	3
Rationale.....	5
Complex dynamic systems, SLA, L2 fluency, and WTC.....	7
Cognitive and social bases of L2 fluency and WTC.....	7
Research Questions.....	10
Organisation of the Dissertation.....	10
<b>Chapter 2: Theoretical Frameworks.....</b>	<b>12</b>
Heuristic Model of Variables Influencing WTC (MacIntyre et al., 1998).....	12
Complex Dynamic Systems (CDS) Theory.....	15
Key properties of complex dynamic systems.....	16
Segalowitz’s Framework of Fluency.....	20
Recap.....	22
<b>Chapter 3: Review of Literature.....</b>	<b>23</b>
Conceptualizing WTC.....	23
WTC as a Trait Predisposition.....	24
Dynamic, Situational, or State WTC.....	25
Complex Dynamic Systems and WTC: Methodologies and Findings.....	27
Conceptualizing Fluency.....	34
Conceptualizing Dysfluency.....	35
Causes of dysfluent speech.....	35
Types of Fluency.....	37
Perceived or perceptive fluency.....	38
Nonverbal fluency.....	38
Utterance or productive fluency.....	39
Cognitive fluency.....	45
Fluency, WTC, and Complex Dynamic Systems.....	48
<b>Chapter 4: Method.....</b>	<b>52</b>
Chapter Overview.....	52
Reviewing Research Questions.....	52
Exploratory Qualitative Design.....	53
Qualitative component.....	54

Use of numbers.....	55
Overview of the Pilot Study Method .....	56
Idiodynamic methodology.....	56
Participants.....	58
Ethics clearance .....	58
Participant recruitment .....	58
Demographics of the participants.....	60
Instruments .....	64
WTC questionnaire .....	64
Praat.....	64
NVivo 12 .....	64
Notebook.....	65
Procedure .....	65
Topic Selection.....	65
Picture description monologic tasks.....	66
Rationale for using a repeated measures design.....	67
Data collection .....	68
Data Analysis .....	69
Stage 1 .....	69
Stage 2 .....	70
Stage 3 .....	71
Stage 4 .....	74
Stage 5 .....	75
Stage 6 .....	76
<b>Chapter 5: Results.....</b>	<b>78</b>
Research Question 1 .....	83
Fluent speech and high WTC .....	83
Fluent speech and low WTC.....	96
Research Question 2.....	104
Dysfluent speech and low WTC.....	105
Dysfluent speech and high WTC .....	117
Research Question 3.....	122
Self-perceived performance .....	123
Supporting ideas/arguments.....	124
Individual factors.....	136
Lexis-related factors (linguistic/cognitive).....	142
Contextual factors.....	161
Organizational factors.....	167
Grammar-related factors (linguistic/cognitive).....	169
Self-perceived performance .....	174
Research Question 4.....	177
Evidence of change .....	179
Interconnectedness.....	184
Recapping interconnectedness.....	193
Formation of attractor and repeller states, and self-organization.....	194
Recapping attractor/repeller states .....	207

<b>Chapter 6: Interpretations and Discussion</b> .....	208
Research Questions 1 and 2 .....	208
A provisional model of the WTC-fluency interactions.....	214
Research Question 3.....	220
A continuum-like model of the interdependent and multi-layered interaction between WTC and fluency.....	225
Self-perception .....	225
Cognitive retrieval and processing .....	228
Segalowitz’s framework for dynamic relationship among sources influencing fluency	229
Research Question 4.....	232
Change.....	232
Interconnectedness.....	237
Formation of attractor states, repeller states, and self-organization .....	241
Recap.....	244
<b>Chapter 7: Conclusions</b> .....	245
What Did I Do?.....	245
What Did I Find? .....	246
Pedagogical Implications.....	248
Limitations of the Study and Future Directions.....	251
Task.....	251
Design .....	252
Participants .....	253
Idiodynamic method .....	254
Self-perceived fluency.....	255
A Note on CDST.....	256
Final Word .....	257
References.....	258
Appendices .....	271

## List of Tables

Table 1. Studies Monitoring Dynamic WTC.....	28
Table 2. Demographics of the Participants.....	63
Table 3. Calculated Temporal Measures of Speech.....	72
Table 4. Participants' Temporal Measures of Speech.....	79
Table 5. Ratings of Selected Runs.....	81
Table 6. Themes Improving WTC during Fluent Speech.....	84
Table 7. Themes Lowering WTC during Fluent Speech.....	97
Table 8. Themes Lowering WTC during Dysfluent Speech.....	105
Table 9. Themes Improving WTC during Dysfluent Speech.....	117
Table 10. Participant-specific Themes and Sub-themes Affecting WTC.....	123
Table 11. Participant-specific Dynamic WTC and Variability Pattern by Topic.....	179
Table 12. Observed Instances of Attractor/Repeller States.....	194

## List of Figures

Figure 1. Continuum-like model of self-perception as a mediating variable between WTC and L2 fluency.....	6
Figure 2. Graphic representation illustrating the rationale to research WTC, cognitive and utterance fluency.....	10
Figure 3. Heuristic models of variables influencing WTC. ....	<b>Error! Bookmark not defined.</b>
Figure 4. A framework for thinking about the dynamic relationship among sources of influence on L2 fluency.....	22
Figure 5. Levelt's model of speech production.....	46
Figure 6. Using the idiodynamic application to self-rate WTC. ....	57
Figure 7. Sample bitmap graph.....	57
Figure 8. Data collection procedure. ....	69
Figure 9. Procedure for calculating the temporal measures of speech.....	72
Figure 10. Praat spectrogram.....	73
Figure 11. Separating intervals (runs, silent pauses, & filled pauses) in MS Excel. ....	74
Figure 12. WTC ratings during long runs (LRs) of a total of 1549.....	80
Figure 13. Patterns of cooccurrence between WTC and L2 fluency.....	82
Figure 14. Pie chart of themes affecting WTC. ....	122
Figure 15. WTC variability patterns.....	180
Figure 16. Generally positive pattern sample (Kaami's task 3).....	180
Figure 17. Positive pattern sample (William's task 2). ....	181
Figure 18. Infrequent, positive & negative pattern sample (Soha's task 3).....	181
Figure 19. Few shifts pattern sample (Pedi's task 2). ....	182
Figure 20. Roller-coaster pattern sample (Akbar's task 1).....	182
Figure 21. Generally negative pattern sample (Sahra's task 3).....	183
Figure 22. Negative sample pattern (Pedi's task 4).....	183
Figure 23. Niki's Task 1 - attractor state. ....	195
Figure 24. Niki's Task 2 - attractor and repeller states.....	196
Figure 25. Niki's Task 3 - attractor and repeller states.....	197
Figure 26. Saba's Task 1 - attractor and repeller states. ....	199
Figure 27. Sahra's Task 2 - attractor and repeller states. ....	200
Figure 28. Anita's Task 3 - attractor and repeller states.....	201
Figure 29. Majid's Task 1 - attractor and repeller states. ....	203

Figure 30. William's Task 1 - attractor and repeller states.....	204
Figure 31. William's Task 4 - attractor and repeller states.....	205
Figure 32. Kaami's Task 2 - attractor and repeller states.....	207
Figure 33. Investigating the interaction between WTC and L2 fluency.....	208
Figure 34. Provisional three-phase model of WTC and fluency interactions in speech production. .....	215
Figure 35. A continuum-like model of multi-layered interaction between WTC and fluency.	225
Figure 36. Interaction between WTC and utterance fluency through self-perceived fluency.	232
Figure 37. Interconnectedness and formation of attractor states in WTC and L2 fluency as dynamic systems. ....	242

## List of Appendices

Appendix A. Carleton University REB Clearance .....	271
Appendix B. University of Ottawa REB Clearance.....	272
Appendix C. Invitation Email (Social media).....	274
Appendix D. Participant Recruitment Email .....	275
Appendix E. Picture Description Tasks.....	277
Appendix F. Background Questionnaire .....	281
Appendix G: Figure 3 Publisher’s Consent .....	282
Appendix H: Figure 4 Publisher Consent.....	283
Appendix I: Interview Transcript and Translation Sample .....	284

### List of Abbreviations

AR	Articulation rate
CDS	Complex dynamic systems
CDST	Complex dynamic systems theory
ESL	English as a second language
IDs	Individual differences
L1	First Language
L2	Second or Foreign Language
LR	Runs (utterances) that exceeded a participant's MLR for a given task.
MLR	Mean length of runs
SLA	Second Language Acquisition
SR	Speech rate (total of syllables divided by response time in seconds)
unWTC	Unwillingness to communicate
WTC	Willingness to communicate

## Chapter 1: Introduction

This chapter is divided into five sections. The first section will provide a quick background to variables under investigation, namely WTC and L2 fluency. The second section attempts to identify the gap and highlight the need to undertake the present research. The third section elaborates on the rationale for investigating WTC and L2 fluency in relation to each other. The chapter will conclude with an overview of the research questions of the study and the organization of the dissertation.

### Background: Putting Things into Perspective

Quantitative and correlational studies have dominated the investigations of psychological research (Gelo, Braakmann, & Benetka, 2008). WTC has not been an exception, and major WTC research efforts have employed quantitative measures. Take, for example, Burgoon and Burgoon (1974) and Burgoon (1976) who introduced the notion of *unwillingness* to communicate, McCroskey and Baer (1985) who pioneered the term WTC, McCroskey and Richmond's (1991) cognitive view of this communication variable, MacIntyre's (1994) investigation of the underlying layers of WTC, or a recent work of Khajavy, Ghonsooly, Hosseini Fatemi, and Choi (2016). One issue, however, with quantitative tools is the tendency to view a given construct as a stable, trait-like characteristic that is not likely to change over time or across contexts. In addition, such investigations have mainly looked at the external correlates of WTC, rather than leaning in to have a more comprehensive look at the underlying processes that shape the variable.

A new research trend has begun to prevail recently, mainly instigated by the classic work of MacIntyre, Dörnyei, Clement, and Noels (1998) and their heuristic model of L2 WTC, which has put the construct into a new perspective. This work essentially brings to light the construct's *multi-layered* nature as well as its variability over time and across situations, which, appears to resonate with

multiple properties associated with CDS. This pyramid-shaped model, which will be elaborated in chapter two, draws on enduring and consistent characteristics such as personality and moves up to more transient, situated factors such as interlocutor and state self-confidence. Given the fact that there are multiple factors in play, decision to communicate tends to be highly complex and dynamic. In support of this, Kang's (2005) empirical observation of dynamicity in WTC and MacIntyre's (2007) call for application of narrow time frames in WTC studies, as opposed to the traditional investigations of long-term patterns, have both led succeeding researchers to adopt state-level perspectives to observe the dynamicity and complexity that determine the decision to engage in, continue, or avoid communication.

The other construct under investigation is L2 speech fluency. Segalowitz (2010) identified three aspects of fluency that have inspired the L2 fluency studies for the past few years. He has proposed that fluency may be viewed at utterance, cognitive, and perception levels. *Utterance fluency* - or the observable and measurable temporal features of speech - has apparently been a more popular subject of investigation in fluency studies, whereas relatively smaller body of literature has looked into the operation of the cognitive processes in control of speech production, or what Segalowitz calls *cognitive fluency*. For better conceptualization of the two dimensions of fluency, I will briefly review the measures typically used when measuring these constructs: utterance fluency literature mainly incorporates the temporal features of speech such as speech rate, articulation rate, number and length of pauses, mean length of runs, while measurement of cognitive fluency has typically involved examining lexical access speed, reaction time speed, efficiency in making word-meaning links, or control of linguistic attention, to name a few (Segalowitz, 2016). While the measures of utterance and cognitive fluency appear to be different, they are not necessarily independent, particularly in view of Segalowitz's (2010, 2016) framework for understanding the processes shaping L2 fluency that highlights the dynamics among a number of influences. Segalowitz proposes that L2

speech production and fluency can be conceptualized as a dynamic system, whereby four specific influences cooperate, interact, and influence each other, bringing about change in the whole system. It is interesting to note that one of the influences or *subsystems* of the fluency system concerns an individual's motivation or willingness to communicate. Notably, Segalowitz argues that this psychological dimension, which involves L2 learner's motivational and belief system, cooperates with the other three forces in the speech production process. This framework, which motivated the present study, will be discussed in detail in the following section.

### **Identifying the Gap and the Present Investigation**

The present investigation is an attempt to look into the dynamics between WTC and L2 fluency during monologic communicative tasks. Whereas second language acquisition (SLA) literature abounds with WTC- or fluency-specific studies, there are very few studies, to my knowledge, that directly observe these variables in interaction with each other (D'Amico, 2012; Nematizadeh & Wood, 2019; Wood, 2012, Wood; 2016). The study by D'Amico compared the effects of two contexts: study-abroad vs. at-home, on oral fluency and WTC. While the findings of the study point to a progress in fluency made by the study-abroad learners, no correlations were found between WTC and fluency. There are a few issues with this study from a CDS perspective. First, this was a correlational study, which would potentially ignore the dynamic changes during communication events (MacIntyre, 2007). On a broader scope, studies employing univariate analyses to explore the relationships between IDs and learner performance may not sufficiently provide a true measure of a construct when monitored in isolation (Larsen-freeman, 1997). Second, this study measured WTC at a trait level and thus did not explore the potential changes that might have occurred during the programs. Therefore, what is reported is what MacIntyre (2007) calls a

“snapshot” of the variable, which falls short of monitoring change. This study, therefore, failed to provide a concrete account of the interaction between the two constructs.

A closer observation of this interaction was made in an exploratory, longitudinal study using a repeated measures design. Wood’s (2012) choice of a longitudinal and repeated measures design is suggestive of his dynamic conceptualization of the construct. However, while promising in method, the study reported a nonlinear, complex, and shifting relationship between the constructs.

Two highly relevant studies that motivated my project were carried out by Wood (2016) and Nematizadeh and Wood (2019). Using an idiodynamic method<sup>1</sup> introduced by MacIntyre and Legatto (2011) on the bases of CDS theory, Wood (2016) investigated this interaction with four intermediate-level ESL students. Having reported four types of interaction, he observed complexity and dynamicity as a result of different cognitive, affective, and linguistic factors. A fairly similar study by Nematizadeh and Wood (2019)<sup>2</sup>, with four Persian-speaking participants, yielded consistent findings, pointing to a dynamic interaction between the constructs. While the two studies were exploratory in nature and were meant to pave the way for future investigation, they had a number of limitations, with the first being the limited number of participants, which would not have allowed for solid arguments of the findings. The other issue pertained to a single data collection session each study held, which did not allow the researchers to gain a thorough picture of the processes. Wood (2016) encouraged future research to investigate fluency breakdowns such as pauses and have participants explain their WTC state at that particular moment. The present study was hence motivated by the scarce literature on the nature of this interaction as well as the flagged limitations of and recommendations made by the above studies.

---

<sup>1</sup> The idiodynamic method will be thoroughly discussed in the Method chapter.

<sup>2</sup> This is a peer-reviewed published article that served as a pilot-study to inform the current project.

## Rationale

This section will discuss the rationale derived from the literature, mainly the dynamic systems theory and Wood's (2016) conceptualization of the dynamics between WTC and fluency.

My conceptualization of this interaction grew out of a published pilot-study (Nematizadeh & Wood, 2019), where I noticed a two-way interaction between WTC and fluency. More specifically, how WTC contributed to fluency in speech and vice versa, or how low levels of WTC troubled speech fluency and vice versa. Such two-way interactions were also affected by several mediating factors that had their roots in individuals' linguistic capacity, cognitive skills, and/or ongoing psychological processes during communicative tasks. Therefore, I began to form a continuum-like conceptualization (see Figure 1) of this interaction with WTC resting on one end and L2 fluency on the other. Given such an image, there might be a number of underlying variables that affect and are shared by both variables and thus could be placed in the middle of the continuum, one of which involves a L2 speaker's perception of their self, proficiency, performance, etc. Furthermore, Segalowitz (2010) proposed sources of influence, including cognitive and perceptual experiences or social context, which may also play a role in the dynamics between WTC and L2 fluency.

Perceived fluency and perceived competence are two variables extensively discussed in the literature. Segalowitz's (2010) notion of perceived fluency - or how an interlocutor's fluency is perceived and judged by listeners - has been found to have high correlations with temporal measures of utterance fluency (Derwing, Rossiter, Munro, & Thomson, 2004; Kormos & Dénes, 2004; Lennon, 1990; Préfontaine, 2013; Towell, Hawkins, & Bazergui, 1996). With respect to self-perceived fluency, Nematizadeh and Wood (2019) also found that the interlocutors' perception of their dysfluent speech through self-monitoring lowered their WTC. Likewise, the notion of perceived competence; that is, how one's language competence is perceived by themselves was found by many

studies as one of the strong predictors of WTC (Khajavy et al., 2016; MacIntyre, Baker, Clément, & Donovan, 2002). Given the significance of self-perception presented above in both variables, it might be plausible to argue that WTC and fluency may somewhat interact with each other as they both involve and develop out of some degree of self-perception.

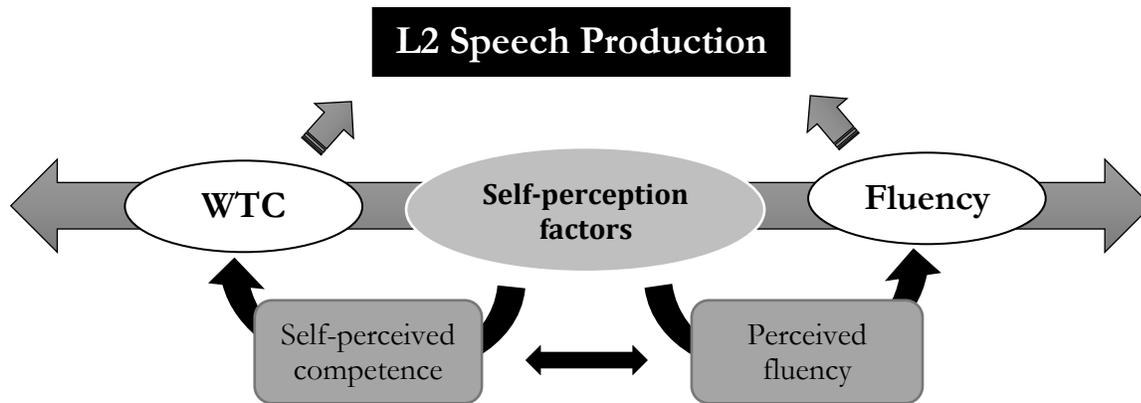


Figure 1. Continuum-like model of self-perception as a mediating variable between WTC and L2 fluency.

Another variable that could be placed somewhere in the middle of the continuum is nonverbal communication tools. Götz's (2013) concept of nonverbal fluency, which involves using extralinguistic means such as gestures, posture or facial expressions to communicate ideas when linguistic resources fail to function, can also have implications for one's tendency to engage in communication. It is believed that there is an association between body language and one's WTC. Surkamp (2014), for instance, has argued that non-verbal communication skills have an influence on the learning process as well as learner's WTC. Duck and McMahan (2015), highlighting the connection between interlocutor's posture while speaking with their attitudes about self, others, and situations, noted that an open posture conveys positive attitudes, meaning the interlocutor is relaxed, confident, and willing to communicate. Given the fact that nonverbal interactions may facilitate communication as well as reduce cognitive load leading to easier speech processing (Götz, 2013), the study of WTC and fluency in relation to each other could carry meaningful implications.

### **Complex dynamic systems, SLA, L2 fluency, and WTC**

Dynamic systems theory also motivated this study. Research has demonstrated that SLA displays features of complex dynamic systems (de Bot, Lowie &, Verspoor, 2007; Larsen-Freeman, 1997; Larsen-Freeman & Cameron, 2008). Some of the properties believed to characterize CDS and SLA include systems' dynamicity, complexity, nonlinearity, and openness. In support of this, a growing body of SLA empirical research has adopted a CDS perspective to viewing SLA constructs (Dörnyei, MacIntyre, & Henry, 2015).

Given that SLA can be viewed as a dynamic system, researchers have recently applied such an approach to L2 studies. In a conceptual discussion accompanied by an empirical investigation, Larsen-Freeman (2006) observed and discussed the L2 developmental and changing patterns in fluency, accuracy, and complexity of L2. Segalowitz (2010) provided an extended literature-based overview of L2 fluency through a framework based on CDST. In the context of WTC research, a few studies have viewed WTC as a dynamic system (MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019; Wood, 2016).

### **Cognitive and social bases of L2 fluency and WTC**

L2 fluency and WTC have underlying cognitive and social elements that interact in a dynamic fashion (Segalowitz, 2010). There is little doubt that WTC is a social phenomenon and fluency has a strong cognitive component. WTC involves one's tendency to engage in a communicative activity, and *cognitive fluency*<sup>1</sup>, a term coined by Segalowitz (2010), involves the underlying cognitive processing required for speed and efficiency of lexical access, as well as attention control, speed, and efficiency. What follows, however, is a discussion of the social bases of fluency and cognitive bases of WTC.

---

<sup>1</sup> Cognitive fluency will be extensively discussed in the literature review chapter.

***Social bases of L2 fluency.*** Segalowitz (2010) drew on social aspects of communication such as appropriateness and naturalness and discussed their potential relevance to discussions of L2 fluency. For instance, in dealing with the social norms of appropriateness in a second language community, some L2 learners may succeed in following the norms, while some may not, and become dysfluent as retrieval of lexical items appropriate for a particular social context may not take place smoothly. Regarding naturalness, Segalowitz argued that in order to be fluent, L2 learners need to master the knowledge of some “culturally determined fixed expressions” (2010, p. 114) as referred to by Pawley and Syder (1983), which is beyond one’s grammatical knowledge and is merely developed through social interactions with native speakers. To do so, L2 learners need to successfully perform 1) native-like selections of linguistic items and 2) maintain native-like fluency. The former is contingent upon the knowledge of social norms, and the latter involves the processing demands of speech production in addition to accuracy and requires lexicalization rather than memorization of expressions, which occurs through social contact with the speech community. To clarify what lexicalization refers to, Pawley and Syder (1983) argue:

What makes an expression a lexical item [as opposed to merely a memorized item], what makes it part of the speech community’s common dictionary, is, firstly, that the meaning of the expression is not (totally) predictable from its form, secondly, that it behaves as a minimal unit for certain syntactic purposes, and third, that it is a social institution. This last characteristic is sometimes overlooked, but is basic to the distinction between lexicalized and non-lexicalized sequence. (p. 209)

In addition to the above social component, using formulaic sequences like *you know* or *let’s see* could also demonstrate the social dimension of speech fluency. Formulaic sequences, according to Wray (2008), are used by speakers for three major functions: 1) reducing the speaker’s cognitive processing effort, 2) organizing discourse structure, and 3) enabling the speaker to influence the

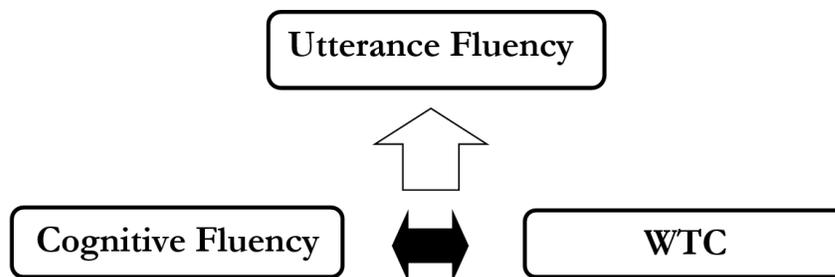
interlocutor, all of which, as Wray contended, are mainly performed to promote the speaker's self in social interactions. In other words, interlocutors use such prefabricated patterns to look fluent and avoid losing face. Wood (2010, 2015) also highlighted the role of social aspects such as voice, context, and identity, arguing they should be considered in studies of speech performance and fluency.

Having outlined the social nature of L2 fluency, I now turn to the discussion of cognitive bases of WTC.

***Cognitive bases of WTC.*** WTC is perceived to have cognitive bases. McCroskey and Richmond (1991), for example, argued that sending messages - or communication - is a result of a volitional choice. What to say and what not to say, how to respond and how not to respond, how to react and how not to react to utterances directed to us are all reflective of the fact that we volitionally make choices that are cognitively processed and articulated. Such may not be the case when it comes to habituated small talk with little cognitive processing demand on the speaker. However, unhabituated and more complicated forms of communication will require greater cognitive involvement for the communication to occur effectively. Therefore, willingness or unwillingness to communicate may also be considered a volitional choice that is realized through cognitive engagement of an individual. As an illustration, empirical investigations by MacIntyre and Legatto (2011) found that the affective states of WTC and anxiety are affected by the cognitive demands of task/topics, which partly involve successful or unsuccessful vocabulary retrieval.

Another source of motivation for this study came from Wood's (2016) study. The following graphic representation by Wood helps clarify the interaction that presumably exists among cognitive fluency, utterance fluency, and WTC, and the rationale for researching them in relation to each other. As illustrated below, Wood's conceptualization of the relationship, which he proposed in a study that

looked that WTC and L2 fluency interactions, shows that cognitive processing required of speech production and an interlocutor's WTC interact with each other.



*Figure 2.* Graphic representation illustrating the rationale to research WTC, cognitive and utterance fluency (Wood, 2016, p. 14).

### Research Questions

The study proposes to investigate the following research questions:

1. How do WTC and L2 fluent speech interact with each other on mostly monologic picture description tasks?
2. How do WTC and dysfluent speech interact with each other on mostly monologic picture description tasks?
3. What attributes (e.g., cognitive, linguistics, etc.) might influence the interaction between WTC and L2 fluency?
4. How does the theory of complex dynamic systems account for the interaction between WTC and fluency?

### Organisation of the Dissertation

This dissertation is organized into seven chapters. Chapter two is reserved for an extended discussion of the theoretical frameworks. Chapter three looks more deeply at the literature concerning WTC, mainly a dynamic conceptualization of it, and L2 fluency. The literature review concludes with dynamically informed research on WTC and provides a concise overview of the few studies that look at WTC and L2 fluency in connection with each other. Chapter four will present an overview of the methodology employed in the study, including information on participants,

instruments, data collection procedures and data analyses stages. Chapter 5 presents the results. The interpretations of stimulated recall interviews measured up to over 150 pages; therefore, the findings will be categorized by themes and majority of the instances for the themes and subthemes will be presented. Chapter six will be a discussion of the results and how the findings addressed the research questions. Chapter seven will wrap up the discussions, briefly summarize the findings, discuss the pedagogical implications, acknowledge the limitations, and suggest directions for further research.

## Chapter 2: Theoretical Frameworks

This study draws on the theory of complex dynamic systems (CDST) as a core conceptual framework. The investigation of WTC in this study was inspired by MacIntyre et al.'s (1998) heuristic model of variables underlying WTC, and the investigation of fluency was motivated by Segalowitz's (2010) framework of the dynamic relationships among sources of influence on L2 fluency. Before providing an overview of the literature in the following chapter, a brief discussion of the above theoretical frameworks will be provided.

### Heuristic Model of Variables Influencing WTC (MacIntyre et al., 1998)

As indicated earlier, this model was revolutionary in view of its thorough and analytic approach to viewing variables underlying WTC. In other words, instead of considering one individual variable/factor contributing to WTC, this model provided a comprehensive account of the

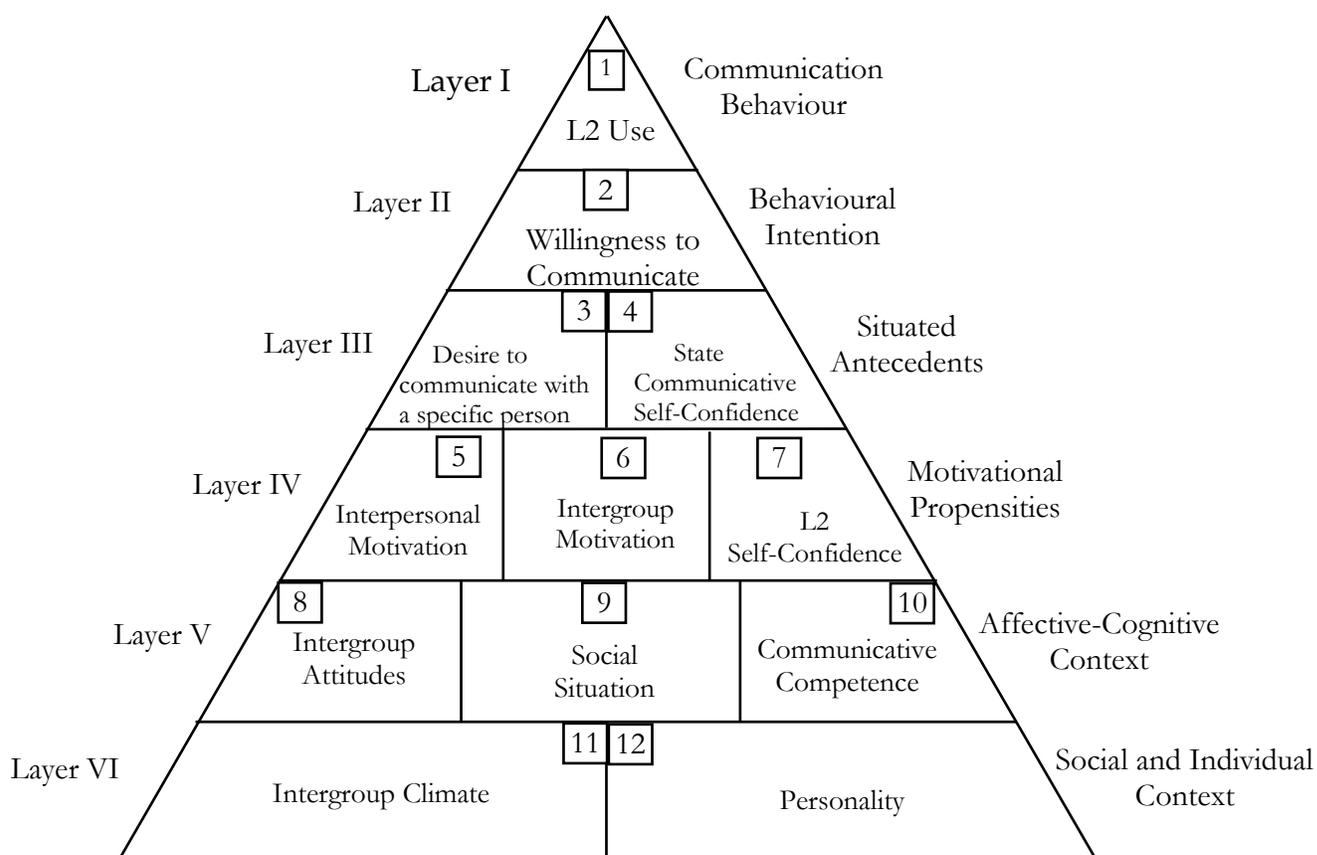


Figure 3. Heuristic models of variables influencing WTC.

collective force growing out of linguistic, communicative, social, and psychological variables that shape WTC. Figure 3 illustrates these variables.

The model is comprised of six levels, with the three levels at the bottom involving the enduring and stable factors such as social and individual context (e.g., personality & intergroup climate), affective-cognitive context (e.g., intergroup attitudes, social situation, & communicative competence), and motivational propensities (e.g., interpersonal motivation, intergroup, & L2 self-confidence). The three levels at the top of the pyramid involve more transient and situation-specific influences, including situated antecedents (e.g., desire to communicate with a specific person & state communicative self-confidence), behavioural intentions (WTC), and communication behaviour (L2 use). Each level will be elaborated below.

At the social/individual level, the authors suggest that individuals with certain *personality* types may or may not choose to engage in communication. For instance, authoritarian personality types may not engage in relationships with ethnic groups that they consider inferior. They also contend that some personality types (e.g., intuitive-feeling) tend to be more successful in interpersonal relationships. The *intergroup climate* mainly involves how ethnographic vitality, prestige, and attitudes towards the community of a L2 spark interest in engaging in communication in that language.

At the affective-cognitive level, *the intergroup attitudes* involve an individual's desire to integrate with a L2 community, fear of assimilation into the L2 culture, and his/her attitudes towards learning a L2. Another component associated with this level concerns the *social situation*, with five subcategories, including:

- participants (and their respective variables like age, gender, class, or relationship with interlocutor) involved,
- setting that refers to time and place of communication (e.g., academic, government),
- purpose (goals of discourse e.g., transferring information, persuading, etc.),

- topic (familiarly & expertise), and
- channel of communication.

The third component at this level involves Dell Hymes's notion of *communicative competence*, along with its subcomponents. The authors argue that an individual's communicative competence or his/her perceived competence - or a L2 speaker's perception of their language competence - could have an effect on WTC.

The motivational propensities level is comprised of three subcomponents, including *interpersonal motivation, intergroup motivation, and L2 self-confidence*. Interpersonal motivation involves 1) the control exercised in social relations mainly by the individuals with power and authority, a behaviour believed to impede the cognitive, affective, and behaviour freedom of interlocutors, and 2) the affiliation; that is, the degree to which an individual displays interest in creating a relationship with an interlocutor, which is prompted by the interlocutor's characteristics. Intergroup motivation involves an interlocutor's sense of belonging to a particular group, and, like the previous subcomponent, it is driven by the control and affiliation. In this case, however, control involves the power relation between groups, and affiliation pertains to situations in which an individual engages in communication mainly because of his/her attitudes towards and integration with another group. The last subcomponent of this level, L2 confidence, concerns the overall belief of an individual in him/herself to communicate in a L2, with a cognitive (self-perceived L2 skills) and an affective (the anxiety associated with L2 use) component to it.

The situated antecedent level is comprised of *a desire to communicate with a specific person and state self-confidence*. The former refers to the extent to which affiliation motive could determine engagement in L2 communication with a person based on their characteristics, exposure to them, or similarities between interlocutors. The control factor, which is mainly exercised through the use of certain discourse, could create comfortable climate that allows the interlocutor to use a L2 or vice versa. The

state self-confidence consists of state anxiety – or the transient feeling of tension and apprehension, and state perceived competence – or the temporary feeling of being capable to communicate effectively.

At the behavioural intention level, there is *WTC* that is defined as “readiness to enter into discourse at a particular time with a specific person or persons using a L2” (MacIntyre et al., 1998, p. 547). The authors adopt a situational approach to view the construct and explain how the factors of control and affiliation may encourage some L2 learners to engage in communication.

The final level at the top of the pyramid concerns L2 use, suggesting how multiple variables play a role in shaping *WTC* and culminate in L2 use.

### **Complex Dynamic Systems (CDS) Theory**

Originating in the fields of biology, mathematics, chemistry, and physics, CDS theory was initially applied to the study of language development and cognitive science by Thelen and Smith (1994), who established a set of principles to define such systems. They suggested that CDS are open and dynamic, comprise interacting elements and agents, constantly change, and self-organize to adapt to new environments. They also asserted that the strength of the interactions among the components changes over time as do the impacts that their subcomponents exert upon each other. Rather than adopting a macroscopic approach, the CDST requires a researcher to focus and engage in a closer observation of phenomena.

As we turn up the magnification of our microscope, we see that our visions of linearity, uniformity, inevitable sequencing, and even irreversibility break down. What looks like a cohesive, orchestrated process from afar takes on the flavor of a more

exploratory, opportunistic, syncretic, and function-driven process in its instantiation.

(Smith & Thelen, 1994, p. xvi)

While Smith and Thelen (1994) urge closer scrutiny of phenomena in science, definitions proposed in the literature have typically associated CDS with such concepts as change, dynamicity, and evolution. van Geert (1994), for instance, conceptualized CDS as a set of variables that mutually interact and influence each other over time. The changes of the subsystems might also shape the external behaviour of the system in interaction with other systems. On the other hand, the interactions of a system with external influences/systems may also affect the states of its subsystems and alter the system's subsequent behaviour. Such internal and external interactions bring about changes within the system, rendering it complex, dynamic, and nonlinear; a behaviour that is highly characteristic of second language systems. The pioneering work of Larsen-Freeman (1997) tapped into the similarities between CDS and SLA, which was later supported by further SLA-related studies (de Bot, Lowie, & Verspoor, 2007; Larsen-Freeman & Cameron, 2008). Subsequently, a number of empirical studies adopted a CDS perspective to examining SLA phenomena such as fluctuations in approach/avoidance motivation (MacIntyre & Serroul, 2015), L2 self (Irie & Ryan, 2015; Mercer, 2015), motivation, anxiety, and self-efficacy (Piniel & Csizér, 2015), and the developmental patterns of teachers' motivation (Hiver, 2015b), to name a few.

CDS are characterized by a number of properties that can inform the studies of WTC. The following section outlines these properties.

### **Key properties of complex dynamic systems**

de Bot et al. (2007) identified four basic characteristics of CDS manifested by SLA, including:

- 1) sensitive dependence on initial conditions;
- 2) variation/change in and among individuals;

- 3) complete interconnectedness of subsystems;
- 4) emergence of attractor states.

***Dependence on initial conditions.*** The notion of initial conditions grew out of the concept of the *butterfly effect* initially introduced by Lorenz (1963), suggesting that the flap of the wings of a butterfly in one part of the world could cause a tornado somewhere else. In dynamic systems, this indicates that any small change within a system or its subsystems may trigger subsequent changes elsewhere within the system. The initial point of measurement by a researcher thus represents the initial condition(s) of a system and marks an important milestone in the ways the system processes tend to develop in the subsequent stages.

From a research methodology perspective, the initial condition or state of a phenomenon under investigation could complicate the way it is measured. Learner-related factors such as L1, L2 proficiency level, age, and essentially all the individual differences (IDs) could shape the initial condition of L2 learners and learning. Further, initial conditions may be dependent on whether a researcher picks the right time to measure a phenomenon (Larsen-Freeman & Cameron, 2008). With regards to WTC, the initial condition can be a reliable predictor of how the system may function during communication. Whether or not an interlocutor is at high levels of WTC when engaging in a communication task influences the communication behaviour that emerges afterwards.

***Change.*** Change is the central concept of complex dynamic systems (de Bot et al., 2007) and has also been referred to as variation, variability, or dynamicity in the literature. In the context of CDS, change could be essentially characterized by three features: nonlinearity, self-organization, and idiosyncrasy.

***Nonlinearity.*** In climate science, despite meteorological breakthroughs, forecasting the pattern(s) of climatic conditions has proved nearly impossible, demonstrating the nonlinearity of climate behaviour. Another illustration of nonlinearity could be the classic example of a sand pile,

where sand is added to the pile to the extent that it leads to an avalanche, which occurs in an unpredictable manner. Overall, not only do the subsystems dynamically change over time and at irregular intervals, but the changes take place in a nonlinear fashion (Waninge, Dörnyei & de Bot, 2014), which explains why dynamic systems exhibit erratic behaviour, typically hard to predict. This also implies that there are no readily predictable cause-effect relationships among the subsystems in CDS and their changing states may not be simply attributed to a single cause. In a nonlinear system, “effect is disproportionate to the cause” (Larsen-Freeman, 1997, p. 143), whereby the effect settles at varying levels of strength in relation to its cause. Larsen-Freeman (2015) further notes any cause is followed by an effect, but predicting the time and the extent of the effect is not reliable.

There are quite a few factors that help explain the nonlinear behaviour exhibited by dynamic systems, however, the system’s sensitive dependence on an earlier state and the interconnectedness amongst the subsystems are two main causes triggering nonlinearity in CDS (de Bot & Larsen-Freeman, 2011). In addition, constant interactions with the external environment contribute to the nonlinearity of dynamic systems. More specifically, the more frequently components of a system interact, the more unpredictable the patterns of behaviour which emerge.

*Self-organization.* As stated earlier, constant interactions among subsystems require them to continuously adapt to any new condition as a result of their previous conditions or the feedback they receive from surroundings. This feature of CDS, which has also been associated with the concept of change, is referred to as self-organization (de Bot et al., 2007) or reorganization (Larsen-Freeman, 2012). Mitchell (2003) defines self-organization as “any set of processes in which order emerges from the interaction of the components of a system without direction from external factors and without a plan of the order embedded in any individual component” (p. 6).

The self-organizing property of dynamic systems makes them challenging to measure due to their constantly changing states. Heylighen (1989) maintains that gaining complete information of how a system operates is barely possible due to internal self-organizing activities. In other words, while data is being collected on a specific state of a system, it may simultaneously be moving towards another state, thereby making it challenging to fully identify or track its state.

*Idiosyncrasy.* Change and development within dynamic systems are characterized by their idiosyncratic or distinctive behaviour, which is another form of variability. Given that a dynamic system consists of many subsystems that are in constant interaction with their surroundings, and that individual cognitive systems operate in unique fashions (van Geert, 2007), it could be argued that individual trajectories of development and change vary to a certain extent.

*Interconnectedness.* Dynamic systems are comprised of a set of variables or subsystems that are interconnected. These subsystems are further made up of smaller subsystems, which interact with other internal or external resources. Therefore, any change in a subsystem may result in further changes elsewhere in the system, demonstrating how subsystems are interrelated. Such interconnected interactions pose a challenge to explaining the changes in or the subsequent behaviour of a system, which involves attributing the changes to a single cause/variable (Larsen-Freeman & Cameron, 2008) while in fact a collective force and a combination of factors are at play.

*Attractor states.* Another important property that characterizes dynamic systems is the formation of *attractor states* or preferred states. Unlike the other properties of dynamic systems reviewed thus far, attractor states involve some degree of stability. An attractor state may be defined as settlement of a system into a unique point of equilibrium over time (Haken, 2006), or “the state the system prefers to be in over other states at a particular point in time” (Steenbeek, Jansen, & van Geert, 2012, p. 66). Newman (2009) argued that attractor states involve “a critical value, pattern,

solution or outcome towards which a system settles down over time” (p. 21). As an illustration, Hiver (2015a) refers to a group of learners who begin a course with differing initial conditions and are influenced by a number of external (e.g. teacher, classmates, or context) or internal factors (e.g. L1, L2 proficiency, etc.) throughout the course. However, some degree of stabilization is expected after a period of collective adaptation where some discernible patterns of behaviour emerge and the system transitions into a more cohesive state. Attractor states are not permanent due to the constant influence of environment on the system but may be insensitive to small perturbations (van Geert, 2007). As opposed to attractor states, there are *repeller states*, which are transient states that perturb the stability of a dynamic system.

Paradoxically, formation of attractor states is not random and takes place as a result of interactions, change, or self-organization. Hiver (2015a) contends that systems do not accidentally settle in attractor states, but any system, in quest of some stability, self-organizes into an attractor state, which may be a result of the feedback it receives from the environment and external sources, or the interactions amongst subsystems (Boschetti, Hardy, Grigg, & Horwitz, 2011).

### **Segalowitz’s Framework of Fluency**

Segalowitz’s (2010) “framework for thinking about the dynamic relationships among the sources influencing L2 fluency” (p. 163) provides an account of the processes in operation that influence L2 fluency. Interesting to note is the fact that the framework (See Figure 4) is developed on the basis of a dynamic systems approach, with four broadly defined components, each of which could be further delineated and studied. The first influence concerns the cognitive and perceptual systems and processes that operate for the purpose of speech production. This influence includes processing speed, stability, and flexibility in planning and constructing utterances using linguistic resources. The second influence, motivation to communicate, includes WTC, beliefs about

communication, concept of L2 self, and identity. Segalowitz argues that motivation plays a role in “energizing and shaping a speaker’s commitment to communicate with optimal fluency” (p. 22). The third influence involves the sociolinguistic demand of the communicative or social context imposed on speakers. The fourth is the cognitive and perceptual experiences such as frequency of exposure or opportunities for practice that facilitate L2 fluency development. More specifically, this is concerned with the number of times L2 speakers have actually heard or used certain words, expressions or structures, which facilitate a smooth retrieval during communicative contexts.

As indicated, the four influences tend to interact and influence each other directly or indirectly for the purpose of L2 speech production. For instance, the efficiency of an individual’s cognitive processing skills (1<sup>st</sup> influence) may improve or lower his/her motivation or WTC (2<sup>nd</sup> influence) to participate in a discussion. There also seems to be an interaction between the motivation to communicate (2<sup>nd</sup> influence) and the social context (3<sup>rd</sup> influence) in that the demands of social contexts, interlocutors, topics, etc. may have an impact upon how motivated an individual is to participate in a social activity. Segalowitz, for example, suggests that a L2 speaker’s inability to use socially appropriate registers or make the adjustments a native speaker interlocutor makes to accommodate a L2 speaker’s low fluency might impact L2 speaker’s motivation. There appears to be an interaction between the social environment (3<sup>rd</sup> influence) and cognitive/perceptual experiences (4<sup>th</sup> influence). A high degree of exposure and practice within a social context would, to a certain extent, facilitate the cognitive processing skills of speakers, such as lexical retrieval or grammar processing. Conversely, speaker would struggle more significantly if they have had no or little exposure and practice in social contexts.

Segalowitz adopts a CDS perspective as he argues that the above influences undergo change over time. Notably, he posits that properties of dynamic systems, such as non-linearity, openness to external influences, and adaptation, all characterize the speech production and L2 fluency systems.

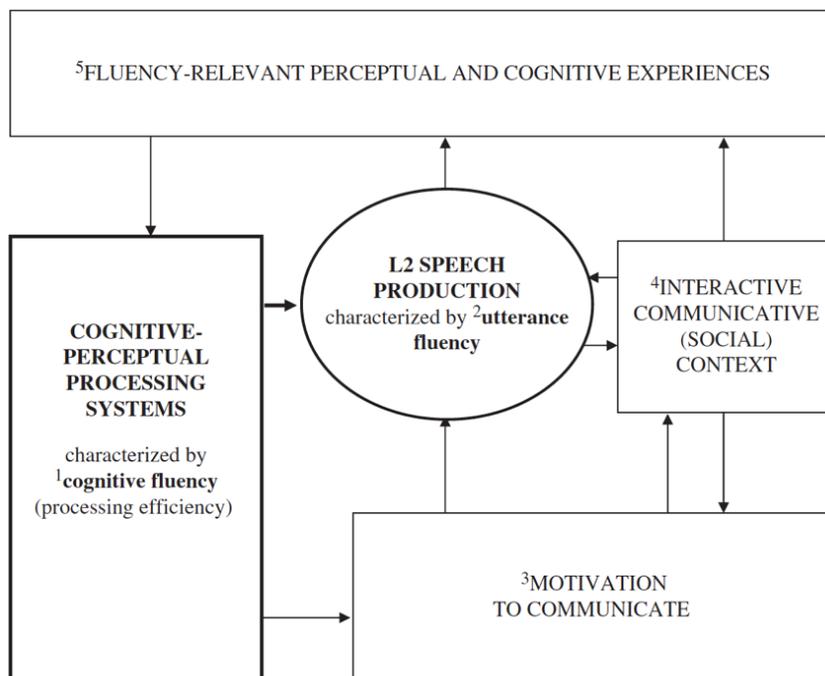


Figure 4. A framework for thinking about the dynamic relationship among sources of influence on L2 fluency.

## Recap

This chapter set out to present the theoretical frameworks that underpin this study. The chapter started with a detailed account of MacIntyre et al.'s heuristic model of L2 WTC because the underlying layers of WTC could potentially inform the findings of the study. The theory of CDS was introduced as both constructs of WTC and L2 fluency have been argued to possess characteristics of a dynamic system (Nematizadeh & Wood, 2019; Segalowitz, 2010). Segalowitz's framework also provided a delicate discussion of how these two constructs may interact and influence each other during communications.

### Chapter 3: Review of Literature

This chapter is divided into two sections: WTC and L2 fluency. The WTC section will first conceptualize the construct of ‘willingness to communicate’ by reviewing its origins and proposed definitions. Trait and state conceptualizations of the variable will be briefly discussed. The focus will then turn to viewing WTC as dynamic system and studies that have adopted a CDS perspective or have observed the properties of CDS will be concisely reviewed. Next, L2 speech fluency will be conceptualized, and dysfluency markers and causes will be briefly discussed. Different types of fluency suggested in the literature along with methods for measuring this variable will be the subject of discussion. The chapter concludes with a review of two studies that have adopted a CDS approach to investigating the interaction between WTC and L2 fluency.

#### Conceptualizing WTC

McCroskey and Baer (1985) introduced the concept of WTC in association with first language performance and perceived it as a “personality-based, trait-like predisposition which is relatively consistent across a variety of communication contexts and types of receivers” (p. 6), while acknowledging its situation-dependent nature. Several years later, in their seminal work on WTC, MacIntyre et al. (1998) argued that L1 WTC may not be truly representative of an individual’s WTC in a L2, referring to a study by Charos (1994) that had empirically indicated it as such. With an emphasis upon L2 WTC and its situational dynamicity, MacIntyre et al. (1998) defined L2 WTC as “a readiness to enter into discourse at a particular time with a specific person or persons, using a L2” (p. 547), inspiring a number of studies (Cao & Jiaotong, 2012; Kang, 2005; Khajavy et al., 2016; Yu, 2011; Wen & Clément, 2003). Not long after this, Kang (2005), having studied the situational fluctuations of L2 WTC qualitatively, proposed his preliminary model of situational WTC and his definition of the construct: “an individual’s volitional inclination towards actively engaging in the act

of communication in a specific situation, which can vary according to interlocutor(s), topic, and conversational context, among other potential situational variables” (p. 291).

### **WTC as a Trait Predisposition**

Trait-oriented definitions of WTC, like that of McCroskey and Baer’s, engendered a large body of correlational and quantitative literature, mainly looking into its correlates or predictors. In enumerating the variables that may potentially influence L2 WTC, MacIntyre et al. (1998) found over 30 factors. As a personality trait, WTC has mainly been researched using quantitative means (e.g. ANOVAs or structural equation modelling) and common predictors of WTC have ranged from self-confidence (Cao and Philip, 2006; Cetinkaya, 2005; Clément, Baker, and MacIntyre, 2003; Ghonsooly, Khajavy, & Asadpour, 2012; Khajavy et al., 2016; Peng & Woodrow, 2010; Yashima, 2002; Yashima, Zenuk-Nishide, & Shimizu, 2004), to motivation (Hashimoto, 2002; MacIntyre et al, 2002; Peng, 2007; Yashima, 2002), perceived competence (Baker & MacIntyre, 2003; Cameron, 2013; MacIntyre, 1994; MacIntyre & Charos, 1996; MacIntyre and Doucette, 2010; Matsuoka, 2006; McCroskey & McCroskey, 1986; Yousef, Jamil, & Razak, 2013; Yashima, 2002; Yashima et al., 2004; Yu, 2011), communication apprehension/anxiety (Cameron, 2013; MacIntyre, 1994; MacIntyre, Babin, & Clement, 1999; MacIntyre & Doucette, 2010; Yu, 2011), and personality (Cameron, 2013; MacIntyre & Charos, 1996). Also a number of external factors that were found to influence WTC include teacher’s support (Menzel & Carrell, 1999; Hsu, 2005; Khajavy et al., 2016; Peng and Woodrow, 2010) contextual factors (Cameron, 2015; Khajavy et al., 2016; MacIntyre et al, 2003), situational variables such as topic, interlocutors, and conversational context (Cao & Philip, 2006; Kang, 2005), classroom variables like group size, medium of communication (Cao & Philip, 2006), cultural variables (Cao & Philip, 2006; Wen & Clement, 2003), and biological variables such as age and gender (MacIntyre et al., 2002).

## **Dynamic, Situational, or State WTC**

One growing line of research has recently concentrated on state WTC in contrast to the traditional trait-like perception of the construct. MacIntyre (2007) posits:

At any moment a learner might feel both motivated to learn and inhibited by anxiety because of the culmination of converging, conflicting processes. Such processes lead to both approach and avoidance tendencies, operating simultaneously, waxing and waning in salience from moment to moment. (p. 572)

Given the description above, WTC is subject to momentary changes due to individual, affective, cognitive, contextual, linguistic, factors or their combination that trigger fluctuations in WTC level (MacIntyre, 2007). The heuristic model proposed by MacIntyre et al. (1998) identified most of these including linguistic, cognitive-affective, individual, and contextual factors, which motivated a number of studies investigating the changing nature of WTC.

Cao and Philp (2006), for instance, conducted a qualitative study to compare L2 learner's self-reported WTC through questionnaires (trait WTC) and their actual WTC behaviour (situational WTC) within the classroom through classroom observations and interviews. The results of this study revealed that classroom observations and interviews were better tools to predict participants' decision to actually engage in the interaction with peers. Group size, topic and interlocutor familiarity, medium of communication, and cultural background were further reported by the learners to bring about rises and falls of WTC.

Cao (2011), using class observations, interviews and journals, investigated the dynamic and situated nature of WTC for 20 weeks with mostly Chinese and Korean participants. The results revealed that topic and task familiarity, interlocutor's and teacher's higher level of language

competence, group size, perceived opportunity to communicate, personality and self-confidence, emotions, and reliance on L1 were among the main factors that caused fluctuations in WTC.

MacIntyre, Burns and Jessome (2011) conducted another qualitative study on high school students' WTC and UnWTC<sup>1</sup> during a French immersion program. Using a focused essay technique for a period of six weeks, the researchers had the students write about 6 situations in which they would be most willing and six situations in which they would be least willing to communicate. It was revealed, through the journal entries, that students' WTC or UnWTC was stimulated by an interaction of linguistic development, L2 self-development and non-linguistic factors. They also reported that factors of interlocutor and context influenced students' WTC. Additionally, students were most willing to communicate within immersion classroom settings and least willing when they were unsure of the answer, afraid of making mistakes, or being corrected by a friend.

Classroom observations, learning journals, and semi-structured interviews were also utilized by Peng (2012), in another purely qualitative study, to identify the individual and contextual factors impacting L2 WTC of four Chinese university-level students. Six categories including learner beliefs, motivation, cognitive factors (e.g. lack of topical knowledge), affective factors (e.g. anxiety or feeling nervous), linguistic factors (e.g. comprehension difficulty or lack of vocabulary knowledge), and classroom environment (e.g. class atmosphere, teaching style, method, procedure, learning tasks) were identified to underlie WTC. Peng also argued that WTC is 'synergistically' constructed through the interaction of individual and environmental factors.

Cao (2014) conducted a very similar study adopting a sociocognitive perspective in an Australian context. The study investigated the dynamic classroom WTC of six participants by triangulating data collected through classroom observations, stimulated recalls, and reflective

---

<sup>1</sup> UnWTC was originally defined as "a chronic tendency to avoid and/or devalue oral communication" (Burgoon, 1976, p. 60)

journals. Like Peng (2012), Cao argued that WTC in a L2 classroom is not simply a trait disposition but is constructed through the interplay of individual (e.g. emotion and perceived opportunity to communicate), environmental, and linguistic factors. She also concludes that a combination effect of these factors differs from individual to individual and is too complex to be predicted.

Cameron (2015) carried out a mainly qualitative study investigating Iranian students' WTC in an ESL context in New Zealand. Employing classroom observations, semi-structured interviews, and a Likert-type questionnaire over multiple intervals for six months, and triangulation of the data, she observed a number of recurring variables such as confidence, motivation, personality that influenced WTC, consistent with the heuristic model of MacIntyre et al. (1998). She also compared the fluctuations of WTC across different occasions of data collection and observed the dynamicity of WTC from semester to semester.

### **Complex Dynamic Systems and WTC: Methodologies and Findings**

Even though investigating WTC from a dynamic systems perspective has only recently become prevalent, the few studies conducted have shown how WTC retains characteristics of a dynamic system, with some of them directly adopting a CDS perspective and some observing properties characterizing CDS (Kang, 2005; MacIntyre & Legatto, 2011; Mystkowska-Wiertelak, 2018; Mystkowska-Wiertelak & Pawlak, 2014; Nematizadeh & Wood, 2019; Pawlak & Mystkowska-Wiertelak, 2015; Pawlak, Mystkowska-Wiertelak, & Bielak, 2015; Wood, 2016). A list of such studies including their topics of inquiry, methodology, instruments, and observed CDS properties is provided in Table 1.

Table 1  
*Studies Monitoring Dynamic WTC*

Studies	Main topic of investigation	Methodology	Data collection & instruments	CDS properties observed
Kang (2005)	Dynamic emergence of situational willingness	Qualitative	Semi-structured interviews, videotaped conversations, & stimulated recall	Change, nonlinearity, unpredictability, interconnectedness
MacIntyre & Legatto (2011)	A Dynamic System Approach to Willingness to Communicate	Idiodynamic methodology (qualitative & quantitative)	Idiodynamic software, video-recordings, stimulated recall interviews	Change, initial conditions, interconnectedness, attractor states, self-organization
Mystkowska-Wiertelak & Pawlak (2014)	Fluctuations in WTC	Qualitative & quantitative	Self-ratings & questionnaires	Change & dynamicity,
Pawlak & Mystkowska-Wiertelak (2015)	Dynamic nature of L2 WTC	Qualitative & quantitative	Self-ratings, audio recordings, questionnaires, follow-up interviews	Change, dependence on initial condition, idiosyncrasy, interconnectedness
Pawlak, Mystkowska-Wiertelak, & Bielak (2015)	Nature of classroom WTC	Quantitative & qualitative	Self-ratings, questionnaires, & a teacher's comments	Dynamicity & unpredictability, complexity, sensitive dependence on initial conditions, idiosyncrasy
Wood (2016)	WTC & L2 fluency	Idiodynamic (qualitative & quantitative)	Idiodynamic software, Video-recordings, stimulated recall interviews	Dynamicity & complexity, interconnectedness, sensitive dependence on initial conditions
Mystkowska-Wiertelak (2018)	WTC fluctuations	Quantitative & qualitative	WTC self-reports, lesson plans, questionnaires, semi-structured interviews	Dynamicity, sensitive dependence on initial conditions, interconnectedness, attractor states
Nematizadeh & Wood (2019)	Cognitive & affective dynamics of WTC & L2 fluency	Idiodynamic (qualitative & quantitative)	Idiodynamic software, Video-recordings, stimulated recall interviews	Dynamicity, complexity & interconnectedness, attractor states

An early qualitative investigation of WTC was pioneered by Kang (2005). Looking specifically at situationally-constructed WTC, Kang employed semi-structured interviews, video-taped conversations and stimulated recall tasks with four non-native speakers. Through triangulating the entire dataset, he found that situational WTC emerges as a result of interaction between situational (topic, interlocutor, and context) and psychological (excitement, responsibility, and security) variables.

While this study was not framed by a CDS perspective, Kang observed the dynamic nature of WTC even in short spans of time and with the same interlocutor. For one thing, a feature Kang observed was the joint role of three interacting psychological variables that co-lead to the emergence of situational variable. This joint interaction resembles, to a certain extent, the interconnected feature of CDS whereby a number of underlying layers influence and interact with each other. Kang goes further and makes a comparison between the psychological variable of *excitement* as opposed to interest, arguing that the former emerges dynamically out of a given situation and fluctuates during communication, while considering interest as an enduring characteristic. Situational WTC that emerges from a given context could interact with trait WTC, causing situational WTC to display unpredictable or nonlinear behaviour.

It could perhaps be argued that the first formal investigation of WTC through a dynamic systems perspective was conducted by MacIntyre and Legatto (2011), who devised an idiodynamic method<sup>1</sup> (MacIntyre, 2012a) to investigate WTC's shifts. Having participants complete communicative tasks on eight different topics, MacIntyre and Legatto were able to observe varying initial conditions in WTC mainly due to the participants' varying levels of familiarity with the topics. Participants displayed greater tendency to speak about the topic most familiar to them and evinced

---

<sup>1</sup> This method will be elaborated in the method chapter.

less interest in the topics they did not know much about. This would, consequently, determine how willing they were to approach the task. As an illustration, the researchers observed that some participants abandoned an oral task early on as they found the topic/task unfavourable (initial condition), despite their ability to carry through when presented with different topics. This highlighted the significance of task/topic in a L2 communication task as a predictor of WTC, and on a broader scale, how contextual factors of this sort determine interlocutors' inclination to avoid or approach and engage in communication. Furthermore, the phenomenon of change consistently characterized all the participants' ratings of their WTC, demonstrating how a previous state transforms into a subsequent state; that is, how a system gets perturbed and self-organizes into another attractor state. Additionally, the data indicated the interconnectedness property of dynamic systems, with affect, cognition, and linguistic factors interacting and influencing each other. More specifically, whenever the cognitive processing for vocabulary retrieval failed, a decline in levels of WTC was inevitable, illustrating an interplay between cognition and affect. Formation of attractor states was also observed whenever a participant perceived himself/herself capable of doing the task; that is, the system self-organized into a period of stability, whereas in the case of another participant, the attractor state was perturbed due to topic shift, resulting in a significant drop in WTC levels. In brief, WTC can settle into an attractor state when linguistic, social, cognitive, and emotional systems operate successfully to facilitate communication. However, struggling to retrieve vocabulary due to linguistic or cognitive breakdowns could perturb the attractor state of WTC, which could result in an interlocutor's abandonment of the task.

Mystkowska-Wiertelak and Pawlak (2014) looked at WTC fluctuations through participants' self-ratings every 30 seconds during five-minute monologues and dialogues, as well as follow-up questionnaires. The authors first compared the effect of tasks, monologue and dialogue, using paired-sample t-tests and found that participants were more willing to speak during monologues than

during dialogues. The authors attribute this statistically significant difference to a number of factors, including participants' independence in leading the discussion, decision on the topic, and greater control over tasks. The results of WTC ratings and questionnaires, including items on WTC, classroom WTC, frequency of communication, perceived competence, and communication anxiety, were then compared using Pearson correlation tests, and statistically significant correlations were found between WTC in English and perceived competence, and between classroom WTC and frequency of communication. The authors acknowledge the dynamicity of WTC, and some of their findings could be explained by the properties of complex dynamic systems. For instance, participants in this study demonstrated varying initial conditions depending on the task type they engaged in. They tended to be more willing to talk at the outset of monologues and unwilling at the outset of dialogues. This initial condition in WTC levels would not last long as the participants would run out of ideas during the monologues, which would then lower their WTC. Participants would, however, gain WTC when engaged in an interactive dialogue. The perturbation to the initial levels of WTC and how it changed during the communicative tasks could be explained by the theory of CDS in that phenomena do not retain stable conditions and undergo change for a myriad of reasons.

Pawlak and Mystkowska-Wiertelak (2015), in a mainly qualitative study with a quantitative component, studied WTC changes through having advanced learners of English carry out an impromptu dialogue in pairs lasting for less than 10 minutes. During the dialogues, the participants were prompted to self-rate their WTC level every 30 seconds using a beeping sound. Subsequently, they attended interviews and completed questionnaires inquiring about the reasons for WTC shifts. While this study did not adopt a CDS approach, Pawlak and Mystkowska-Wiertelak were able to observe a number of characteristics resembling those of CDS. For one thing, the researchers found that initial levels of participants' WTC determined who would initiate the conversation, highlighting the importance of one's initial condition in rendering one willing or unwilling to communicate.

Looking at the figures illustrating participants' self-ratings of their WTC, consistent variability and change characterised the WTC system and emerging patterns of WTC changes tended to be idiosyncratic to each participant. These changes also took place due to interactions among linguistic (e.g. lack of lexical knowledge), cognitive (e.g. failure of lexical retrieval) and affective factors (e.g. anxiety), all of which closely resemble the interconnectedness characteristic of WTC as a CDS. The authors further acknowledge that learners' WTC during communicative task was affected by a multitude of influences, suggesting the complexity of the construct, and that these influences are “intricately interwoven, interact in unpredictable ways and are often themselves in a state of flux” (p. 8), all of which characterize CDS. As an illustration, lack of lexical resources (linguistic) resulted in high levels of anxiety (affect) which in turn lowered WTC levels. In addition, when individuals were invited to express their opinions by their partner, were asked to discuss their views, or were simply interested in the topic of discussion, a rise in WTC level was observed which remained stable as long as the speaker had ideas to carry on, implying what appears to be formation of an attractor state.

Pawlak, Mystkowska-Wiertelak, and Bielak (2015), in an attempt to investigate patterns of change in WTC and dig deeper into the contextual and individual factors shaping WTC, conducted a mixed-methods study in a classroom context. The researchers recruited 60 advanced students of English in four different intact groups and used WTC self-rating grids (every five minutes), questionnaires (including open-ended and closed items), and teacher observations to study WTC shifts and patterns during conversation classes. The researchers acknowledge that the WTC behaves like dynamic systems, mainly due to unpredictable, multi-level interactions between the contextual and individual variables. Variability in individuals' WTC was observed in all the four groups and the tasks employed, whereby magnitude and degrees of variations were idiosyncratic to each group. It is also argued that such variations were observed as a result of interactions between factors such as topic, tasks, and learner-related variables. Sensitive dependence on initial conditions was also

observed in this study's dataset. More specifically, the researcher found it impossible to identify a common pattern in the WTC fluctuations across the four groups, with dramatic differences in the initial conditions of WTC that determined the subsequent shifts in the system, suggesting dependence on the initial condition feature of CDS.

Another study by Mystkowska-Wiertelak (2018), with a qualitative and quantitative design, explored the classroom-based WTC fluctuations of a single participant during a speaking course. The researcher used five-minute self-reports of WTC, which were cross-referenced with detailed lesson plans, as well as questionnaires and semi-structured interviews. The study also looked at the contextual and individual factors that contributed to WTC shifts. Mystkowska-Wiertelak observed the dynamic nature of WTC on varying time spans including during single tasks/ activities, individual classes and throughout the entire semester, which were mainly attributed to the contextual variables including topic, task, and interlocutor. It also appears that since the participant of this study had extensive lexical knowledge, he welcomed warm-up activities focused on this linguistic dimension, which improved his WTC for the rest of the lesson. This exemplifies an interaction between the linguistic (vocabulary knowledge) and contextual variables (task/activities), which emerges in the form of high WTC. It could be further argued that the participant's WTC, which improved because of his interest in the vocabulary-focused instruction, set the tone for the rest of the lesson, testifying to dependence on the initial condition feature of CDS. Another illustration of dependence on initial conditions was observed during the participant's interactions with other interlocutors, whereby his WTC was shaped by the proficiency level of the interlocutors as well as the degree of their engagement in the task. Moreover, the researcher reports a period of stability in WTC levels mainly because of the participant's positive impression of the tasks' usefulness, paving the way for an upcoming positive and stable level of WTC, which, from a CDS perspective, resembles an attractor state.

Wood's (2016) and Nematizadeh and Wood's (2019) studies will be reviewed later in the chapter.

### **Conceptualizing Fluency**

Speech fluency has been a very controversial construct to define (Wood, 2010). Lennon (1990), in a widely-cited work, distinguished between narrow and broad senses of fluency. The broad sense refers to an individual's overall proficiency. Fluency, as a result of this generic conceptualization, has been linked to not only structural, lexical, and phonological accuracy, but also “discourse coherence and cohesion, conversational pragmatics, sensitivity to register and pragmatics, and communication strategies” (Wood, 2010, p. 10) that constitute overall proficiency. Götz (2013) in her study of native and non-native speakers of English asked native speakers of English to rate non-native speech samples and found that “the perceptive fluencemes “accuracy”, “idiomaticity”, “register”, “accent” and “intonation” shape native speakers’ perception of fluency” (p. 87). Overall, a non-technical conceptualization of the construct outside the realm of applied linguistics is what Lennon (1990) refers to as broad sense of fluency.

On the other hand, the narrow sense, that is technically used by applied linguists, refers to the characteristic features of fluency such as speed, pauses, hesitations, repetitions and the like (Luoma, 2004). Many scholars have proposed other definitions to better identify the construct, most of which involve the concept of fluidity in speech (Segalowitz, 2010). For instance, Koponen and Riggensbach (2000) argued that the term fluency has been associated with the notions of ‘rapidity’, ‘automaticity’, or ‘flow’ of speech or “smoothness or continuity of speech” (p. 8). Likewise, Wood (2010) referred to it as “naturalness of flow of speech, or speed of oral performance” (p. 9). A commonly-cited definition proposed by Fillmore (1979, p. 93) involves four features of speech including the ability to talk 1) at length and make semantically dense sentences, 2) without many

pauses/fillers, 3) in a creative way, and 4) in a variety of social contexts. Overall, it appears the term fluency, in a technical sense, is associated with such concepts as speed, flow, and length of speech. Wood (2010) suggests that defining fluency as a distinct phenomenon from other aspects of oral performance will be possible through associating it with temporal measures of speech including speed, pause, hesitation, and fillers.

### **Conceptualizing Dysfluency**

Important as it is to conceptualise the notion of fluency, any research concerning fluency must tap into what is not considered fluent speech. Dysfluent speech is characterized by a number of markers. Schmid and Beers Fägersten (2010) contended that when people talk, they tend to make mistakes, repeat, pause, hesitate, backtrack, all of which may be perceived as markers of dysfluent speech. Lennon (1990) argued that the speech of non-native speakers may contain pauses and repetitions that can be interpreted as dysfluency markers. In another study, Lennon (2000) maintained that filled pauses such as *em* and *ur* could be perceived by the listener as a marker of dysfluent speech. Pawley and Syder (2000) noted that “any pause or pause filler, any marked fluctuation in rate of articulation, any marked lengthening or rearticulation of a syllable, or any reformulation of a construction or lexical choice” should be considered marker of dysfluency (p. 171).

### **Causes of dysfluent speech**

There have been a number of studies examining the causes of dysfluent speech (Bortfeld, Leon, Bloom, Schober & Brennan, 2001; Oviatt, 1995). Riegenbach (1991) maintained there are different language-related aspects that are involved in speech fluency. More specifically, she noted:

In order for there to be fluency, then, it appears that many different conditions have to be met – some proficiency in grammar, pronunciation, and vocabulary to mention a few. In the case of two-party speech other possible conditions may be related to sociolinguistic and even affective factors. Nonfluency, on the other hand, can arise from a deficiency in any one of these areas: the inability to produce a given grammatical structure may be the first link in a chain of dysfluencies that may as easily have begun with a comprehension lapse, a pronunciation problem, or a motivation for precision in word choice. (p. 439)

What follows is a brief summary of three factors that have been found in the literature to cause dysfluency in speech.

***Speech processing and planning load.*** Oviatt (1995) studied dysfluencies in three task-oriented conversations and found out that longer utterances were likely to be less fluent, thus concluding speech production processing load is a factor causing dysfluency. Oviatt's study also found that most of the dysfluency markers were detected at the outset of the utterance where the speaker is busy planning the speech. Therefore, planning and processing load were two factors leading to dysfluency.

***Self-monitoring.*** Speech fluency literature has investigated the role of speech self-monitoring (see Broos, Duyck, & Hartsuiker 2016; Kormos, 2000; Nooteboom & Quené, 2017). Speakers engage in a process of self-monitoring, which mostly involves the decision over being fluent or accurate. Self-monitoring, in case inaccuracy is detected, may be followed by self-repairs that cause dysfluency. While, in the context of native speakers, there is evidence that speakers tend to value fluency over accuracy (Seyfeddinipur, Kita, & Indefrey, 2008), Nematizadeh and Wood (2019) looked at the cognitive influences of speech production (and WTC) in L2 speakers and found that

perception of inaccurate speech led to pausing and self-initiated repair. The authors also observed that mispronunciations or inappropriate lexical choices resulted in instances of dysfluency such as reduced speech rate or shorter utterances. This cognitive processing of detecting errors of all sorts seemed to interact with and influence speakers' affective state, which will be the subject of discussion later in this chapter.

***Coordinating communications/conversations.*** Bortfeld et al. (2001) referred to the functions of time and turn as two factors that might bring about dysfluency. They maintained that when speakers pause too long to produce an utterance, they may lose the attention of their audience; therefore, they reach out to use markers of dysfluency like filled pauses (e.g. um) to keep the attention of their audience. Additionally, being obsessed with production of inaccurate language may also result in the use of fillers or self-repairs which are also instances of dysfluency. Nematizadeh and Wood (2019) found out that inaccurate language resulted in an inhibition of the speaker that remained in speakers' subconscious and continued to trouble the speech production for a while.

## **Types of Fluency**

Wood (2001) interpreted fluency as a “definable and observable aspect of speech which can be linked to cognitive processing” (p. 574). This interpretation encompasses both the temporal measures of speech and the cognitive capacity required for fluent speech production. Segalowitz (2010) distinguished between cognitive, utterance, and perceived fluency. Similarly, Götz (2013) introduced a triad of different fluencies including productive, perceptive, and non-verbal fluency. Segalowitz's notions of utterance and perceived fluency resemble what Götz referred to as productive and perceptive fluency, respectively. However, cognitive and non-verbal fluency seem to involve different notions. The following sections will provide an extended overview of these terms.

As mentioned before, Segalowitz's concept of utterance fluency shares many similarities with Götz's notion of productive fluency. However, Götz's term incorporates the cognitive planning pressure during speaking, speakers' use of formulaic sequences, and fluency enhancement strategies that ease the planning pressure. It is evident that Götz's productive fluency also embraces the role of cognition in speech production while Segalowitz has separated productive from cognitive fluency.

### **Perceived or perceptive fluency**

These terms are conceptualized as the inferences made by listeners about an individual's utterance fluency. Segalowitz (2010) defined perceived fluency as "the fluency that is ascribed by a listener to a speaker, based on impressions drawn from hearing speech samples produced by the speaker" (p. 49). Götz coined the term *fluencemes of perception* as the features that influence the perception of fluency by listener, including positions of pauses (not necessarily the quantity or length of them), accuracy of the speech, intonation, idiomaticity, intonation, accent, pragmatic features, and lexical diversity. She contended that the way listeners perceive L2 speech fluency is not necessarily based on features attributable to the concept of fluency as used in applied linguistics.

### **Nonverbal fluency**

Nonverbal fluency is a term introduced by Götz (2013) and has more to do with extralinguistic aspects of communication than the actual production of fluent speech. As mentioned earlier, Götz (2013) argues there are certain features that facilitate the communication but do not involve the use of speech. She sets infants' communication as an example, where the communication does not take place verbally and is mostly carried out through gestures, facial expression and other extralinguistic means. In non-native adult's speech, she maintains, speech production requires a lot of

cognitive processing where speakers reach out to nonverbal communication to get the meaning across. This, in fact, reduces the cognitive load and pressure, thus easing productive fluency.

### **Utterance or productive fluency**

Lennon (1990) distinguished between fluency and other aspects of oral proficiency such as lexical range, syntactic complexity, etc. and argued that fluency is a purely performance phenomenon. Therefore, from a performance-based perspective, utterance or productive fluency refers to the actual production of speech where certain characteristics of an utterance such as temporal and measurable features of speech are detectable. Segalowitz (2010) noted “the domain of utterance fluency is the set of objectively determined timing, pausing/hesitation, and repair features of the utterance, reflecting the impact of the cognitive fluency on the underlying speech production processes” (p. 49). Additionally, utterance fluency is an important concept as it forms part of the assessment of oral proficiency along with other components such as accuracy and pronunciation. Tavakoli and Skehan (2005) have identified three types of features observable in utterance fluency that include speed fluency involving rate of speech, breakdown fluency entailing disruptions in the flow of speech, and repair fluency that refers to corrections and false starts.

***Measuring utterance fluency.*** Speech fluency may be measured qualitatively or quantitatively. The qualitative measurement of fluency can be carried out either through evaluation scales of oral proficiency (e.g. ACTFL) with a defined set of holistic criteria, or analytic scales (e.g. CEFR), that have identified a set of descriptors for any level of proficiency, used by the speaking assessors to rate different components of speech including fluency (Luoma, 2004). Quantitative measurement of fluency, on the other hand, involves measuring temporal features of speech and

promises a more objective evaluation of the construct. The following two sections will provide an account of both measurement methods.

*Qualitative measurement.* Qualitative measurement of fluency is carried out through holistic scales of oral proficiency or the analytic scales. Holistic scales of oral proficiency provide a set of defined descriptors for each level of proficiency to be used by speaking assessors based on their holistic impression of speech features including fluency, accuracy, and pronunciation. Luoma (2004) maintained that holistic rating involves “an overall impression of an examinee’s ability in one score. The American Council for the Teaching of Foreign Languages (ACTFL) speaking scale is an instance of a holistic scale. Analytic scales, on the other hand, delineate oral performance into several underlying components or criteria like fluency, accuracy, pronunciation, etc., requiring assessors to rate each on a separate scale. Analytic scales “contain a number of criteria, usually 3 - 5, each of which has descriptors at different levels of proficiency. The scale forms a grid, and the examinees usually get a profile of scores, one for each of the criteria” (Luoma, 2004, p. 68). Luoma maintained that there are several advantages to the analytic scales. These scales provide richer and more precise information on the specific strength and weaknesses of the examinee and provide raters with an elaborate guidance, thus making the evaluation easier and more valid. Common European Framework of Reference (CEFR) can be considered an instance of analytic scales for spoken language use. The levels of oral proficiency according to this scale include A1, A2, B1, B2, C1, C2, with A1 as the lowest and C2 as the highest level. The subcomponents of spoken language use include range of grammatical structures, fluency, accuracy, interaction, and coherence. The keywords frequently used in the scale of fluency descriptors include length or stretch of utterances produced, smooth flow, tempo, pauses, false starts, hesitations, and reformulation. Interestingly, many of these key terms which include “interlocutor”, “speaking comprehensibly”, “making himself understood” (Council of Europe, 2001, p. 74), entail the notion of perceived or perceptive fluency discussed

earlier. International English Language Testing System or IELTS also uses an analytic scale where oral language skills are delineated into four components, one of which is fluency and coherence. The most recurring key markers of fluency or dysfluency include repetition, self-correction, hesitations, speaking at length, speech pace, and pauses/length of pauses (British Council, 2016). Unlike the CEFR scale, which was developed based on a perceived fluency framework, IELTS speaking rubrics seem to have originated from a more utterance-based approach.

*Quantitative measurement.* Unlike qualitative measurement approaches, which use a set of defined descriptors for each level, quantitative measurement of fluency offers a more objective approach to measuring the construct. Wood (2001) contended that if we are to define fluency as a distinct aspect of oral proficiency, we will have to focus on temporal variables of speech such as speed, pauses, hesitation, fillers, and so on. Blake (2006) has identified 50 different temporal measures of fluency that are related to quantity, rate, pausing, and language repairs. However, Ginther, Dimova, and Yang (2013) argued that the main temporal measures of fluency commonly used in the literature are measures of quantity, rate, and pause.

Measures of quantity include the length of time the speaker takes to respond or the number of units such as words or syllables. *Total response time* is the total time of the response in seconds and includes speech time (meaningful words spoken) and pause times (silent and filled). *Speech time* includes the time when meaningful utterances and words are produced and excludes all types of pauses. *Phonation time ratio* is speech time divided by the total time of speech sample in seconds. *Total number of syllables* refers to the total number of syllables spoken during the speech sample (Kormos & Dénes, 2004).

Measures of rate involve temporal quantities divided by the number of syllables or words. These include *speech rate* (SR); that is, the total response time including speech time and pause time in seconds divided by the total number of syllables, *articulation rate* (AR); that is, the total speech time

excluding pauses in seconds divided by total number of syllables, and *mean length of run* (MLR), which refers to the total number of syllables spoken in a task divided by the total number of runs/utterances (Kormos & Dénes, 2004).

SR has been referred to as an important marker and the strongest indicator of speech fluency by many researchers (Baker-Smemoe, Dewey, Bown, & Martinsen, 2014; Götz, 2013; Lennon; 1990; Möhle, 1984; Towell, 1987; Wood; 2010). Additionally, it has also been shown through longitudinal studies that speech rate has proven as a measure that demonstrates fluency changes over time (Freed, 1995; Towell, Hawkins & Bazergui, 1996). Cucchiarini, Strik, and Boves (2002) stated that speech rate is an important temporal measure as it considers both measures of rate and pausing. Götz (2013) pointed out that there is a strong relationship between speech rate and other temporal measures like mean length of run and pause time. She noted “the fewer pauses the learner utters and the longer the mean length of runs of their speech is, and the more words they utter per minute” (p. 16).

MLR is not obviously a measure of rate, but more of a measure of density, which represents both “syntactic well-formedness and vocabulary” (Ginther et al., 2013, p. 383). Wood (2010) referred to MLR as a significant indicator of speech fluency, noting that longer and fluent utterances that characterize advanced or native speakers’ speech are indicative of their balance/planning skills, attention, and their greater repertoire of automatized chunks of language that help them to formulate utterances. He further maintains:

In fact, an increasingly skillful blend of automatized chunks of formulaic strings and frameworks of speech, together with newly assembled strings of words, is thought by some to be what enables speakers to produce the longer runs between pauses which distinguish fluency. (p. 30)

It is worth mentioning that MLR has been used in many studies as a robust and reliable indicator of speech fluency (Baker-Smemoe et al., 2014; Lennon, 1990; Möhle, 1984; Rossiter, 2009; Towell; 1987; Towell et al., 1996, Wood, 2010). Götz (2013) contended that MLR is closely interrelated with the speaker's use of formulaic sequences. In other words, she states “the more formulae the learners use, the more processing time they can spend on the formulation of the rest of the utterance and, logically, the longer the speech runs become” (p. 18).

Measures of pausing are also significant when studying fluency. Raupach (1984) noted that “fluency cannot be reduced to speed of delivery and that articulation rate has less impact on our perceptions of fluency than the length, the nature, and the location of pauses in an utterance” (p. 538). Measures of pausing are comprised of *the total pause time* that include the time speaker remains silent for planning, *filled pauses* or *fillers* (e.g. uh, um, etc.), and *mean length of pauses*, that is the total pause time in seconds divided by the *number of pauses, location and length of pauses* (Kormos & Dénes, 2004).

Silent pauses refer to the moments where no meaningful lexical item is spoken. Gut (2009) defined silent pauses as “silence or the occurrence of non-speech acoustic events such as breathing and noise” (p. 80).

Gut (2009) maintained filled pauses consist of “nonlexical fillers such as ‘uh’ and ‘erm’ and elongations of sounds (drawls)” (p. 80). Rochester (1973) argued fillers are used by speakers whenever the speech production apparatus is searching for a word, phrase, or idea. In other words, filled pauses help the speaker think while keeping the attention of the listener (Clark & Fox Tree, 2002), which is what Maclay and Osgood (1959) had referred to as the floor-keeping function. Lennon (1999) believed that filled pauses and repetitions are related to each other and facilitate planning functions. Götz (2013), in her investigation of native and non-native speakers' fluency,

considered filled pauses as words because they are used as fluency-enhancing strategies. She further stated that filled pauses are the most frequently used planning strategy in both native and non-native speech samples.

Even though length of pauses has been the subject of investigation in a number of studies investigating speech fluency (Freed, 1995; Ginther et al., 2010), Götz (2013) argued that this measure is not of a significant importance, citing Cucchiriani et al. (2002) who argued: “less fluent speakers, in general, do not make longer pauses than more fluent speakers, but they do pause more often” (p. 2870). In other words, it is the number of pauses that characterize fluent or dysfluent speech rather than their length. However, among the studies that consider the length of pause as a fluency marker, there has been a controversy over what length of a silence qualifies it as a pause. For instance, Golman-Eisler (1968) argued that breaks of shorter than .25 seconds are not considered a pause, but breaks that are associated with phonetic structures of word or breathing; a statement that was later supported by Fayer and Krasinski (1995). Other researchers have proposed minimum pause cutoffs of .10 (Griffiths, 1991), .20 (Lennon, 1990), and .40 seconds (Freed, 1995). Riggenbach (1991) classified length of pauses into four categories, which include “micropause - a silence of .2 seconds or less, hesitation - a silence of .5 seconds or greater, unfilled pause - a silence of .5 seconds or greater, and filled pause - voiced “fillers” which do not normally contribute additional lexical information” (p. 426).

Location of pauses has also been a focus of fluency research. Dechert (1980) argued that pauses mostly occur at the breaks between what he terms as ‘episodic units’, and believed that pausing by the participant in his case study provided time to search for words and phrases. Lennon (1984) reported that pauses mainly take place at the clause breaks. Wood (2010), through reviewing the literature, concluded that “the location and the clustering of pauses are much stronger indicators of relative fluency than the number or the duration of pauses” (p. 27).

## Cognitive fluency

Even though the term *cognitive fluency* was introduced by Segalowitz (2010), a number of speech production theories had previously highlighted the importance of cognitive processes, dating back, at least, to 1980s. Levelt's (1989) *model of speech production* identified two types of knowledge that operate to produce speech: *declarative* and *procedural*. The declarative knowledge refers to the explicit knowledge of the language (e.g., grammar rules) while the procedural knowledge involves the automatic and unconscious ability of applying the linguistic rules without explicit attention (Segalowitz, 2010). Fluent production of speech entails smooth conversion of declarative to procedural knowledge, which according to the Levelt's model occurs through three stages; including *conceptualization*, *formulation*, and *articulation* (see Figure 5). The conceptualization module is in charge of choosing the content of the message, which is then transmitted to the formulator responsible for syntactic, semantic, and pragmatic planning, and phonetically acceptable forms. The formulation module has access to declarative knowledge and picks the items in the form of *Lemmas* (declarative knowledge in the form of words and grammar) based on the plans. The phonetic plan is finally transmitted to the articulation module for the actual production of speech.

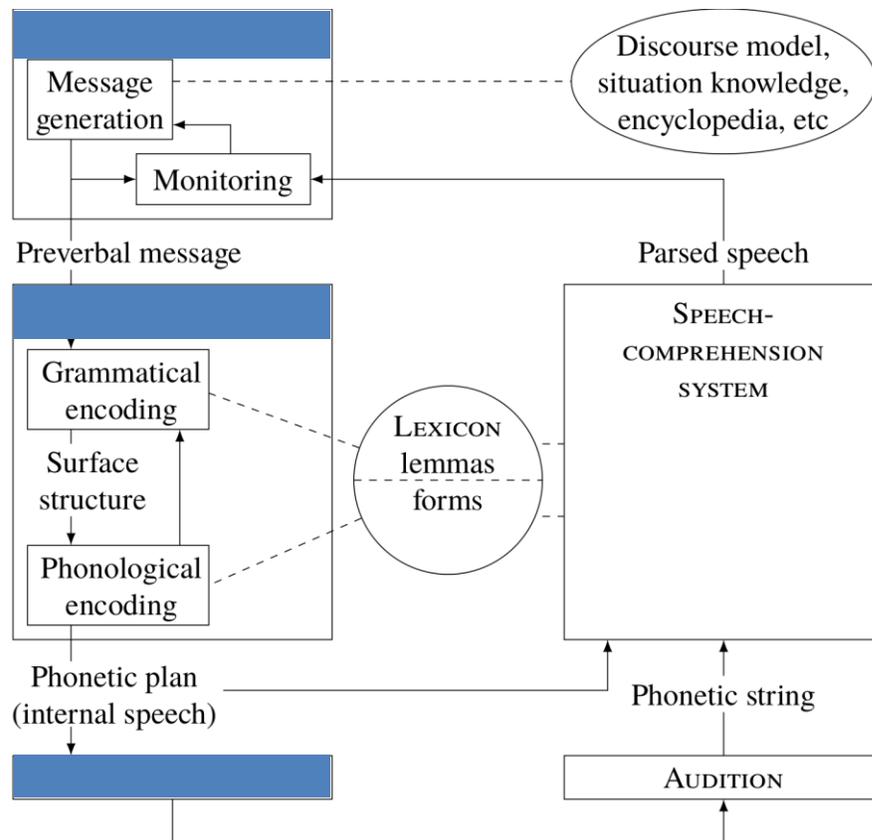


Figure 5. Levelt's model of speech production.

Another speech production theory that is relevant to the study of cognitive fluency is *Logan's (1988) instance theory*, which holds that memory retrieval is key to automatization. Automaticity takes place holistically while items are retrieved from the long-term memory, and as this occurs several times, the retrieval becomes an automatic task, thereby facilitating fluent production of speech. Wood (2010) also referred to the dichotomy of *long-term* and *short-term memory*. Long-term memory is a repository used to store the syntactic and lexical information as well as morphological, phonological and semantic rules, while short-term memory, with a limited storage, is responsible for constructing utterances for production. The longer the utterances, the more demand on the short-term memory and producing fluent speech.

Segalowitz (2010) provided an interesting overview of the research conducted on cognitive bases of fluency by reviewing the definitions of fluency proposed by Goldman-Eisler (1951, 1961, 1968), Rehbein (1987), and Meisel (1987). Goldman-Eisler (1951) pioneered the notion that temporal phenomena of speech fluency are influenced by cognitive mechanisms. For Rehbein (1987), being fluent meant that the “activities of planning and uttering can be executed nearly simultaneously by the speaker of the language”, which implies automatization and entails some cognitive processing (p. 104). Meisel (1987) stressed the communicative acceptability of the speech act by the interlocutor. Putting all these together, Segalowitz (2010, 2016) introduced the term cognitive fluency and defined it as “the speaker’s ability to efficiently mobilize and integrate the underlying cognitive processes responsible for producing utterances with the characteristics that they have” (Segalowitz, 2010, p. 48). He noted:

This process involves mobilizing the mechanisms for planning the utterance, for lexical search, for packaging the information into a grammatically appropriate form, for generating an articulatory script for speaking the utterance, etc. It also involves integrating all of these processes in a way that minimizes inefficient processing, reduces or eliminates internal sources of interference and crosstalk that could disrupt the fluidity and evenness of production over time (p. 48).

***Measures of cognitive fluency.*** Cognitive fluency may not be as simple as utterance fluency to empirically observe and measure. Focusing on L2 fluency, Segalowitz and Freed (2004) measured cognitive variables of fluency including speed and efficiency of lexical access and attention control. To collect data on lexical access, participants were presented with lexical items and were asked to make speeded forced-choice judgments about whether the words referred to living or non-living entities. They were required to make a choice by clicking on a computer mouse and their reaction

time and accuracy were recorded. To measure the attention control, the researchers had the participants make speeded responses to indicate which of the three words on the computer screen matched a sample stimulus and their reaction time was measured in milliseconds. Of lexical access speed, lexical access efficiency, attention control speed, and attention control efficiency, Segalowitz and Freed (2004) found that both lexical access speed and lexical access efficiency were positively correlated with fluency, suggesting higher fluency when lexical items were accessed faster and more efficiently. However, there was a negative correlation between fluency and the attention control measures, meaning speech rate was negatively influenced when participants had high degrees of attention control over different aspects of speaking. They also concluded that gains in attention control entailed gains in ability to self-monitor speech, which might focus the interlocutor's attention to form and accuracy and thus lower their fluency or their tendency to speak faster.

### **Fluency, WTC, and Complex Dynamic Systems**

As discussed earlier, the literature specifically looking into the interaction between WTC and fluency is rather limited. Here, two relevant studies will be reviewed. Wood (2016) used the idiodynamic method to investigate the interaction between WTC and L2 speech fluency with four intermediate-level ESL students. Participants engaged in a monologic picture description task while being videotaped. Participants then viewed their recordings and rated their WTC moment by moment. The final step involved a stimulated recall task, where the researcher looked into factors that had triggered shifts in WTC. The researcher made quantitative analysis of the temporal measures of speech (e.g. speech rate, mean length of runs, etc.), some of which were then analysed in relation to the corresponding self-ratings of WTC. Wood drew on MacIntyre's (2012b) concept of *wave* to explain the concepts of change and variability in WTC.

Having reported four types of influence, including 1) high fluency leading to high WTC, 2) low fluency leading to low WTC, 3) high WTC leading to high fluency, and 4) low WTC leading to low fluency, Wood concluded that the key properties of CDS characterise WTC and the interaction between WTC and fluency is complex and dynamic as a result of different cognitive, affective, and linguistic factors. More specifically, the participants in this study demonstrated dynamic levels of WTC as it was influenced by factors including cognitive skills of speech production (e.g., item retrieval), linguistic competence (e.g., vocabulary and uncertainty about accuracy), and affective state (e.g., negative self-assessment, or anxiety). The cognitive, affective, and linguistic variables, as subsystems of WTC, were found to influence one another, causing perturbations to the system (WTC), demonstrating the system's interconnectedness as a key principle of dynamic systems.

Wood demonstrated that WTC dropped when a participant did not receive positive feedback from their interlocutor, or in other instances, low WTC was caused by feeling uncertain about grammatical accuracy, or failure to retrieve a lexical item, which turned out to be a common reason for lowered WTC in this study. By the same token, one of the participant's WTC improved when he managed to communicate what he meant and perceived his lexical items as being appropriate. Wood also reported cases where drops in WTC lasted until subsequent utterances were produced by the participants, hinting at the dependence on initial conditions property of CDS. In addition, interconnectedness among the underlying layers of speech production including linguistic knowledge, cognitive processing capacities, and affective factors were observed to improve or lower WTC.

Nematizadeh and Wood (2019), in an article which served as a pilot-study to the present project, looked at the cognitive and affective dynamics of WTC in interaction with temporal measures of speech, drawing on Segalowitz's (2010) dynamically-informed framework of fluency, which accounts for interactions among a number of influences, including WTC. This study also

employed the idiodynamic method with a qualitative component to monitor WTC shifts during a communication task with four participants.

The researchers were able to observe the moment-by-moment interaction between affect and cognition. Self-ratings of WTC and qualitative analysis of the location of fluent runs demonstrated how these two are constantly interacting with each other. In many cases, when cognitive processing such as vocabulary or grammar structure retrieval took place successfully, speakers were able to maintain a normal flow of speech, which improved their WTC and their motivation to carry on fluently determined subsequent fluent utterances. On the other hand, participants' decreased level of WTC because of unsuccessful cognitive processing partly troubled the production of fluent speech, leading to pauses or short/broken utterances.

The findings of the study were also interpreted through a dynamic systems perspective, demonstrating how this interaction retains features of CDS. The participants' self-ratings of their WTC consistently demonstrated the shifting and dynamic nature of the construct, mainly occurring as a result of the participants' constant self-monitoring of speech. The ongoing interactions between the cognitive, affective, and linguistic systems that shaped WTC during communications not only demonstrated the interconnectedness feature of CDS, but was a main reason for the fluctuations of WTC. The formation of attractor states was observed in the data of one of the participants when discussing her daily personal experience. More specifically, possessing supporting ideas was among the main reasons rendering the participant willing to talk.

Overall, this literature review has provided an overview of the dynamic WTC research, reviewed the concepts of utterance and cognitive fluency, and surveyed the limited body of research that has investigated L2 fluency and WTC in connection with each other. It appears that the social

and cognitive dimensions of both constructs, as suggested by Segalowitz (2010), may be the links that connect them. A quotation from Segalowitz (2016) succinctly states this:

If learners' cognitive and social experiences result in increased motivation to communicate, then they will engage in more L2 use, creating a positive feedback loop in the cognitive-perceptual processing system that enhances cognitive fluency, leading to improved utterance fluency and more successful L2 encounters (Segalowitz, 2016, p. 91).

## Chapter 4: Method

### Chapter Overview

This chapter provides a detailed account of the method used to address the inquiry questions. After quickly reintroducing the four research questions, the research design and a discussion of the rationale behind it will be presented. An overview of the pilot-study that informed this project will be provided along with a quick recapitulation of the idiodynamic methodology. Next, participants and the participant recruitment process will be described. Instruments, data collection stages and procedures, and data analysis will follow at the end.

### Reviewing Research Questions

In discussing the method, it is important to reintroduce the four inquiry questions that guided this research:

1. How do WTC and L2 fluent speech interact with each other on mostly monologic picture description tasks?
2. How do WTC and dysfluent speech interact with each other on mostly monologic picture description tasks?
3. What attributes (e.g., cognitive, linguistics, etc.) might influence the interaction between WTC and L2 fluency?
4. How does the theory of complex dynamic systems account for the interaction between WTC and fluency?

The first question, which looks into the interactions between WTC and L2 fluent speech, motivated this undertaking and formed the basis of the research. While the small-scale pilot study has offered some insights into the possible patterns of interactions, there is certainly a need for a larger-scale and more detailed investigations into the nature of the interaction as well as the determining factors affecting it. For instance, it is known that fluent speech may coincide with a high

WTC, or dysfluent speech with a low WTC (Nematizadeh & Wood, 2019), however, whether the cooccurrence is random or systematic remains to be explored.

Questions two and three arose during the pilot study. For one thing, it was observed that participants would lose WTC due to self-perceived dysfluency; however, the limited amount of data made it hard to conclude if there was a direct interaction between the two variables or an indirect one, for example through a shared cognitive or affective factor. A larger amount of data was needed in order to observe this.

Additionally, while the pilot-study investigated the cognitive and affective dynamics, it soon became evident that the factors underlying this interaction extended beyond cognition and affect. For example, linguistic factors such as lexical and grammar knowledge or contextual factors such as interviewer or topic were found to affect WTC. This finding motivated the present study to delve further into the nature of this interaction.

The fourth research question arose from studies by MacIntyre and Legatto (2011), Wood (2016), and Nematizadeh and Wood (2019), which opted to view WTC as a complex dynamic system. Despite the fact that these studies observed dynamicity and complexity in the WTC system, the inadequacy of data associated with them remains to be addressed.

### **Exploratory Qualitative Design**

This study, as indicated earlier, draws on CDST as a conceptual framework and is designed around the notion that phenomena are subject to change over time. Therefore, it was essential for the design to be dynamically informed and carry the potential of monitoring change. Since the application of CDST to SLA research is still in its infancy, and given the scarce literature looking into WTC or L2 fluency, this study adopted an exploratory qualitative research design. Stebbins (2001)

argued that “researchers explore when they have little or no scientific knowledge about the group, process, activity, or situation they want to examine but nevertheless have reason to believe it contains elements worth discovering”. Despite the fact that WTC studies employing a dynamically-informed design are few in number, they have added some pieces to the puzzle and demonstrated that this avenue is worth exploring further. The research design was therefore guided by the efforts to consider such dynamicity.

### **Qualitative component**

This study has a strong qualitative component. Marshal and Rossman (2016) identify 12 qualitative research types that justify the use of a qualitative design and here I refer to those mostly pertinent to my study. They argue that a qualitative design is justified if research “elicits tacit knowledge and subjective understandings and interpretations” (p. 100). For instance, while there are a few studies that have looked into L2 speakers’ WTC changes, the small number of participants and limited datasets have most likely constrained the researchers’ and L2 learners’ perceptions of the factors as well as the processes that bring about change in WTC (MacInyre & Legatto, 2011; Nematizadeh & Wood, 2019). Another reason to undertake qualitative research is to “delve in depth into complexities and processes” (Marshal & Rossman, 2016, p. 100). As indicated, this study draws on CDST, at the heart of which is an interest in explaining the complexity of processes and how multiple processes interact and cooperate. This will be facilitated through a qualitative design. Qualitative studies are also used wherever research “cannot be done experimentally for practical reasons” (Marshal & Rossman, 2016, p. 100). While qualitative studies typically examine phenomena in authentic contexts (Cresswell, 2014; Marshall & Rossman, 2016), I chose a laboratory-based design for practicality purposes. Data collection procedures in this study involve the use of a computer application that requires video-recording participants and engaging with them in a stimulated recall

procedure. Using the application, recording participants in real-life contexts, and engaging them in a retrospective process of recalling the processes were believed to be practically (and ethically) challenging, if not impossible. Additionally, to achieve a unified understanding of the factors shaping WTC, I needed to simulate controlled data collection conditions that would engage participants in fairly similar communicative events so as to make repeated observations of the same factors and processes. Monitoring a communicative variable with varying participants in authentic communicative contexts would have added to the complexity of the investigation, thus I needed to control for the context. Lastly, Marshal and Rossman (2016) argued that qualitative design is used in research that “seeks to understand experience”. (p. 100). This study conducts interviews to engage participants in explaining mental processes and perceptions; a mental image of the experienced processes that become complex when influenced by multiple internal (e.g., linguistic, affective, cognitive) and external (e.g., contextual) factors.

### **Use of numbers**

This study mainly presents descriptive statistics, including the temporal measures of speech (e.g., SR and MLR), and the frequency of the patterns of interaction between WTC and fluency, numerical information concerning the variables influencing WTC, and dynamic WTC means and standard deviations, to better present the data. While the WTC variable was mainly a subject of qualitative investigation, descriptive statistics were used to report the frequencies of the emerging factors. L2 fluency was firstly analysed quantitatively, which involved computing the temporal measures of speech such as SR and MLR. The temporal measures were used to distinguish fluent and dysfluent speech and informed the interpretation of WTC changes.

## **Overview of the Pilot Study Method**

The data collection for the pilot study took place in January, 2016. The study investigated the cognitive and affective dynamics between WTC and L2 fluency, using the idiodynamic methodology. Four ESL participants with highly similar demographics (age, L1, & proficiency level, education level, exposure degree to English, length of residence in Canada) participated in a data collection session wherein they performed a one-minute picture-description task. The tasks were video-recorded and viewed immediately after by the participants, who rated their WTC using the idiodynamic method and explained their WTC shifts in a stimulated recall procedure. WTC fluctuations were examined case by case against the temporal measures of speech and a number of patterns emerged. It was concluded that the two variables interact and influence each other in positive and negative ways. Self-monitoring of speech and vocabulary retrieval were found to influence this interaction the most.

While the pilot study offered certain insights about the interactions between WTC and L2 fluency, it was found that a single dataset might fall short of providing adequate evidence with respect to additional factors that might trigger and shape the dynamics between the two variables. In addition, the limited number of participants was another limitation that made it difficult to draw definitive generalizations.

### **Idiodynamic methodology**

The idiodynamic method, firstly introduced and employed in L2 research by MacIntyre and Legatto (2011), was devised on the basis of CDST and its prime focus on the phenomenon of change. Through this method, a participant is firstly audio or video-recorded during a communication task. The recording is then played back immediately to the participant to assist them in recalling their thoughts while the communication was taking place and rate a communication



## **Participants**

This section will present participant-relevant information concerning the current project, including ethics clearance, sampling, recruitment, and demographics.

### **Ethics clearance**

This study was reviewed and approved by Carleton University and the University of Ottawa Research Ethics Boards (REB) on August 24, 2017 and September 25, 2017, respectively (Appendices A & B). The approval was granted to conduct research with, video-record, and interview human participants.

### **Participant recruitment**

A cloud-based instant messaging application, called Telegram, was used to identify and recruit participants. A participant recruitment message (see Appendix C), including the inclusion criteria, was posted in a Telegram channel that hosts Iranian members in Ottawa. Interested applicants sent private messages to me for further information, after which I communicated more details and confirmed whether or not they met the study criteria. Once confirmed, participants received an email (see Appendix D) with details on the study, its objectives, variables under investigation, types of data that were to be collected, data collection procedure, and compensation. Participants were asked to reply to the email and express interest in writing. Once they did so, sessions were scheduled and communicated to them. Participants who participated in all the data collection sessions received a compensation of \$80.

***Sampling.*** A non-random purposive technique (Dörnyei, 2007; Mackey & Gass, 2005) was employed to select the participants. This is a non-probability sample strategy that requires the

participants to possess certain characteristics based on the objectives set by the research. A purposive sampling technique was employed mainly because it was assumed to yield information-rich cases (Patton, 2011). Also, such a strategy would allow selection of participants who 1) can make themselves available, 2) are willing to participate, and most importantly, 3) are capable of communicating their experiences and opinions in a reflective, expressive, and articulate manner (Bernard, 2006; Spradley, 1979). Below, an account of the inclusion criteria will be provided.

***Inclusion criteria.*** 45 participants expressed interest in participating in the study, 20 of whom (11 males & 9 females) qualified, based on five criteria, including age range, L1, length of exposure to English in English-speaking countries, field of study, and language proficiency test scores (IELTS<sup>1</sup> or TOEFL<sup>2</sup>), to control for the influence of extraneous variables. All participants were between 25 to 32 years of age, spoke Farsi/Persian as their first language (L1) and English as L2, had lived in Canada for a period of six months to a year, were graduate students of an engineering program, and had scored between 6 and 7 on the IELTS speaking 1-9 scale, or an equivalent score on a different proficiency test during the year prior to the data collection.

Access to an age range of 25 to 32 was perceived to be convenient since this is the age most of the Iranian students choose to pursue studies at a graduate level in Canada. Given that differing age ranges mean differing levels of exposure to English, selecting a specific age group allowed for a homogenous participant group and offered a more focused study of one single group rather than with participants of multiple age groups. Therefore, participants were only asked if they were between 25 and 32, and an affirmative response qualified them as potential research participants. Regarding L1, participants who shared my first language were recruited since it was assumed that

---

<sup>1</sup> International English Language Testing System

<sup>2</sup> Test of English as a Foreign Language

communication of certain abstract concepts in English as their L2 especially during interviews would be a challenge and might influence their expression of thoughts. Exposure to L2 has also been proved to influence WTC (Chang, 2018); therefore, this study recruited participants with fairly similar length and type of exposure to English. So, the participants were first-year students of their programs and had daily interactions in English while attending courses or with their supervisors. This study chose to recruit participants with homogeneous L2 competence since perceived competence is believed to lower communication anxiety (Khajavy et al., 2016) and predict WTC (MacIntyre & Charos, 1996). Therefore, it was assumed that heterogeneity in participants' L2 proficiency would have an impact on the validity of data.

### **Demographics of the participants**

What follows is a detailed account of the general information collected concerning the participants. Each participant was assigned a pseudonym. A summary of the participants' demographics is also provided in Table 2.

***Niki***. She was doing a Ph.D. in electrical engineering at the time of this study, had lived in Canada for almost a year, and had received an overall score of 7 in the IELTS, with a 7-band score in the speaking component.

***Pouya***. He was doing a Ph.D. in health science, had lived in Canada for seven months, and had received an overall score of 6 in the IELTS, with a 6-band score in the speaking component.

***Linda***. She was doing a Ph.D. in electrical engineering at the time of this study, had lived in Canada for almost a year, and had received an overall score of 96 (from 120) in the TOEFL, with a score of 21 (6.5 in IELTS) in the speaking component.

**Sara.** She was doing a master's in environmental engineering, had lived in Canada for just less than a year, and had received an overall score of 6.5 in the IELTS, with a 6.5 band score in the speaking component.

**Majid.** He was doing a master's in technology innovation, had lived in Canada for almost a year, and had received an overall score of 6.5 in the IELTS, with a 6.5 band score in the speaking component.

**Pedi.** He was doing a master's in environmental engineering, had lived in Canada for seven months, and had received an overall score of 6.5 in the IELTS, with a 6.5 band score in the speaking component.

**Samaneh.** She was doing a Ph.D. in civil engineering, had lived in Canada for nine months, and had received an overall score of 6.5 in the IELTS, with a 7-band score in the speaking component.

**Mohsen.** He was doing a master's in computer engineering, had lived in Canada for a year, and had received an overall score of 7 in the IELTS, with a 6.5 band score in the speaking component.

**Saba.** She was doing a Ph.D. in mechanical engineering, had lived in Canada for a year, and had received an overall score of 100 in the TOEFL, with a score of 23 (7 in IELTS) in the speaking component.

**Lili.** She was doing a Ph.D. in chemical engineering, had lived in Canada for almost 6 months, and had received an overall score of 7 in the IELTS, with a 7-band score in the speaking component.

**Mo.** He was doing a Ph.D. in mechanical engineering, had lived in Canada for almost a year, and had received an overall score of 7 in the IELTS, with a 7-band score in the speaking component.

**Sahra.** She was doing a master's in computer science, had lived in Canada for almost a year, and had received an overall score of 7 in the IELTS, with a 7-band score in the speaking component.

**Hero.** He was doing a master's in computer science, had lived in Canada for a year, and had received an overall score of 86 in the TOEFL, with a score of 22 (6.5 in IELTS) in the speaking component.

**Sepehr.** He was doing a master's in mechanical engineering, had lived in Canada for almost nine months, and had received an overall score of 6.5 in the IELTS, with a 7-band score in the speaking component.

**William.** He was doing a master's in technology innovation, had lived in Canada for seven months, and had received an overall score of 6.5 in the IELTS, with a 6.5 band score in the speaking component.

**Anita.** She was doing a master's in sustainable and renewable energy engineering, had lived in Canada for almost 6 months, and had received an overall score of 6.5 in the IELTS, with a 6.5 band score in the speaking component.

**Soha.** She was doing a master's in computer engineering, had lived in Canada for nearly 6 months, and had received an overall score of 7 in the IELTS, with a 7-band score in the speaking component.

**Mehrzad.** He was doing a Ph.D. in electrical engineering, had lived in Canada for almost 6.5 months, and had received an overall score of 6 in the IELTS, with a 6-band score in the speaking component.

**Akbar.** He was doing a master's in system science, had lived in Canada for almost 8 months, and had received an overall score of 97 in the TOEFL (6.5 in IELTS), with a score of 22 (6.5 in IELTS) in the speaking component.

**Kaami.** He was doing a master's in system science, had lived in Canada for a year, and had received an overall score of 94 in the TOEFL (7 in IELTS), with a score of 22 (6.5 in IELTS) in the speaking component.

Table 2.  
*Demographics of the Participants*

Participants' Pseudonyms	Gender	IELTS or equivalent speaking score (1-9)	Length of residence in months	Field of Study	Degree
Niki	F	7	App. 12	Electrical eng.	PhD
Pouya	M	6	7	Health science	PhD
Linda	F	6.5	App. 12	Electrical eng.	PhD
Sara	F	6.5	Less than 12	Environmental eng.	Master's
Majid	M	6.5	App. 12	Technology innovation	Master's
Pedi	M	6.5	7	Environmental eng.	Master's
Samaneh	F	7	9	Civil eng.	PhD
Mohsen	M	6.5	App. 12	Computer eng.	Master's
Saba	F	7	App. 12	Mechanical eng.	PhD
Lili	F	7	6	Chemical eng.	Master's
Mo	M	7	App. 12	Mechanical eng.	PhD
Sahra	F	7	App. 12	Computer science	Master's
Hero	M	6.5	App. 12	Computer science	Master's
Sepehr	M	7	9	Mechanical eng.	Master's
William	M	6.5	7	Technology innovation	Master's
Anita	F	6.5	6	Sustainable energy	Master's
Soha	F	7	6	Computer eng.	Master's
Mehrzaad	M	6	6.5	Electrical eng.	PhD
Akbar	M	6.5	8	System science	Master's
Kaami	M	6.5	App. 12	System science	Master's

## **Instruments**

### **WTC questionnaire**

A Likert-type questionnaire by MacIntyre, Baker, Clément, and Conrod (2001) was used in this study. This questionnaire contains 54 items that elicits information about a respondent's WTC inside and outside L2 classroom. The questionnaire uses a scale of 1-5 for degrees of WTC, with 1 indicating 'almost never willing' and 5 'almost always willing'. The questionnaire was completed by each participant in the first session. The results of the questionnaire were not directly used in the data analysis; however, responding to 54 items relating to WTC was believed to enhance participants' understanding of the WTC as the variable they would be rating throughout the sessions.

### **Praat**

Praat, which was used for the purpose of measuring temporal features of speech, is an open-source acoustic and speech analysis computer application and was used to convert audio recording into spectrograms. When an audio recording is loaded in Praat, a feature called *Annotate to Textgrid* illustrates a waveform of the dynamics of wave and silences with their respective time and waves' amplitude. This feature also creates and labels the intervals as 'sounding' or 'silent'. A query function in Praat allows a researcher to count the number of such intervals. Praat does not directly measure the temporal features of speech fluency and requires specific external scripts written for that purpose.

### **NVivo 12**

NVivo is a qualitative data analysis application that is used when researchers are working with mainly textual data. In this study, the application facilitated the creation and integration of

codes/factors that influenced WTC, as indicated by the participants in the stimulated recall interviews.

### **Notebook**

The data collection of this study including video-recording, replays, use of the idiodynamic application, and screen captures were performed using an HP Stream notebook.

### **Procedure**

#### **Topic Selection**

The important role of topic has been well established in the WTC literature. For instance, MacIntyre and Legatto's (2011) study demonstrated how topics triggered shifts in WTC across communicative tasks. Likewise, quite a few other studies have found a topic and topic familiarity effect on L2 speakers' WTC (Kang, 2005; Mystkowska-Wiertelak & Pawlak, 2014; Nematizadeh & Wood, 2019; Pawlak & Mystkowska-Wiertelak, 2015). Therefore, a questionnaire was employed to homogenize topics for the purpose of minimizing the effect of participants' background knowledge of the topics on their performance. To this end, prior to the data collection, four homogenous topics were identified (out of a total of 10) using a background questionnaire (Appendix F) that was constructed and validated by Khabbazbashi (2017). The questionnaire was completed by 20 Persian respondents who were not the actual participants of this study but shared most of the participant characteristics required by the study. This Likert-style questionnaire contains eight items that elicit information about the participants' interest, familiarity, background knowledge, and lexical knowledge of the topics. The initial ten topics included shopping, hobbies and free time activities, foods, online vs. on-campus education, crime and security, art, advertisement, transportation and

travel problems, jobs and lifetime careers, and technology. Each response was assigned a number: strongly agree was assigned +1, agree +.5, disagree -.5, and strongly disagree -1. The respondents' responses to all the items were totalled and averaged, then four topics with the closest ratings were selected. The selected topics included foods, online vs. on-campus education, technology, and transportation/travel problems.

### **Picture description monologic tasks**

This study employed picture description monologic tasks for a number of reasons since the type of speech elicitation tasks is believed to affect both speech fluency (Derwing, Rossiter, Munro, & Thomson, 2004) and WTC (Mystkowska-Wiertelak & Pawlak, 2014). Fluency literature has typically used four types of speech elicitation tasks, namely read-aloud, picture description, story-telling, and spontaneous speech sample (Segalowitz, 2010). Read aloud tasks would not have retained the communicative nature of a task examining a communication variable. The story-telling tasks would have put additional memory demand on the participants, as they are required to listen to a recording and engage in a recall task, which involves retrieving non-linguistic information (Segalowitz, 2010). The spontaneous speech tasks would have been ideal tasks because of high ecological validity; however, there were two challenges: firstly, I would have no control over what the speakers would choose to say and which direction they would choose to take the discussion. Secondly, in the context of this study, analysis of the temporal measures of speech would have been a challenge with dialogic speech samples. More specifically, I would have had to tear apart the speech samples and pick the chunks produced by the participants. However, picture descriptions, as a classic means of speech elicitation (D. Wood, personal communication, June 18, 2019), seemed to present less of a challenge. For one thing, since they are mainly monologic and contain little interference of a second interlocutor, measuring the temporal features of speech can be performed with better

precision. Another advantage, as indicated by Segalowitz, would be its capacity of potentially constraining what the participants talk about without making an unnecessary memory demand on the participants as story-retelling tasks would. Given this unpredictability, picture descriptions ensured all participants would undergo fairly similar processes of speech planning and production. Furthermore, previous research has demonstrated WTC changes attributed to lexical retrieval (MacIntyre & Legatto, 2011; Wood, 2016) and struggling for supporting ideas/arguments (Nematizadeh & Wood, 2019; Pawlak, Mystkowska-Wiertelak, & Bielak, 2015). To ensure this study would add more pieces to the puzzle, relevant words, images, and thought-provoking questions were gathered on a sheet (see Appendix E) for each topic and supplied to the participants to assist them with generating ideas or retrieving words, which is consistent with previous literature (MacIntyre & Serroul, 2015).

### **Rationale for using a repeated measures design**

Examining the dynamics of WTC can involve macro or micro timescales. By micro, I mainly refer to changes on shorter time-scales, such as seconds and minutes. Given that the majority of dynamic WTC research has adopted a micro perspective, this study aimed to bridge this gap by making observations of WTC across longer time-scales. Another orientation in the literature pertains to the use of single data collection sessions (see MacIntyre & Legatto, 2011, Nematizadeh & Wood, 2019; Wood, 2016). While these studies have certainly contributed to our understanding of the variable, their conclusions have been made based on a very small body of evidence. Therefore, a repeated measures design was selected, not for its traditional quantitative purpose of observing progress or change over time, but to allow for observation of the dynamics between WTC and L2 fluency on micro and macro timescales and across different topics.

## Data collection

The data collection took place at the libraries of the two universities. Four individual sessions, with approximate intervals of two to three days, were scheduled with each participant over a two-week period. During the first sessions, participants received a short introduction to the research and the variables under investigation (WTC and L2 fluency) in Persian to ensure consent before they read and signed the consent forms. Participants were also verbally provided with the MacIntyre et al.'s (1998) definition of WTC and Wood's (2010) definition of speech fluency to ensure a clear understanding of the variables, and were then asked to complete the WTC questionnaire, knowing they were able to ask for clarifications or skip items they did not feel comfortable responding to. Here is the step-by-step procedure that was followed every session. A visual is also provided in Figure 8 illustrating the steps:

1. Participants were given a set of pictures to describe about a topic, a list of guiding questions, and a list of relevant vocabulary to the topic. Participants were also given a minute to prepare.
2. They described the sets of pictures for approximately three minutes while being video recorded.
3. They viewed their recorded video once or twice depending on how comfortable they were rating their WTC. It should be mentioned that all the participants were given a chance or two to experiment with the idiodynamic application only the first time they used it; the results of this step were, however, discarded.
4. Once they felt ready, they rated their WTC while viewing the video-recording. This step was screen-captured to facilitate the subsequent analysis. The application also generated a bitmap graph that illustrated the WTC shifts.
5. Using the captured bitmap graph and the scree-captured video-recordings, the participants and I engaged in a stimulated recall task in mother tongue (Persian) (Gass & Mackey, 2007), in which we discussed the reasons that had triggered the shifts.

Whenever clicks were observed on recorded screen captures or significant rises or falls of WTC were illustrated on bitmap graphs, I would pause the recording and ask for explanations. I mainly began with asking: “what happened to your WTC here?”. This phase was also screen captured for easier mapping of data sources. Whenever explanations were not clear, I would ask them to provide more details or clarifications.

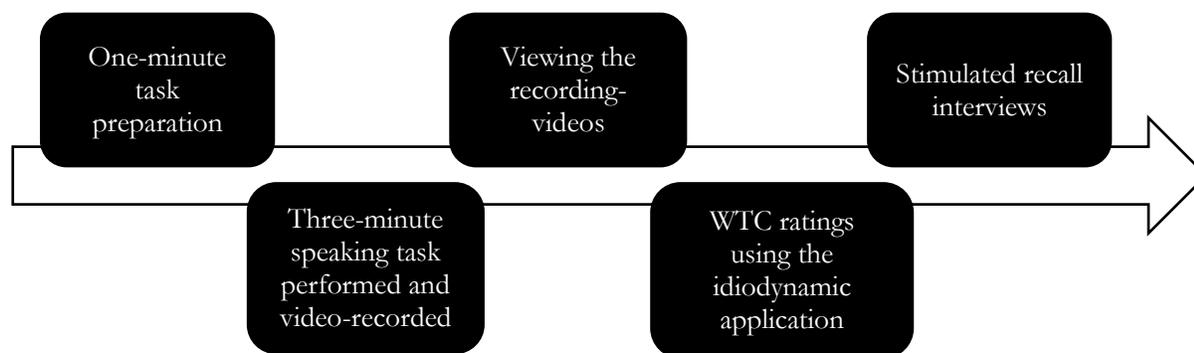


Figure 8. Data collection procedure.

## Data Analysis

What follows is a detailed account of how the collected data were analysed. The analysis took place in five different stages over a two-year period. This study used long runs (LRs) - or runs that exceeded the MLR for each task as the fluency units of analysis, which is consistent with the pilot research (Nematizadeh & Wood, 2019). The WTC shifts, illustrated through the bitmap graphs, were used as the WTC unit of analysis, which is also consistent with previous research (MacIntyre & Legatto, 2011; Wood, 2016).

### Stage 1

Part of the data analysis was performed during the stimulated recall interviews. More specifically, some initial coding was done and field notes, mainly including codes attributed to reasons or factors causing shifts to WTC along with the exact timing in seconds, were taken. This

proved to be a very handy source when cross-checking final *in vivo* codes in stage 2. Another source of codes was available from the pilot study that had produced a list of codes of the factors/reasons causing shifts to WTC, which was used as a so-called *codebook* (Saldaña, 2013), and informed the emerging codes in the subsequent stage. These codes included relevant educational background, discussing personal experience or interest, topic familiarity/transitions, hesitating between ideas, idea retrieval, lexical knowledge/retrieval/repetitions, inaccurate language, self-monitoring speech, perception of dysfluency, jotted-down notes, and access to picture prompts. Access to this code list significantly facilitated the final coding in NVivo.

## Stage 2

The codebook of the pilot study was assumed to have revealed limited insight into the codes' variety, and a longer list of codes was expected to emerge from the larger datasets of the present study. Therefore, the stimulated recall interviews of five randomly selected participants were transcribed verbatim (Appendix I)<sup>1</sup>, translated into English literally, and *in vivo* coded. *In vivo* coding is defined as “the terms used by [participants] themselves” (Strauss, 1987, p. 33). Datasets of the five participants (20 sessions/25% of the entire data) were believed to represent and produce the codes that would have emerged out of the remaining datasets. At this point, with 31 sub-themes categorized into seven themes, a point of saturation was achieved. Saturation, in the context of qualitative research is defined as a point where “no new information seems to emerge during coding, that is, when no new properties, dimensions, conditions, actions/interactions, or consequences are seen in the data” (Strauss & Corbin, 1998, p. 136). At this stage, cases of already identified codes were repeating themselves and no new codes were being identified.

---

<sup>1</sup> Appendix I provides the sample transcripts and translations of one of the participants. The rest of the transcripts are all available upon request.

### Stage 3

This stage, which took place in many phases, mainly involved measuring the temporal features of speech and aimed to partly address the first and the second research questions. A summary of this stage is provided in Figure 9. Firstly, the three-minute tasks were converted to audios and transcribed. Then, the number of syllables was measured using an online syllable counter ([www.syllablecounter.net](http://www.syllablecounter.net)). The total response time was divided by the number of syllables, outputting the speech rate (SR). The other temporal features were measured using Praat. To do that, the recorded samples were inserted into the application and annotated utterance by utterance, which is defined as any run between two pauses. Silent pauses longer than 0.25 seconds (Goldman-Eisler, 1968; Fayer & Krasinski, 1995) were automatically detected through a Praat function called *Annotate to TextGrid* (Silences). Filled pauses were manually identified and labelled as FP. As illustrated in Figure 10, the red highlights represent a spoken run, the green an FP, and the blue a silent pause. A script<sup>1</sup> written for Praat by Mietta Lennes, a scholar at the Department of Modern Languages at the University of Helsinki, was used to output the calculated total duration of the intervals including spoken runs, silent pauses, and FPs. What the script does specifically is read the entire duration of the intervals and present them altogether in a text file, which I copy-pasted into MS Excel. In Excel, I was able to separate the spoken runs, silent pauses, and FPs along with their respective durations, and then calculate the number, the durations of each interval, and the total duration of each type of interval, as illustrated in Figure 11. All the available numerical values along with some basic Excel formula allowed for making precise calculations of the temporal measures of speech, which are presented in Table 2 along with a recap of the definitions (Kormos & Dénes, 2004; Wood, 2010). MLR was the main fluency unit of analysis in this study and SR was sometimes used to inform the

---

<sup>1</sup> [http://phonetics.linguistics.ucla.edu/facilities/acoustic/calculate\\_segment\\_durations.txt](http://phonetics.linguistics.ucla.edu/facilities/acoustic/calculate_segment_durations.txt)

interpretations. Additionally, access to other temporal measures helped provide a more comprehensive picture of every participant's overall fluency.

Table 3.  
*Calculated Temporal Measures of Speech*

Temporal Measures	Definition
Total number of intervals	Including runs, silent, & filled pauses
Total speech time	In seconds
Number of runs	Speech intervals
Total pause time	Totaled silent time in a task in seconds
Number of silences	Number of silent intervals
Total FP length	Totaled filled pause intervals in a task in seconds
Number of FPs	Number of filled pauses in a task
Speech rate (SR)	No. of Syllables divided by the total response time in seconds
Articulation rate (AR)	No. of Syllables divided by speech time in seconds
Mean length of runs (MLR)	No. of syllables divided by number of runs

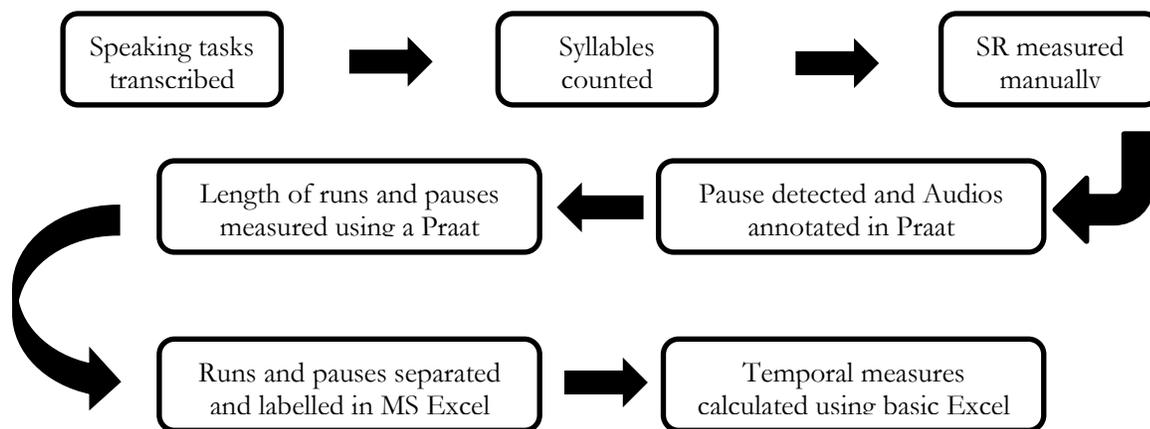


Figure 9. Procedure for calculating the temporal measures of speech.

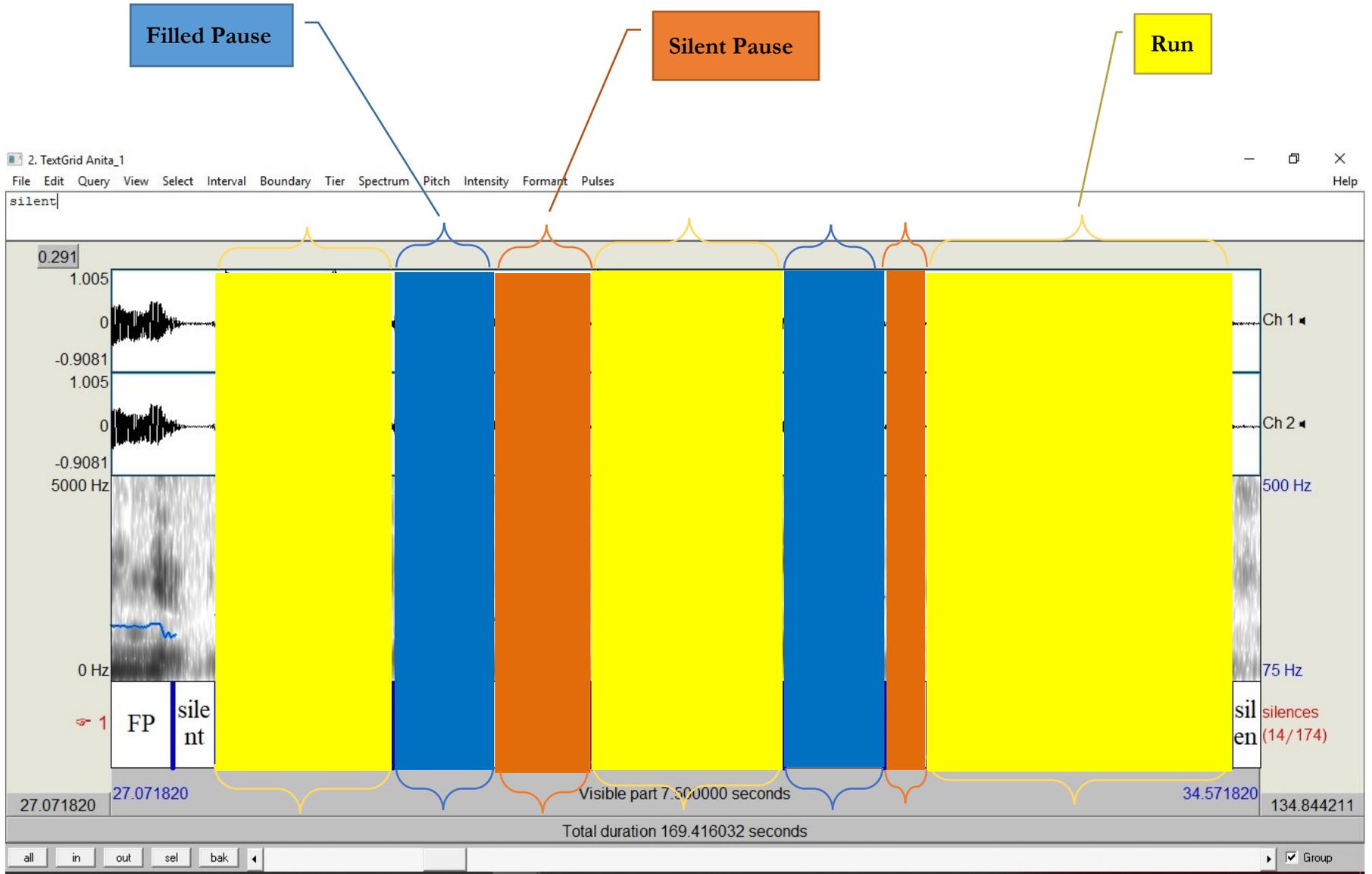


Figure 10. Praat spectrogram.

	C	D	E	F
25	usually people say	1.150726767		
26	FP			0.689273
27	silent		0.616	
28	vegetables and	1.244025989		
29	FP			0.659974
30	silent		0.28	
31	these organic foods are healthy	1.976		
32	silent		0.952	
33	and I believe there are some artificial	2.6		
34	silent		0.328	
35	chemical substances in a food	2.752		

Figure 11. Separating intervals (runs, silent pauses, & filled pauses) in MS Excel.

#### Stage 4

This stage involved mapping multiple data sources and making interpretation of the stimulated recall interviews. Data sources included:

1. the WTC ratings screen captures
2. the generated bitmap graphs
3. the participants' explanations of WTC shifts during the stimulated recall interviews
4. the annotated Praat transcriptions
5. the temporal measures of speech.

During this stage, the explanations of the WTC changes provided by the participants during the interviews were analysed. The analysis was mainly guided by identifying the LRs for each task as the fluency unit of analysis and WTC dynamic ratings as the WTC unit of analysis. Therefore, LRs for each task were identified and copied into an Excel file along with their coinciding WTC ratings, which also included the participant's comments on the changes. It should be mentioned that there were a few ratings where participants, despite being prompted to, had not provided any comments or

recalled a reason. The stimulated recall interviews were viewed and participants' reasons were identified and linked to their corresponding WTC ratings. In presenting the results, I included the long runs (LRs), their corresponding syllable count, along with the exact location where WTC change had occurred with its respective degree of fluctuations. All this helped make more informed interpretations in addressing the RQ1.

### **Stage 5**

This stage was mainly concerned with coding the stimulated recall interviews that were documented in stage 4. The coding procedure was guided by three main objectives: 1) identifying the ways/patterns WTC and L2 fluency interacted (RQ1), 2) coding cases of dysfluent speech and discussing any existing interactions with WTC (RQ2), and 3) completing the coding for the remaining 15 participants for factors shaping WTC (RQ3). All the coding took place simultaneously.

With regards to the first objective, I was looking for patterns of interaction between WTC and L2 fluency during the identified long runs. This search was informed by the pilot study that had found cooccurrence of:

1. high WTC and high fluency
2. high WTC and low fluency
3. low WTC and high fluency
4. low WTC and low fluency.

Once an interaction was detected, I tried to determine, using the participants' explanations, whether it had occurred directly or indirectly through other types of variables (e.g. linguistic, affective, cognitive, etc.).

The second objective involved detecting and coding dysfluent speech. In this study, I used what Lennon (1990, 2000) called markers of dysfluent speech including silent or filled pauses, which

exceeded .25 seconds, and repetitions. It should be noted that, since the stimulated recall interviews were guided by WTC shifts and not fluency, the search for dysfluency cases was limited to the segments that had been explained by the participants. Therefore, dysfluency markers that were present in the data but had not been explained by the participants had to be excluded. Clusters of consecutive and/or long filled and silent pauses, and repetitions, which had triggered changes in WTC, were identified and coded in NVivo. Once dysfluency markers were detected and coded, they were then categorized based on the factors that had triggered them drawing on participants' commentaries.

Concerning the third objective, the coding took place manually through listening to the stimulated recalls of the remaining 15 participants. I used *in vivo* coding and associated the emerging codes with the codes that had previously emerged in stage 2.

### **Stage 6**

The data was reviewed again in this stage to address RQ4 and the review procedure was guided by the bitmap graphs, the MS Excel files, and the interpretations of the stimulated recall interviews within their respective contexts. To reiterate, the CDS properties included:

- 1) sensitive dependence on initial conditions
- 2) interconnectedness amongst sub-systems
- 3) change characterized by the system's self-organizing capacity, nonlinearity, and idiosyncrasy
- 4) and system's settlement into attractor states.

Through this process, my search for these properties was informed by the findings of MacIntyre and Legatto (2011), MacIntyre and Serroul (2015), Nematizadeh and Wood (2019), and Wood (2016). First, the second-by-second dynamic ratings of WTC, generated in Excel files, were

averaged, which outputted numerical values for dynamic WTC and showed inter- and intra-individual variability in WTC. The Excel files were also used to compute the standard deviation (SD) of each speech sample. The SDs showed the magnitude of change for each task. Then the bitmap graphs were analysed for any specific variability patterns. The attractor/repeller states were visually detected using the bitmap graphs. Periods of stability that lasted for a while were considered attractor states, while abrupt and transient shifts were considered as repeller states. The search for instances of interconnectedness was informed by previous research (MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019; Wood, 2016) and thus focused on interactions between linguistic, cognitive, and affective variables. The identified instances were coded in NVivo and will be discussed case by case.

## Chapter 5: Results

This chapter is divided into four sections, each presenting data with respect to the four research questions:

1. How do WTC and L2 fluent speech interact with each other on mostly monologic picture description tasks?
2. How do WTC and dysfluent speech interact with each other?
3. What attributes (e.g., cognitive, linguistics, etc.) might influence the interaction between WTC and L2 fluency?
4. Does the theory of complex dynamic systems account for the interaction between WTC and fluency?

Before presenting the results for the research questions, the main temporal measures of speech (Table 4), the WTC ratings during the LRs (Figure 12 & Table 5), and patterns of cooccurrence between WTC and L2 fluency (Figure 13) will be presented. All this information was used to inform the analysis of the data.

RQ1 focused on fluent speech in interaction with high or low WTC. First, numerical and thematic information regarding the themes and sub-themes triggering change to WTC will be provided in a tabular form. Then the supporting evidence, including LRs representing fluent speech and the coinciding ratings for WTC, will be presented and discussed. RQ2 focused on dysfluent speech in interaction with high or low WTC. This section will also provide numerical and thematic information on the observed dysfluent cases in a tabular form, followed by a case-by-case discussion of dysfluent speech cases and the participants' explanations for their WTC changes. RQ3 approached the interplay through WTC; therefore, the information presented will include a comprehensive review of the themes and subthemes that brought about shifts in WTC, accompanied by the coinciding fluency measures. RQ4, which attempted to view the interaction from a CDS perspective,

Table 4.  
*Participants' Temporal Measures of Speech*

	Topic 1			Topic 2			Topic 3			Topic 4		
	<u>MLR</u>	<u>SR</u>	<u>AR</u>									
Niki	10.65	3.14	4	6.14	2.52	3.61	7.92	2.79	3.56	8.69	3.1	4.05
Pouya	5.26	2.41	3.67	7.19	2.65	3.86	5.26	2.41	3.83	6.7	2.58	3.9
Linda	9.19	2.03	3.22	10.2	2.41	3.45	7.53	2.22	3.15	8.81	2.26	3.21
Sara	5.89	2.01	3	7.94	2.38	3.29	8.79	2.11	3.18	6.13	2.12	3.15
Majid	8.13	3.01	4.2	12.33	3.45	4.32	10.52	3.31	4.24	9.18	3.4	4.59
Pedi	7.41	2.55	3.41	7.49	2.73	3.64	7.16	2.63	3.51	7.81	2.23	3.08
Samaneh	9.95	2.53	3.32	9.2	2.59	3.3	9.67	2.68	3.32	8.02	2.84	3.66
Mohsen	12.71	3.49	4.15	11.54	3.22	4.03	13.2	3.34	3.97	13.26	3.4	4.04
Saba	10.48	3.57	4.53	12.34	4.05	4.99	10.89	3.66	4.55	11.93	3.73	4.56
Lili	5.78	2.12	2.96	5.99	2.39	3.33	5.71	2.15	3.12	4.53	1.82	3.06
Mo	7.1	2.67	4.31	6.86	2.74	4.25	7.44	2.46	4.01	7.57	2.77	4.27
Sahra	8.1	2.65	3.74	8.6	2.65	3.74	6.3	2.35	3.61	6.35	2.75	4.24
Hero	7.45	2.39	3.31	8.23	2.47	3.54	6.2	2.22	3.26	9.13	2.68	3.48
Sepehr	3.48	1.62	2.79	4.76	2.06	3.27	4.38	1.95	3.45	4.29	1.91	3.12
William	7.24	2.85	3.9	7.37	2.61	3.92	6.42	2.8	4.22	9.12	3.44	4.66
Anita	5.06	2.45	3.54	8.17	3.12	4.09	7.56	2.76	3.81	8.27	2.81	3.76
Soha	7.08	2.72	3.91	8.2	2.88	3.7	7.56	2.62	3.57	7.99	2.7	3.56
Mehrzhad	4.09	2.18	3.55	6.25	2.55	3.75	4.73	2.32	3.71	6.61	2.55	3.62
Akbar	5.87	2.56	3.53	8.77	2.89	3.51	5.97	2.73	3.53	5.69	2.68	3.73
Kaami	7.43	3.11	4.32	6.68	2.99	4.46	7.04	3.33	4.82	7.88	3.35	4.63
Average	7.41	2.60	3.66	8.21	2.76	3.80	7.51	2.64	3.72	7.89	2.75	3.81

is addressed through numerical data including averaged dynamic WTC, standard deviations, and patterns of change observed in the bitmap graphs. Seven patterns of change in WTC will be presented through bitmap graphs. The observed properties of CDS, including interconnectedness and formation of attractor/repeller states, will conclude the chapter.

Table 4 mainly presents the three temporal measures of speech, including MLR, SR, and AR, specific to each participant and task. Figure 12 and Table 5 essentially provide the same information. Figure 12 is a pie chart that helps to visualize the interactions between WTC and the LRs. While the information presented in this Figure is preliminary, it seems to suggest that fluent speech coincided with more positive than negative WTC. Table 5, moreover, presents numerical and participant- and task-specific information concerning the dynamics of WTC during the LRs across the four topics. As can be observed, 386, 371, 390, 402 LRs (a total of 1549) were identified for topics one, two, three, and four, respectively, where 674.5 LRs (44 %) coincided with high WTC and 70.5 (4 %) of LRs with low WTC. 802 (52 %) LRs were not rated at all. While the table provides participant- and task-specific information with regards to the ratings of the LRs.

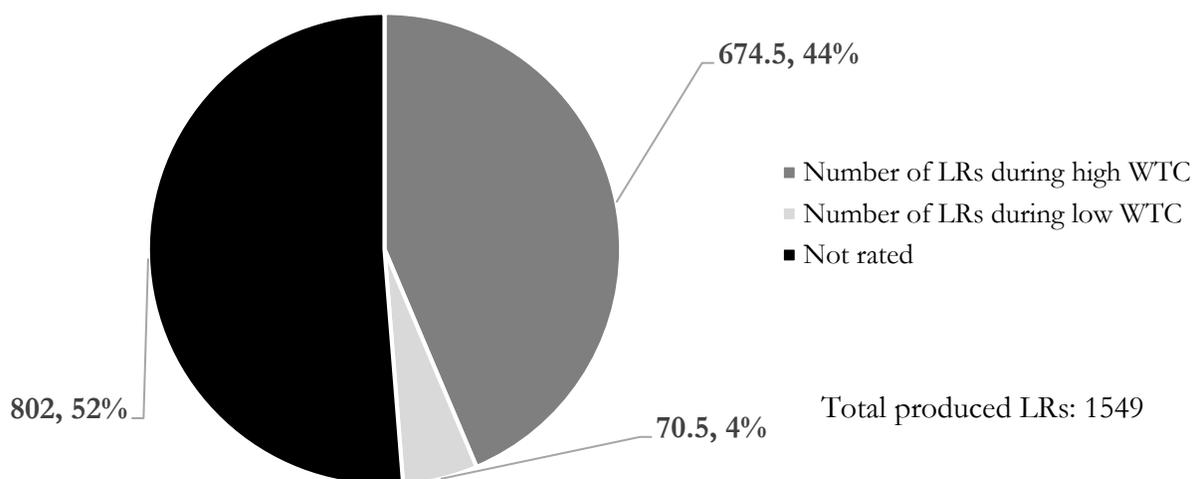


Figure 12. WTC ratings during long runs (LRs) of a total of 1549.

Table 5.  
Ratings of Selected Runs

Topics → Runs → ↓Participants	Topic 1				Topic 2				Topic 3				Topic 4			
	Selected LRs	Rated LRs			Selected LRs	Rated LRs			Selected LRs	Rated LRs			Selected LRs	Rated LRs		
		+	-	No		+	-	No		+	-	No		+	-	No
<b>Niki</b>	22	18	2	2	24	16	0	8	27	25	0	2	22	20	0	2
<b>Pouya</b>	19	5	1	13	23	3	0	20	20	5	0	15	21	4	0	17
<b>Linda</b>	14	8	0	6	11	6	0	5	14	9	1	4	12	6.5	.5	5
<b>Sara</b>	15	6	0	9	18	4	2	12	17	4	2	11	17	4	1	12
<b>Majid</b>	21	8	3	10	18	1.5 <sup>1</sup>	2.5	14	20	1	0	19	19	0	0	19
<b>Pedi</b>	18	7	4	7	11	3	1	7	18	1	0	17	13	1	0	12
<b>Samaneh</b>	12	9	1	2	16	13	0	3	18	13	0	5	27	12	0	15
<b>Mohsen</b>	19	13	2	4	22	16	3	3	20	18	0	2	21	11	2	8
<b>Saba</b>	19	8	0	11	17	4	0	13	21	4	0	17	18	2	0	16
<b>Lili</b>	16	13	0	3	10	8	0	2	9	6	0	3	9	2	0	7
<b>Mo</b>	16	5	2	9	14	3	0	11	16	5	0	11	19	6	0	13
<b>Sahra</b>	12	6	1	5	16	4.5	.5	11	14	3	2	9	15	8	0	7
<b>Hero</b>	18	13	4	1	18	14	1	3	17	9	0	8	16	8	1	6
<b>Sepehr</b>	15	1	1	13	20	2	0	18	18	2	0	16	18	2	0	16
<b>William</b>	22	17	0	5	17	10	2	5	19	15	2	2	20	20	0	0
<b>Anita</b>	21	2	0	19	24	8	0	16	19	6	1	12	24	7	0	17
<b>Soha</b>	26	19	1	6	23	14	0	9	21	2	3	16	22	11	0	11
<b>Mehrzaad</b>	22	11	1	10	20	17	1	2	16	9	3	4	24	15	5	4
<b>Akbar</b>	25	12	3	10	16	12	2	2	34	11	1	22	34	12	1	21
<b>Kaami</b>	34	11	0	23	33	5	4	24	32	12	0	20	31	7	0	24
<b>Total</b>	386	192	26	168	371	164	19	188	390	160	15	215	402	158.5	10.5	232

<sup>1</sup> Values with .5 refer to the LR's that were rated both positive and negative.

As illustrated in Figure 13, the investigations of the LRs and dysfluent cases along with their coinciding WTC revealed four types of interactions between the two variables, which include:

- 1) Fluent speech and high WTC (674 cases),
- 2) Fluent speech and low WTC (70.5 cases),
- 3) Dysfluent speech but high WTC (13 cases), and
- 4) Dysfluent speech but low WTC (125 cases).

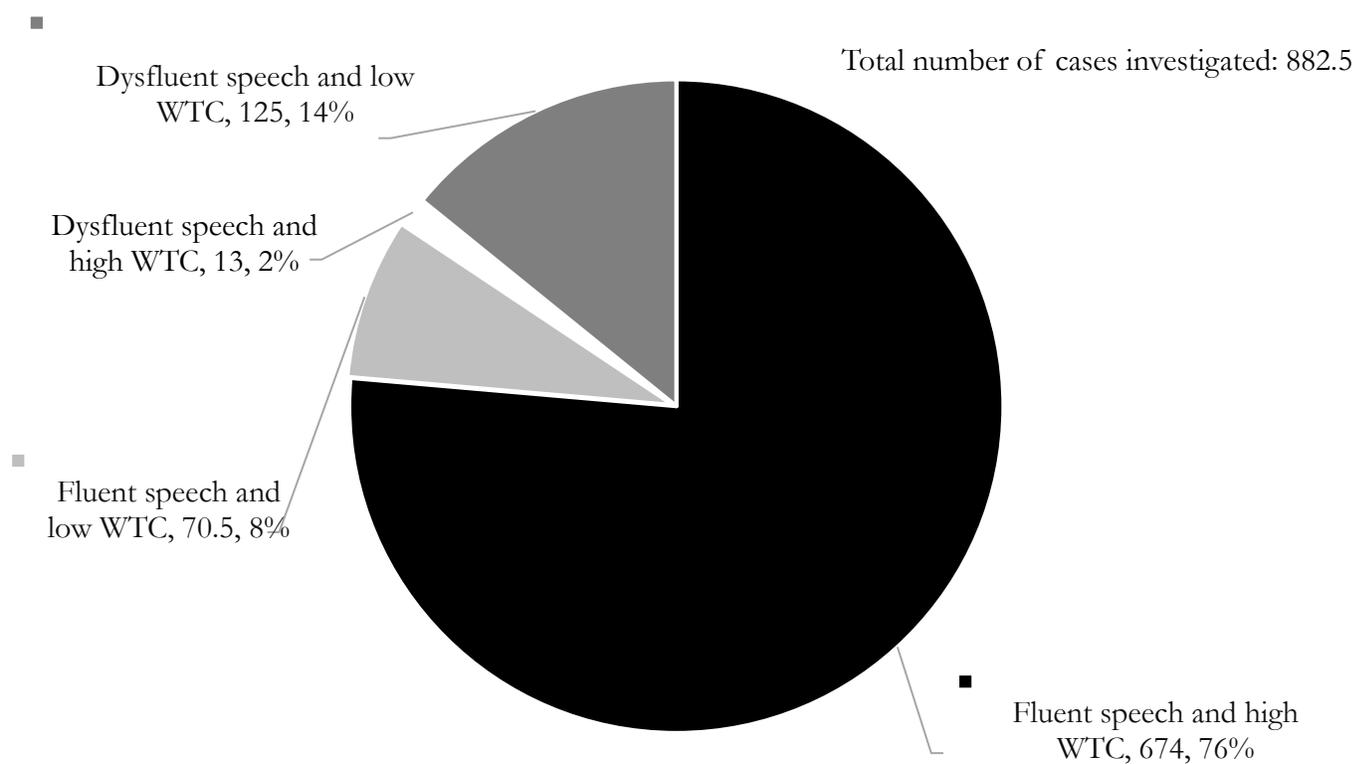


Figure 13. Patterns of cooccurrence between WTC and L2 fluency.

Of the above patterns, the first two concern the first research question, which looks at possible interactions between fluent speech and high/low WTC, while the remaining two concern the second research question with a focus on dysfluent speech and WTC. Instances for each pattern will be categorized and presented by themes and subthemes.

### **Research Question 1**

RQ1: How do WTC and L2 fluent speech interact with each other on mostly monologic picture description tasks?

To address the above research question, long runs (LRs)<sup>1</sup> that exceeded MLR for each task were identified and the coinciding states of WTC were analysed.

#### **Fluent speech and high WTC**

As indicated above, 674 LRs that coincided with a high WTC were identified. Reasons for high WTC were investigated and seven themes including 23 sub-themes emerged (see Table 6). It should be noted that there were consecutively produced LRs during which similar subthemes had triggered a high WTC. There were also LRs that coincided with a high level of WTC but for which participants had not explained the reasons, explaining why the total number in Table 6 (N=316) differs from the total number of LRs (N=674). Table 6 presents themes from the most recurring to the least. LRs along with participant's explanations of their high WTC are presented in the same order.

---

<sup>1</sup> For consistency, I will use the acronym LR(s) to refer to the long runs that exceeded the MLR and were thus identified as the fluency unit of analysis in this study.

Table 6.  
*Themes Improving WTC during Fluent Speech*

No	Factor type	Factors lowering WTC	Number of observed cases
1	Individual	Personal experience	51
2		Belief - views - opinions	26
3		Daily personal routine	19
4		Background knowledge	18
5		Interest	17
6		Recent conversation or prior preparation	7
7		Accomplishment	4
8		Educational background	2
9	Cognitive	Idea retrieval (or example)	30
10		Lexical retrieval	23
11	Support idea/argument	Possession of support idea	48
12	Linguistic	Lexical appropriacy	7
13		Lexical knowledge	5
14		Grammar structure	5
15		Use of infrequent or advanced lexical items	4
16	Self-perception	Perception of fluent speech	12
17		Perceived control-dominance over language	3
18		Perception of successful argument	3
19		Self-correction	1
20	Organizational	Jotted-down notes, plan, provided prompts	21
21		Topic transition	2
22	Contextual	Topic familiarity	6
23		Interlocutor approval	2
Total			316

**Individual.** The individual theme refers to the factors specific to each individual (also called personal factors in the literature) and included discussing such sub-themes as personal experience, belief/views/opinions, daily personal routine, background knowledge, interest, recent conversation or prior preparation, accomplishments, and educational background.

*Personal experience.* In one case, Samaneh's WTC rose as she recalled a personal experience during several consecutive LRs. More specifically, she recalled losing around 15 kg on a diet, which she had planned to use as a supporting argument. Also, she stated that, as opposed to a negative public impression, she believed that dieting was not harmful and could be very healthy:

... and finally I have experienced diet (+4) (FP .35) As I remember as I started to educate in (+3) (Silent .34) bachelor level (Silent .27) (FP .43) I got a little overweight and I think that (FP .62) I was not in

*shape (+1) and also (Silent .52) (FP .58) I wasn't able to run and fast as possible (+3) (Silent .77) so I decided to go to gym and also I saw a doctor (+2) (Silent .56) (FP. 26) who gave me pro professional diet (+3) (FP .66) (Silent .68) program (FP .32) and I think that (FP 1.03) not only diet could not be dangerous but also it could be very helpful (+5) for ...*

In another instance, two of Samaneh's LRs were produced successively while she maintained a high level of WTC, which was because she was sharing a personal experience with shopping online in cold weather conditions and the comfort it brought to her life:

*... it's much much more easier than going to shopping center and buying something (20 Syl., +4)(Silent .44) especially in the bad weather in Canada I think this application would be very very useful (29 Syl, +5).*

Pedi's WTC improved as he was able to relate a personal experience to his discussion to support his argument. His SR rose to a high of 2.5 syl./sec., which was slightly higher than his overall SR of 2.23 syl./sec. for the task:

*... for example for me when I want to come to here from Canada (+2) from Iran (silent .43) I have I had to wait eight hours in Frankfurt airport (.32) and after that (silent .37) I (FP .94) had a eight hour flight to Canada (Silent .59) so this is one of the most frustrating (silent .52) (FP .92) travel that that I have ever had ...*

In another instance, Lili's WTC rose as she recalled a recent experience whereby a friend had received her when she landed in Canada for the first time. This was a pleasant experience she cherished and was very interested to bring up:

*... I mean sometimes we need to (Silent .52) a person come and (5 Syl., +2) (FP .47) pick us up and (FP .65) help us about our luggage (7 Syl., +1) ...*

*Belief - views – opinions.* In the following instance, Saba displayed great willingness as she discussed her personal belief. She added that she personally believed that people should not be on a diet and should prevent a situation that necessitates this as losing weight through diets is always a challenge not many people can meet:

*... so much weight because I know that it's gonna be really difficult and tough to lose the weight (24 Syl., +5) (Silent .55) so I just try to control my weight instead of (Silent .41) eating a lot of food and then (Silent .40) trying to be on a diet to lose the weight (Silent .32) so I just try to control what I am eating what I am*

*drinking however it's really difficult because sometimes you cannot avoid you know eating sweet things because I really love (49 Syl., +5) ...*

In another instance, Anita found it easy to share her views and beliefs regarding travelling, which coincided with three consecutive long runs. In comparing the four topics, she stated that she did not need technical knowledge when discussing travel problems as opposed to topics like technology or on-campus or online education, which was why she found it easy to discuss this topic:

*... Ok about travel problems (Silent .56) (FP .74) some of a travel problems are a very serious especially for (18 Syl.) (FP .43) someone whose travelling for the first time and (12 Syl., +1) (FP .48) to (Silent .40) a new place a place they haven't been there before (13 Syl.) (Silent .36) ...*

*Daily personal routine.* Lili was willing to discuss her daily routines in the following two LRs.

While reviewing the advantages of technology, she recalled how she used all sorts of applications to talk to her family on a daily basis as a newcomer to Canada:

*... talk with your relatives with your family members in other (16 Syl., +3)...*

or

*... talk (FP. 56) to each other by phone or by text messaging or (12 Syl., +3)...*

In another instance, William's WTC rose because he began reviewing his daily routine at the university food court, which he did quite fluently:

*... for eating at university there are low options to choose from (17 Syl., +4) (Silent .77) if there were more options I I would (9 Syl., +3)...*

*Background knowledge.* Sara's WTC improved once she began discussing a subject using her own general knowledge about the topic as well as her personal achievements. In the cluster below, she drew on her knowledge of proper dieting (e.g. good portion of protein, fiber, and carbs), which improved her WTC, and the fact that retrieving lexical items did not take place smoothly (a filled pause before each) did not perturb her WTC. Despite the pauses, the cluster is considered fluent as it contains three LRs and maintains a SR of 2.52 syl./sec., which is higher than the overall SR for the task (2.01 syl./sec.):

*... in my own point of view (Silent .61) a healthy meal (FP .33) should consist of (FP .63) a good portion of protein (7 Syl., +3) (Silent .69)(FP .67)(Silent .57) fiber and (FP .82)(Silent .44) a complex carbohydrate (7 Syl.)(Silent .74)(FP .42) in my own life I try to eat healthy and I need it to control my weight beside my (22 Syl., +7) ...*

In another instance, Mohsen discussed how technology, his favorite topic that is quite relevant to his field of study, has improved the way and the comfort with which we travel. He possessed great knowledge regarding technology and had just taken a trip during which technology had brought him convenience; therefore, he was very willing to talk about it:

*... thank god for the technology that we have now that is like we can just hop on a plane and you are gone in like five hours (30 Syl., +4) (Silent .66) you can travel up to like three thousand kilometers which if you wanna do it in a car it will take like thirty hours (30 Syl., +2), (Silent 1.38) and you just sitting there relaxed you have your laptop in front of you you have your (20 Syl., +1), (Silent .55) internet nowadays in the airplane you have your you have live TV I remember like it was three weeks back and I was (30 Syl., +4), (FP .49) (Silent .31) coming back from (Silent .70) Vancouver to Ottawa actually with a plane and it was Air Canada I don't know what was it exactly I don't remember (36 Syl., +4) (Silent .45) ...*

*Interest.* In one instance where Sara used her notes, she spotted a topic of her interest; that is, her bucket list, which raised her WTC. She explained that she would usually get excited whenever she talked about the items on her wish list; both the ones she had checked off and the ones that were yet to be checked off. In the cluster below, where she talked about her bucket list, her speech was produced rather fluently characterized by two long runs and a speech rate of 2.29 sec./syl., which was slightly higher than her overall speech rate (2.11 sec./syl.):

*... the other thing (Silent .25)(FP .58) I like to discuss is that I have a (Syl. 10) (Silent .27) backpack trip (+6) (Silent .71) in my bucket list (Silent .43) I really like to do that (Silent .37)(FP .93) but I think I need to work on my self-esteem before doing it (16 Syl.) (Silent .91) but (Silent .57) for sure I will do it at least once (9 Syl.).*

Lili's WTC rose in one instance and remained high as she found her personal interests and beliefs quite relevant to the topic and had thus planned to discuss them. More specifically, she was very interested to discuss her likes about foods so she had ideas and was willing to discuss them:

*I want to talk with you about my food habits and my (14 Syl., +3) (FP .52)(Silent .75) diets to tell about my diets and (8 Syl., +1) (Silent .26) at first I want to mention that (12 Syl., +5) (Silent .54) I'm (Silent .28) so conscious about my diet I mean I'm (12 Syl.) ...*

*Recent conversation or prior preparation.* Mohsen's WTC rose because he recalled a recent conversation with his professor whom he worked with as a teaching assistant. He had engaged in a discussion with the professor about the necessity of attendance checks and had also been asked to express his opinion on the issue, which he used to support his argument here. His speech is very fluent below:

*... professor do some kind of attendance check (Silent .28) if students want marks or (Silent .64) like reward them in some way you are to (Silent .88) make them to come (Silent .81) to be honest I think it (Silent .56) should be necessary to some extent for especially if you are like first year student or a second year student to some extent (34 Syl., +6)...*

*Accomplishment.* Sara managed to produce an LR in task one, in which her WTC was at its highest because she discussed a personal achievement. She explained that the fact she had managed to control her diet and weight was gratifying and whenever she recalled it, she was willing to bring it up. She added that she was proud that she had been able to maintain an eating habit wherein sugar and simple carbohydrates were deducted:

*... but I deduct sugar and simple carbohydrates mostly (15 Syl., +5) (Silent .63) almost for (Silent .57)(FP .72) for years ...*

*Educational background.* In one instance concerning educational background, Linda's WTC rose to a significantly high level as she drew on her experience and educational background to support her argument. In support of this, she reasoned that she felt more prepared because she possessed the lexical knowledge required of the argument, which evoked a feeling of security that she possessed adequate resources to carry on, improving her WTC:

*... the degree from online educations is not very valuable (17 Syl.) (Silent)(FP)(Silent) because if we are in the classroom (Silent)(FP) we have more motivation (+4) to (Silent) understand the topic and (Silent)(FP)interact with prof or answer the questions and be more (Silent)(FP) active in the class (Silent)*

*because (FP) for example some people like to be the centre of attention and they like to answer (25 Syl., +1) more questions ...*

**Cognitive.** This theme mainly involved the efficiency of the participants' online cognitive capacity to recall ideas or retrieve lexical items.

*Idea retrieval (or example).* In one instance, Mohsen began task three with a high level of WTC as he was reminiscing about a pleasant childhood memory and smooth retrieval of ideas during a cluster of runs whose MLR significantly exceeded his average MLR. He explained that he was conscious of the fact that the information was being retrieved smoothly and speech was produced so fluently, both of which improved his WTC:

*... I remember when I was four years old because he was a programmer and like all of us who were interested in computer so my dad bought an IBM two fifty six (42 Syl., +2) ...*

Following this, he managed to make a comparison between past and present technology, where his WTC rose again not only because of the retrieval of the idea of comparing the two, but also retrieving the expression *compared to*, which he considered appropriate:

*... computer that if you think about it compared to (13 Syl., +1) (Silent .45) nowadays piece of technology that we have around us (15 Syl., +1) ...*

In another instance, Lili's WTC also rose and remained high as she recalled the idea of a food pyramid, which she thought would help her make her argument. She was also able to maintain fluent speech:

*... food pyramid I mean I eat carbohydrates and I eat vegetables and I eat (22 Syl., +5) (Silent .39) fruit (Silent .62) and (FP .60) everything in a food pyramid in a day (13 Syl., +3) (Silent .44) I try to be (Silent .31) to have a healthy diet and healthy lifestyle (13 Syl., +2) ...*

*Lexical retrieval.* In one instance, while Pouya was discussing travel problems, the idea of currency exchange crossed his mind, which he found quite relevant to the discussion. He added that successfully retrieving the lexical items he required improved his WTC, which occurred during a LR.

He added that he might improvise ideas during conversations and if deemed supportive of the argument, his WTC could increase:

*... actually exchange your money to that currency and many of this stuff can be (Syl. 21, +2) ...*

In another fairly similar instance, Linda's WTC rose because of the retrieval of the word *addicted*, which she thought was an advanced word and effectively communicated her thoughts:

*... also some people specially new generation are addicted (+3) to the video games (Silent .32) or (Silent .58) (FP .85) online games (Silent .47) and they waste their time or (Silent .44) they may become antisocial because they spend a lot of time ...*

In a different instance, Mohsen's WTC rose and remained high while retrieving technical lexical resources for items he had used many years back. More specifically, he explained that smooth retrieval of ideas coupled with a number of technical words (e.g. floppy disk, megabits, operating system, hard drive), which were readily available, encouraged him to talk, which he did quite fluently:

*... eight megabits sixteen megabits such a thing like that (14 Syl. +2) (Silent .47) and the hard drive on it like the memory that you save all of your files were like (21 Syl., +3) (Silent .53) six megabits (Silent .35) I remember the first windows (Silent .47) (FP .39) operating system that I installed on it was like (14 Syl., +1) (Silent .68) I installed it using four floppy disks and (11 Syl.) (Silent .52) after installing the operating system it give me an error that (19 Syl., +1) (Silent .48) there is no room left for me I cannot do any of them and it evolves so fast it evolves (23 Syl., +2) ...*

### ***Support idea/argument.***

*Possession of support idea.* Sahra started task four with a high level of WTC during two LRs because she knew how to start and what to say. She further stated that she possessed ideas to discuss for a while, so she felt secure and willing to speak:

*... I think there is no serious problem (10 Syl., +2) (Silent .90) (FP .61) yeah (Silent .42) (FP .72) except the jet lag (Silent .84) especially when you want to travel from here to Iran (15 Syl., +1) ...*

In another instance, Sahra ran out of ideas in the task four, which led to a long silence and lowered her WTC. As a result, the interviewer intervened to ask some follow-up questions, which

gave her some more ideas to discuss and her WTC rose immediately after. The last part of the cluster below contains three LRs, during which she maintained high WTC. She explained that the questions had prompted her to remember her conversations with her Canadian friends about the Canadian culture, and how much punctuality was important:

- Sahra: *Something that's important (silent .27) departure (FP .95) (Silent .41) time (Silent .69) for traveling (FP .45) and (Silent 3.32) (FP .52) what we can do (Silent) (FP. 55) (Silent .91) before (-1) traveling (Silent .52) ...*
- Interviewer: *Can I ask you a question? Can you tell me if you have ever experienced inside a city whenever you are traveling from a place to another? Let's say you're going from home to work.*
- Sahra *Oh does it count as a travel? (+1)*
- Interviewer: *Yeap!*
- Sahra *maybe the problem could be the traffic (Silent 1.34) we should just became sure that we arrive on time specially whenever have some kind of (22 Syl., +2) (Silent .49) (FP .70) (Silent .32) meeting for our work or something like that it's not very good (17 Syl., +2) (Silent .28) to be (FP .36) to became late (Silent .61) so we have to first of all became sure that all we will be on time there or maybe early (22 Syl., +1) (Silent 1.12) and I think we are done ...*

Hero's WTC was quite high when he started task one because he had a plan and possessed an abundance of support ideas to discuss, which he presented fluently:

*In my opinion it's better to have a healthy diet (15 Syl., +2)(Silent .49) (FP .53) It has some reasons most of the scientists recommend that to have that it is better to have a healthy diet because it keeps you in a good shape (36 Syl., +5) (Silent .36) and also help you to live longer (9 Syl., +2) (Silent .36) On the other hand, if you want to go out with your friends and (15 Syl., +2) (FP .56) (Silent .43) with your families, you one of your options is going to restaurants (17 Syl., +2) (Silent .40). Most of the restaurants offers (Silent .46) junk food although, they may (Silent .82) say that it is not the junk foods but they use (11 Syl., +2)...*

In another instance whereby retrieving support ideas improved Mehrzad's WTC, he gained WTC because he possessed some support ideas to elaborate on the benefits of on-campus education during what appears to be fluent speech:

*... as I said before according to my choice (11 Syl.) (FP .84) I think that in a on campus education there are (14 Syl., +1) (Silent .25) several benefits that you can (9 Syl., +1) (Silent .33) (FP 1.40) (FP .92) lead you to (Silent .25) (FP .52) (Silent .35) take it (Silent .32) for example (FP .48) in on campus education you have enough time for (14 Syl., +1) (Silent 1.18) communication with new person (9 Syl., +2) (Silent*

.52) *that you can't find it in a online one (11 Syl., +2) (Silent .33) or some kind of ceremonies (8 Syl., +1)*  
...

***Linguistic.*** The linguistic theme included subthemes that involved the participants' grammar or lexical knowledge of the language, such as lexical appropriacy, lexical knowledge, grammar structure, and use of infrequent or advanced lexical items.

*Lexical appropriacy.* Mohsen's WTC rose in the following cluster because he perceived his speech as fluent and had used a number of lexical items he considered appropriate. More specifically, he explained that using phrases like *track my heartbeat* and *track my whereabouts* and avoiding a cliché word like *location* and instead using *whereabouts* made him proud of his speech quality, which encouraged him to carry on:

*... bought just to watch TV with it like I have two laptops one gaming and one regular and I have a work laptop (28 Syl., +2) (Silent .74) and like which makes it three laptops in total (11 Syl., +2)(Silent .85) I have a smart watch which track my heartbeat it can track my whereabouts (17 Syl., +2)(Silent .71) it can give me my messages if I want if I am in a meeting instead of bring taking out my phone I am just doing this and looking at my boss and say yeah yeah it am totally paying attention to what you are doing right now (58 Syl., +7)(Silent .50) ...*

*Lexical knowledge.* In one instance, Mehrzad's WTC increased upon realizing that he possessed the vocabulary he needed to discuss a newly retrieved idea, which was the three categories of protein, carbs, and fibre:

*... portion of protein (5 Syl., +2) (Silent .47) because protein is the (6 Syl., +2) (Silent .39) special (FP .67) (FP .42) fact for a (Silent .31) making muscles for athlete (7 Syl., +2) (Silent .40) and you should have a (5 Syl., +2) (Silent .28) enough carbohydrates (6 Syl.) ...*

*Grammar structure.* In one instance, Mohsen's WTC improved as he made use of a double-negative sentence. He thought the structure he used was not very common and that he used it accurately. Following this, his WTC increased because he felt he was doing a great job in using his language skills and fluently telling a story to the interviewer:

... continue for two kilometers if you wanna have AC and it was like in middle of desert (Silent .60) there was no other option not to have AC (+1) (.69) so that was our usual routine that we had to like just go stop and catch up with each other like oh how are you oh I am good how are you like (36 Syl., +2) ...

*Use of infrequent or advanced lexical items.* In an instance, Sara's WTC rose for two reasons; with the first being her interest in the topic, and the second being the use of the word *mandatory*. She explained that whenever she recalls an advanced word that fits into the context of her discussion and supports her argument, her WTC tends to improve:

... I believe that eating healthy is mandatory for everyone not just for (20 Syl., +3) (Silent .41) and gaining weight losing weight but for being healthy in life ...

**Self-perception.** This theme mainly involved the participants' self-perception of their speech, including perceived fluent speech, perceived control/dominance over language, perception of successful argument, and self-corrections.

*Perception of fluent speech.* The cluster of utterances below shows how Linda's WTC fluctuated as a result of availability or unavailability of ideas and how using notes reinforced her WTC. She was willing to discuss her personal experience of having to drop off her luggage at the outset. While she struggled to retrieve the word *plane*, she managed to carry on while reviewing her experience. She lost track of supporting ideas at this point, which reduced her WTC and led to a series of pauses. At this point, she took a look at her notes to keep talking, where she spotted the idea of language barrier and felt prepared to speak more fluently after almost a minute of instability in speech, the self-perception of which improved her WTC:

... so just we should wait (Silent .62)(FP .56) or (FP .67) when we want to give our luggages to the (+1) (FP .82)(Silent .68) plane (Silent .44)(FP .56) there are many long lines (Silent .53)(FP .58) which is time-consuming (Silent .58) (FP .73) and all the time (-1) (Silent .44) (FP .75) (Silent .72) some people (FP .61) specially foreigner have problem with the language (+1) (Silent .37)(FP .45) they don't know how to communicate (+1) properly (+2) and they may face problems by misunderstanding (25 Syl.) or they may miss even their flights...

In another instance, Mo's WTC rose because he had perceived his speech as more fluent compared to the beginning of the task, wherein he had perceived his speech as very fragmented and full of pauses. However, this was the first time he felt he was speaking at an acceptable speed, which improved his WTC:

*... meeting and might be very (Silent .57) problematic (Silent .70) for you and another thing is the (Silent .53) let's say exposure to pollution if you want to (14 Syl.) (Silent .38) (FP .57) travel from one single point to another point (12 Syl., +2) ...*

*Perceived control/ dominance over language.* In one instance, Soha was able to maintain a high level of WTC mainly because of her ability to elaborate on the idea of disadvantages and also add some humour, which gave her a feeling of control over the English language:

*... experiments and these things (+1) (Silent .68) or may maybe solving some problems (9 Syl.) (FP .44) it's not suitable for that kind of things (11 Syl.) (Silent .69) and because of this there are kind of like disadvantages of doing online courses and I believe that online courses (27 Syl., +2) (Silent .44) they are just (Silent .39) suitable more suitable to do some like cheating doing cheating (LF) and these things it's easier to do on an online course and the exams are like (36 Syl., +3) ...*

*Perception of successful argument.* In one instance, Pouya's WTC improved during an LR because he was impressed with the argument he had made up to that point, encouraging him to carry on. His speech is fluent for the most part of the following cluster:

*... travel problems between quality of life and travel problems because (18 Syl.) (Silent) each of them each have (Syl. 5)(Silent) any travel problem can influence (8 Syl.) (Silent) (FP) quality of your life (6 Syl.)(Silent) (FP) (Silent) well (Silent) people can search a lot (6 Syl.)(Silent) about different ways of travelling (10 Syl.)(Silent) about (Silent) (FP) (Silent) the arrival date (5 Syl.)(Silent) (FP) of their long trips (4 Syl.)(Silent) for example about different travel agencies (14 Syl.)(Silent) different deals just to find the best possible deal (13 Syl., +2) ...*

*Self-correction.* After the perception of inaccurate speech in using comparative structure, which lowered Kaami's WTC and led to dysfluent speech, he was able to repair and his WTC rose, after which he produced a number of LRs. He stated that he is typically concerned about being judged by other interlocutors and this gets very stressful particularly when he is uncertain about the accuracy of

his structures. In this case, this lowered his WTC and coincided with a number of pauses. However, he was immediately able to self-correct and recover, which improved his WTC and led to a series of fluent runs:

*... information (Silent .74) in the past two years (Silent .25) we (Silent .61) created (Silent .67) information like (Silent 1.37) not like (Silent 1.02) (-3) multiple times (Silent .28) the (Silent .37) fifty years ago twice the amount of information (9 Syl., +2) (Silent .35) made in the fifty years ago (7 Syl., +1) (Silent .52) everybody like we are still mining it we are still collecting it (19 Syl.) (Silent .46) at the moment I sometimes I think (10 Syl., +3) (Silent 1.03) when will happen ten years from now what would happen how can we manage (17 Syl.) (Silent .53) this amount of information these are my concerns (13 Syl.).*

**Organizational.** This theme mainly involves how the participants prepared for the tasks during the one-minute preparation time or how they used their notes or the provided vocabulary sheets.

*Jotted-down notes, plan, provided prompts.* In one instance in task four, Linda's WTC was positive as she had a plan of categorizing her ideas into international and urban transport, which she felt secure about:

*Transportation problems can be in (+1) (Silent .54)(FP .46) abroad or within city inside the city (-1) ...*

In another instance, Sepehr's WTC rose because of some support ideas he was able to generate after a question was posed to him by the interviewer. The question was "what can people do to avoid travel problems?". His WTC rose because he was not only able to use the words and the structure of the prompt, but also because the question prompted him to come up with some ideas. The cluster below contains three long runs with 15, 16, and 16 syllables, which was not very common in his speech with an MLR of 4.28 syl./run:

*... but to avoid this problems it's better to make some plans (15 Syl.) (Silent .77) to find (Silent .36) (FP .58) to list (Silent .60) something that you wanna to in your city in your travel (16 Syl., +1) (Silent .49) and (FP .64) make (Silent 1.70) and ask some people that are familiar to that city or they (16 Syl.) ...*

*Topic transition.* In a case of topic transition, after a series of lexical retrieval failures and pauses when discussing the contributions of technology, William shifted the focus of his talk and began discussing contributions of technology to social media, which he felt more comfortable talking about. This led to an improved WTC and fluent speech:

*... education it is very useful if it's (13 Syl., +2) (FP .29) (Silent .56) used in (Silent 1.6) for example (FP .37) the (Silent .76) sonography or (-2) (Silent .26) other stuff it's (Silent .42) again useful but for social media it has connected (15 Syl., +2) ...*

**Contextual.** This theme involved the participants' familiarity with the topics or the positive effect of the interviewer.

*Topic familiarity.* Mehrzad began task one with a high level of WTC because of familiarity with the topic; since he was a personal trainer, he had widely read about foods, nutrition, and dieting as part of his job:

*... The topic of your question is (8 Syl., +2) (FP) very close to because (6 Syl., +1) (FP) I (FP) spend most of my time in gym (8 Syl., +1)...*

*Interlocutor approval.* In an interviewer-related instance, Linda's WTC improved not only because of a case of successful lexical retrieval but also because she perceived the interviewer's nodding as a sign of approval of what she was discussing. She further explained that in daily conversations, it is very important for her to receive confirmation of her ideas from her audience, and this typically improves her WTC:

*... in addition in this way we can (FP) socialize (+3) with other people ...*

### **Fluent speech and low WTC**

In addition to the above discussion where fluent speech coincided with high levels of WTC, there were instances of fluent speech, during which participants displayed low WTC. In this section,

the factors and the reasons triggering low WTC will be presented and discussed. As Table 7 shows, a total of 70.5 cases were identified whereby WTC declined due to five themes and 21 subthemes.

Table 7.  
*Themes Lowering WTC during Fluent Speech*

No.	Factor type	Factors lowering WTC	Number of observed cases
1	Issues with ideas	Lack of support ideas	24
2		Perception of poor argument	5
3		Lack of prior knowledge	2
4		Improvisation	2
5		Perception of irrelevant ideas	2
6		Unsuccessful communication	1
7	Issues with lexis	Retrieval	3.5
8		Appropriacy	6
9		Repetition	3
10		Hesitation	2
11	Issues with grammar	Sentence construction	2
12		Hesitation/uncertainty	2
13		Inaccuracy	1
14	Individual	Lack of interest	6
15		Discussing an unpleasant experience	2
16		Discussing a personal weakness	1
17		Discussing a regret	1
18		Discussing a private matter	1
19		Effect of a personal problem prior to the interview	1
20	Performance-related	Stuttering	2
21		Pronunciation	1
Total			70.5

***Issues with ideas.*** This theme mainly involved issues the participants experienced with ideas, including lack of support ideas, perception of poor argument, lack of prior knowledge, improvisation, perception of irrelevant ideas, and perception of unsuccessful communication.

***Lack of ideas.*** PEDI's WTC dropped significantly due to being concerned about not having any more supporting ideas to continue. The cluster below began with a series of consecutive pauses, during which his WTC gradually dropped. Even though he was able to stretch an utterance long enough, his WTC continued to fall as he was concerned and uncertain how to continue the task. He

explained that at this point he was thinking about how to continue the talk and struggled for a few seconds:

*... most of the J... (FP .50) the (Silent .34) the (Silent .40) foods (-2) that get prepared really (-2) soon are junk Foods (-1) (Silent .69) and the fast foods but just talking about myself and I really don't care about it because honestly I'm not ...*

In another instance of lack of ideas, Samaneh's high WTC dropped as she had difficulty retrieving supporting ideas but still managed to set the example of seafood as a dish she disliked, which helped her make a LR. However, she explained that since she had never thought about foods she disliked, she had decided to make up some ideas to avoid silence but felt very unwilling to discuss information that was not true:

*... but I prefer to prepare healthy food because I will (Silent .25) use less oil (+4) (Silent .54) for drying my food (Silent .54) but in restaurant it will not be happen (+1) (Silent .68) (FP 1.23) (FP .94) moreover (-2) I prefer to eat (Silent .51) boiled vegetables (+2) or even (FP) I cook or also (-2)(Silent .48) (FP .46) I cook my (-2) (FP) for example seafood in oven instead of frying (-2) (Silent 1.08) (FP 1.03) in pan ...*

*Perception of poor argument.* In one instance, while discussing online education, PEDI had the impression that the examples he was giving to support his argument were poor and aimless. More specifically, after he was done discussing students' attitudes towards online learning, he attempted to set a few examples to better illustrate why some prefer online education but had found out the examples were not efficiently supporting what he was trying to communicate. At the same time, he felt that he was aimlessly stretching the talk, which was why his WTC dropped. It is noteworthy that his speech started to become dysfluent before his WTC dropped:

*... because nowadays students are really easy-going and they don't really want to put themselves into the trouble (Silent .46) so they usually prefer online (Silent .36) (FP .69) method of Education (Silent .93) they can (Silent .33) do whatever they want and (FP .52)(FP .56) just sit beside the computer (Silent .35) and just (Silent .37)(FP .45) (Silent .54) simply (FP .78) check their (FP .67)(Silent .44) I don't know emails (-3) they can play (Silent .45) they can use their mobile phones ...*

Another instance of poor argument occurred when Mehrzad made an untimely topic transition. More specifically, he went about discussing the differences between domestic and foreign

travel, while he had initially planned and prepared to discuss the similarities. This hesitation between ideas lowered his WTC. His speech was fluent, but rather meaningless, which is why he lost WTC:

*... (Silent .28) (FP 1.02) they talking your mother tongue (8 Syl., +2) (Silent .47) and (FP .63) but another time you want to abroad or (11 Syl.) (Silent .28) (FP .67) traveling to some foreign language I think that they are (14 Syl.) (Silent) different kind of problems in this travels (11 Syl., +1) for example (FP .62) in spite of some kind of problems (8 Syl., -2) (FP .66) are the same for both of them ...*

*Lack of prior knowledge.* In one instance, Sara's WTC rose and fell in a short span of time as she moved from discussing what she had some knowledge about (on-campus education) to an argument, about which she hardly possessed any prior knowledge (online education). Even though she felt uncertain, she was able to make a conjecture and keep her speech fluent:

*... on campus education works better for practical field like engineering or (+4) (Silent .70)(FP1.04) some fields related to art or sports but maybe I have no idea maybe (Silent .41)(FP .59) it can work for some humanity's field (-2) ...*

*Improvisation.* In one instance where Majid was improvising, his WTC dropped significantly, but he managed to construct one LR, while most of the surrounding utterances were dysfluent:

*... most of the time because we are from a country (silent .27) who know (Silent .28) (-5) the people in my country (-7) cook different kind of foods we are using meat (-2) we are using (Silent .58) (FP .33) (Silent .33) different (Silent .58) you know we are using (-5) (Silent .74) herbs we are ee. different kinds of (-4) (Silent .42) foods (-4) (FP .54)(Silent .39) I cannot say ...*

*Perception of irrelevant ideas.* In one instance, William's WTC dropped while his speech remained quite fluent. He explained that he had generated a supporting idea and was prepared to elaborate on it; however, he had realized, in the middle of his talk, that maybe the problem he was discussing might only be true about his own educational institutions and not all the institutions in Canada. This doubt had lowered his WTC even though he remained focused and fluent maybe because he had a plan to follow:

*... there's still (Silent .28) connection problem (-1) (Silent .68) problems (-2) and like technological problems like (12 Syl.) (Silent 1.42) the problem with microphone the problem with bigger camera (12 Syl., -1) ...*

*Unsuccessful communication.* Anita's WTC dropped since she did not have a positive impression about the way she had expressed herself, and had she not been pressed for time, she would have preferred to reword her sentences or provide more clarifications. While her fluency did not appear to be troubled (two LRs), her WTC declined significantly because of this:

... *if I go back I wouldn't do it. But (FP .92) (Silent .40) because (FP .49) on my experience I cannot rely on other people experience (18 Syl.) (Silent .92) and (FP .61) so in my opinion you cannot avoid it (12 Syl., -3)...*

**Issues with lexis.** This theme mainly concerned the participants' issues with lexical retrieval, appropriacy, repetition, and hesitation.

*Lexical retrieval.* In one instance, Mehrzad's fluent speech coincided with low WTC as he struggled with lexical retrieval. He explained that since he was unable to retrieve the word *web* of the World Wide Web, he decided to replace it with the word *internet* in order to avoid a pause. This lowered his WTC as he failed to recall the ideal word he had in mind:

... *and benefits like (FP .44) (Silent .44) the (Silent .70) (FP .76) worldwide (Silent .36) famous thing that is internet (8 Syl., -1) (Silent .72) (FP .43) all of us use internet for (8 Syl., +1) (Silent .33) finding some places (Silent .52) for searching for (FP 1.20) looking for everything that they (9 Syl., +1) ...*

*Lexical appropriacy.* In one instance of lexical inappropriacy, Pouya's WTC dropped because he was not certain about the appropriacy of the utterance: *people will lose the chance to*. He added that he had been searching for an equivalent that would communicate his idea and even though he retrieved one, he still felt uncertain about whether he had successfully communicated what he meant:

... *and type of relationships (Silent .35) are going to be (Silent .56) (FP) (Silent .44) online you know (Silent .35) they are not (FP .71) (Silent .39) people (FP .48)(Silent .60) won't actually people will lose the chance to (Syl. 11, -1)(Silent .46) see each other (Silent .79) ...*

*Lexical repetition.* In one instance of perceived lexical repetition, Linda's high WTC because of actively supporting her argument using relevant ideas dropped due to repeating lexical item. The word *example* was repeated twice, where she felt she could have chosen a synonym instead of using

the exact same word. Even though there was a very slight drop in her WTC levels, her fluency did not seem to be troubled:

*... technology help us to do our tasks faster (Silent)(FP) even (+1)(Silent) for example online banking is very good example (-1)(Silent) to do our works or when there are many online applications ...*

*Lexical hesitation.* One case of lexical hesitation occurred during one of Majid's longest utterances which contained 42 syllables and was rated both positively and negatively. He explained that the low WTC was because he knew what he was about to say at the outset of the sentence; however, immediately after, where he uttered: *they cannot look or they cannot concentrate on student feedback*, he had hesitated over the words: *look* or *cannot concentrate*, and still struggled to communicate what he had in mind. He had originally planned to argue that teachers cannot draw their students' attention, but he seemingly failed to do so, which led to a slight drop in his WTC. He added that he did not try to self-correct to avoid pauses:

*... Teachers or professors (+1) they cannot look or they cannot concentrate on student feedback (-1) they cannot get any feedback what they are teaching or what they are talking about ... (42 Syl.)*

**Issues with grammar.** This theme was concerned with issues participants had with grammar including sentence construction, grammatical hesitation/uncertainty, and inaccurate speech.

*Sentence construction.* While William managed to produce a LR, his WTC dropped as he had been struggling to retrieve comparative structures for a while in English (e.g. comparative adjectives). He was not able to do that and his WTC dropped. His speech is mainly dysfluent except for one LR, indicating his skill of stretching speech despite struggling with sentence construction:

*... education and the (Silent .32) professor will (Silent .69) also benefit (Silent .34) more in a way that it recognize the (9 Syl., -1) (Silent .26) level of the education of the (Silent.40) students (-2) (Silent 2.30) (FP.68) the point is that there are ..*

*Hesitation/uncertainty.* In one instance of grammatical hesitation/uncertainty, Linda's

WTC underwent back-to-back rises and falls. Her WTC had initially risen as she had a specific plan of approaching the task (categorizing her ideas into international and urban transport), which she felt secure about. However, upon starting, she hesitated whether to use the preposition *within* or *inside* for *the city*, which led to a drop in her WTC. It is worth mentioning that her fluency did not appear to be troubled as she was able to produce utterances longer than her MLR for this task:

*Transportation problems can be in (+1) (Silent .54) (FP .46) abroad or within city inside the city (-1) ...*

*Inaccuracy.* In another instance, Mohsen's WTC declined due to a grammar error during a stretch of fluent speech. Even though he managed to self-correct, his WTC still declined:

*... that could happen when you're (Silent .44) doing the (Silent .49) travel with a car (Silent .97) If you have a puncture if your car get broke break down (-1)...*

***Individual issues.*** This theme involved subthemes relating to participants' lack of interest, or discussion of an unpleasant experience, a personal weakness, a regret, a private matter, or the effect of a personal problem prior to the interview.

*Lack of interest.* In one instance, Mo started the task with a low level of WTC as he disliked the topic of healthy and unhealthy foods. Since he did not really take the idea seriously in his real life, he had no support ideas to support the argument. He added that while he still managed to produce speech, he knew that he would have ultimately struggled with ideas, which indeed happened and resulted in dysfluent speech.

*If you ask me if I eat healthy food or not (12 Syl., -2)(FP .87) I can say both yes and no (-2) (Silent .79) because (FP .61) most of the time I try to eat healthy food (Silent 1:12) the problem is (FP .77) (-3) (Silent 1:04) I don't care much about (Silent .73) (FP .72) (Silent .31) what food is healthy or (Silent .36) what food is not healthy ...*

*Discussing an unpleasant experience.* After a period of stability, Sara's WTC dropped due to discussing an unpleasant experience during a long run. She explained that she is typically very reluctant to discuss such experiences unless she has to. In this case, she recalled an experience when

she arrived at a destination at night time and did not have a chance to enjoy the beautiful scenery.

While her WTC dropped due to this reason, her speech remained fluent:

*... for me I hate to reach my destination (9 Syl.) (Silent .30) at night (Silent .52) (FP .46) especially if it's the first time I'm visiting (-3) that place (19 Syl.) ...*

*Discussing a personal weakness.* The following instance shows Sara's high WTC because of feeling secure when she related the discussion to her own preference; however, her WTC began to significantly drop as she moved on to discuss a personal weakness. She explained that she had strong team-working skills and preferred to work in an environment that involves group working, though online education requires a lot of self-motivation, which she lacked and considered a weakness she had to overcome. She added that discussing a personal weakness like this with someone she did not know would make her uncomfortable and lower her WTC:

*... I think that on campus education works better at least for me (17 Syl., +2)(Silent .43) and because (FP .97)(Silent 1.6) for online education I think the person should be self-motivated... (Syl. 18, -6) ...*

*Discussing regrets.* In one instance, Mo discussed his regret of not being able to accomplish a goal. More specifically, his WTC dropped because he personally believed that dieting had always been a challenge for him, which he had rarely managed to do:

*... always wanted to be in a good shape (9 Syl., +1) (Silent 1.08) but (Silent 1.48) it is really hard it's really hard (-2) and then (Silent .74) (Silent .27) whenever I try to go for a diet (10 Syl.) (Silent .80) I stop doing that after a few days (LF) (9 Syl., +4) ...*

*Discussing a private matter.* In one instance, Hero decided to discuss his own weight gain and loss experiences and managed to do this fluently; however, he was unwilling to do so because of considering this a private matter and feeling uncomfortable to discuss this with someone else:

*... I myself sometimes I am a person that who gain weights ten kilograms (16 Syl., -2) (FP .54) or lose weights for 10 kgm. It depends I am be on diet or not (16 Syl., -2) I Usually ...*

*Effect of a personal problem prior to the interview.* In one instance where Sara was obsessed with a personal problem that had occurred to her on the day of the interview, Her WTC declined. She began the topic with a low state of WTC and explained that it had taken her longer than usual to prepare for and start the task as she was preoccupied and felt extremely unwilling:

*Nowadays people use technologies (10 Syl, -4) (FP .64)(Silent .76) Ok in their life even without noticing it (Silent .62) I mean sometimes it's unconscious (Silent .54) (FP .78) like people they wake up with their clock alarms (+4) (Silent .48) ...*

**Performance-related issues.** This theme mainly involved oral performance issues that the participant experienced including stuttering or mispronunciations.

*Stuttering.* In one instance, Kaami's stuttered (underlined) over a word, which lowered his WTC. He explained that his WTC would have dropped more significantly in his real-life interactions in such cases. In this particular case, his speech appears to be fluent:

*... but even in that case (Silent .64) tha. (Silent .25) tha. that might be a good idea (-2) but ...*

*Pronunciation.* Mehrzad's WTC dropped as he mispronounced the word *experienced*. He explained that he was aware of the mispronunciation, but did not try to repair and continued:

*... computer or online works but (8 Syl, +1) (FP .43) (Silent .32) in online in on campus education there are they can they could be more experienced person I think that (27 Syl, -2) ...*

## Research Question 2

While the first research question was an investigation of WTC changes during fluent speech, the second research question involved an observation of WTC changes during dysfluent speech:

RQ2: How do WTC and dysfluent speech interact with each other on mostly monologic picture description tasks?

To address the above question, 138 cases of dysfluency in speech were identified. It should be noted that the investigation of dysfluent speech focused solely on instances during which WTC had fluctuated and for which an explanation had been provided by the participants. Of the total of 137, 125 cases involved situations whereby dysfluent speech coincided with low WTC, while the 13 remaining cases were concerned with cooccurrence of dysfluent speech and high WTC.

### **Dysfluent speech and low WTC**

The 125 cases, which were characterized by the dysfluency markers, were coded LFLW (low fluency, low WTC) in NVivo. The identified cases were investigated within their corresponding contexts and reasons/factors causing a decline in WTC were determined using the participants' comments. Table 8 shows five different types of factors that emerged along with each specific factor/reason that had lowered WTC. These factors included issues relating to lexis, grammar, content, performance, and the interviewer. These factors will be presented, in the order presented in the table, along with examples to illustrate the processes.

Table 8.  
*Themes Lowering WTC during Dysfluent Speech*

Theme type	Sub-themes lowering WTC	Number of cases
Lexis	Issues with lexical retrieval or relevant lexical retrieval	21
	Uncertainty about lexical appropriacy or hesitation	14
	Lack of lexical knowledge or lexical error	12
Sentence construction	Sentence construction and structuring issues (hesitations)	13
	Grammatical Inaccuracy	10
Argument	Lack of support ideas or examples	29
	Issues with impromptu ideas or aimless talk	6
	Going off-topic, or irrelevant ideas	5
	Topic transition	2
	Lack of plan or organization of ideas	2
Performance	Pronunciation issues, stutters or stumbling over a word	5
	Dysfluency (long silence)	4
Interviewer	Signals or distractions	2
Total		125

**Issues with lexis.** The most recurring theme (21 cases) that lowered WTC pertained to issues the participants experienced with lexis, including retrieving lexical items they needed in order to express themselves, shortage of lexical knowledge to communicate their point, uncertainty about appropriacy of a lexical item, or hesitation in using a lexical choice.

*Issues with lexical retrieval or relevant lexical retrieval.* Issues with retrieving a lexical item or a relevant lexical item turned out to be the most recurring lexis-related factor lowering WTC. As an illustration, Niki's dropped from a positive level during an LR in the following case where she possessed a support idea but struggled with retrieving an appropriate word for the context. The word *united* required a silence and a filled pause to be retrieved. She added that even after this, she was uncertain if she had successfully communicated what she meant, which explains the following broken and short utterances as well as pauses:

*... you know I think it it helps the world will be (11 Syl., +2) (Silent .54) (FP .47) united (-2) (Silent .42) or (Silent .70) something like this (Silent .36) I think (Silent .28) and (FP .52) (Silent .58)...*

Towards the end of the task, her WTC dropped once again due to failing to retrieve relevant words despite the availability of ideas. She explained that she knew what she wished to discuss but was struggling to find the required lexical resources to make her point more elaborately. She finally decided to use a more general lexical item and move on:

*... they can't spend time on (Silent .38) on (Silent .64) other activities (-1)(Silent .84) and (FP .62) (Silent .59).*

In both of the cases above, lexical retrieval issues resulted in dysfluent speech and lowered her WTC.

*Uncertainty about lexical appropriacy or hesitation.* In 14 of the lexis-related cases, participants indicated a concern about the appropriacy of a lexical item they used or a hesitation whether using a lexical item would be appropriate.

In the instance below, Linda's high WTC dropped and her speech turned more dysfluent.

She explained that her high WTC at the outset was mainly because she had jotted down the word *fraud* as a supporting idea. Later, however, a lexical item she knew in Persian (equivalent of networks) was not retrieved in English so she had to use the word *works*, knowing this would not be an appropriate item for the context. Her hesitation over the lexical choice is evident through a series of connected filled and silent pauses prior to the item. An utterance later, she used the word *back*, which she deemed informal for this context, and her WTC dropped once again:

*... it can has some disadvantages (Silent) like (FP)(Silent) fraud activities (+2) so (Silent) when we use online (FP)(Silent)(FP) online (-1) (Silent) works we should be careful (Silent)(FP) not to be (Silent) hacked (-1) or (FP) some people (Silent) ...*

In another similar case, Soha's WTC dropped as she retrieved the wrong equivalent for *fat*, which lowered her WTC. She explained that she had been searching for the word for a while and had failed to retrieve it at that point, and thus had to move on using the word *oil*, knowing it would not communicate what she meant. She also mentioned that the filled pause before the word *oil* showed she was struggling to retrieve the word. Her lowered WTC was also followed by a series of connected pauses:

*... I try to ignore something like sugar or (12 Syl., +3) (FP. 70) oily or these thing (-1) (Silent .64) (FP 1.22) (Silent 1.41) but (Silent .65) (FP .40) (Silent .40) ...*

*Lack of lexical knowledge or lexical error.* 12 of the lexis-related factors involved cases where participants indicated they were not confident if they possessed the required lexical knowledge of the topics or subtopics they were discussing. For instance, Pouya's positive WTC at the outset of task three dropped to a negative level mainly resulting from a lack of lexical knowledge. He explained that, despite the presence of idea, he had been struggling to find an appropriate equivalent phrase in English for *becoming emotionally distant* for a few seconds; a search that seemed to increase his cognitive load and result in frequent pauses and repetitions before retrieving the expression: *getting far from each other*. His distorted facial expressions and hand gestures were indications of frustration and

communicated his doubt about whether he had communicated his point. He added that even though he had managed to retrieve a phrase, he still felt uncertain about it, which lowered his WTC. The obsession with the appropriacy of the phrase did not appear to end there and seemed to continue to trouble his speech during the subsequent runs as his SR during the cluster of runs below is 2.3 syl./sec., which is slightly below his overall SR of 2.4 syl./sec.:

*... in some situations and some (Silent .57)(FP .39) (Silent .47) for some people it (Silent .73)(FP .49) really (Silent .73)(FP .49) make make people (Silent .68)(FP .40) (Silent 1.38) get far from each other (Silent .56, -2) you know (FP .47)(Silent .74) and type of relationship (silent .35) are going to be Silent .56) (FP) (Silent .44) online you know (Silent .35) they are not (FP .71) (Silent .39) people (FP .48)(Silent .60) ...*

**Issues with sentence construction.** Another theme that emerged as having a negative effect on WTC pertained to issues with structuring sentences. More specifically, in 13 of the cases, participants indicated that they had struggled to smoothly structure their sentences, while in 10 cases, they had detected a grammar error in their speech.

*Sentence construction and structuring issues.* One instance of difficulty in sentence construction occurred when Akbar was discussing his travel experience in Istanbul. His high WTC at the outset of the cluster below was because he specifically knew what he intended to discuss. In fact, he had discussed the exact same topic with a friend in English a few days prior to the data collection, and this conversation had reassured him that he would have adequate linguistic resources to use and discuss the topic successfully. Towards the end of the cluster, however, he struggled to choose the right structures to communicate his ideas, which lowered his WTC and turned his speech dysfluent during the shorter runs towards the end of the cluster compared to the earlier runs. His sentences appear to have a chaotic structure:

*... for example when I was at the Istanbul (12 Syl., +1) (Silent .28) I had problem of (Silent .35) calling and connecting with a tour guide (10 Syl., +2) my family and (-1) (FP) (Silent) a lot of (-1) (FP) the customary thing (FP) which the most important (-1) (Silent) was (FP) about the whereabouts of (-1) (FP) (Silent) FP historical monument (FP .52) building ...*

*Grammatical Inaccuracy.* Another sentence construction issue that lowered WTC was when the participants detected a grammatical error in their speech. One instance occurred when Lili's WTC dropped upon detecting a grammatical error. She explained that once she spotted the use of a wrong preposition in her speech (*call with you*), she purposely repeated it to buy her a second chance to correct it but had failed, which lowered her WTC and resulted in dysfluent speech in the following utterances:

*... a doctor can (Silent .43) Skype with you or can (Silent .72)(FP .45)(Silent 1.29) call with you can call with you to (-2) (Silent .46) (FP .43) say (FP .65) some (FP .39) positive points some (FP .64) (Silent .55) prescriptions for you ...*

***Issues with support arguments.*** The second recurring theme concerned issues with support arguments, including lack of support argument/ideas/examples, struggling with impromptu ideas, discussing off-topic or irrelevant ideas, lack of plan or organization, or problems with topic transitions.

*Lack of support ideas or examples.* The most recurring theme of all the factors concerned situations in which participants lacked adequate supporting ideas or examples to continue their discussions of the topics. In one instance, Niki failed to think of an example to support her argument. More specifically, while searching her mind for some academic fields of study to help her compare which majors might benefit from online or on-campus education, her WTC dropped as it took her some time to recall any. While she was debating this, she struggled to fluently put the words together, resulting in the following dysfluent cluster of speech, in which her WTC also dropped:

*... and (FP .62) (Silent 4.96, -3) (FP .73, -1) (Silent 1.99) about (FP .85) (Silent 5.07) (FP .37) I think one of the (Silent 1.21) (FP .47) (Silent .28) fields( Silent .26) that maybe online education (Silent .42) will be OK for them (Silent .32) maybe (Silent .76) like the language (Silent .70, -1) ...*

In another instance, Linda abandoned a task as she felt she did not have the required knowledge to make her argument. Her fluent speech turned dysfluent as she found out that her

knowledge of seafood was limited and that she might end up giving false information, due to which she lost WTC and terminated the task:

*... and seafood is recommended more, because seafood are (Silent .46) (-4) (FP .84) (Silent 1.23) (FP .70) (Silent 2.12) are very (Silent .69) healthy and (-1), that is it.*

*Impromptu talk.* For six of the cases in which lowered WTC and dysfluent speech cooccurred, participants indicated that they had run out of support argument/ideas, and in order to avoid pauses, had chosen to improvise ideas. However, they had failed halfway through mainly because they were not prepared; that is, they lacked the required linguistic resources, or further support arguments. For instance, Majid's WTC significantly dropped after a period of fluency due to not retrieving ideas and having to improvise in order to avoid pauses, which ironically caused a series of connected silent and filled pauses. His SR during the following cluster was 2.73 syl./sec., which was lower than his SR for the task (3.01 syl./sec.). He explained that he was uncertain about what he was saying and was improvising, which coincided with self-corrections and frequent pauses, a combination of which lowered his WTC during the underlined segment. He added that, since he was discussing a topic he had never discussed before, he struggled with ideas and structures, but if he had been discussing more familiar subjects such as his studies, he would have been much more fluent as everything would have been planned and organized in his mind. In another instance, the pauses and repetition of structures surrounding the word *herb* shows his struggle with both ideas and retrieval of relevant words. At the end of the cluster below, his lack of support ideas once again lowered his WTC and caused dysfluent speech:

*... in our home when we are choosing whatever we are gonna eat yeah we choose (19 Syl. +1)(FP .43) the healthier one (Silent .66) (FP .35) (-5) (Silent 2.08) (FP 1.11) (Silent 2.65) (-5) most of the time because we are from a country (silent .27) who know (Silent .28) (-5) the people in my country (-7) cook different kind of foods we are using meat (-2) we are using (Silent .58) (FP .33) (Silent .33) different (Silent .58) you know we are using (-5) (Silent .74) herbs we are ee. different kinds of (-4) (Silent .42) foods (-4) (FP. 54)(Silent .39) I cannot say I am in specific kind of food but sometimes (Silent .33) can say (Silent .29) I do not (Silent .36) eat (Silent .66) specific seafood (Silent .47) but (FP 1.07) I eat for example I can say I do*

*not eat ham or pork but (Silent .49) you know (Silent .76) (FP .48) so (FP .48) (Silent 1.53) what else (-2) (Silent .50)(FP 1.42)(Silent .47)...*

*Discussing irrelevant ideas.* In a total of five cases, the participant's WTC dropped upon realizing that their support ideas were irrelevant to the main topic. In an instance, and in a not very common circumstance, Lili realized that she might have misunderstood the topic and talked off-topic once she looked at a photo provided to her that illustrated travel problems. She added that she had planned to discuss learning new cultures while travelling, for which she had jotted down notes and vocabulary (e.g. indigenous culture, religious rituals etc.), but after looking at the photo illustrating people travelling at an airport, she had realized that she was limited to discussing problems experienced while traveling, not the problems tourists may experience after arriving at a destination. It is interesting to note that all this debating had occurred in her mind while she was still discussing the previous point (different time zones & jet lag) and was simultaneously planning the upcoming supporting ideas. At this point, she felt lost and struggled with how to carry on the task, which lowered her WTC and led to dysfluent speech:

*... you arrive in another country it's again morning (FP .51) and it could it could be (Silent .42) (FP .68) (Silent 1.81) (FP 1.00) (Silent .35) get you (-2) (FP .65) (Silent .48) some problems (FP .73) (Silent .23) the specialists (FP .45) called it jet lag ...*

In another case, Hero's WTC dropped upon realizing that a supporting idea he brought up was irrelevant to what he had initially planned to discuss. At the beginning of the cluster below, his high WTC was because of his general knowledge and personal interest in technology. More specifically, he had planned to discuss the electronic devices that he typically used in his life and the idea of robots reproducing themselves. However, the decline in his WTC occurred when he noticed his support argument of children's toys, which had just crossed his mind, was hardly relevant to the discussion. He also added that had this occurred in a real-life situation, he would have abandoned the

talk. Here, this low level of WTC coincided with a number of subsequent pauses towards the end of the cluster:

*... I am a fan of Technology I use different devices such as (18 Syl., +2) (FP .42) smart phones laptops computers (7 Syl., +2) (Silent .47) Xbox (FP .68) (Silent .48) (FP .91) I found it interesting (Silent .54) and I was watching a movie about (10 Syl.) (FP .41) (-1) (Silent .73) the children's (FP .68) (Silent .40) the different children's toys ...*

*Topic transition.* Another issue that lowered WTC and caused dysfluent speech occurred during Linda's topic transitions. In the first case, her WTC dropped where she thought the idea being discussed might be offensive to a specific cultural ethnicity. She mentioned that she had initially decided to go over her experience with foods that smell and set Asian foods as an example. After feeling this might be offensive to Asians, she decided to skip the idea, which is why she ran out of ideas, her WTC dropped, and her speech turned dysfluent. At this point, she felt embarrassed and intended to abandon the task:

*... For example (Silent .54)(FP .68) (Silent .59) if the food doesn't have a good smell, I never try it even if I know it's healthy, it's good for me, I never go close and never try. (Silent .91) yeah especially Asian foods (-1) (Silent .71)(FP .61)(Silent 1.89) and (Silent 13.89)(-5) ...*

In another instance, Linda's WTC dropped as she transitioned from discussing the disadvantages of technology to discussing an advantage. Her high WTC for using an advanced word dropped as she turned silent for about five seconds as a result of changing the subject and having to retrieve ideas to continue. She retrieved an idea, her WTC rose, but it took her a few runs before she was able to produce a long run:

*... addicted (+3) to the video games (Silent .32) or (Silent .58) (FP .85) online games (Silent .47) and they waste their time or (Silent .44) they may become antisocial because they spend a lot of time (15 Syl.) (Silent .41) on the computer (Silent .53) (FP .55) so (Silent 1.16) they cannot go (Silent .67) out of the fake world (Silent .28) and find friends (+1) for themselves (Silent 1.14) (FP .79) (Silent 4.94) (-1) (FP .60) I can (FP .57) (Silent .47) mention about research (+1) (Silent .48) (FP .87) because (FP .65) (Silent .92) ...*

*Lack of plan or organization of ideas.* In two cases where Mehrzad was about to start tasks three and four, he was unwilling to start because he lacked a solid plan to start his discussion, despite

having jotted down notes. In the first instance, his low WTC was mainly because he did not have an outline of ideas to present in an orderly manner. In the one-minute prep times, he had managed to jot down ideas, but had not prioritized the order in which they had to be discussed. Except for the one LR, his speech is fairly dysfluent. Later, his WTC improved, however, when he found a way to link a jotted down note to his discussion:

*Ok (FP .48) (Silent .88) the topic of (Silent .42) our conversation is about the technology (Silent .72) I think that (-1) (FP .61) technology is (FP .63) ...*

In the second case, the low WTC was due to lack of a solid plan to begin the task with. He explained that the one-minute prep time had flown by too quickly for him and, as a result, he had only managed to jot down some key words without devising a plan as to how and in what order to present the ideas:

*Ok (FP .84) (Silent 1.17) (-1) I want to talk about the some problem that happen in a travel (17 Syl.) (Silent .47) (FP .65) I think (FP 1.52) it's depend on a different kind of travel some (14 Syl., +1) (FP .95) sometimes you want to have a travel in your country (14 Syl., +1) ...*

In both cases above, his initial LRs are simply introductory sentences with no specific content addressing the topic. While they appeared to help him get started with the task, he paused a few times before actually discussing the topic. It should be mentioned that once he decided what to discuss, his speech became fluent and his WTC improved.

**Performance-related issues.** A total of nine cases identified pertained to the participants' task performance including issues with articulation like stutters or stumbling over words, and long periods of silence, both of which lowered participants' WTC. All the instances will be presented in this case.

*Pronunciation issues, stutters or stumbling over a word.* In the first case that happened to Linda, she struggled with pronouncing the word: *carbohydrates*, which lowered her WTC. She explained that she

was uncertain and tried to give the word a rising intonation to seek feedback from the interviewer about the accuracy of her pronunciation, after which she was corrected and could carry on. Her speech turned dysfluent due to this hesitation in pronouncing the word:

*I never go close and never try. (Silent .91) yeah especially Asian foods (-1) (Silent .71)(FP .61)(Silent 1.89) and (Silent 13.89)(-5) also I know carbo carbohydrates? (-1) (Silent .35) carb carbohydrates (Silent .54) (FP .68) (Silent .37) ...*

The same issue also affected Kaami's WTC and led to speech dysfluent. Prior to this in the cluster below, his WTC had risen as a result of a rarely used word in his lexicon, which he was impressed with. At the end of the cluster, however, his WTC declined due to a hesitation in pronouncing the word: *carbohydrates* during a series of runs that were less fluent than his runs at the outset of the cluster:

*... friends who like hang out and eat a pizza or have a burger or something (24 Syl.) (Silent .44) I crave for junk foods but (Silent .54) I care about eating healthy like after eight I usually don't try to ate eat something (25 Syl., +1) (Silent .69) like (Silent .28) with fat or rice or like (Silent .52) carbohyd... carbohydrate (-2) or stuff (silent .36) but (silent. 40) I can usually try to ...*

In a very similar instance to the one above, Mehrzad's hesitation and uncertainty about pronouncing the word *fibre* reduced his WTC and caused dysfluency after a period of high WTC and fluent speech. At this point, he had decided to discuss three categories of protein, carbs, and fibre, which had improved his WTC prior to this. He explained that he had been uncertain about the pronunciation of this word since the time he had decided to discuss it. His stumble over the word demonstrates his hesitation, too. His fluency significantly diminished when it came to this section compared to the outset of the cluster below:

*... and you should have a (5 Syl., +2) (Silent .28) enough carbohydrates (6 Syl.) (Silent) (FP) and (FP) beside you should have (5 Syl.) (Silent) some (FP) (FP) (Silent) food that (-4) contain f.f fibers like ...*

Another instance occurred when Akbar was introducing reasons why he had bought an iPad. In the beginning of the cluster below, he was able to smoothly recall those reasons, because of which his WTC had risen and remained high throughout the entire cluster, except one case where he lost

WTC as a result of stumbling over the word *transfer*, which had occurred due to him subconsciously planning the upcoming sentence structure and thus not able to focus. His fluent speech turned dysfluent just prior to this:

*...the reason (FP .71) for using a cell phone beside (8 Syl., +2) (Silent .56) iPad (Silent .26) was that I could an iPad for (8 Syl.) (FP .53) reading (Silent .45) (FP 1.01) having kind of portable laptop with myself wherever I went (17 Syl., +1) (Silent .31) I have a (FP .29) just light device (Silent .31) with me (Silent .39) to (FP .39) (Silent .32) tran transfer (-2) our document specially the work-related document (16 Syl., +3) ...*

Stumbling over a word also affected Majid's WTC upon pronouncing a word he considered *basic* or elementary in English. After a fluent run, he stumbled over the word *master*, which was preceded by a case of repetition *I have* and accompanied by a hesitation in choosing a preferred structure of words, causing a number of silent and filled pauses before and after, resulting in a drop in his WTC:

*.... when you are taking online courses I have i have done my (Silent. 1.09) (FP. 27) software ma (FP .28) masters of (FP. 42) (-2) (Silent .36) engineering in software engineering in Iran engineering in software engineering in Iran and completely online course ...*

*Dysfluency (long or frequent pauses).* In the following four instances, participants indicated that their WTC dropped as a result of dysfluent speech. In one instance, Mo's WTC dropped because of a few pauses that he had to make to gather his thoughts and produce speech. The first run in the cluster below was a question provided to him, which he read to himself aloud. Once he prepared to discuss the disadvantages of technology, he felt the ideas and the relevant vocabulary were not flowing smoothly and he struggled between pauses, which lowered his WTC:

*... does technology offer any disadvantages (Silent 1:15)(FP .64)(Silent 1:09) I can say yes (-1) (FP .91)(Silent 1.25) ...*

Hero's WTC also dropped in the midst of a number of pauses and a direct result of them, as he struggled to retrieve what to say next, before he decided to discuss his own preference:

*... classes at the university you won't don't have to pay for that money. (Silent 1.72) (FP .61) (-1) (Silent 1.25) I myself prefer to (FP .95) (Silent .44) attend to a regular class because I think that I can learn more (17 Syl, +5) (Silent .44) ...*

Another instance where dysfluency lowered WTC was when Akbar hesitated between ideas and his fluent speech turned dysfluent. He explained that he was content with the smooth retrieval of ideas and vocabulary until he began to linger for a while over whether to continue elaborating further on the discussion of a course he was taking at the time or not, resulting in a long FP, which lowered his WTC. He decided to bring the discussion of that specific course to an end and revert back to the main topic of the task and was able to produce fluent speech again:

*... give you a lot of (Silent .80) perspective a lot of ideas what to do during session after that or use some complementary works or what exactly would you (34 Syl, +5) (Silent .28) (FP 1.04) (-3) do with that material that you have learned in the class (13 Syl) ...*

In the last instance, Kaami's WTC dropped as a result of a series of pauses he had to make over debating whether to continue telling the complete version of a joke or only discuss its intended message; a hesitation that caused pauses that lowered his WTC:

*... and at the moment (Silent .25) he said that and (Silent .52) he rephrased himself that (Silent .57) someone (Silent 1.13) (-3) said (Silent .90) that the (Silent .37) phrase...*

*Interviewer-related issues.* The remaining two cases occurred when participants' low WTC was caused by misunderstanding or getting distracted by the interviewer. In the first instance, Linda ran out of ideas and asked if she had to carry on. The interviewer stepped in to assist her by asking a question in which there was a word she misunderstood and asked for clarification, which reduced her WTC. In the dialogue below, she apparently either did not understand what was meant by the word *urban* or missed the word for some reason. The answer she provided was irrelevant so the interviewer had to rephrase the question. She asked for clarifications, which was why her WTC dropped for not having understood the question. It is noteworthy that the runs she produced while she was unwilling were less fluent compared to the earlier or later runs.

- Linda: *so should I talk more it's one fifty eight*  
 Interviewer: I am going to ask you a couple of more questions if you don't mind?  
 Linda: *Sure*  
 Interviewer: So, when you are talking about urban transport systems, which kind of transport system do you personally prefer?  
 Linda: *(FP) (Silent) I prefer flight*  
 Interviewer: I am talking about urban transport like city transport.  
 Linda: *Oh OK (FP) so you mean like (FP) OC Transpo (-1).*  
 Interviewer: Do you prefer to bus to your destinations?  
 Linda: *Yes.*  
 Interviewer: Do you prefer to take taxis? Do you prefer to ride a bike? Do you prefer to take metro if there is any in your hometown?  
 Linda: *If there is any metro I prefer to take metro (+1) but in my hometown there is no metro (Silent) bike takes a long time so I don't need prefer to take the bike (Silent) or taking the taxi is expensive (Silent) so I prefer to take the bus.*

In the second instance, William's high WTC dropped as the interviewer signalled him to look away from the camera and face the interviewer. This distracted him and caused him to temporarily lose his train of thought, lowering his WTC and causing a few pauses before he was able to regain control over his talk:

*... on-campus education is (Silent .46) definitely more effective than online education (16 Syl.) (Silent .38) has (Silent 1.06) on campus education (-2) (Silent 1.45) is (FP.59) (Silent 1.68) (FP .64) the person is ...*

### **Dysfluent speech and high WTC**

There were 13 instances where dysfluent speech, characterized by long or frequent pauses, coincided with a high level of WTC. I will first present these instances in tabular form and then discuss them case by case (there will be no thematic categorization in this case). Table 9 categorizes the cases by the type of theme that improved WTC and provides participant information and what unfolded subsequent to the case. An overall discussion will follow at the end.

Table 9.  
*Themes Improving WTC during Dysfluent Speech*

	Factor type	Reason for high WTC	Participant	Subsequent turn of event
1	Support argument	achievement	Pouya	FIA <sup>a</sup>

2	Support argument	achievement	Sahra	RDWD <sup>b</sup>
3	Support argument	Support ideas (notes)	Linda	RDWD
4	Support argument	Support ideas (notes)	Linda	RDWD
5	Support argument	Interest and personal experience	Sara	FIA
6	Support argument	Personal belief	Sara	FIA
7	Support argument	Personal experience	Lili	RDWD
8	Support argument	Daily life	Sahra	FIA
9	Linguistic/cognitive	Lexical retrieval	Linda	FIA
10	Linguistic/cognitive	Lexical retrieval	Sara	FIA
11	Linguistic/cognitive	Lexical retrieval	Mohsen	FIA
12	Linguistic/cognitive	Idea & Lexical retrieval	Linda	RDWD
13	Linguistic/cognitive	Lexical Retrieval in progress	Samaneh	FIA

a. Fluent immediately after, b. Remained dysfluent and WTC dropped

In the first instance, Pouya's high WTC coincided with a dysfluent utterance while he was discussing an accomplishment. More specifically, the rise in his WTC occurred because he was discussing an accomplishment he was proud of. While his speech was not very fluent at the outset, his WTC remained at a positive state throughout the whole cluster. However, he was finally able to build an LR towards the end and his WTC rose:

*... five times (Silent .51) I I lost weight (Silent .52, +5) (FP .51) for five times and (Silent .47) every time, I lost at least (Silent .37, +4) twenty kilograms (Silent .39) and yes this is what I have done (8 Syl., +2) ...*

In another instance, retrieval of relevant words to her discussion improved Linda's WTC despite the fact that her speech was not very fluent. She explained that she thought of the word *seafood* as being very relevant to her argument, and the fact that she had retrieved it had raised her WTC:

*... but we can get proteins from meat, (Silent .45)(FP1.02) beans or (+2) (Silent .72)(FP .80) (Silent .96) or seafood (+2) (Silent .44) ...*

In the next instance, Linda struggled to retrieve a word, which caused a number of pauses. She did not lose WTC as she had taken notes of the word and only had to look down at her notes:

... (Silent)(FP)(Silent) however (FP) it can has some disadvantages (Silent) like (FP) (Silent) fraud activities **(+2)** so (Silent) when we use online (FP)(Silent)(FP) online **(-1)** (Silent) works we should be careful (Silent) (FP) not to be (Silent) hacked **(-1)** or (FP) some people (Silent) ...

In another instance, Linda's WTC rose while her speech appeared to be fairly dysfluent. The negative level of WTC was caused by a topic transition during, which she remained silent to retrieve ideas to continue. However, once she was able to retrieve an idea, her WTC improved not only because she felt she had made up for the long silent pause, but also because of retrieving an appropriate lexical item (resources). In this case it appeared that her WTC rose a few seconds earlier than she was able to produce fluency speech:

... (Silent .53) (FP .55) so (Silent 1.16) they cannot go (Silent .67) out of the fake world (Silent .28) and find friends **(+1)** for themselves (Silent 1.14) (FP .79) (Silent 4.94) **(-1)** (FP .60) I can (FP .57) (Silent .47) mention about research **(+1)** (Silent .48) (FP .87) because (FP .65) (Silent .92) technology and internet helped the (Silent .56) (FP .67) (Silent .40) all the research area a lot because we can have access to many resources **(+1)** (Silent .40) easily ...

In another case, Linda's WTC rose and remained high mainly because of having the plan to discuss flight delays, but as she was constructing the upcoming sentence in her mind, her speech became dysfluent. She explained that she had found herself hesitating between two structures: *so it's not* and *it's kind of*, which finally lowered her WTC, too:

... and sometimes my flights (FP .47) have delays **(+1)** (FP .72) so it's not (Silent 1.46) it's kind of **(-1)**(Silent .36) (FP .92) we cannot avoid that ...

Sara began task one with a high level of WTC as the topic involved discussing her own interest and a personal experience. She had been wondering why people she saw at the gym expected to lose weight without investing on an efficient diet. Following the positive rating, she used a proverb she had heard and used before and this also improved her WTC to a certain extent during what appears to be a dysfluent speech:

... some people (Silent .25) think (FP .82) that (Silent .30) going to the gym is enough (Silent .61) to remain healthy (Silent .89)but (FP .30) as British says **(+7)** (Silent .48)(FP .71)(Silent .59) Abs are made in the kitchen rather than at the gym ...

Sara's WTC rose in another instance where she appeared to run out of ideas and thus the interviewer intervened to ask her follow-up questions to keep the task going. Her WTC increased during a seemingly dysfluent cluster of utterances and remained stable mainly because she was discussing her personal belief and thus able to formulate an example (that practical fields like engineering should be taught on campus) to support her argument:

Sara: *yeah it has (Silent .52) some advantages and disadvantages each of them.*

Interviewer: *and which one do you think is more efficient in transferring the knowledge from the professor to the students?*

Sara: *(FP 1.16) it depends on so many criteria (Silent .88) like it depends first of all it depends on the field as I said (.35) the practical fields they need (Silent .57) to be (FP .55) taught (FP .42)(Silent .35) as on campus (+2) (Silent .81) (FP .75) like (Silent .79) ...*

In another instance, Sara remained willing to communicate during dysfluent speech. She began the task with very high levels of WTC, which remained high for a while because of successful vocabulary retrieval and discussing her personal interest. While the cluster below contains five LR's, her speech rate for the cluster (2.04 syl./sec.) was slightly below her overall speech rate (2.11 syl./sec.). Her high level of WTC for discussing her interest in the topic was maintained further when she managed to retrieve *bustle and bustle*, which she thought, was quite appropriate for the context and was a low-frequency word. During the following long run, using the word *necessarily* improved her WTC once again for the same reasons:

*OK talking (Silent .51) talking about travelling I believe is a must for (14 Syl, +5) (Silent .45) everyone (Silent .79) (FP .8) (Silent .8) in such a hustle and bustle life (9 Syl, +3) (Silent .85) and (FP .84) (Silent 2.06) (FP .86) it's a kind of (Silent .44)(FP .45) escaping (+4) (Silent .67) from (FP .76) routines (Silent .59) day routine days life (Silent .82) and (FP .73) but some people they say it's so expensive (Silent .51) but (FP .40) it's not necessarily (+5) (Silent .44) (FP .91) you can bo book hustle instead of booking a five star (14 Syl, +3) (Silent)(FP) hotel (Silent) this way you can communicate with more people you can find (14 Syl.) (FP)(Silent) some people ...*

Samaneh's WTC rose while she was discussing foods that she thought should be avoided in any diet. Despite a number of pauses, her WTC did not seem to be influenced because she still managed to retrieve words relating to the context even though the retrieval took place slowly:

... personally I avoid eating ham (+2) or (Silent .41) fried (Silent .73) (FP .79) foods (+2) (FP .37) because I think it could have a long undesirable long-term effect (-2) on our body (+4)...

In what seems to be a fairly dysfluent speech, characterized by many pauses, Mohsen used the word *overheated* which improved his WTC. He explained this was not a word in his lexicon that he would commonly use. However, since he retrieved an appropriate lexical fit for the context and managed to communicate what he meant, his WTC rose:

... so (Silent .32) the car get (Silent .28) like (Silent .26) overheated (+1) if you wanted turn the AC on (Silent .61) ...

In another instance, Lili's WTC rose while discussing her personal experience of having to stay at airports while traveling, which coincided with a fluent run. A few pauses occurred as a result of searching for the word *entertainment*, even though her WTC still remained positive while she was reviewing her experience. However, her WTC dropped once she realized that she lacked additional ideas to continue with and thus terminated the task:

... you have to stay in the airport without any (10 Syl., +2)(Silent .40) (FP .45) comfortable place to rest without any (Silent .27) food without any (Silent .40) (FP .26) entertainment (+1) (Silent .25) (FP .40) you should just stay (Silent 1.15) and there is a lot of (Silent .25) (FP .86) (Silent .89) problems regarding to (Silent .40) transportation (-3).

Sahra's low WTC, due to struggling to retrieve the word *problem* resulting in repetition of the word *another*, rose as she turned to discuss a personal daily routine during what seemed to be dysfluent speech:

... there is a lot of another another (-1) problem that we are student we just stay (21 Syl., +2) (FP .75) beside (Silent .42) behind a table (+2) (Silent .24) we don't do a lot of ...

In another instance where her speech turned dysfluent, her WTC rose because she was discussing her French language skills, which she considered an achievement and felt proud of. More specifically, she had recalled speaking among a group of Francophone speakers who had admired her

language skills. Later, her dysfluent speech coincided with running out of ideas that led to a long silence and lowered her WTC:

*... it's (FP .25) like (Silent 1.11) we can (Silent .43) understand (Silent .28) (FP .76) their culture easily (+1) ...*

### Research Question 3

The third research question involved an investigation of the factors that triggered shifts in WTC and its interaction with L2 fluency. The question is as follows:

RQ3: What attributes (e.g., cognitive, linguistics, etc.) might influence the interaction between WTC and L2 fluency?

To answer this question, the stimulated recall interviews were coded and seven theme types and a total of 28 sub-themes emerged. Figure 14 illustrates the themes along with their corresponding percentages. Table 10 presents additional detailed participant-specific information about the frequency of the sub-themes. They will then be discussed and multiple instances of each will be provided.

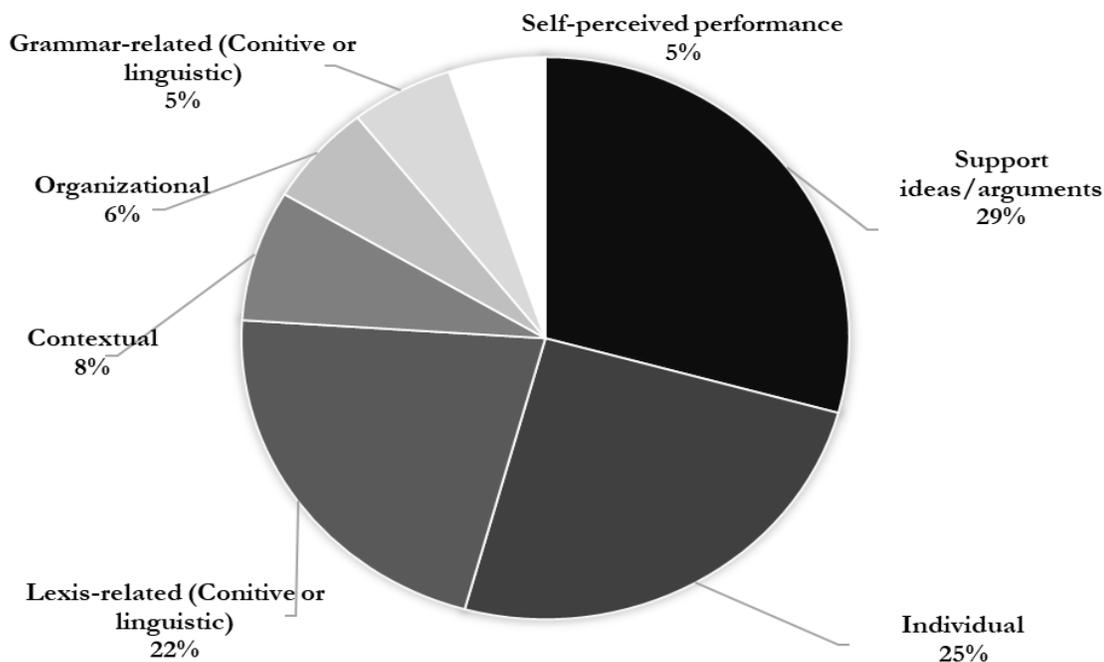


Figure 14. Pie chart of themes affecting WTC.



### Supporting ideas/arguments

Participants indicated that their WTC fluctuated as a result of factors that can best be attributed to supporting ideas/argument. These instances were identified and categorized into five different themes, including: possession or lack of support ideas/examples, impromptu ideas, perceived inappropriacy or irrelevance of ideas, perception of successful argument, and perception of unsuccessful communication of ideas.

***Possession, retrieval, or lack of support ideas/examples.*** One case where retrieval of a support idea improved WTC was after Niki had lost WTC due to failure to retrieve the lexical items (Previously discussed) she needed in order to make her argument. During the final utterance where she managed to recall a supporting idea (language), her WTC increased, leading to a long run of 14 syllables. More specifically, she explained that once the idea of language crossed her mind, she thought of comparing it with math and then discussing which method of education could benefit each subject:

*... and (FP .62) (Silent 4.96, -3) (FP .73, -1) (Silent 1.99) about (FP .85) (Silent 5.07) (FP .37) I think one of the (Silent 1.21) (FP .47) (Silent .28) fields( Silent .26) that maybe online education (Silent .42) will be OK for them (Silent .32) maybe (Silent .76) like the language (Silent .70, -1)because they need just to communicate just to talk but ( 14 syl, +2)...*

Linda's WTC also rose as she was able to think of a new support argument. In this instance, her WTC had dropped due to a long silence; however, she managed to retrieve ideas and the required vocabulary (*medical application of technology*) and got back on with the task, which led to an increase in her WTC during an LR:

*... and we can share ideas with other (FP .72) scientist (Silent .81)(FP .76)(Silent 3.68) (-1) also some helpful medical applications of technology (+2) (Silent .25)(FP. 65) has been developed ...*

Sara's WTC fluctuated due to lack of and then hitting upon an idea in the second task. Her WTC rose towards the end of the task where she appeared to run out of ideas and thus the interviewer had to ask her a follow-up question to sustain the task. Her WTC increased during a seemingly dysfluent cluster of utterances. She started to become more fluent towards the end, which she explained was because of discussing her personal belief and that she was able to support her argument with an example (the idea that practical fields like engineering should be taught on campus):

Sara: *yeah it has (Silent .52) some advantages and disadvantages each of them.*

Interviewer: *and which one do you think is more efficient in transferring the knowledge from the professor to the students?*

Sara: *(FP 1.16) it depends on so many criteria (Silent .88) like it depends first of all it depends on the field as I said (.35) the practical fields they need (Silent .57) to be (FP .55) taught (FP .42)(Silent .35) as on campus (+2) (Silent .81) (FP .75) like (Silent .79) engineering fields they need to work in labs or in the field (+4) (Silent .97) ...*

Majid's low WTC due to retrieval issues rose once he managed to retrieve an idea and its relevant lexical phrase *healthy diet*, and remained stable for a while, as did his fluency, characterized by a number of LR's. Apparently, he did this by discussing his own case:

*Ok. let's now talk about our food our (FP .41) any (-1) (Silent .44)(FP .55) healthy diet we have or not (+3) (Silent .45) so (FP .60) at first I wanna ta I wanna talk about myself because I really I really like (23 Syl., +5) I really like to (Silent .44) eat a lot and especially when there is delicious food (16 Syl., +2) (Silent .38) whenever my when my wife (Silent .34) cooks (+5) (Silent .48) for me but (FP .35) in terms of talking about diet I have never been on diet (15 Syl., +1) but (Silent .61)(FP .58) sometimes I choose to stop eating some specific things like coke like sugar (19 Syl., +3) (Silent .57)(FP .57) these kinds of things I always like to drink these kinds of things (14 Syl., +3) (Silent .94) it depends...*

In another instance later in the same task, Majid's WTC fluctuated because of support ideas. In the following cluster of utterances, his WTC began to rise as he recalled more ideas that helped him speak fluently, but after a series of LR's, his WTC significantly dropped due to not retrieving ideas and having to improvise in order to avoid pauses. His fluent speech and high level of WTC

were thus affected by his struggles to continue his fluent speech, resulting in a series of connected silent and filled pauses:

*...in it (Silent .52) but it (Silent .26) it depends on the situation sometimes we're gathering together we are you know we are in party we are not choosing whatever we are eating (40 Syl., +2) (Silent .28) I cannot (Silent .26) prevent myself to touch that so I am going to pick that one (15 Syl.) (Silent .26) yeah (Silent .26) but (FP .55) in our home when we are choosing whatever we are gonna eat yeah we choose (19 Syl. +1)(FP .43) the healthier one (Silent .66) (FP .35) (-5) (Silent 2.08) (FP 1.11) (Silent 2.65) (-5) most of the time because we are from a country (silent .27) you know (Silent .28) (-5) the people in my country (-7) cook different kind of foods we are using meat (-2) we are using (Silent .58) (FP .33) (Silent .33) different (Silent .58) you know we are using (-5) (Silent .74) herbs we are ee. different kinds of (-4) (Silent .42) foods (-4) (FP. 54)(Silent .39) I cannot say I am in specific kind of food but sometimes (Silent .33) can say (Silent .29) I do not (Silent .36) eat (Silent .66) specific seafood (Silent .47) but (FP 1.07) I eat for example I can say I do not eat ham or pork but (Silent .49) you know (Silent .76) (FP .48) so (FP .48) (Silent 1.53) what else (-2) (Silent .50)(FP 1.42)(Silent .47).*

Pedi's WTC rose when he chose to share a daily personal experience that he considered relevant to the task. In the excerpt below, he recalled his daily experience of seeing youth glued to their electronic devices on the bus, which he had found very unusual when comparing them to the youth who would typically spend more time talking to each other on public transit back home. He believed this comparison supported his argument, which improved his WTC and coincided with fluent speech:

*... these things are the (.85) positive things of the (Silent .44)(FP .80)(Silent .28) technology and the mobile phone and the other things (15 Syl. +2)(Silent .44) but also it has some disadvantages ...*

In the following long cluster, Samaneh's WTC fluctuated because of the availability and unavailability of support ideas. She explained this was because she had an abundance of ideas she had recalled during the preparation time. She was both familiar with and interested in the topic (food) and thus had extensively read about it. Towards the end of this part, she ran out of ideas, her WTC dropped for the first time, and this was accompanied by three consecutive pauses. To compensate for this, she decided to provide examples of what she liked or disliked; a decision that helped her recall her favorite dish (boiled vegetable), which improved her WTC a bit. However, she once again found it difficult to recall what she disliked, which coincided with a drop in her WTC and

brought about a series of pauses and fragmented utterances. She still managed to set the example of seafood as a dish she disliked:

*Honestly I try to eat healthy food because my health is very important for me (+6) (Silent .69) and personally I prefer to cook at home instead of going to a restaurant (+4) (Silent .57) why it would be very funny for me because I would have a chance to gather with my friends (+3) and we would have a time more time to talk with each other (+2) (Silent .44) but I prefer to prepare healthy food because I will (Silent .25) use less oil (+4) (Silent .54) for drying my food (Silent .54) but in restaurant it will not be happen (+1) (Silent .68) (FP 1.23) (FP .94) moreover (-2) I prefer to eat (Silent .51) boiled vegetables (+2) or even (FP) I cook or also (-2) (Silent .48) (FP .46) I cook my (-2) (FP) for example seafood in oven instead of frying (-2) (Silent 1.08) (FP 1.03) in pan ...*

In another instance, Saba had recalled a recent conversation with her husband; an experience that she had found relevant to the task and had improved her WTC during the following two LRs:

*... fast food because sometimes I need. sometimes I need to eat unhealthy sometimes I say to my husband (28 Syl, +3) (FP .38) we need (Silent .61) (FP .69) some micro micro organism and some bacteria and some unhealthy eating (20 Syl, +3) ...*

Mo's WTC went up when he managed to retrieve the idea of dining out. He explained that he loved going out to eat and had discussed dining out with someone in English, which is why he felt prepared to discuss it here. His speech also became more fluent from this point on and he was able to produce three LRs:

*... if I wanted to have fast-food I usually go out so (14 Syl, +5) (Silent .31) whenever I go out (Silent .54) that kind of (FP .31) (Silent .51) fast-food or junk food might come to my mind to (Silent .32) have it (Silent .48) just to save time and then get full and come back to focus on my (Silent .64) stuff ...*

In another instance, Hero recalled a personal experience with a distance learning project, which gave him enough support ideas to carry on the task. He further explained that he had also taken online courses and had seen issues with online courses experienced by students closely, the knowledge of which gave him confidence to discuss it, which he did fluently:

*... I think as a technology (Silent 1.02) new learning system is published which is called online learning and lot of (18 Syl, +3) (FP .58) courses now available online and you can access them through the internet (19 Syl, +1) ...*

Sepehr began the second task with a fairly high level of WTC because he had knowledge about the topic and had planned to discuss his personal interest. He had started the task knowing he wanted to talk about his preference for on-campus education. Having the plan along with supporting ideas improved his WTC. His high WTC coincided with two LRs:

*... Online (FP .31) versus (Silent .27) on campus education (+1) personality (Silent .81) I like on campus education (9 syl.) (Silent .64) I know that (FP .72) (Silent 1.12) we have now in this days we have more population and (14 Syl.) ...*

Anita started the third task with a high level of WTC because of a personal interest in the topic. She mentioned that upon starting that task, she had an abundance of ideas she was very interested to share. There was a case where retrieval of the word *range* took her longer than usual, but since she was more focused on sharing her ideas, it did not affect her WTC. In the following runs, her WTC rose as she was able to recall more devices as well as her daily experience of the purposes for which she used the electronic devices. She further added that she found it easier to retrieve words related to technology for two reasons: firstly, she had some background information in computer programming; second, most of the technology-related words in Farsi are borrowed from the English language and are thus the same. Therefore, she was not concerned about retrieving words since the very same terms are widely used in Farsi. The cluster below contained five fluent runs and a SR of 3.00 syl./sec., which was slightly above her overall SR of 2.76 (syl./sec.):

*... I am going to talk about technology just about my life my personal experience (23 Syl., +1). (Silent 1.15) Because it has a wide and (Silent .57) it has a wide (FP 1.00) (Silent .84) I don't remember (Silent .52) ok wide range (Silent .40) and so I am not going to talk about all of them (13 Syl.) (Silent .50) All devices that I am using is my computer (13 Syl.) (Silent .37) and my cell phone (+5) I use it I use them in my everyday life (13 Syl.) (Silent .49) I do everything with them for example anything (15 Syl., +1) ...*

Soha's WTC fluctuated because of firstly lacking and then retrieving support arguments. She explained the drop was due to the fact that she was unable to continue supporting her argument, which was why she had decided to completely shift the focus. In this instance, not being able to support her argument appeared to turn her fluent speech to dysfluent speech:

... to (Silent .60) (FP .78) innovations and because people can (10 Syl.) (FP .39) get information very easy (Silent .41) so and can be connected to each other and (11 Syl.) (FP .52) can lead to **(-1)** (Silent .54) (FP .59) like (Silent .48) nowadays I can say ...

Immediately after the cluster above, she was able to think of new ideas and her WTC rose:

... like countries or regions that they are out of date because they (15 Syl., **+1**) (Silent .41) (FP 1.26) they can communicate together (FP .43) (Silent .32) if there are any (Silent .26) even if they are far away from each other in any part of the world (18 Syl.) (Silent .63) they can connect so they can be updated and use (12 Syl.) (FP .33) get (FP .29) advantage of all kind of technologies (11 Syl., **+1**) (Silent .75) ...

Mehrzad's WTC significantly dropped because he ran out of ideas and became very dysfluent and finally silent. The interviewer intervened to help him with ideas, which helped him with WTC and fluency:

Mehrzad: ... for a person who want to be in a (Silent .35) academic places I think (Silent .76) and (FP .81) (Silent .23) (FP .58) (Silent 1.04) (FP .47) (Silent .69) I think that (FP .37) (Silent .77) there is not any **(-5)** (Silent .53) (FP .36) (Silent .51) special thing **(-2)** (Silent .24) that **(-1)** (Silent .91) I want to say (Silent .82) **(-1)** (FP .43) (Silent 1.61) ...

Interviewer: So, can I ask you a question? If you were the employer of a company, would you prefer to hire someone who has done an online program or an on-campus one?

Mehrzad: Definitely on-campus education (Silent .33) on campus education maybe people who (FP .51) take a (Silent .30) (FP 1.05) their degree from online have a people are good in some kind of (16 Syl., **+1**) (Silent .61) computer or online works but (8 Syl., **+1**) (FP .43) (Silent .32) in online in on campus education there are they can they could be more experienced person I think that (27 Syl., **-2**) ...

Akbar's WTC fluctuated due to availability of ideas during a fairly fluent cluster. While he was discussing his personal experience of comparing his diets before and after coming to Canada, his WTC remained high, so did his fluency. His WTC dropped during the third long run in the middle of the cluster, which was because he had been wondering what to discuss after this. His speech, as a result, became fragmented and dysfluent towards the end of the cluster as he later struggled with retrieving further support information, explaining his earlier low WTC and his low WTC at the end of the cluster:

... I really (FP .41) made a big difference (6 Syl., +1) (FP .44) between my diet when I was in Iran (10 Syl.) (Silent .48) and I think (FP .76) it's really important for every one especially for me because before coming in here I checked up from my (31 Syl., +4) (Silent .30) complete health and realized that I have a (10 Syl., -3) (Silent .51) increase in my liver fat (7 Syl.) (Silent .52) so I think having a lot of vegetables and fruits (14 Syl.) (FP .42) and also (Silent .27) not a lot of (FP .61) fried (FP .52) material would help (FP .41) or (FP .50) (-2) (Silent .31) health (Silent .60) (FP .88) because (FP .72) even (FP .28) (Silent .32) ...

Kaami's WTC rose because of the availability of support ideas, which he recalled from a personal experience with online courses:

... a semester I like took a semester online and have done one online (19 Syl.) (Silent .44) and (FP .25) (Silent .27) I think (Silent .38) on campus education is more efficient because (14 Syl., +2) (Silent .70) in on campus (FP .48) (Silent .35) on campus we you have the face (8 Syl.) (Silent .52) face to face interaction with your like (10 Syl., +2) (Silent .39) instructor ...

A few runs later, he recalled more features of the two types of education from his experience and his WTC rose once again during two LRs:

... and other people ideas and you can ask always can ask questions (17 Syl., +2) (Silent .96) (FP .40) (Silent .42) but in (FP .46) online education you don't have that you can't ask question you don't have those interactions (26 Syl.) aside from that I believe that (Silent .99) (FP .46) (-2) (Silent 2.28) there're there are more (Silent .41) to on campus education the social interaction that comes with it (19 Syl.) (Silent .69) that has its own assets (Silent .34) also (Silent 1.00) that social interaction would affect people life so (14 Syl., +1) (Silent .60) I am imagining myself like having (11 Syl.) (Silent .91) like four years of online education I think it's (14 Syl.) (Silent .33) really tough cause you are always on your own (11 Syl.) (Silent 1.36) you have to do everything online (10 Syl.) (Silent .28) there are so many times that (7 Syl.) (Silent .58) like (Silent .57) usually on online education (10 Syl.) ...

Three consecutive pauses in the middle of the above cluster were caused by a moment of hesitation over how to continue his discussion and lowered his WTC. However, he decided to revert to discussing the features of the types of education and his personal experience that he felt secure discussing and; therefore, his WTC rose again shortly after.

**Discussing impromptu ideas.** A few of the participants indicated that they had chosen to improvise ideas whenever they ran out of notes or ideas. By *improvising ideas*, they mainly referred to situations whereby they had to discuss ideas for which they were unprepared both linguistically and

in terms of ideas. Deciding to improvise was in order to avoid silence and seemed to involve taking a risk because they were potentially uncertain of how it would turn out in the end. In the instances that will be presented below, their WTC fluctuated depending on whether they perceived the outcome successful or not. In one instance, Majid's high WTC dropped and his fluent speech turned dysfluent since he struggled to continue his speech due to lack of support ideas, where there are a series of connected silent and filled pauses. Later, his WTC dropped because he was mainly uncertain about the ideas he was improvising, which coincided with a number of self-corrections and frequent pauses; a combination of which lowered his WTC:

*...in it (Silent .52) but it (Silent .26) it depends on the situation sometimes we're gathering together we are you know we are in party we are not choosing whatever we are eating (40 Syl., +2) (Silent .28) I cannot (Silent .26) prevent myself to touch that so I am going to pick that one (15 Syl.) (Silent .26) yeah (Silent .26) but (FP .55) in our home when we are choosing whatever we are gonna eat yeah we choose (19 Syl. +1)(FP .43) the healthier one (Silent .66) (FP .35) (-5) (Silent 2.08) (FP 1.11) (Silent 2.65) (-5) most of the time because we are from a country (silent .27) who know (Silent .28) (-5) the people in my country (-7) cook different kind of foods we are using meat (-2) we are using (Silent .58) (FP .33) (Silent .33) different (Silent .58) you know we are using (-5) (Silent .74) herbs we are ee. different kinds of (-4) (Silent .42) foods (-4) (FP. 54)(Silent .39) I cannot say I am in specific kind of food but sometimes (Silent .33) can say (Silent .29) I do not (Silent .36) eat (Silent .66) specific seafood (Silent .47) but (FP 1.07) I eat for example I can say I do not eat ham or pork but (Silent .49) you know (Silent .76) (FP .48) so (FP .48) (Silent 1.53) what else (-2) (Silent .50)(FP 1.42)(Silent .47)*

Later he added that his struggle with ideas and then structuring sentences was because he was discussing a topic he had never had to talk about before in English, but if he had been discussing more familiar ideas such as his studies, he would have been much more fluent as everything would be planned and structured in his mind.

Mohsen's WTC also dropped due to discussing some impromptu ideas during what appeared to be a LR. At the outset of task four, he struggled to recall any sorts of travel problems that lowered his WTC. He mentioned that he was speaking impromptu and off the top of his head, so he was not certain where he was going with his talk:

*... since that I done most of my travels with a car (Silent .62) I can only think about the travel (Silent .27) about the troubles and about the (Silent .69) things (-1) that could ...*

In another instance, after a period of high WTC and fluency, characterized by several consecutive long runs, Hero's WTC dropped since he ran out of support ideas, which coincided with dysfluent speech at the end of the cluster below. He explained that he had discussed all his notes at this point and thus had to refer to a prompt question on the paper provided to get some ideas. He added that having to improvise ideas made him lose control over the task and thus uncomfortable:

*... Most of the restaurants offers (Silent .46) junk food although, they may (Silent .82) say that it is not the junk foods but they use (11 Syl., +2) (Silent .43) (FP .52) they use all (Silent .44) lots of (Silent .28) oils and (Silent .40) that's make it unhealthy (Silent .62) So, in your daily life you have to eat (FP .89) (Silent .26) junk foods and (-2) (Silent 1.08) if you want to have fun (Silent .55) so (Silent 1.21) (FP 1.12) (Silent 1.12) ...*

The same dynamic lowered Hero's WTC in the second task whereby lack of support ideas caused him to begin improvising ideas, which did not make sense to him and this lowered his WTC. More specifically, while he managed to build three LR's, his low WTC was because of not finding his argument very sensible and that he was simply putting words together without any plans. This lack of confidence in what he was discussing appeared to finally lead to a number of connected pauses:

*... some may say that online learning (FP .53) (Silent .53) sometimes if you want to gain the credit you need to (14 Syl., -2) (Silent .36) (FP .23) pay money (Silent .26) and then you (-2) (Silent .35) (FP .71) get the degree and a certificate that you pass that (14 Syl.) (Silent .68) (FP .72) (Silent .64) (FP .40) pass that (FP .41) (FP .57) course (Silent .57) ...*

***Perceived inappropriacy or irrelevance of ideas.*** In a number of cases, participants appeared to be concerned about whether the support ideas they were discussing were inappropriate or irrelevant to the topic. For instance, when discussing foods, Linda lost WTC because she had found an example she was about to set offensive to a specific cultural ethnicity. She mentioned that she had initially decided to go over her experience with foods that did not smell favourably and set Asian foods as an example. After feeling this might be offensive to specific ethnicities, she had decided to drop it, leading her to run out of support ideas and lose WTC as a result. Her speech

began to become dysfluent, at which point, she felt embarrassed and would have liked to abandon the task:

*... For example (Silent .54)(FP .68) (Silent .59) if the food doesn't have a good smell, I never try it even if I know it's healthy, it's good for me, I never go close and never try. (Silent .91) yeah especially Asian foods (-1) (Silent .71)(FP .61)(Silent 1.89) and (Silent 13.89)(-5) ...*

Lili's WTC dropped when discussing travel problems as she realized that she might have misunderstood the topic and might have gone off-topic. She added that she had planned to discuss learning new cultures, for which she had jotted down notes and vocabulary (e.g. indigenous culture, religious rituals etc.), but had suddenly realized, from the photos provided, that she was limited to discussing travel problems. At this point, she felt lost and did not know how to carry on the task, which lowered her WTC and coincided with a long series of connected pauses:

*... you arrive in another country it's again morning (FP .51) and it could it could be (-2) (Silent .42) (FP .68) (Silent 1.81) (FP 1.00) (Silent .35) get you (FP .65) (Silent .48) some problems ..*

In another case, Sahra lost WTC due to a combination of reasons, including perceived lack of coherence in support ideas. At the outset of the cluster below, she had been searching an equivalent for *warmth of the family*, which she had failed to do and thus had to go with the word *privacy*, knowing her true idea was not being communicated. Later, her WTC dropped again as she perceived her sentences as incoherent, explaining that her example of comparing past and present hobbies was not really supporting the overall topic of technology. Immediately after, she ran out of support ideas and her WTC dropped again resulting in a silence lasting for seven seconds. She explained that she had lost her train of thought and was feeling lost and distracted:

*... everyone has his own privacy (-1) (Silent .34) it's just like we are always apart we are with our cell phones and it's not like (Silent .55) before we just sit beside in front of TV and talk and (14 Syl.) (Silent .25) just (FP .66) (Silent .26) like that (-1) (Silent) and (FP .52) (-2) (Silent 7.6) ....*

In one instance, at the outset of the cluster below, Hero's high level of WTC because of discussing his personal interest dropped towards the end when he found his support argument of

children's toys irrelevant to the main topic of technology. He explained that he had intended to use some examples from a movie, but had failed in relating it to the main topic. He further added that he would have most likely abandoned the talk had he been in a real communicative situation. Here, this low level of WTC coincided with a number of subsequent pauses towards the end of the cluster:

*... I am a fan of Technology I use different devices such as (18 Syl., +2) (FP .42) smart phones laptops computers (7 Syl., +2) (Silent .47) Xbox (FP .68) (Silent .48) (FP .91) I found it interesting (Silent .54) and I was watching a movie about (10 Syl.) (FP .41) (-1) (Silent .73) the children's (FP .68) (Silent .40) the different children's toys ...*

Sepehr also lost WTC as he did not feel confident in how relevant his ideas would be in supporting the overall topics of travel problems. He explained that he had perceived his speech *aimless* and *incoherent* and was aware of the fact that he was going nowhere with what he was discussing:

*... some another (Silent .50) problems like (Silent 2.72) finding (-1) (FP .70) (Silent .85) finding (Silent .60) good hotels (Silent 1.08) (FP 1.00) finding (Silent .53) good restaurants because (Silent .32) you you ...*

Soha's WTC dropped because she perceived her support ideas as irrelevant and off-topic. She further explained that while she was busy constructing her sentences, she was thinking of the irrelevance of her ideas to the main topic of technology. Her speech also looked fragmented and contained many pauses:

*... there are lots of advantages (FP .44) in compare like (FP .62) in compare with (Silent .67) I can say like ten years ago (Silent .33) I've been (FP .71) like (FP .54) far away from (Silent .64) (FP .71) studying (FP .59) and (-1) (FP .63) education for like ten years ...*

***Perception of successful argument.*** In one case, which lasted for almost a minute, Pouya's WTC remained stable and finally rose as he was satisfied with the argument he had made. While he did not rate his WTC until the last run below, he explained that his WTC was not really disturbed for any specific reasons, adding that the satisfaction he received from his argument encouraged him to carry on:

... Well (Silent) travel problems are serious yes (Syl. 9) (Silent) (FP) (Silent) they are serious because (Syl. 7)(Silent) (FP) (Silent) there is a (Silent) concrete relationship between time and time and (12 Syl.)(Silent) (FP) travel problems between quality of life and travel problems because (18 Syl.) (Silent) each of them each have (Syl. 5)(Silent) any travel problem can influence (8 Syl.) (Silent) (FP) quality of your life (6 Syl.)(Silent) (FP) (Silent) well (Silent) people can search a lot (6 Syl.)(Silent) about different ways of travelling (10 Syl.)(Silent) about (Silent) (FP) (Silent) the arrival date (5 Syl.)(Silent) (FP) of their long trips (4 Syl.)(Silent) for example about different travel agencies (14 Syl.)(Silent) different deals just to find the best possible deal (13 Syl., +2) ...

In the next instance, Mohsen stated that, in addition to successful lexical retrieval, the fact that he perceived himself so competent in language production that he was able to accompany it with relevant facial expressions to better communicate his points had made him more willing to talk:

... what kind of routines do I follow (Silent .60) as a person to see like (Silent .75) are you eating healthy or not for example I do have some (16 Syl., +2) (Silent .27) funny ...

Mo also became more willing to talk because he felt he was making a successful argument and the support ideas were flowing fluently:

... that interaction help you to concentrate on the subject (15 Syl.) (Silent .65) because once you're alone you might (9 Syl., +3) (Silent .85) get bored because of (Silent 1.02) you're alone and you can't have physical communication (17 Syl.) ...

In another instance towards the end of task three, Akbar retrieved a support idea (his relative's unpleasant experience) when discussing the disadvantages of technology, which helped him end the discussion successfully and this improved his WTC:

... fake relationship that they could make using technology (15 Syl., +1) but (FP .71) in (FP .34) general I think technological devices (12 Syl., +1) (Silent .25) would be more advantages (6 Syl., +2) (Silent .27) necessary (Silent .36) for any people in this modern era (9 Syl., +2).

In the next instance, Kaami's WTC rose after almost a minute into the task and it happened because he believed the argument he was making was valid and the way he was using the language to communicate his ideas was exactly how he had wished to:

... and like in case you lose your passport or your wallet or (14 Syl.) (Silent .99) lose all your money (Silent .71) there has to be something to cover that up you have to (15 Syl., +1) (Silent .44) think about that having an travel insurance is (13 Syl.) (Silent .60) safe to do someone has to consider but so many people don't have money to (22 Syl., +2) (Silent .34) like insure their travels ...

**Perception of unsuccessful communication of ideas.** This theme mainly pertained to the negative impressions participants had about the ways they had communicated ideas. While most of these cases related to the uncertainty about the lexical items they used, a few instances did not seem to have originated from a shortage of linguistic resources. As an example, in the following instance, Sara's WTC dropped as she struggled and felt unable to communicate her thoughts using words. She explained that she could not do this in her mother tongue, either. Her speech also turned dysfluent in this case:

*... while people lost face-to-face communication (Silent .47) and it cannot (FP 1.06) (Silent .49) compensate the (Silent .28) (FP .98) need for (-3) (Silent 1.36) (FP .76) com. need for communication that they need (Silent .45) (FP .68) when they (Silent .51) (FP .86) talk to each other ...*

### **Individual factors**

This category of themes involved fluctuations of WTC as a result of reasons that were peculiar to individuals. More specifically, they were rooted in participants' life experiences, beliefs, interests, accomplishments, memories, or daily routines/habits. What follows is a presentation of some of these instances, starting from the most recurring.

**Personal Experience.** This sub-theme pertained to situations where participants recalled a relevant experience to the topic and were able to relate it to their discussion. In one instance, Kaami's WTC improved and he gained control over his speech as he recalled support ideas from his personal experience of travelling to Italy:

*... make arrangement about the place they want to stay there that's an important (20 Syl., +3) (Silent .59) (FP .31) (Silent .90) important thing they have to make some arrangements like some reservations (19 Syl.) (Silent .53) about the places they want to see so that place (11 Syl.) (Silent .26) like close to other places they want to visit (11 Syl., +2) (Silent .91) ...*

In another instance, Akbar's high WTC was because he was simply casting his mind back to a conversation with university professors, staff, and classmates in person during class projects or for

discussing employment opportunities. He further explained that whenever he discusses personal experiences, he does not need to generate ideas because they are already available and he only needs to sort out sentence structures and vocabulary selection:

*... I should say that when you have the chance to study on campus (18 Syl, +2) (Silent .42) you can have interaction with other people stud such as students, (17 Syl, +3) staff, professor...*

Soha also displayed more willingness when discussing a personal experience, during which she had taken a series of unnecessary trips for getting a visa. Drawing on her experience, she was able to make a comparison between residents of countries who require visas for other countries and those who do not. She further elaborated on the troubles she had gone through while traveling to the countries which had required a visa for entry. She added that this was an experience she liked to share. In addition to her experience, she was content with the way she ended the task and thought the concluding sentences directly addressed the main topic of the task, which was ‘travel problems’:

*... just like easy and first of all they speak the language is important too they speak English it can be spoken it is spoken everywhere (35 Syl, +1) (Silent .25) in over around the world (Silent .68) and then they have not no problem not much problem to get visa or these thing but (20 Syl, +1) (Silent .35) the other may be may face some problem like (11 Syl.) (FP 1.06) (Silent .30) language or getting visas or anything like that (13 Syl.) (Silent .30) and (FP .79) (Silent .81) so because of that we need the passenger they need to (14 Syl, +1) (Silent .33) manage everything to be sure about their visa and anything like that (20 Syl.) ...*

The following instances also demonstrated how Niki’s WTC rose a as result of discussing her personal experience during her trips abroad, which she was just excited to reminisce about. She also added that she had discussed these experiences before with other people in English, which had contributed to her WTC during this task.:

*... for example I had this problem before I traveled to Turkey and I didn't know any Turkish word (26 Syl, +5) ...*

*... another example I traveled to India and I had a lot of problem with their food because I couldn't eat the spicy food and and all of their food was spicy (42 Syl, +4) ...*

*... public transportation or if you want rent a car you have to know they will accept your driving license or not (28 Syl, +5) ...*

**Personal interest.** Participants indicated that their WTC had improved when they discussed ideas of their interest. On the other hand, there were very few cases where Mohsen and Mo indicated that their lack of interest in what they were discussing had lowered their WTC.

Sara's WTC rose once she began discussing a topic she was interested in. She explained that her interest was because of the fact that the subject she was discussing should receive attention from the public:

*... I believe that eating healthy is mandatory for everyone not just for (20 Syl., +3) (Silent .41) and gaining weight losing weight but for being healthy in life ...*

In another instance, Mohsen's WTC improved as he was discussing Persian food, which he loved and cooked:

*... I wanna go and I wanna go explore I wanna go like have some Indian food I wanna have some sushi I wanna have some Thai food (35 Syl., +6) (Silent .71) like wait the meat food (Silent .71)*

Lili's WTC rose at the outset of task one and remained high for a few runs as she found her personal interests and beliefs quite relevant to the topic and had thus planned to discuss them:

*... I want to talk with you about my food habits and my (14 Syl., +3) (FP .52)(Silent .75) diets to tell about my diets and (8 Syl., +1) (Silent .26) at first I want to mention that (12 Syl., +5) ...*

**Personal belief.** Some of the participants also indicated a high WTC when discussing personal beliefs or expressing personal opinions. For example, during an exchange with the interviewer, Sara's WTC improved when she discussed her belief regarding online education. She explained that she was personally a team-worker, as an employer; however, she would like to hire someone who was a self-motivated and independent worker, who could complement her. She thought that those who take online courses have learned to work independently, which is why she preferred to hire those who have completed online degrees. This is how she justified her attitudes and her WTC increased as she was capable of logically expressing her belief:

Sara: ... *but if I want to hire someone I prefer to hire someone who did online education (Syl. 23)*

Interviewer: *And why is that?*

Sara: *(FP. 37) because (FP 1.02) they are more self-motivated as I said before they can work by themselves (18 Syl., +5) (FP .46) better than (Silent .93) on campus students (1.02) and that's it ...*

In another instance, William expressed his opinion about how important it was to try all types of food, and discussing this belief was among the factors that improved his WTC:

*... in general I believe that that food is so important so I need to (19 Syl.) reconsider my my mindset about the (10 Syl., +5) (Silent .57) having (Silent .47) different types of foods ...*

Mehrzad's WTC also rose as a result of expressing his personal opinion and retrieving relevant lexical items. Discussing his personal views on the types of education and successfully retrieving a number of relevant words improved his WTC. He explained that he had intended to clarify that there was no one best type of education and it all depended on the individuals, their fields of study, and their goals. Discussing this belief, along with successful retrieval of vocabulary, improved his WTC in this case:

*... there are difference between both of them (10 Syl., +2) (FP .39) sometimes it depends on the situation I think that it's not a (18 Syl., +2) (Silent .50)(FP .55) some kind of absolute thing that you want to say (12 Syl., +1) (Silent .32) which one of them is completely (9 Syl., +2)...*

**Recent relevant conversation.** Another factor that participants mentioned that had an effect on their WTC was conversations they had shortly prior to the interview sessions. In the following two instances, Saba's WTC rose because she had practiced speaking about a very similar topic while preparing for a language test speaking interview. She added that she had considered taking an online course and discussed its advantages and disadvantages with a friend, so she felt fully prepared to even go beyond three minutes:

*... you have this opportunity that you can just stay at home so you don't need to commute every day from home to go to the campus and sometimes it take it's taking a long time a long time for you (53 Syl., +4)*

*... other students so you can communicate with them you can talk about the lecture also you can be in the class you can talk with the ... (34 Syl., +4)*

Lili also indicated that recalling a recent conversation with her husband had increased her WTC. She explained that they had discussed unhealthy eating shortly prior to the interview, in which she had mentioned to her husband that they should have unhealthy food sometimes:

*... fast food because sometimes I need. sometimes I need to eat unhealthy sometimes I say to my husband (28 Syl., +3) (FP .38) we need (Silent .61) (FP .69) some micro micro organism and some bacteria and some unhealthy eating (20 Syl., +3) ...*

In another instance, improvement in WTC occurred as Sahra recalled a recent conversation with her cousin in which they had discussed a memory:

*... and the diet like (FP .78) (-1) we should just (.42) drink water or we should (FP .28) there is some kind of diet diet I remember one of my cousin told that (18 Syl., +5) ...*

A similar instance was observed when William began the first task. Before he started the task, he mentioned that he had discussed the topic of food in English elsewhere and this had given him confidence for this task. As a result, he had managed to take a lot of notes and develop a plan as to how to use his notes. He added he was confident that he would be able to complete this task, which had improved his WTC:

*... at least in (Silent .47) recent month (Silent .83) since I don't have enough time to cook (10 Syl., +2) (Silent .92) and I believe that cooking (Silent .48) brings healthy food even in in good restaurant (12 Syl., +4) ...*

In another instance, Akbar stated that a previous relevant conversation with an English-speaking friend about a healthy diet improved his WTC here. He added that this conversation had not only helped him generate ideas to discuss, but also, he had made language errors in that conversation, which he had noticed after the conversation and was thus able to avoid them here:

*... exactly before I come to Canada (11 Syl., +5) (FP .32) I thought (FP .36) I'm (Silent .25) having healthy diet (6 Syl.) (Silent .27) but after coming here (6 Syl.) (Silent .41) and eating especially Chinese and*

*Korean food I realized that it was completely different between what I would imagine (34 Syl., +5) (Silent .44) (FP .43) because (FP .76) since I love to cook a lot of food (9 Syl.) ...*

**Daily routines/habits.** The participants also displayed willingness to discuss their daily routines. In one case, for example, Sara's WTC improved when she recalled and discussed her daily personal routine. She explained that it took her longer than usual to prepare for and start the task as she was preoccupied with a personal problem that had occurred to her earlier that day and therefore felt extremely unwilling to do the task. However, shortly after she managed to regain her composure as she discussed her daily personal experience, which led to an increase in her WTC:

*Nowadays people use technologies (10 Syl., -4) (FP .64)(Silent .76) Ok in their life even without noticing it (Silent .62) I mean sometimes it's unconscious (Silent .54) (FP .78) like people they wake up with their clock alarms (+4) (Silent .48) and they use different devices to prepare their meals and then they use (+1) (Silent .60) different means of transportation all of them are technologies ...*

In another instance, PEDI's WTC improved when he shared a personal matter that he considered relevant to the discussion. He explained that he had taken a look at his notes and was prepared to add new support argument to his discussion. Also, he was inclined to discuss a daily routine of eating fast food to gain weight as he thought he was thin, and having such food was a quick way of gaining weight:

*... another thing that I want to mention is that so the (Silent .31) by eating junk food and fast-foods (+5) (Silent .39) (FP .35) people usually can gain (FP .48) on weight (Silent .51) (FP .39) really fast (Silent .44) and because I think I'm a bit (FP 1.15) (Silent .41) (FP .49) thin (Silent .28) and I really want to gain some weight so I (-5) (Silent .56) just try to have junk food and (Silent .68) fast-food sometimes ...*

In another instance, Mohsen's WTC rose when he discussed his weekly routine of going to a local supermarket to buy some sirloin to marinate and barbeque over the weekends; a routine experience which he was inclined to discuss here:

*... like are you eating healthy or not for example I do have some funny habit that I do all the time like on Sunday mornings or on Saturday mornings I have like I have to go to the grocery store like Walmart or Metro (59 Syl., +5) (Silent .47) I have to find the (Silent .33) most gorgeous like (Silent .25) lightest (-2) (silent .60) red meat like ...*

**Personal accomplishments.** There were a number of instances where discussing personal accomplishments improved participants' WTC. For instance, Pouya felt proud of discussing the fact that he had managed to lose a lot of weight five times:

*... five times (Silent .51) I I lost weight (Silent .52, +5) (FP .51) for five times and (Silent .47) every time, I lost at least (Silent .37, +4) twenty kilograms (Silent .39) and yes this is what I have done ... (8 Syl., +2) ...*

Sara's WTC rose for a fairly similar type of reason. She explained that she was very willing to bring up the fact that she had managed to control her diet and weight, which she was proud to share with others:

*... in my own life I try to eat healthy and I need it to control my weight beside my (22 Syl., +7) ...*

In another instance, Sahra's WTC improved as she discussed her French language proficiency, which she was very proud of. She had also recalled speaking among a group of Francophone speakers, who had admired her language skills:

*... it's (FP .25) like (Silent 1.11) we can (Silent .43) understand (Silent .28) (FP .76) their culture easily (+1) ...*

### **Lexis-related factors (linguistic/cognitive)**

Another recurring theme that affected WTC involved a variety of vocabulary-related issues. These included lexical knowledge, retrieval, appropriacy, and repetition. What follows is an elaboration of this theme and its subthemes, along with the supporting instances.

**Lexical knowledge or lack of lexical knowledge.** Some of the participants indicated that once they believed that they possessed the required lexical knowledge about a topic prior to or during the task, they were more willing to engage in or carry on communication. As an example, when discussing dieting, Mo's WTC rose mainly because he felt confident he had the vocabulary

knowledge required of the task. To stay in shape, he had searched and read about the topic and thus learned quite a few lexical items, which facilitated fairly fluent speech:

*... for diet I always wanted to for a diet if (11 Syl.) (Silent .32) can end up (Silent .32) with better shape for me (+3) (Silent .32) always wanted to be in a good shape (9 Syl., +1) (Silent 1.08) ...*

Mo's WTC also improved once again when discussing technology devices. He explained that he had brainstormed some examples (devices) and had just recalled them, knowing he possessed the required lexical items to use in order to elaborate on the point he was trying to make:

*... and these are things that I regularly use it very much every day and there are definitely some (28 Syl., +1) (Silent .71) some advantages with these devices (Silent .91) for instance (FP 1.04) (Silent .25) it (Silent .22) those are three (Silent .30) I believe they are here to make the life easier (12 Syl., +2) ...*

Akbar's WTC rose in a cluster of fluent runs for three reasons: he had a) relevant personal experience, b) had discussed it briefly with a friend prior to the session<sup>1</sup>, and c) had previously searched and practiced relevant vocabulary on the topic of online vs. on-campus education:

*... will teach you the material that you can also learn in an online (17 Syl., +1) (FP .35) (Silent .26) education system but (Silent .85) beside (Silent .36) the (FP .42) courses or session you have the opportunity to (13 Syl., +2) (FP .66) learn here a lot of (Silent .47) professional example a lot of (10 Syl., +2) (Silent .72) (FP .25) experience that professor and other student have (13 Syl.) (Silent .35) and another thing is about the chance of (11 Syl., +3) (Silent .28) (FP .34) having team work and home work with other (10 Syl.) ...*

While the above instances demonstrate how vocabulary knowledge improved WTC levels, there were a number of cases where WTC dropped due to lack of lexical knowledge. In one example, Sahra's WTC dropped as she felt frustrated due to her limited vocabulary. While discussing the disadvantages of technology, she used the word *exercises*, which she thought was a cliché word. She explained that the negative rating was due to the fact that she *hates* the word *exercise*, and the reason was that this was the only word she would recall when it came to talking about sports and staying fit. She added that she knew many other words like *physical training*, which she would not recall

---

<sup>1</sup> Items a and b will be elaborately discussed later.

automatically in such context. She thought that the word *exercise* was widely used in a variety of contexts, like in education, or sports, and she should be able to retrieve more specific words to communicate her ideas. This lowered her WTC and coincided with dysfluent speech:

*... kind of disadvantages (Silent) we just (FP) (Silent) so less exercise (-1) and (Silent .48) (FP .33) it's some kind (FP .63) somehow (Silent .55) (FP .34) (Silent .32) difficult (FP .35) ...*

Mehrzad's high WTC dropped once he chose to discuss the food pyramid, the picture of which was presented to him in the task. While the idea of a food pyramid looked familiar to him, which was initially the reason why he had chosen to discuss it, once he started, he found out that he did not have the required lexical knowledge to elaborate on that. So, there was the idea, but not enough vocabulary. At this point, he had to simultaneously retrieve words and carry on the task. His WTC declined due to a lack of words, and so did his fluency, because he was cognitively fixated on vocabulary retrieval and speech production. He mentioned that he knew he was not making a rich argument and that he should have used better gap fillers instead of the filled pauses in the middle of the cluster below. While his speech contained four long runs, there were many pauses and his SR for this segment is 1.89 syl./sec., which is lower than his overall SR of 2.18:

*... I saw in this picture (6 Syl.) (FP .63) there are a (Silent .45) food pyramid that (5 Syl.) (FP .61) show (-2) (Silent .42) (FP 2.69) the beneficial things (6 Syl.) (FP .57) and (FP .41) (-2) (Silent .38) some stuff that would be (5 Syl.) (Silent .36) very (FP .76) useful for a athlete (6 Syl., -2) (Silent .44)...*

Lack of vocabulary seemed to affect Mehrzad's WTC in another instance where he did not know the expression *tourist attraction*, and therefore had to use the very general word of *place*, which lowered his WTC. He mentioned he had tried to find a more appropriate and effective word, but had failed. His speech also looked dysfluent with six pauses surrounding it and a SR of 1.6 syl./sec., which was significantly lower than his overall SR.

*... or (FP .44) for (FP 1.07) going to see the (FP .68) place on that country (-1) (Silent .50) or (FP .67) any kind of them (Silent .82) then I think that ...*

Akbar's WTC fluctuated due to lack of lexical knowledge. His high WTC because of sharing his experience as a supporting argument dropped when he did not recall a word equivalent to *fatigue* and instead used the word *tiring*, which was preceded and followed by a number of pauses:

*... wasn't so usually when I was in Iran and eating breakfast in there I usually eat tea (25 Syl., +2) (Silent .40) with (FP .58) baked (FP .54) (Silent 1.07) bacon and egg (Silent .32) and nothing else and not (Silent .29) even (Silent .46) one (FP 1.06) cup of fruit or vegetables (Silent .50) (FP .35) which made (FP .32) my day (FP .50) full of (FP .48) (Silent .72) tiring and (-2)(FP .39) kind exhaustion (Silent .49) and I think that was because I didn't eat vegetables and fruits (21 Syl., -2)...*

***Lexical retrieval failure/success and WTC.*** Another recurring theme that was found to affect WTC and fluency was the cognitive demand imposed by retrieving vocabulary during the tasks. Retrieving involved searching and identifying an appropriate item for a context and articulating it. The general idea was that whenever a lexical item was smoothly retrieved, it would improve both WTC and fluency; WTC mainly because participants were able to deliver a self-satisfying performance, and fluency because the participants would not have to pause for retrieval. On the other hand, when participants struggled with lexical retrieval, they ended up pausing, which not only resulted in dysfluency, but created a sense of dissatisfaction with their performance that decreased their WTC.

One first example occurred when Niki, in search of some academic fields of study to help her compare which majors could benefit from online and on-campus education, lost WTC because it took her several seconds to recall any. While she was processing this, she struggled to fluently put the words together, resulting in the following dysfluent cluster of speech where her WTC dropped to a negative level as well:

*... and (FP .62) (Silent 4.96, -3) (FP .73, -1) (Silent 1.99) about (FP .85) (Silent 5.07) (FP .37) I think one of the (Silent 1.21) (FP .47) (Silent .28) fields( Silent .26) that maybe online education (Silent .42) ...*

Niki lost WTC once again in the same task due to another unsuccessful lexical retrieval, which cost her a few silences and a filled pause. Once she retrieved the word, she got back on track again, managed to build a LR and her WTC increased by +1. During the stimulated recall interview, she also mentioned that she keeps monitoring the accuracy of her speech in terms of grammar (e.g. third person singular 's' or comparative adjectives) and lexical items while talking, and depending on the quality of the language produced, she might feel uncertain, which is very likely to lower her WTC:

*... especially if they have access to (10 Syl.) (Silent .28) you know stop (Silent .37) pause the (Silent .68) (FP .56) (Silent .21) the (Silent .45, -1) the (Silent 1.04) the video (Silent .66) and (Silent .38) start it again and do it again and again (Syl. 12, +1) ...*

Niki's WTC dropped from a positive to a negative state in task three due to not retrieving an appropriate lexical item for the context. More specifically, retrieving the word *united* was negatively rated as it took a silence and a filled pause for her to retrieve. She added that even after this, she felt uncertain if she had successfully communicated what she had meant, explaining the following broken and short utterances as well as pauses:

*... you know I think it it helps the world will be (11 Syl., +2) (Silent .54) (FP .47) united (-2)(Silent .42) or (Silent .70) something like this (Silent .36) I think (Silent .28) and (FP .52) (Silent .58)...*

Towards the end of the task, her WTC dropped once more since she failed to retrieve relevant words to the argument despite the presence of ideas, which was when she abandoned the task. She explained that towards the end of the task, she consistently struggled to find the required lexical resources to make her point despite having supporting ideas:

*... they can't spend time on (Silent .38) on (Silent .64) other activities (-1)(Silent .84) and (FP .62) (Silent .59).*

In the following cluster of utterances, Linda's positive WTC dropped due to failure in lexical retrieval and choice of words. She explained that prior to the drop, her WTC had improved as a result of discussing the disadvantages of technology, which she felt knowledgeable about. The word

*fraud* was a supporting idea that she had jotted down to use. However, a lexical item she knew in Persian was not retrieved in English so she had to use the word *works*, knowing this was not the best lexical choice for the context. Her hesitation over the lexical choice was evident through a series of connected filled and silent pauses. An utterance later, she used the word *back*, which she thought was an informal term for this context, and her WTC dropped once again (this is evidence for perceived lack of lexical appropriacy as well, which will be discussed later):

... (Silent)(FP)(Silent) however (FP) it can has some disadvantages (Silent) like (FP)(Silent) fraud activities (+2) so (Silent) when we use online (FP)(Silent)(FP) online (-1) (Silent) works we should be careful (Silent)(FP) not to be (Silent) hacked (-1) or (FP) some people (Silent) ...

In the following instance, Sara lost WTC when discussing an unpleasant experience that she went through on a daily basis. Three consecutive pauses and struggling with retrieving the word *communication* brought about dysfluent speech, which coincided with a low WTC:

... so you can see that you can use your cell phone (FP .83)(Silent 2.24) and it profits you (Silent .53) and you can use it in a bad way (Silent .69)(FP .79)(Silent .63) that you lost like you lose your (FP 1.16)(Silent .9) communication (-1) with others or (Silent 1.80) whatever disadvantages that it can bring (Silent 1.55) and (Silent 3.74) that's it.

Majid's WTC slightly dropped upon the start of task one due to difficulty retrieving an appropriate word; however, it increased immediately after retrieval took place. The following cluster of utterances displays how his low level of WTC due to not retrieving a more appropriate lexical item instead of the word *food* caused dysfluency characterized by repetition of the word *our*, a silent, and two filled pauses. However, once he managed to retrieve the idea and the lexis of *healthy diet*, his WTC rose and remained stable for a while, as did his fluency, which is characterized by a number of LRs:

Ok. let's now talk about our food our (FP .41) any (-1) (Silent .44)(FP .55) healthy diet we have or not (+3) (Silent .45) so (FP .60) at first I wanna ta I wanna talk about myself because I really I really like (23 Syl., +5) I really like to (Silent .44) eat a lot and especially when there is delicious food (16 Syl., +2) (Silent .38) whenever my when my wife (Silent .34) cooks (+5) (Silent .48) for me but (FP .35) in terms of talking about diet I have never been on diet (15 Syl., +1) but (Silent .61)(FP .58) sometimes I choose to

*stop eating some specific things like coke like sugar (19 Syl., +3) (Silent .57)(FP .57) these kinds of things I always like to drink these kinds of things (14 Syl., +3) (Silent .94) it depends...*

Towards the end of the same task, Majid's WTC dropped to very low levels due to failure of vocabulary retrieval, among other reasons. He seemed to struggle with retrieving the word *herb*, which was followed by many pauses and repetition of the same structures, showing he was struggling with both ideas and retrieval of relevant words:

*... (most of the time because we are from a country (silent .27) who know (Silent .28) (-5) the people in my country (-7) cook different kind of foods we are using meat (-2) we are using (Silent .58) (FP .33) (Silent .33) different (Silent .58) you know we are using (-5) (Silent .74) herbs we are ee. different kinds of (-4) (Silent .42) foods (-4) (FP .54)(Silent .39) I cannot say.*

Pedi's WTC fell because of failing to retrieve words he needed to communicate the idea of foreign and domestic travels as well as correctly structuring the sentences. While the excerpt below began with a long run, he struggled to quickly retrieve the word *abroad*, which resulted in a series of pauses and reduced WTC. He mentioned that it was not only the word retrieval but he had difficulty choosing the right sentence structure (to be discussed later) to put his idea into words. During the stimulated recall, he mentioned what he had been trying to communicate was that traveling abroad was very different and thus more difficult than traveling domestically. While he finally managed to somehow communicate this, his WTC dropped upon struggling with lexical and structure choices. The words *internal* and *in the country* could also indicate he had not been so confident about his lexical choices:

*... Problems in travel we can make some kind of categorization if you are travelling out (FP .57)(Silent .56) you know (FP .72) (-2)(Silent .76) a broad or another country make it (Silent .32) a bit more difficult than internal in the country travel (Silent .76) in terms of (FP .61) abroad (FP 1.18) travels (Silent .40) (-1) sometimes we need to ...*

Mohsen's WTC declined due to lexical retrieval failure. In one instance, his WTC rose and fell during and after a considerably long run. At the outset of the above part, he rated his WTC quite high as he was discussing a personal routine; or a rule he had set for himself and enjoyed discussing it

as a support idea here. However, his WTC declined, so did his fluency, as the retrieval of a better lexical item for the phrase *red meat* failed. He explained that this was a weekly routine for him to go to a local supermarket to buy some sirloin to marinate and barbeque. While he knew the word *sirloin*, it was not retrieved, and he had to move on with a more elementary item (*red meat*), making him feel he was unable to exactly communicate what he had in mind. He went further to mention he had felt really disappointed with himself as he was not able to recall a word he would use on a weekly basis in conversations at the grocery store:

*... like are you eating healthy or not for example I do have some funny habit that I do all the time like on Sunday mornings or on Saturday mornings I have like I have to go to the grocery store like Walmart or Metro (59 Syl, +5) (Silent .47) I have to find the (Silent .33) most gorgeous like (Silent .25) lightest (-2)(silent .60) red meat like ...*

Saba's WTC dropped in task three due to lexical retrieval failure. As shown in the cluster of utterances below, she was struggling to come up with a word after *became*, which she failed to do and ultimately decided to restructure her sentence. She mentioned that she was also uncertain about what grammar structure to go with. This not only lowered her WTC significantly, but also coincided with a lot of pauses surrounding it:

*... had more advances so it (Silent .29) it actually (Silent .39) (FP .43) became (FP .89) (Silent .83) it became (FP .46) like (-4) (Silent .49) (FP .55) a very (Silent .41) (FP .34) (Silent .25) it actually expanded ...*

Lili's WTC also dropped due to a failure to retrieve a lexical item during the subsequent dialogue with the interviewer. The cluster below began with a LR that was not rated, but she struggled to retrieve words like *wear* or *put on* which were not retrieved, resulting in several connected pauses that lowered her WTC. Subsequently, her fluency was troubled as she did not retrieve the word *destination*, at which point the interviewer intervened to help. Her WTC remained stable, but she mentioned that it would have if the struggle for the word and the silence had lasted longer. Later, she produced a long run that was not rated, after which her WTC increased as she used the word *jet lag*

and the fact that she had experienced real jet lag for the first time in her life a few months prior the interview:

Lili: *... difference in the weather you don't know how to (13 Syl.) (Silent .65)(FP .63)(Silent .52) how to (FP .47) (Silent .92) put your clothes (-1) and how (Silent .59)(FP .44) would be the weather in your (FP .68) (Silent .98) in your (FP .51) ...*

Interviewer: *destination?*

Lili: *destination yes (Silent .33) and another problem for long distances for examples from (Silent .47) Iran to North America (Silent .47) (FP .33) you should consider (Silent .26) this issue that you (Silent .63) (FP .92) would face with jet-lag (5 Syl., +3) ...*

Vocabulary retrieval affected Mo's WTC where it fluctuated as he failed to recall relevant words, but managed to do so seconds later, which improved his WTC. He mentioned that he had been struggling to think of an idea and retrieve relevant words, which he had failed to do at the beginning and his WTC had dropped, so had his fluency. However, after a period of struggles, he shifted focus and discussed the on-campus education, about which he had experience. He also had greater lexical knowledge about it, which was why he was able to retrieve the relevant vocabulary, resulting in higher WTC and fluency:

*... could be more effective (Silent 1.23) (FP .52) so (FP .49) (Silent .68) but in online (-1) (Silent 1.13) (Silent 1.13) communication could be there (Silent .42) (Silent .50) but it might be not as (-2) (Silent .71) effective as this one because (Silent .96) (FP .93) physically I think (Silent .32) we are more (Silent .33) interested to (Silent 1.06) get in touch with people and communicate with people other than the (18 Syl., +2) ...*

Sahra's WTC underwent consecutive rises and falls at the outset of task one. She explained that she had a personal experience that she was interested to share, which increased her willingness. Following that, however, she found it difficult to retrieve some English words, and instead was retrieving the French equivalents since she knew French, too. It took her time to recall lexical items, which resulted in pauses and lowered her WTC and fluency in this case. Immediately after, her WTC rose again as she began discussing her culture, which she did fluently:

... *but you know as you know we are students we don't have too much time to prepare the healthy food but we do our best* (29 Syl., **+5**) (Silent .61) (FP .30) *to for example choose* (FP 1.34) (Silent .46) *healthy food like* (FP 1.00) *chicken* (**-4**) (Silent .41) *or* (Silent .92) (FP .30) *the seafood or something like that* (Silent .60) (FP .54) *but normally as you know Iranian food has lots of calorie and oil* (19 Syl., **+5**) ...

Hero's WTC dropped because of a failure in retrieving the word *benefit*, which took him a few pauses and one case of repetition to be retrieved, lowering his WTC. However, he managed to retrieve the word soon after and his WTC rose as a result, coinciding with fluent speech:

... *this has lots of* (FP .72) (FP .67) (Silent 1.51) *this has lots of* (**-2**) (Silent .33) (FP .72) *benefits like you can* (Silent .28) *learn* (FP .72) *learn at home and that* (Silent .33) *you can open the Youtube and* (8 Syl., **+2**) ...

Sepehr's WTC dropped as he did not retrieve a word he needed. He noted that he had been looking for the noun phrase *fast food restaurants*, which he was not able to recall and had to use other words like *subway* or *malls* to make his point. The retrieval failure had lowered his WTC and coincided with dysfluent speech characterized by quite a number of pauses at this point:

... *all the time I* (Silent .32) *I go to the* (Silent 1.04) *subways* (FP .44) *this* (**-1**) (Silent .42) *some malls and* (Silent .40) *buy junk foods* ...

William's WTC was affected when words that were part of his repertoire were not smoothly retrieved. In the middle of task three, a picture on the vocabulary sheet suggested to him the idea of using technology in medicine. Once he began discussing the contributions of technology to medical fields, he realized that he lacked lexical knowledge in those areas, and even though he recalled a word such as *sonography*, he failed to retrieve the word *medical*. He added that he felt uncertain of further lexical resources he would need to continue this discussion, which lowered his WTC and his fluency:

... *education it is very useful if it's* (13 Syl., **+2**) (FP .29) (Silent .56) *used in* (Silent 1.6) *for example* (FP .37) *the* (Silent .76) *sonography or* (**-2**) (Silent .26) *other stuff it's* (Silent .42) *again* ...

Anita also reported a WTC drop as a result of lexical retrieval issues. In one instance, her lowered WTC coincided with dysfluent issues, too. Below, retrieving the word *rule* took her a few consecutive pauses, and she mentioned that her WTC almost dropped. She further explained that

she knew the accurate grammar structure as well as the equivalent of the word *rule* in Persian, but not in English. She added that the stress caused by the pauses preoccupied her for a couple of sentences, and if she had not taken notes, she would have significantly lost her WTC here due to this:

... because (FP .33) each country or each (FP .93) (Silent .88) region has its own (FP .63) (Silent 1.00) (FP .32) its own (Silent .84) (FP .94) rules (Silent .64) so (FP .63) (Silent .39)...

Soha's WTC dropped from positive levels as she was not able to retrieve the lexical item that would have best communicated what she meant. Her high WTC mainly because of topic familiarity (discussed previously) dropped as she retrieved the wrong word: *oil* for the word *fat*. She added that she had been searching for the word for a while but had failed and thus had to move on using the closest lexical item available, knowing the word would not thoroughly communicate what she meant. She also mentioned that the filled pause before the word *oil* shows she was trying to recall the word. Her lowered WTC is also followed by a series of connected pauses:

... is the thing that I care about (8 Syl.) (Silent .66) because the delicious food is always most has have (14 Syl. +2) (FP .90) has the most calorie (Silent .60) I try to ignore something like sugar or (12 Syl., +3) (FP .70) oily or these thing (-1) (Silent .64) (FP 1.22) (Silent 1.41) but (Silent .65) (FP .40) (Silent .40) ...

A few runs later, her WTC dropped again due to vocabulary retrieval and grammar. She explained that at this point she had not yet retrieved words like fatty, greasy etc., and thus had to reuse the word *oily* again. She had also hesitated over using the singular or plural form of the word *food*<sup>1</sup>, as this would influence the following verb form. This lowered her WTC and resulted in three consecutive pauses. She mentioned that she loses confidence during daily conversations with her English-speaking roommates whenever she cannot recall a word, which makes her reluctant to converse and she would rather *abandon the conversation and go back to her room*.

... all the junk food junk food are food that (Silent .92) (FP .59) (-1) (Silent .26) they have (Silent .89) lots of sugar in that or (Silent .46) so oily or ...

---

<sup>1</sup> Sentence structuring issues will be discussed later in this chapter.

Mehrzaad also struggled with vocabulary retrieval. In the following cluster, his WTC dropped and rose while he managed to maintain fluent speech. He explained what he was trying to communicate was that robots are the main reason why employees get laid off. He felt desperate during the first two runs in search of a word or a way to communicate this. Though he finally retrieved the word *fire* that improved his WTC, he still thought that was not the best choice:

*... use robot (Silent .50) as a worker and (Silent .40) (FP .60) they say that it's not very (8 Syl., -1) (Silent .35) useful for a (Silent 1.14) people because most of worker (8 Syl., -1) (Silent .34) are fired from computer companies (9 Syl., +1) (Silent .51) and (FP .45) (Silent .52) I think that in spite of all of them ...*

From this point on, I will focus mainly on how vocabulary retrieval improved WTC. Linda's WTC improved upon the retrieval of the word *socialize*, which occurred after a filled pause:

*... in addition in this way we can (FP) socialize (+3) with other people ...*

Sara's WTC improved twice consecutively because of successful retrieval of a proverb and what she called an advanced word, among other reasons. At the outset of task one, her high WTC because of discussing her own interest and personal experience continued to remain high as she successfully retrieved and used a proverb she had heard before. While dysfluent, her speech became fluent after her WTC rose:

*... some people (Silent .25) think (FP .82) that (Silent .30) going to the gym is enough (Silent .61) to remain healthy (Silent .89) but (FP .30) as British says (+7) (Silent .48)(FP .71)(Silent .59) Abs are made in the kitchen rather than at the gym ...*

Majid's WTC also improved from successful vocabulary retrieval. After a period of low WTC, he used his jotted-down notes and a number of appropriate words to regain his WTC. The LR below, which coincided with a high level of WTC, was produced after he took a look at his notes and retrieved more support arguments. The run also contained the word *sparkling*, which was not a common word in his lexicon and he was quite impressed after using it. He mentioned that the

correct pronunciation of the word and the impression it left on the audience had also affected his WTC positively:

... *these days there are lots of different kind of drinks with sparkling and lots of sugars in it* (22 Syl, +4)  
...

Mohsen also began the first task with a fairly high level of WTC and explained this was due to the ease in retrieving the words he needed for the context. Also, his fluent speech and the fact that he did not have to struggle to produce speech had improved his will to continue:

... *what kind of routines do I follow* (Silent .60) *as a person to see like* (Silent .75) *are you eating healthy or not for example I do have some* (16 Syl, +2) (Silent .27) *funny* ...

Lili's WTC rose because of recalling a personal experience relevant to the task and retrieving a lexical item. She explained that she had recalled this personal experience while reminiscing about a few years back when she had gained extra weight. Therefore, she had ideas to use to support her argument. In addition, she thought that retrieval of the collocation *sedentary lifestyle* was timely and contributed to her WTC:

... *I had a sedentary lifestyle* (11 Syl, +4) *and* (FP .52)(Silent 1.02) *didn't do any* (FP .56)(Silent .80) *sports* (FP .44)(Silent 1.09) *any sports okay?* (Silent .40) (FP .43) *so on the time I decided to lose my weight and have a* (14 Syl, +1) ...

Sahra's WTC rose as she retrieved the words *interact* and *virtual*, which she had learned in her studies and thought were very relevant to her discussion. The retrievals occurred during fluent speech:

... *online education we can say that the students* (13 Syl, ) (FP .91) *cannot* (Silent .27) *interact* (Silent .84) (FP .44) (Silent .69) *they can interact but they can virtually interact on online education but* (22 Syl, +1) (FP .92) *in on campus education* (FP .45) *they can interact physically they can see their classmates so it could be more* (20 Syl, ) (FP .58) *efficient* ...

In another instance, Sahra's low WTC due to lack of support ideas picked up once she managed to retrieve what she called a *sophisticated collocation*. The cluster below began with an LR that was not rated, though shortly after, she ran out of ideas in elaborating further on how technology

facilitates our life. Then, she was able to retrieve an advanced noun phrase *technological revolution decade*, which improved her WTC:

*... our life became easier with this kind of modern technology (16 Syl.) (Silent .68) and (-1) (FP .75) (Silent .52) so (-1) we're having the (Silent .39) (FP 1.10) technological revolution decade (11 Syl., +1) ...*

At the end of the first task, William's WTC rose because of discussing his personal opinion and the retrieval of a word he considered advanced. He had used the collocation *reconsider one's mindset* a few times before, was sure of the correct usage, and thought it was an advanced lexical item, which helped him close the task efficiently. This coincided with a LR:

*... in general I believe that that food is so important so I need to (19 Syl.) reconsider my my mindset about the (10 Syl., +5) (Silent .57) having (Silent .47) different types of foods ...*

Soha's WTC rose in task four because she was following a plan as well as the quick lexical retrieval of the phrase *public transport*, which coincided with two LRs:

*... because you can consider to travel with (11 Syl., +1) (Silent .67) using your own car (Silent .27) mean travel (FP .54) travel by your car or travel by plane (10 Syl.) (Silent .47) or like other public transports like bus and and this things if I want to consider travel by car it's (27 Syl., +1)...*

In the beginning of task two, Mehrzad discussed his personal views on the topic and successfully retrieved a number of relevant words, both of which improved his WTC. He had decided to clarify that the best type of education sometimes depends on individuals, their major, and goals. This was a plan that had improved his WTC. Also, in the remainder of the cluster below, the words he needed such as *situations* or *absolute* had been successfully retrieved, which had led to an improvement in his WTC, all during what seemed to be very fluent cluster of runs:

*... there are difference between both of them (10 Syl., +2) (FP .39) sometimes it depends on the situation I think that it's not a (18 Syl., +2) (Silent .50)(FP .55) some kind of absolute thing that you want to say (12 Syl., +1) (Silent .32) which one of them is completely (9 Syl., +2)...*

Akbar's WTC rose because of successful retrieval in addition to two other reasons. He explained that his WTC in the following cluster was because he was content with his management of

the task. He was discussing his daily routine and managed to retrieve the word *deduction*, which he considered relevant to the context and would not commonly use:

*... and another thing that I should add (9 Syl., +1) (FP .28) to (FP .30) my deduction (Silent .29) is that when you are in university (11 Syl., +2) (Silent .52) you have the chance of (Silent .54) (FP .71) transferring your experience and studying more easily (14 Syl., +3) (Silent .33) faster (Silent .28) and more efficient (Silent .27) to the industry.*

Kammi began the third task with a high WTC as he studied information technology, had an abundance of ideas to discuss, and dealt with the subject on a daily basis at work. He also added that he was thrilled to have recalled part of a stand-up comedy act he had watched approximately six months prior to the interview and had never talked about ever since. This was not planned and had been recalled spontaneously:

*... I believe technologies bring us so many good things (14 Syl., +3) (Silent .45) and at the same time (Silent .80) some bad things (Silent .93) like (Silent 1.41) quote from Luis C. K. my favorite comedian (12 Syl.) (Silent .75) that he was on in a plane and (8 Syl.) (Silent .52) they had Wi-Fi in the plane and he was so happy about that (16 Syl., +2) ...*

**Lexical repetition.** While repeating lexical items in most cases occurred as a result of either lack of lexical knowledge or failure of lexical/support idea retrieval, and in this sense, they might have better fitted into the previous sections, it appeared that repetition of lexical items affected WTC and fluency because it seemed to be perceived as a communicative weakness by some participants regardless of whether or not it resulted from cognitive or linguistic failure. For instance, Majid mentioned during the stimulated recall interviews that repeating the same lexical items could *bore his audience* (in task one) or *lower his WTC* (in task three), which is why retrieving appropriate and different words are important to him. Therefore, I chose to discuss lexical repetition them in a separate section.

One first case was when Pouya was discussing online vs. on-campus education and struggled to retrieve relevant support ideas as well as lexical items, ending up repeating: *you can*, which obviously shows how he avoided silence to retrieve ideas and words. However, as can be seen, the

cluster below contains a number of silences and filled pauses in addition to repeating the phrase three times, which, he explained, had happened as he was in search of ideas and at the same time concerned about retrieving relevant lexis to communicate them:

*... and you can (FP .61) (Silent 1.52) you can do (Silent .33) you can have access to (-2) (Silent .58) (FP .54) better online resources ...*

Pedi's WTC fluctuated due to lack of ideas and having to repeat vocabulary. While he appeared to enjoy a high level of WTC while discussing his own interest (having fruits and vegetables), he started to think of further support arguments upon the word *digest*, which he failed to do and had to repeat the same idea (*digestion*), which lowered his WTC:

*... but (FP) I really (FP) want to everyday (+5) I try my best to have some fruits (Silent) and vegetables as well (23 Syl.) (Silent) because vegetables and fruits help to (Silent) digest (FP) your food and just (FP) I believe that (FP) it helps your stomach (Silent) to digest food (Silent) (FP) better (-5) (Silent) (FP) and it has (FP) its own (FP) benefits vegetables ...*

Mohsen's WTC fluctuated as he discussed a personal interest and then realized that he was using redundant and repetitious words. While his discussion of interests in trying different international foods improved his WTC, in the following runs, he lost WTC when he realized that he was repeating words and the same ideas that he had already used in previously in the task. He added that it might happen even when speaking Persian and this was not necessarily due to speaking a L2. His fluency was not influenced negatively in this case:

*... I wanna go and I wanna go explore I wanna go like have some Indian food I wanna have some sushi I wanna have some Thai food (35 Syl., +6) (Silent .71) like wait the meat food (Silent .71) and something and I was thinking I found out (Silent .52) that all of the Persian food if you think about the really hard (Syl. 16, -4) (Silent .28)...*

Sahra's WTC declined as she perceived her language repetitious. She explained that typically when she runs out of words and has to use a word twice especially in a short span of time, as was the case here (*try*), she felt her talk was getting boring to the listener and thus her WTC dropped. Her speech became rather dysfluent prior to the repetition:

... and (Silent 2.95) I haven't try (FP .39) the on cam the online education (Silent .59) (FP .45) but (Silent .18) I prefer to try **(-1)** that because ...

Akbar also mentioned that he felt lexical repetitions might bore listeners. In the cluster of utterances below, his WTC dropped first due to lack of lexical knowledge. Also, while he was in the midst of discussing his personal experience, upon uttering the words *fruits* and *vegetables*, he realized that he had repeated them too many times, which could make his discussion boring to the listener.

This lowered his WTC, but did not appear to influence his fluency:

... with (FP .58) baked (FP .54) (Silent 1.07) bacon and egg (Silent .32) and nothing else and not (Silent .29) even (Silent .46) one (FP 1.06) cup of fruit or vegetables (Silent .50) (FP .35) which made (FP .32) my day (FP .50) full of (FP .48) (Silent .72) tiring and **(-2)** (FP .39) kind exhaustion (Silent .49) and I think that was because I didn't eat vegetables and fruits (21 Syl., **-2**)...

**Perceived lexical appropriacy/inappropriacy.** A number of the participants indicated that the lexical choices they made might have an effect on how willing or unwilling they would become moving on. While not a recurrent theme, this pointed to the fact that participants self-monitored their speech quality, which might give them positive or negative impressions about their performance and self-perceived competence or how their performance is perceived by their audience.

For instance in task four, Niki's WTC underwent a drop from a positive level due to uncertainty about the appropriacy of the lexical items she was using. When discussing measures that should be taken prior to travelling, she felt uncertain about the words (*number or ticket or anything*) she used and thought the lexical items she was using about precautions for traveling (e.g., *book the hotel, checking their flight*) were not really communicating her ideas; a feeling that lowered her WTC:

... usually before traveling they have to (11 Syl. 0) (Silent .38) gather information (Silent .40, **+1**) and (Silent .39)book the hotel (Silent .42, **+1**) and check their (Silent .38) flight (Silent .63)(FP .22)(Silent .44) number or ticket or anything (Silent .69, **-1**) ...

Majid's WTC was also affected by the quality of a lexical choice at the outset of task two where his WTC fluctuated during one of his LRs of 42 syllables. He explained that the high WTC

was because he felt confident of the content of the sentence; however, immediately after, where he uttered: *they cannot look or they cannot concentrate on student feedback*, he had hesitated over the words *look* or *cannot concentrate* and struggled to communicate what he had in mind. He had originally planned to argue that teachers cannot draw their students' attention, but he seemingly failed to do so, which led to a light drop in his WTC. He added that he did not try to self-correct to avoid pauses:

*... Teachers or professors (+1) they cannot look or they cannot concentrate on student feedback (-1) they cannot get any feedback what they are teaching or what they are talking about (42 Syl.) ...*

In another instance of WTC fluctuation, Mohsen's positive WTC dropped to a negative level as he struggled with ideas. He not only got frustrated due to failing to think of a support idea, but he seemed to be dissatisfied with the choice of the words following the frequent pauses, where his WTC dropped. He explained that he likes to be creative and independent when it comes to vocabulary rather than looking at the words provided to him. He also mentioned that the expression *I think* was too elementary to be used and he would only use such patterns only if he had no other choices. His low WTC coincided with runs that were shorter than his typical LRs:

*... tell me where to read what to read (+1)(Silent .40) in order to do it myself so (+1) (Silent 1.04) (FP) I think (-2)(Silent .53) yes (Silent .40) on campus is good (-1) on campus is necessary (Silent .44)...*

In another instance, Mohsen's dissatisfaction with a retrieved lexical item lowered his WTC again; while he did retrieve a word, he still thought that it would not really communicate what he meant:

*... some training (Silent .64) but they do (Silent .64) actual in my work we do we do some training (+2)(Silent .70) better than just they know (Silent 1.18) both of them are equally (Silent 1.87)(-1) relatively necessary (-2) and not necessary (Silent 2.86) ...*

Mo's WTC declined as he perceived a retrieved word to not be adequately communicating his thoughts. In the excerpt below, while he was discussing the drawbacks of technology, and robots in particular, he tried to argue that in tasks in which feelings and emotions play important roles, robots would not be able to deliver a satisfactory job. He used *gadgets or devices*, which he felt, would

not properly communicate what he meant, which is why his WTC dropped. It is important to note that his struggle with retrieving vocabulary apparently resulted in a number of pauses as he was seemingly cognitively preoccupied:

*... because of less (Silent .31) or having no (Silent .32) emotional (Silent .62) (FP .83) nerves or (Silent 1.17) any feeling from (Silent .28) this kind of gadgets (Silent .56) or devices (Silent .58) (Silent .45) you might encounter (-2) with (FP .61) (Silent .57) problems ...*

In a different instance, the use of a wrong collocation that originated from a negative transfer from French to English lowered Sahra's WTC as she was not able to retrieve a better expression. At this point, she felt uncertain about the accurate usage of the collocation, raising her intonation to request a confirmation, which lowered her WTC. This coincided with a series of pauses before and after the decline in her WTC:

*... my sister like to (Silent .28)(FP .79)(Silent .48) do or to do bicycle? (-3) (Silent .50) I don't know it's correct or not (Silent .58) but (FP .37) ...*

Hero's high WTC dropped due to a hesitation over how to start his sentence. More specifically, he hesitated whether to start the sentence with *although* or *based on*, showing he had the ideas but was struggling to put them into sentences. This lowered his WTC and coincided with a series of pauses and a case of repetition:

*... they missed a (Silent .72) very important exam (+1) (Silent .79) so (Silent .63) (FP 87) (Silent 1.18) al. although (-1) (Silent .99) based on this based on what ...*

Soha's high WTC dropped due to perceived lexical inappropriacy and lack of support ideas. The following cluster began with two LRs and her WTC was positive, too. Later, however, she felt uncertain whether the word *save* would communicate what she had in mind even though she was able to produce a LR. Repetition of the word also indicates her doubt. Immediately after, she ran out of ideas, and had to shift the focus, which lowered her WTC and appeared to coincide with a number of pauses towards the end of the cluster. When asked why her WTC had dropped given that she had managed to bring that part of discussion to an end, she responded that she had been extremely

dissatisfied with the way she had ended that part and had felt she had not expressed her opinion to the fullest. The dissatisfaction had mainly come from the fact that her general knowledge about the topic was significantly greater than what she had managed to discuss:

*... something like that or artificial food like (12 Syl.) (Silent .59) (FP .76) thing the food that I have lots of (8 Syl., +1) (FP .46) extra thing added to (Silent .52) save save them (Silent .51) save them for long time they could be junk food (10 Syl., -3) (Silent .60) (FP 1.08) (Silent 1.76) but (FP .89) (-2) (Silent .36) but about the ...*

In one last instance, Akbar's WTC dropped due to a failure to retrieve a word and dissatisfaction with the lexical item he used. In the interview, he mentioned that he could have simply used the words *read* or *study* instead of *pursue*:

*... (FP.42) really like (FP) to (Silent) pursue (-2) (Silent) (FP) but the thing was (FP) (Silent) even if (FP) ...*

### **Contextual factors**

The theme mainly involved cases where topical knowledge, familiarity, or transition, as well as the effects of the interviewer and camera affected the participants' WTC.

***Topic-related factors.*** One recurring theme that emerged during most of the participants' interviews had to do with the topic under discussion. This could more specifically be broken down into prior/background knowledge about the topics, familiarity with them, or transitions between topics. While it may not always be possible to draw a clear distinction between the words 'familiarity' and 'knowledge', I categorized them based on participant's exact choice of word. Participants mentioned they had acquired the knowledge of or familiarity with topics through reading materials such as article (e.g. Sara, Lili, Mehrzad, & Anita), general search (e.g. Mo), or through courses they had taken in or outside their degree program (e.g. Sahra, Kaami, Sepehr). Below I provide a number of instances whereby this factor impacted participants' WTC.

*Prior/Background topic knowledge.* For example, Niki's WTC moved from a negative to a positive state and her fluency improved because she drew on her background knowledge about Persian food. The cluster of utterances below was initially dysfluent, which appeared to be due to her struggle with ideas: *I don't know different diet I don't know different program.* While this utterance qualified as an LR, she did this by simply repeating: *I don't know.* However, her WTC rose, which she explained was because of her knowledge of Persian food and how she cared about nutritious foods, among other reasons. Her fluency was quite high, too:

*...they they use (silence .27)(FP .44)(silence .64)(FP .55)(silence 2.14)(FP .28)  
different diet I don't know different program different schedule to check (21 syl, -3) (silent .55) the calorie  
that they use every day and what they are eating what (18 syl, +4) (silent .40) what I am eating what I  
should eat what should I buy (13 syl, +3) ...*

In another instance, Majid's WTC rose because his educational background had offered him the knowledge he needed to make an argument. He mentioned that he had completed a Master's program back in Iran, and the program he was doing at the time of data collection was a hybrid; that is, it combined both online and on-campus components. Therefore, to support his arguments, he simply needed to review his educational background and experience. He managed to make fairly long LRs, too:

*... again when you are outside of the country when you can when you can't participate in the class online helps  
a lot (30 Syl.) (Silent .64) when you need (FP .78) to use the (FP .47) all the time of the class when you  
(+1) are when you want to (13 Syl.) (FP .61) teach (Silent 1.34) is in online is more useful (Silent .40) for  
example here we have ...*

In the following multiple cases from Sara, her knowledge of foods improved her WTC during the following LRs. She mentioned that she had read widely on diets and nutrition:

*... should consist of a good portion of... (9 Syl, +3) ...  
... I don't call it a diet because... (9 Syl, +5) ...  
... in my own life I try to eat healthy and I need it to control my weight beside my (22 Syl, +7) ...*

In a different instance, Sara' WTC rose and fell in a short span of time as she moved from discussing what she was knowledgeable about to an argument she was not certain about. More

specifically, she began to elaborate on her on-campus education experience using her prior knowledge. She studied environmental engineering and seemed to be capable of supporting the argument, which led to a high WTC in a seemingly fluent and long run; however, her WTC dropped as she turned to discuss the online education; she felt uncertain as she had no background information, which caused a drop in her WTC:

*... on campus education (Silent .51)(FP .56) you will interact with other students and you get knowledge from them and (FP .75) you can give your knowledge to them (Silent .80)(FP 1.11) (Silent .61) it's more it's it (FP .82) involves (Silent .28) (FP .48) in group work (Silent .35) more than online education (Silent .79) and (FP .65)(Silent .95) but I think (FP .38)(Silent) on campus education works better for practical field like engineering or (+4) (Silent .70)(FP1.04) some fields related to art or sports but maybe I have no idea maybe (Silent .41)(FP .59) it can work for some humanity's field (-2) ...*

Mo's WTC rose because of the availability of ideas and adequate vocabulary knowledge that he had acquired through general reading:

*... can end up (Silent .32) with better shape for me (+3) (Silent .32) always wanted to be in a good shape (9 Syl., +1)...*

A rise in Anita's WTC occurred because she had read on the subject and therefore had some prior knowledge about it. She further explained that she had read an article in English about nutrition and the knowledge she had acquired from the article had given her confidence about what she was discussing and about to discuss, where she managed to produce a number of LRs:

*... these organic foods are healthy (8 Syl.) (Silent .92) and I believe there are some artificial (11 Syl.) (Silent .32) chemical substances in a food (8 Syl., +4) ...*

Linda's WTC rose because of the very same reason. She explained that whenever she discusses a familiar topic she feels secure because ideas and vocabulary are available, which improves WTC. In this case, she explained that her high WTC was partly because of having prior knowledge from her field of study that was relevant to the topics:

*... video or their pictures which was not possible in the past ... (33 Syl., +1)  
 ... in the past people used letters which take a long time ... (13 Syl., +1)  
 ... technology help us to do our tasks faster ... (12 Syl., +1)  
 ... also some people specially new generation are addicted to the video games ... (21 Syl., +3)*

... all the research area a lot because we can have access to many resources ... (20 Syl., +1)  
 ... also some helpful medical applications of technology ... (17 Syl., +2)  
 ... in general I think the advantages of technology ... (17 Syl., +1)

*Topic familiarity.* In addition to prior topic knowledge, some participants indicated that familiarity with topics impacted their WTC. As an example, Mo's WTC rose because he shifted focus to discuss a familiar topic, about which he felt more secure since he believed to possess relevant ideas and vocabulary to use. The following cluster also contained two LR:

... if you want to avoid for example for case of time (14 Syl., +3) (Silent .56) if you want to avoid (FP .66)(Silent 1.36) depend on where (Silent .33) where you are living (Silent .33) you might (FP .79) be you personal car for example or maybe a motorbike or a bicycle could be (23 Syl.) ...

In another instance, Soha's WTC rose because she was very familiar with the topic and thus confident enough to discuss it beyond three minutes. Her high WTC consistently coincided with LR:

... about being healthy I don't believe that I don't care that everything that I eat it is healthy (27 Syl., +3) (Silent .44) most of the time I think about (8 Syl.) (FP .43) (Silent .53) the calorie (Silent .27) (FP .30) is the thing that I care about (8 Syl.) (Silent .66) because the delicious food is always most has have (14 Syl. +2) (FP .90) has the most calorie (Silent .60) I try to ignore something like sugar or (12 Syl., +3) ...

In another example, Sahra's WTC rose because of her experience with an online course, which she found very relevant and liked to share. She had taken some courses in e-learning and e-commerce, in which she had learned about a number of benefits offered by online courses:

... there are (FP .46) advantages and disadvantages for both of them (12 Syl.) (Silent .52) For (FP .42) example, I have attending to some online courses before (15 Syl., +3) ...

Pouya's WTC rose twice because he felt he was discussing a familiar situation, both of which coincided with fluent speech:

... your friends just besides you imagine that ... (10 Syl., +2)  
 ... maybe you prefer to text him rather than talking to him because you are ... (18 Syl., +2) ...

*Topic Transition.* Transitioning from one idea to another was also indicated by some participants to affect WTC. For example, Linda's high WTC dropped as she shifted the focus of her

talk, transitioning from *discussing addiction to video games* to *research and how technology and internet help us*. Struggling with ideas perturbed her WTC and cost her a number of pauses, a situation she finally overcame when more support ideas became available:

*... on the computer (Silent .53) (FP .55) so (Silent 1.16) they cannot go (Silent .67) out of the fake world (Silent .28) and find friends (+1) for themselves (Silent 1.14) (FP .79) (Silent 4.94) (-1) (FP .60) I can (FP .57) (Silent .47) mention about research (+1) (Silent .48) (FP .87) because (FP .65) (Silent .92) technology and internet helped the ...*

Mehrzaad lost WTC due to an untimely topic transition, wherein he turned to discuss the differences between domestic and foreign travel, while he had initially planned to discuss the similarities. This hesitation between ideas lowered his WTC.

In another instance, after a period of high WTC when discussing how his cellphone facilitated his travel experience in Istanbul, Akbar shifted the focus to discuss the disadvantages of cellphones, where he felt unprepared and struggled at structure level, leading to a reduced WTC and fluency:

*... and (FP .41) there is (-2) (FP 1.52) beside the (Silent .45) advantages there is a ...*

In a number of instances, participants indicated other reasons that can best be associated with contextual factors, including the interviewer and camera effects.

***Interviewer effect.*** The interviewer effects mainly originated from an issue with performance, which the participants believed, would create a negative impression in the interviewer's mind. For instance, Sahra mentioned that having to repeat a word twice lowered her WTC because she thought it might bore her audience. Mehrzaad also stated the feeling of not being able to thoroughly make his point as a result of lacking the lexical knowledge gave him a feeling that he was failing at the conversation and the listener might no longer be interested in what he was talking about. In a different instance, Mehrzaad was not able to retrieve the word *web* in the *World Wide Web*,

which he knew but had to replace with another lexical item *internet*, and this lowered his WTC. He explained that fact that he was unable to use the ideal word in front of the interviewer had lowered his WTC. All the three instances above have been discussed under the category of lexis-related factors also.

In another instance, Kaami stumbled over pronouncing the word *distraction* and explained that his WTC would have declined more significantly if he had been in a conversation with a native speaker who would have had much better proficiency in English and would have possibly judged the quality of his speech:

*... like there are so many more inter. dist. distraction (10 Syl., -2) (Silent .43) compared to on campus education (10 Syl.) ...*

In another instance, discussed previously in the grammar-related section, Kaami perceived his speech inaccurate when struggling to use a comparative structure and lost WTC. He explained that, at this point, he was consistently obsessed with the feeling of being judged by the interviewer and this got very stressful particularly when he was uncertain about the accuracy of his structures.

One last interviewer-related instance involved a situation where Linda misunderstood the interviewer and this lowered her WTC. In this first case, which was also discussed above in the dysfluent speech and low fluency section, Linda ran out of ideas, so the interviewer intervened to ask a question and assist her with ideas, in which there was a word she did not understand and asked for clarification.

**Camera effect.** In two cases, Majid and Mehrzad indicated that their WTC dropped as a result of being recorded, in addition to a number of other reasons. In the first instance, Majid's low WTC because of being uncertain about the pronunciation of the word *artificial* declined further as he

felt nervous as a result of being recorded. Because of this, he added, he was trying to be as accurate and fluent as he could:

*... (Syl. 38) (Silent .70)(FP .49)(Silent .28) jam or (-4) (Silent .28) you know (Silent .74) anything has any artificial flavor (-5) in it (Silent .52) ...*

Mehrzaad also pointed out that, in an instance discussed under the lexis-related factors, being recorded had caused inhibition and lowered his WTC.

### **Organizational factors**

In regards to organization, the two factors of jotted-down notes and having a discussion plan were identified as having an influence on the participants' WTC. It is noteworthy that the jotted-down notes involved the direct use of the ideas on note paper.

***Jotted-down notes.*** In one instance, Pouya's WTC rose because of the notes he had made prior to the task. He recalled that he had the idea of *flight delays* jotted down and was seeking an opportunity to discuss it:

*... you might think that OK if a flight delay happens ... (12 Syl, +2)*

In another instance, Linda's speech became dysfluent as a result of a decision to skip a support idea she perceived offensive to an ethnic group and ran out of ideas, which lowered her WTC. She explained that she had felt embarrassed for the silence caused and would have liked to terminate the task. However, she was able to use another idea, which came directly from her notes, and carry on:

*... never try it even if I know it's healthy, it's good for me, I never go close and never try. (Silent .91) yeab especially Asian foods (-1) (Silent .71)(FP .61)(Silent 1.89) and (Silent 13.89)(-5) ... also I know carbo carbohydrates? (-1) (Silent .35) carb carbohydrates (Silent .54)(FP .68)...*

Pedi also used his notes and gained willingness to continue. He explained that his notes included a daily routine of eating fast food to gain weight as he thought he was thin and having such foods was a quick way of gaining weight. He found this relevant to the discussion and was interested to share it:

*... another thing that I want to mention is that so the (Silent .31) by eating junk food and fast-foods (+5) (Silent .39) (FP .35) people usually can gain (FP .48) on weight (Silent .51) (FP .39) ...*

In another instance, Anita's low WTC due to pauses for the slow retrieval of a lexical item, rose to a positive level as she took advantage of her notes and recalled a view she held about traveling. She added that the stress caused by the pauses remained in her subconscious for a couple of utterances, and if she had not taken the notes, she would have significantly lost her WTC here due to the pauses. She was able to shift the focus of her talk using her notes and carry on the task with a high WTC:

*... because (FP .33) each country or each (FP .93) (Silent .88) region has its own (FP .63) (Silent 1.00) (FP .32) its own (Silent .84) (-1) (FP .94) rules (Silent .64) so (FP .63) (Silent .39) other you have to you cannot in my opinion you cannot avoid them (19 Syl., +1) (Silent .25) because FP .88) if you (FP .38) if this is your first time you haven't any experience and on (16 Syl.) (Silent .43) you this case you cannot use other people's experience (15 Syl.) (Silent .51) (FP .61) for example for me (Silent .31) my aunt (FP .73) always told me about the travel or how to go (13 Syl., +1) ...*

**Discussion plan.** It appeared that writing up a discussion plan during the one-minute preparation time improved some of the participants' WTC. In one instance in task four, Linda had planned to categorize her ideas into international and urban transports, which had given her a feeling of security and preparedness to start the task:

*Transportation problems can be in (+1) (Silent .54)(FP .46) abroad or within city inside the city (-1) ...*

In another instance at the outset of task two, Majid's WTC rose because he had planned to argue that teachers cannot draw their students' attention in online classes, which had risen his WTC,

even though he subsequently lost WTC due to hesitating between two lexical items, which lowered his WTC:

*Teachers or professors (+1) they cannot look or they cannot concentrate on student feedback (-1) they cannot get any feedback what they are teaching or what they are talking about (42 Syl.) ...*

Soha's plan and organization of ideas improved her WTC at the outset of task four as she felt that the way she had classified the subtopics and organized her ideas was very efficient:

*... because you can consider to travel with (11 Syl., +1) (Silent .67) using your own car (Silent .27) mean travel (FP .54) travel by your car or travel by plane (10 Syl.) (Silent .47) or like other public transports like bus and and this things if I want to consider travel by car it's (27 Syl., +1)...*

### **Grammar-related factors (linguistic/cognitive)**

This theme involved two subcategories; cognitive and processing issues with sentence structuring slightly prior to the point they were uttered and perception of inaccurate speech after the utterances were produced. The first category involved a number of instances where participants lost WTC when they struggled to smoothly structure a sentence, specifically marked structures with less frequency or use, which led to delays in speech production and dysfluency speech. It should be mentioned that some participants' WTC seemed to remain stable during such a situation. The second grammar-related category pertained to cases where inaccurate speech was produced and detected by some participants; some chose to self-correct and some moved on. In both cases, there were instances where WTC was affected and some where WTC remained intact.

***Sentence construction.*** One case that shows how sentence structuring may challenge speakers during communication occurred when Saba was discussing technology. As shown in the excerpt below, while she struggled to retrieve a word after *became*, which she failed to do, she mentioned that she had also been uncertain about what grammar structure would best communicate her thoughts. This not only lowered her WTC significantly, but also coincided with a lot of pauses:

*... had more advances so it (Silent .29) it actually (Silent .39) (FP .43) became (FP .89) (Silent .83) it became (FP .46) like (-4) (Silent .49) (FP .55) a very (Silent .41) (FP .34) (Silent .25) it actually expanded ...*

In another instance, Mo lost WTC due to lack of interest as well as sentence structuring issues. He explained that he was not interested in discussing what he did not regularly do: *I do not eat much one single thing*. Not only did he lack interest in this, but also, he was not certain if the way he had structured the sentence could communicate what he meant or not, which is why he decided to rephrase it as follows: *so I can say*:

*... one dimensional on specific type of I don't go over (Silent .32) and I don't eat too much one single thing (-2) (Silent .67) so I can say (-1) (FP .60) (Silent 1.71) (FP .88) I I never try ...*

Akbar's WTC dropped as he got confused as to how to start a sentence. He explained that he had a plan to approach the topic, which was to introduce, expand, and end his talk. He initially had intended to discuss how his impression of a healthy diet had changed upon his arrival to Canada, but had struggled how to structure his introductory sentence to best communicate his point. His LR became fairly dysfluent as he proceeded and he also lost WTC. Following the low level of WTC, he was able to come up with a structure that helped him put his ideas into words. His speech became more fluent and his WTC rose:

*In first of all I should say about the (Silent .32) nature of (FP .45) (Silent .91) concept of (FP .36) healthy food (-3) (Silent .53) (FP .65) (Silent .67) exactly before I come to Canada (11 Syl., +5) (FP .32) I thought (FP .36) I'm (Silent .25) having healthy diet (6 Syl.) (Silent .27) but after coming here (6 Syl.) (Silent .41) and eating especially Chinese and Korean food I realized that it was completely different between what I would imagine (34 Syl., +5) (Silent .44) (FP .43) because (FP .76) since I love to cook a lot of food (9 Syl.) ...*

Later in the same task, his WTC improved because he managed to think of support ideas and was able to choose appropriate grammar structures to communicate them. He explained that he had intended to discuss being overweight, but had increasingly found it more difficult to process the translation of his ideas from Persian into English, mainly due to struggling with building the

structures of the sentences. His speech also became increasingly dysfluent towards the end of the cluster below:

*... when I was working out regularly (10 Syl, +3) (FP 1.10) I (Silent .28) always had the problem with a lot of fat overweight (14 Syl, +2) (Silent .50) I couldn't realize why is (7 Syl, -1) (FP .63) (Silent .25) (FP .38) this happening (Silent .41) (FP .53) and (FP .72) maybe it (FP 1.24) it exaggerating but (7 Syl, -1) (Silent .32) I think ...*

At the outset of task four, Akbar lost his WTC while producing fluent speech, which became increasingly dysfluent because of sentence structuring reasons. While he was drawing on a personal experience and not struggling with ideas, putting them into English structures was what challenged him. His struggle with sentence construction emerged in dysfluent speech towards the end of the cluster below. He further explained that, at this point, as a result of struggling with structuring sentences and trying to avoid pauses, he had had to use all his notes, which he had planned to gradually use through the three-minute task. As a result, he ran out of ideas and significantly lost WTC as he had used up all his ideas and was left with no ideas to continue:

*In considering travel problem I should say that the most import (17 Syl.) (FP .44) usual and customary problem (9 Syl.) (Silent .43) (FP .49) in travels are usually (7 Syl.) (FP .66) the (Silent .42) difficulty of connection and having guidance (13 Syl., -2) (FP .42) for (Silent .35) address of (Silent .32) hotels (-2) (SP .34) (Silent .52) and also (-1) (FP .59) the best (FP .40) option for shopping (Silent .58) or hotels (FP .30) restaurants (-2) ...*

**Perceived inaccurate speech.** A decline in Pouya's WTC was observed as a result of inaccurate speech. The utterance cluster below began with a long utterance with high WTC, which remained stable until he made a grammatical error (*both of them has*), which was not only followed by a series of silences and filled pauses but lowered his WTC. He mentioned that while being preoccupied with retrieving a grammar structure, he made a grammatical error, which he recognized immediately after. Even though he was able to self-correct, his WTC dropped as a result of the error and he would have abandoned the talk if he had not had to complete the three-minute task:

... connection, to have a better relationship with them **(+2)** (Silent .52)(FP .50), this way you can share (FP .58) better experiences, more experiences, (Silent .69) but (FP. 56)(Silent .84) both of them has (Silent .55)(FP .75)(Silent .41)(FP .35) it have its own advantages **(-2)**, have their own ...

Another instance of grammar error was that of Linda, whose WTC declined to negative levels. She explained that her lack of knowledge about online courses had initially lowered her WTC, which declined further when she noticed an error (*there is limitations*) in her speech. She added this is typically a factor that results from self-monitoring her speech and affects her WTC in daily conversations,. She mentioned that on occasions where she is talking to a native speaker, her inaccurate speech could embarrass her and significantly lower her willingness to remain engaged in the conversation:

... but I am not sure if we have online education (FP)(Silent) we can (Silent)have access to other people **(-1)** or (Silent)(FP)(Silent) there is limitations **(-2)** because ...

Pedi's WTC declined as a result of a combination of lexical retrieval (discussed previously) and grammar error, which occurred when he detected a usage error of the word *abroad* as an adjective. He explained he was not sure whether the noun phrase (*abroad travels*) was accurate, which coincided with his hesitation during a filled pause:

... a broad or another country make it (Silent .32) a bit more difficult than internal in the country travel (Silent .76) in terms of (FP .61) abroad (FP 1.18) travels (Silent .40) **(-1)** sometimes we need to ...

In another instance, Sahra noticed an error in the use of a comparative adjective (*more lazy*) at the end of task three, which lowered her WTC during a fairly dysfluent speech:

... difficulty for your future (Silent 32) you have to play and (FP .61) (Silent 1.00) nowadays (Silent .78) just (FP .59) (Silent .8) to learn became more (Silent .28) (FP .67) lazy **(-1)** ...

In another instance, Hero's high WTC because of support ideas dropped due to perception of an inaccurate structure. He explained that his WTC was mainly positive except for an instance where he was not sure about the accuracy of the structure. While his language appears to be grammatically accurate, his perception of inaccurate speech slightly perturbed his WTC level. The

two pauses before *get in a day* showed his moment of hesitation. After this however, he regained control over the talk and his WTC rose again:

*... another thing some scientists recommends is (11 Syl, +3) (FP .45) that you only count the calories (9 Syl, ) (Silent .67) The amount of calories that you (9 Syl, +2) (Silent .57) get in a day (-2) (Silent .62) So, let's say a slice of pizza may have (11 Syl, +1) ...*

Another case of lowered WTC occurred when Sepehr detected incorrect language usage (*I lose some weight* instead if I lost ...). He pointed out that his WTC dropped since he realized that he had used an incorrect tense, which was immediately followed by a series of connected pauses:

*... I lose some weight I don't know because (Silent .68) because of some stress or (1.47) some (Silent .45) bad feelings and (Silent 1.34) bad conditions in my life (Silent .30) I lose about (Silent 1.13) ten to twelve kilograms (-1) (Silent 1.03) (FP .39) and (FP .78) (Silent 2.15) (FP .27) so I think (Silent .43) ...*

Mehrzaad's inaccurate usage of a preposition (*travel with a plane*) in task four lowered his WTC. He explained that he had realized that the expression had been used inaccurately and this had lowered his WTC. This appeared to have also resulted in a number of pauses. He added that this negative feeling obsessed his subconscious for a while, which he found difficult to recover from:

*... way of communication (Silent) (FP) in spite of (FP) (-1) (FP) this problem I think that (Silent) another kind of (FP .36) difficulty maybe happens (Silent .26) (-2) (FP .38) traveler (FP .40) who (Silent .57) travel with a (FP .59) (Silent .52) plane (-1) (Silent .27) plane ...*

Kaami also lost WTC in task three due to rewording (*like not like multiple times*) after a period of high WTC. He had initially intended to make a comparison using a comparative structure, over which he had hesitated and struggled with accuracy:

*... information (Silent .74) in the past two years (Silent .25) we (Silent .61) created (Silent .67) information like (Silent 1.37) not like (Silent 1.02) (-3) multiple times (Silent .28) the (Silent .37) fifty years ago ...*

In another case, his WTC dropped due to an incorrect grammar structure that he tried to self-correct, and a hesitation in structuring his sentence. His struggle with structuring his sentences is evident in the way they were formed. He indicated he had been cognizant of the inaccuracies, but had failed in self-correcting, which had lowered his WTC. He had eventually decided to leave it the

way it was and move on to avoid further pauses. His speech also became dysfluent towards the end of the below cluster:

*... to avoid some places not not (Silent .37) visit it avoid (-3) some places or (Silent .75) and not visiting some places in order to not being (Silent 1.44) (FP .30) in order to avoiding (Silent .52) (-4) stealing (Silent 1.13) and (Silent .74) other thing ...*

### **Self-perceived performance**

This theme mainly involved instances in which participants indicated issues or satisfaction with their performance as perceived by themselves, which included perceived control over language, perceived fluent speech, and perceived dysfluent speech.

***Perceived control over language.*** This sub-theme involved participants' perception of their control and competence in using their language skills (e.g., grammar performance) competently. In one instance, Kaami began task two with a high level of WTC because he had jotted down notes and felt prepared to begin the task. Shortly after, he was impressed with a passive structure he used:

*Online education so there there are (10 Syl., +2) (Silent .88) online education and on campus education two things that (17 Syl.) (Silent .74) can be managed together can be done separately (15 Syl., +1) (Silent .44) so I had experience for ...*

In another instance, Majid's WTC increased because of successful lexical retrieval and interest in the topic. In the remainder of the cluster, however, his WTC remained high because of the control he had over his language performance and that he was able to add some humor to his discussion while being able to maintain fluent speech. He believed that making a joke in a language shows one's mastery of that language, and it appeared that he was impressed with his show of proficiency in front of another interlocutor in a L2:

*...I wanna talk about myself because I really I really like (23 Syl., +5) I really like to (Silent .44) eat a lot and especially when there is (laughter) delicious food (16 Syl., +2) (Silent .38) whenever my when my wife (Silent .34) cooks (0. +5) (Silent .48) for me...*

**Perceived fluent speech.** This sub-theme involved instances wherein participants perceived their speech fluent. For instance, Hero had a high WTC in the following cluster and explained it was because of his perception of fluent speech. He added that he had ideas, which were retrieved smoothly, and thus he was able to put the words together and produced good quality speech, which increased his WTC:

*... some may say that you ok you cannot (9 Syl, +3) (FP .52) (Silent .79) ask questions directly from the professor (11 Syl, +3) (Silent .85) so, this happens in the regular class if you have (13 Syl, +2) (FP .67) anytime if you have (FP .31) any question then you can ask raise your hand and ask your question from the professor (20 Syl, +4) ...*

Hero's WTC rose once again for the same reason, which, he explained, was because he was able to structure his questions fluently:

*... you really can't trust the driver (9 Syl, +2) (Silent .57) if the driver is going to drive safety (Silent .57) safely? (Silent .86) or (Silent .54) can you reach the destination in time? (Silent .52) so if you want to use this kind of transportation ...*

In another instance, William's WTC rose not only because of the smooth retrieval of ideas, but also the fact that he was able to express himself fluently and avoid Persian-to-English translation. He added out of the blue that, on daily conversations, he monitors his speech fluency and perception of fluent speech motivates him to discuss things further and vice versa; if he considers his speech fluency *terrible*, he seeks any opportunity to bring conversations to an end:

*... but about time for cooking since I am a student (13 Syl, +4) (Silent .55) If I want to cook I should spend a lot of time and I should spend (16 Syl, +4) (Silent .55) perhaps in the mornings to evenings (10 Syl, +3) ...*

In another instance, Kaami perceived his speech as flawless and fluent and his WTC improved, as a result:

*... access to information all the time (12 Syl.) (Silent 1.09) you never get lost using your phone you have google maps you never get lost (19 Syl, +1) (Silent .81) you can (Silent .47) find (Silent .57) all the information about everything about restaurants about (19 Syl, +1) (Silent 1.05) place to go (Silent .32) what to watch what not reviews like (8 Syl.) (Silent .50) like if (Silent .96) ten years ago not twenty years ago someone want wanted a review (15 Syl.) (Silent .50) about a movie he had to wait for (10 Syl.)...*

A similar reason improved Kaami's WTC again shortly after the above instance. He not only perceived his speech fluent, but also believed that he was supporting his argument effectively:

*... this one has good life (Silent .25) he is happy he is happy and (9 Syl.) (Silent .25) like you judge judge judge (Silent .27) that affected the brain negativity (10 Syl., +2) ...*

In another instance, William's WTC improved because of successful vocabulary retrieval and the perception of fluent speech. He explained that he had perceived his speech as very fluent and this had improved his WTC. He further explained that dysfluent speech could become boring to listeners, while fluent speech is more likely to spark interest in listeners:

*... for the graduation parties and such lots of things of course it's impossible and there should be physical contact and (30 Syl. +3) (Silent .68) a for celebrations for gatherings (silent .29) it should all be gatherings ...*

Improvements were also observed in Akbar's WTC as a result of retrieving a personal experience and the perception of fluent speech. He explained that in addition to recalling his personal experience in Beijing, he had perceived his speech as fluent and this had also improved his WTC towards the end:

*... (FP .31) you see when you go to a foreign country and (12 Syl., +1) (Silent .34) the most problematic and disastrous problem (12 Syl.) (Silent .27) would be the people of that country (9 Syl.) (Silent .25) which aren't capable of communicating with you (15 Syl., +1) (Silent .53) you speak English they don't know anything (11 Syl.) (Silent .29) and they answer in their own language that was (11 Syl., +1) ...*

**Perceived dysfluent speech.** This sub-theme involved instances whereby participants perceived their speech as dysfluent and their WTC was affected. In the following instance, Linda's lack of support arguments resulted in a long pause, which lowered her WTC:

*... and we can share ideas with other (FP .72) scientist (Silent .81)(FP .76)(Silent 3.68) (-1) ...*

In another instance, Sara's WTC dropped due to the frequent repetition of the word *communication* and *need* towards the end of the cluster as well as continuous and long filled and silent pauses:

... online world (Silent .75) (FP .48) like (Silent 1.59) cell phones and other means of communication (Silent .64) **(-2)** they they are the main they became as the major means of communication (Silent .44) while people lost face-to-face communication (Silent .47) and it cannot (FP 1.06) (Silent .49) compensate the (Silent .28) (FP .98) need for **(-3)** (Silent 1.36) (FP .76) com. need for communication that they need (Silent .45) (FP .68) when they (Silent .51) (FP .86) talk to each other ...

Saba also ran out of ideas and turned silent, which lowered her WTC:

... I can say about healthy food (Silent .46) (FP .45) **(-4)** (Silent .32) I think eating fruit fruits and vegetables ...

#### Research Question 4

The fourth research question aimed at monitoring the interactions between WTC and L2 fluency and determining whether they resemble those of the CDs. The question is as follows:

RQ4: How does the theory of complex dynamic systems account for the interaction between WTC and fluency?

To this end, the idiodynamic application outputs including an Excel file and a bitmap graph were analysed. While the bitmap graphs depict the WTC dynamics in a visually effective and unambiguous way, variability of WTC was further measured using the Excel file outputs of the idiodynamic software and is demonstrated in two ways. The Excel files contained the numerical values pertaining to second-by-second changes of WTC for each task. The numerical values were first averaged to calculate dynamic WTC, which is consistent with the method used by MacIntyre and Legatto (2011). Then an Excel formula was used to compute the dynamic standard deviation (SD), which is in line with the method used by MacIntyre and Serroul (2015). The dynamic WTC values represent the frequency of variability on a per-second basis, while the dynamic SD show the magnitude of changes, with greater SD suggesting greater variability. As can be seen in Table 11, a great deal of variability characterises the idiodynamic ratings of WTC, where a majority of the changes are positive, suggesting a high WTC, as indicated in Figure 15, whereas a few instances display a negative trend, whereby participants' WTC were mostly low. For instance, Niki's WTC

changed for an average of 1.24 times per second during task 1, Saba's WTC underwent very few fluctuations (0.03 times per second) in task 3, or Sepehr's WTC did not change at all in task 4. As per SDs, Hero's WTC changes in task one shows the greatest magnitude of all (SD=2.68), while a majority of SDs turned out to be lower than 1.00.

In addition to the dynamic WTC and SDs, the variability patterns of the bitmap graphs were visually studied and clustered around seven major patterns out of a total of 80 graphs. The patterns included

1. Generally positive (GP)
2. Positive (P)
3. Infrequent, positive & negative (IPN)
4. Few shifts (FS)
5. Roller-coaster (RC)
6. Generally negative (GN), or
7. Negative (N).

The patterns are ranked from the least to most recurrent along with their respective frequency in Figure 15. A sample of each pattern is also provided in Figures 16 to 22. The bitmap graphs were also used to detect attractor/repeller states. In addition, cases where WTC changes were triggered through interaction between more than one factor provided evidence for the interconnectedness of CDS.

## Evidence of change

Table 11.

*Participant-specific Dynamic WTC and Variability Pattern by Topic*

Participant s	Task 1			Task 2			Task 3			Task 4		
	Dynamic WTC	Dynamic SD	Variability pattern									
Niki	1.24	1.76	GP	0.59	0.88	GP	0.54	0.77	P	0.77	0.85	P
Pouya	0.47	1.22	GP	0.00	0.43	IPN	0.03	0.43	IPN	0.05	0.37	GP
Linda	0.26	1.01	GP	0.16	0.65	GP	0.091	0.37	GP	0.00	0.00	GP
Sara	0.66	1.20	GP	0.16	0.69	GP	0.08	0.72	IPN	0.45	1.01	GP
Majid	-0.21	1.60	RC	0.00	0.13	FS	0.006	0.11	FS	-0.00	0.15	FS
Pedi	0.14	1.36	P	0.04	0.23	FS	0.01	0.12	FS	-0.06	1.36	N
Samaneh	1.46	1.78	GP	0.67	1.12	P	0.57	1.003	GP	0.43	0.88	P
Mohsen	1.45	1.80	GP	0.64	1.12	GP	0.55	0.90	P	0.27	0.58	P
Saba	0.71	1.78	GP	0.13	0.53	P	0.06	0.57	IPN	0.07	0.47	P
Lili	1.58	1.48	GP	1.06	1.32	GP	0.65	1.16	GP	0.12	0.46	GP
Mo	1.10	1.85	GP	0.14	0.56	GP	0.008	0.17	FS	0.28	0.73	GP
Sahra	0.25	1.73	GP	0.00	0.45	GP	-0.08	0.34	GN	0.16	0.40	GP
Hero	1.16	2.68	GP	1.02	1.72	GP	0.13	0.43	GP	0.23	0.56	GP
Sepehr	-0.03	0.52	IPN	0.00	0.09	FS	0.009	0.15	IPN	0.00	0.00	NR
William	1.18	1.75	GP	0.47	1.16	GP	2.00	1.94	GP	4.03	0.95	P
Anita	-0.08	0.97	IPN	0.21	0.60	GP	0.14	1.83	GP	0.05	0.36	GP
Soha	0.89	1.32	GP	0.13	0.45	P	0.00	0.20	IPN	0.05	0.23	P
Mehrzaad	0.82	1.68	GP	0.02	1.19	GP	0.05	0.64	GP	0.05	0.59	RC
Akbar	0.05	1.46	RC	0.79	1.63	RC	0.37	0.92	GP	-0.08	0.58	GN
Kaami	0.23	0.65	GP	-0.15	0.76	GP	0.33	0.98	GP	0.062	0.60	IPN
Average	0.66	1.48	-	0.30	0.78	-	0.27	0.68	-	0.34	0.55	-

Roller-coaster = RC, Generally positive = GP, Generally negative = GN, Infrequent positive & negative = IPN, Positive = P, Negative = N, FS = Few Shifts, No rating = NR

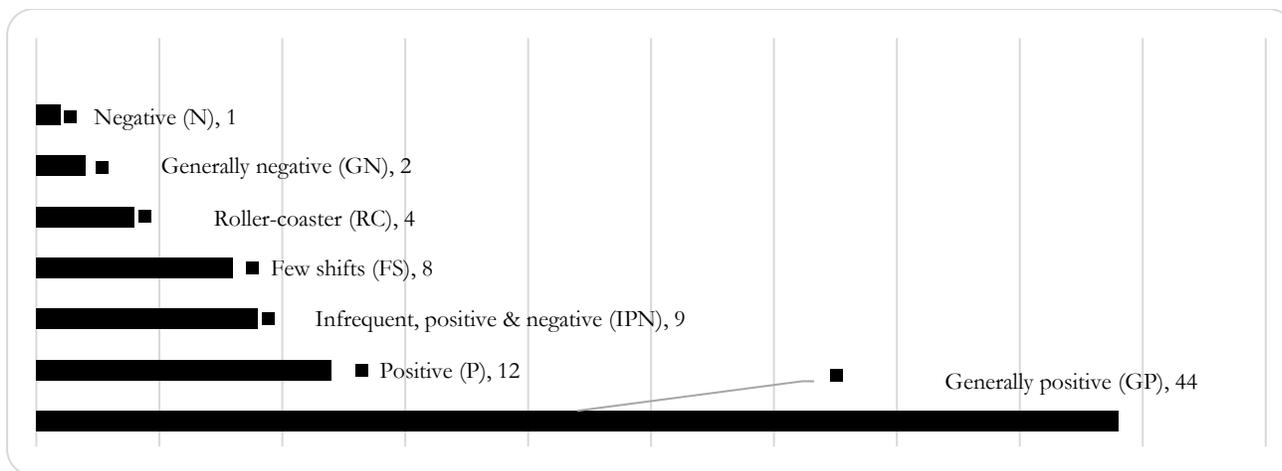


Figure 15. WTC variability patterns.

As the Figure 15 shows, eight patterns of variability emerged from a total of 80 bitmap graphs. The most recurrent pattern ( $N=44$ ) indicated generally positive WTC throughout the tasks.

The *generally positive pattern*, as illustrated below (Figure 16), involved graphs with over 90% positive rating of WTC and very few negative ratings.

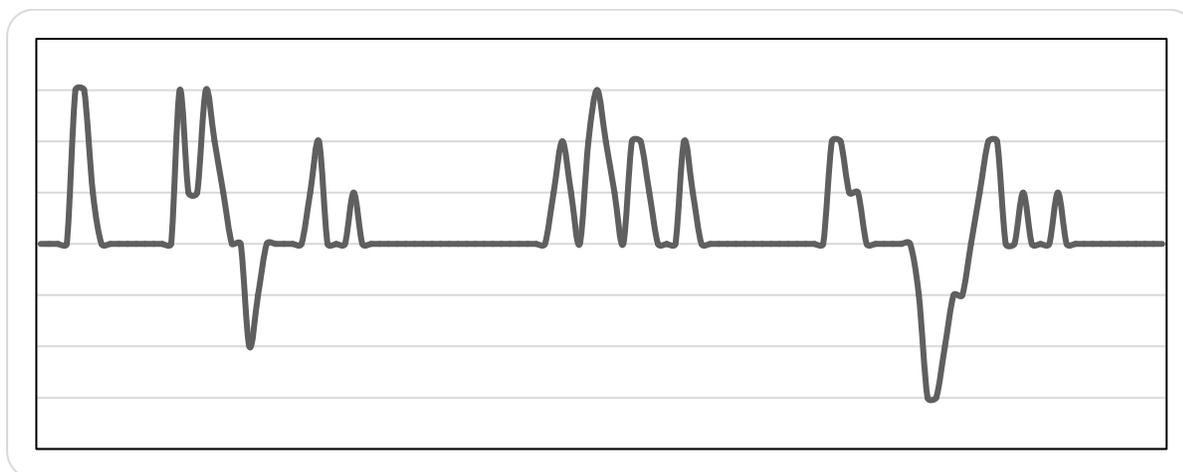


Figure 16. Generally positive pattern sample (Kaami's task 3).

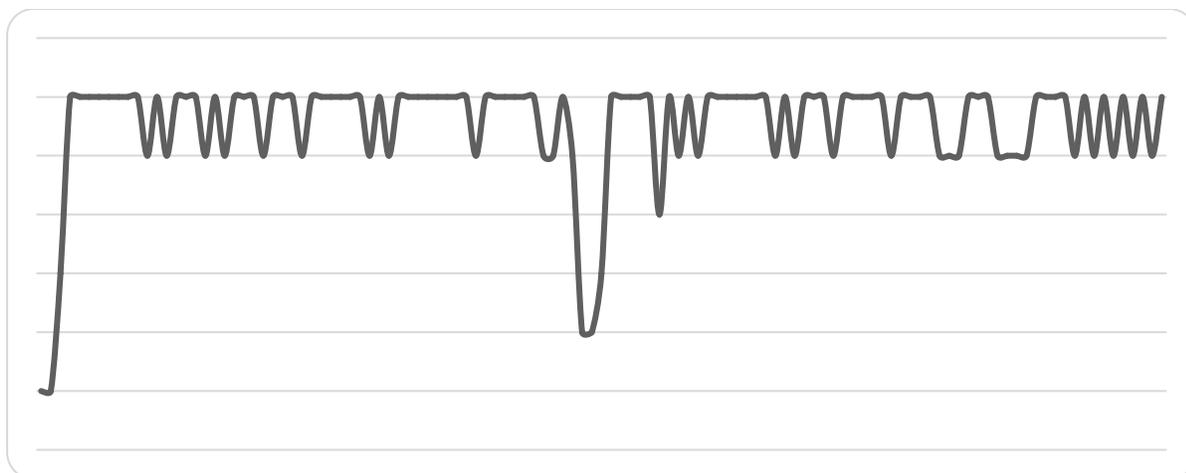


Figure 17. Positive pattern sample (William's task 2).

The *positive pattern* was the second recurrent type of patterns ( $N=12$ ), whereby participants had maintained positive WTC throughout an entire task and reported no decline. A sample is provided in Figure 17.

The *infrequent, positive and negative pattern*, which was ranked the third ( $N=9$ ), involved tasks wherein WTC fluctuated rather infrequently, but when it did, the changes were equally positive and negative (see Figure 18).



Figure 18. Infrequent, positive & negative pattern sample (Soha's task 3).



Figure 19. Few shifts pattern sample (Pedi's task 2).

The next recurrent pattern of variability, called the *few shifts* pattern, was observed in eight graphs and involved very infrequent changes, in most cases once or twice (see Figure 19).

Fluctuations were sometimes positive and sometimes negative.

Next was the *roller-coaster* pattern ( $N=4$ ) and involved graphs wherein WTC fluctuated frequently both positively and negatively. A sample is provided in Figure 20.

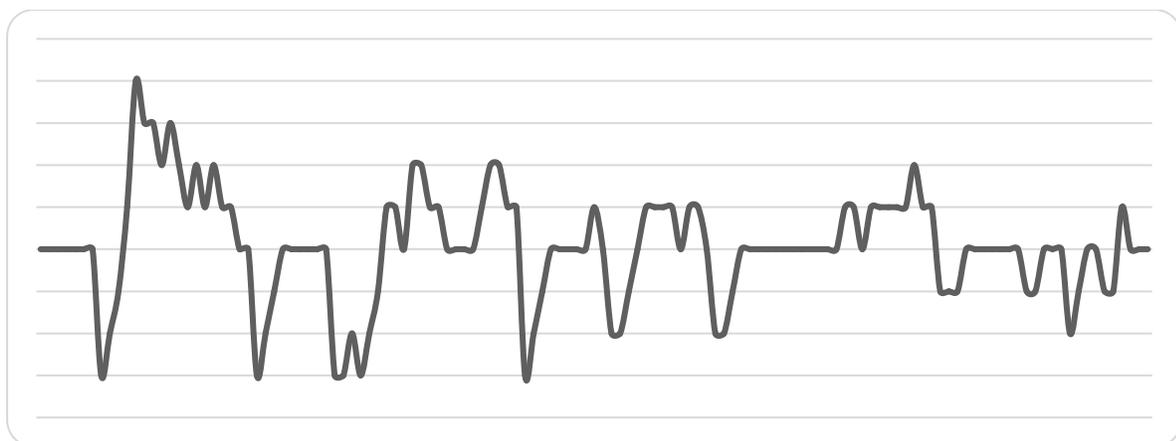


Figure 20. Roller-coaster pattern sample (Akbar's task 1).

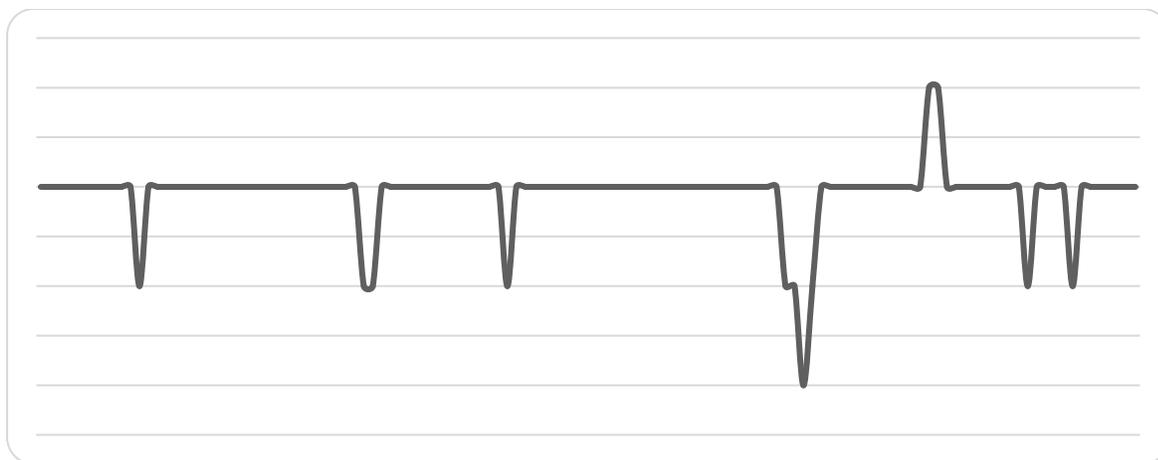


Figure 21. Generally negative pattern sample (Sahra's task 3).

As opposed to the *generally positive pattern*, there were two bitmap graphs, called *generally negative* (see Figure 21) that represented a mainly negative WTC during the tasks. The two cases showed fluctuations with over 90% of negative rating of WTC and very little positive ratings.

As can be seen in Figure 22, in the *negative pattern*, two of the bitmap graphs showed only negative fluctuations in WTC during the tasks, and the changes were in both cases not frequent.



Figure 22. Negative sample pattern (Pedi's task 4).

## Interconnectedness

The following section elaborates on the coded cases that suggest an interconnected interaction between three major variables underlying WTC and fluency, namely, linguistic, cognitive, and affective. The task excerpts are provided in a way to facilitate the understanding of the communication context detailing on silences, filled pauses (FP) like *um* or *uh*, and number of syllables for each utterance along with its respective WTC self-ratings and participants' explanations of the fluctuations. It should be noted that the instances discussed below may have been discussed in previous sections; however, this section adopts a CDS perspective to viewing WTC and fluency changes and highlights the interconnected interactions. Also, the data of four of the participants did not contain any cases of interconnectedness.

**Niki.** In one instance, Niki's WTC dropped from a high of +4 WTC to a low of -1 due to detecting an incorrect grammar form. She was uncertain about the preposition that collocates with the word 'interested'; which not only explained the delay in articulating it but also lowered her WTC. This indicates how linguistic uncertainty caused an unexpected memory search, which failed in this case and caused the speaker to have to restructure and use an infinitive structure (*to help* instead of *in helping*), which reduced WTC and subsequently troubled her speech. The whole event explains her cognitive struggle to produce speech including the silence, filled pause and the short utterance:

*... I don't know how but I think there are some people that they are (Syl. 16, +4) (Silent .63) int. (hesitation) (FP .35) interested to help the (Syl. 7, -1) (Silent .76)(FP .41) you know the (Silent .49) yeah newcomers and ...*

**Pouya.** In another instance, Pouya's mainly positive WTC at the outset of the task gradually dropped to negative levels, mainly resulting from struggling with lexical retrieval. He explained that, despite the presence of ideas, he had been struggling to find an appropriate equivalent phrase in English for *becoming emotionally distant* for a few seconds; a search that seemed to have increased his

cognitive load resulting in frequent pauses and repetitions before and after the phrase. Despite the fact that he managed to retrieve a phrase, his uncertainty about the appropriacy lowered his WTC.

*... in some situations and some (Silent .57)(FP .39) (Silent .47) for some people it (Silent .73)(FP .49) really (Silent .73)(FP .49) make make people (Silent .68)(FP .40) (Silent 1.38) get far from each other (Silent .56, -2) you know (FP .47)(Silent .74) ...*

**Linda.** Multiple cases of interconnectedness were observed in Linda's first task. In the following fluent runs, she explained that whenever she discusses a familiar topic such as her personal experience/beliefs, or daily routines, she is not concerned about the availability of ideas and is confident that relevant vocabulary is available, which improves her WTC. This peace of mind facilitates a smooth retrieval of language items she needs.

*... nowadays internet is very useful to know what we should eat and (19 Syl., +3) ... (experience)  
... organic foods are very good for our health as well (13 Syl., +1) ... (belief)  
... food is very important in our health and I believe we should pay more attention what we eat (24 Syl., +3)  
... (belief)  
... in general I try to cook by myself (11 Syl., +3) ... (routines)*

In another similar case, a significant rise in Linda's WTC occurred, which she attributed to smooth recall of her experience and educational background to support her argument. She added that she felt more prepared; that is, she believed she possessed the lexical knowledge required of the argument, which gave her a feeling of security and reassured her that she had sufficient information to back up her argument. This improved her willingness to carry on:

*... the degree from online educations is not very valuable (17 Syl.) (Silent .94)(FP .85)(Silent 1.22) because if we are in the classroom (Silent .32)(FP .33) we have more motivation (+4) to (Silent .40) understand the topic and (Silent .48)(FP .44) interact with prof or answer the questions and be more (Silent .39)(FP .59) active in the class (Silent .40) because (FP .48) for example some people like to be the centre of attention and they like to answer (25 Syl., +1) more questions ...*

**Sara.** In another instance, Sara started task four with high WTC, which she attributed to her interest in travelling as well as smooth retrieval of lexical items. She further explained that managing to retrieve *bustle and bustle*, which she thought was quite appropriate for the context and was a low-

frequency word, had improved her WTC. In the subsequent LR, the word *necessarily* improved her WTC once again because of the same reason:

*OK talking (Silent .51) talking about travelling I believe is a must for (14 Syl., +5) (Silent .45) everyone (Silent .79) (FP .8) (Silent .8) in such a hustle and bustle life (9 Syl. +3) (Silent .85) and (FP .84) (Silent 2.06) (FP .86) it's a kind of (Silent .44)(FP .45) escaping (+4) (Silent .67) from (FP .76) routines (Silent .59) day routine days life (Silent .82) and (FP .73) but some people they say it's so expensive (Silent .51) but (FP .40) it's not necessarily (+5) (Silent .44) (FP .91) you can bo book hustle instead of booking a five star (14 Syl., +3) (Silent)(FP) hotel ...*

**Majid.** In another case, Majid's WTC dropped in an instance where he stuttered over the articulation of the word *master*. Later, he explained that there was a small delay in recalling the word, causing a stutter that lowered his WTC. This coincided with confusion and a clumsy word order, resulting in a number of pauses:

*.... when you are taking online courses I have i have done my (Silent. 1.09) (FP. 27) software ma (FP .28) masters of (-2) (FP. 42) (Silent .36) engineering in software engineering in Iran and completely online course ...*

**Pedi.** Pedi's lack of adequate support arguments and his perception of a plain presentation of ideas caused dysfluent, slow speech. He was not only discontent with it, but also struggled a lot with retrieving relevant support ideas, both of which lowered his WTC. It seems like this lack of support ideas resulted in frequent filled pauses, and his perception of the fragmented, dysfluent speech brought about a sense of dissatisfaction that lowered his WTC. He further mentioned that, in daily conversations he has in English, he monitors his fluency and, if his speech is perceived as dysfluent, his WTC could drop.

*.... you can easily see (silent .52) in movement of the city (Silent .57) and you can see that (FP .42) people (silent .33) (FP .87) just check the buses stops (FP 1.11) (-1) the schedule of the buses (Silent .55) to ...*

**Lili.** Lili's WTC dropped in one case due to inaccurate speech, which she mentioned she had attempted to self-correct. She then stated that she had detected the error *call with you*, and had tried to self-correct, explaining why she had repeated the phrase. However, despite spotting the error, she

failed to correct it, which not only lowered her WTC but appeared to overload her cognitive capacity required of fluent speech production:

*... a doctor can (Silent .43) Skype with you or can (Silent .72)(FP .45)(Silent 1.29) call with you can call with you to (-2) (Silent .46) (FP .43) say (FP .65) some (FP .39) positive points some (FP .64) (Silent .55) prescriptions for you ...*

Towards the end of the task, Lili retrieved more information from an article she had read, which not only gave her ideas and vocabulary, but also led to an increased WTC. She further elaborated that she had read a paper on the disadvantages of technology in which she had come across the concept of immoral use of technology, which she had found relevant to the task and had improved her WTC:

*... in my point of view the biggest problem regarding to this topic is (18 Syl, +4) (Silent .58) extension of immorality ...*

**Mo.** In this case, discussion of an experience he had just prior to the data collection session had improved Mo's WTC. He elaborated that, as a teaching assistant, he had tried to convince his students to attend the laboratory session of an engineering course in order to have hands-on experience with using lab devices. This experience had contributed to his confidence in the use of linguistic resources to express himself more clearly and more fluently:

*... to touch it (Silent .26) you better to touch it (Silent .32) you better to see it from a close distance to get a better understanding of how the mechanism look you eventually need to (34 Syl, +3) (Silent .26) play it (Silent .27) play with that device ...*

In the next task, Mo's WTC dropped as he failed to recall further examples to contribute to the argument. He explained while he was full of ideas about the advantages of technology, he knew very little about its disadvantages. After a short period of struggling, he finally recalled a disadvantage that robots offered but felt lexically unprepared to delve into it more specifically and thus insecure to

continue discussing it. Once he found it difficult, he struggled between pauses, causing reduced WTC:

*... the case when you don't have any gadget or technological (16 Syl.) (Silent .70) (FP .51) devices (Silent .83) (FP .79) (Silent .32) for example (Silent .1.44) (FP 1.30) (-2) (Silent .28) for example for the case of robot ...*

In another instance, Mo's WTC rose because of discussing a familiar topic, about which he had ideas and vocabulary to use. More specifically, he recalled a recent discussion in a group meeting with colleagues where they had discussed the transportation in Ottawa, in which he had heard and used relevant vocabulary. This had given him a feeling of security and improved his WTC to bring the subject up here:

*... again you have to see how expensive is the gas how expensive is the (19 Syl., +4) (Silent .26) vehicle it's off (Silent .66) and (FP 1.06) (Silent 1.04) you have to decide whether to go by public transportation if it's cheaper than (22 Syl.) ...*

**Sahra.** Sahra's WTC dropped as she felt dissatisfied with a sentence structure. She explained that when she speaks English, she tends to translate from Persian or French. This not only takes time and results in pauses, but also in many cases, like the cluster below, the translation does not output a proper sentence structure in English, both of which lowered her WTC in this case:

*... normally my (FP) me and my sister try to (FP .93) just (Silent .51) (FP .31) (Silent .39) cook the foods in a healthy way (Silent .37) don't use a lot of oil (Silent .64) try to not use use a lot of rice and bread (-1) (Silent 1.12) but you know (Silent .77) junk food is really ...*

In a different instance, Sahra's WTC dropped as she struggled with retrieval of the word *problem* causing a lexical repetition (*another*). Immediately after, her WTC rose as she turned to discuss a personal daily routine. Here, she mentioned that in search of both ideas and vocabulary, she had been repeating a limited range of ideas and vocabulary since the beginning of the task, which finally lowered her WTC:

... *there is a lot of another another (-1) problem that we are student we just stay (21 Syl., +2) (FP .75) beside (Silent .42) behind a table (+2) (Silent .24) we don't do a lot of ...*

Sahra started task three with a fairly high level of WTC, as she was taking advantage of the notes she had taken prior to the task. Her positive WTC was because of the availability of ideas she had on her note paper, and that she was able to use words or phrases that were appropriate to the context such as *advantages, disadvantages, time-consuming, and saving energy or money*. She had recalled the lexical items and supporting ideas from a previous course in e-learning and e-commerce, in which she had learned about a number of benefits offered by online courses:

... *and there are some kind of advantages and disadvantages for both of them (18 Syl., +1) (FP .30) for example for online (FP .50) education (+1) (Silent .48) it's some kind of time-consuming because we don't pass our times in traffic (20 Syl., +2) (Silent .67) and (FP .51) it is some kind of save energy and money (+2) ...*

**Hero.** In one instance, Hero managed to produce several fairly consecutive LRs that seemed to impress him. He explained that he had ideas that were retrieved smoothly and he was able to build fluent stretches of sentences and good quality speech, which increased his WTC:

... *some may say that you ok you cannot (9 Syl., +3) (FP .52) (Silent .79) ask questions directly from the professor (11 Syl., +3) (Silent .85) so, this happens in the regular class if you have (13 Syl., +2) (FP .67) anytime if you have (FP .31) any question then you can ask raise your hand and ask your question from the professor (20 Syl., +4)...*

**Sepehr.** Sepehr started the task with an extremely low WTC mainly due to linguistic weaknesses such as uncertainty about lexical knowledge or grammar structures. He further explained that a combination of lacking ideas and uncertainty about vocabulary and grammar structures had lowered his WTC at the outset, so he was not confident how to continue:

*Unfortunately, (-5) I (Silent 1.15) I don't eat healthy food because (FP .81) I live (Silent .35) with myself ...*

In another instance, Sepehr's WTC dropped due to an unsuccessful lexical search. He reasoned that his WTC dropped because he had expected to recall more healthy foods such as

different types of foods, fruits, or vegetables, which he failed to do and it caused a number of pauses that lowered his WTC:

*... I don't have time to cook (Silent .34) and (FP .46) cook (Silent .96) and (FP .55) buy healthy foods, (Silent .73) fruits (-1) (Silent .84) (FP .66) ...*

Sepehr's WTC declined once again due to uncertainty about vocabulary and grammar. He explained that he had not adequately prepared for the task during the preparation time, assuming it would not have been challenging given his knowledge of technology. At this point, it was around 30 to 40 seconds that he had been struggling at lexical level as he had the ideas but was finding it difficult to convert them into English. He explained that sometimes he had also struggled with grammar, particularly when he was building new structures, apparently where the cognitive processing took longer than usual. His low WTC as a result of the struggle with vocabulary and grammar appears to have led to a number of pauses, too:

*... communication and (Silent .82) (FP 1.06) (Silent 2.87) and (Silent .50) (-1) relationship between people (Silent .80) I think (Silent 1.99) (FP .72) ...*

In task four, Sepehr's WTC rose because of the support ideas he was able to generate through a question provided to him. The question provided to him was "what can people do to avoid travel problems?". His WTC rose because not only was he able to use the words and the structure of the prompt, but also because of finding more to say:

*... but to avoid this problems it's better to make some plans (15 Syl.) (Silent .77) to find (Silent .36) (FP .58) to list (Silent .60) something that you wanna to in your city in your travel (16 Syl., +1) (Silent .49) and (FP .64) make (Silent 1.70) and ask some people that are familiar to that city or they (16 Syl.) ...*

**William.** William's WTC rose because of the smooth retrieval of ideas, which, he stated, helped him make his point. He further mentioned that not only did the ideas retrieved improve his WTC, but also the fact that he was able to express himself fluently and avoid Persian-to-English translation encouraged him to continue. He also added, out of the blue that, in daily conversations,

he monitors his *speech pace*, which, if perceived fluent, motivates him to discuss things further.

Conversely, if he perceives his speech to be *terrible*, he seeks any opportunity to bring the conversation to an end:

*... but about time for cooking since I am a student (13 Syl., +4) (Silent .55) If I want to cook I should spend a lot of time and I should spend (16 Syl., +4) (Silent .55) perhaps in the mornings to evenings (10 Syl., +3) ...*

In another instance, William's WTC rose because of the availability of the grammar structures he needed as well as lexical items. He was content with the accurate use of the grammar structure and the smooth lexical retrieval, both of which improved his WTC:

*... combinations of these two like (8 Syl., +1) (Silent .64) alongside the campus education there is online education like (19 Syl., +2) (Silent .52) seminars and like the lectures that are presented online as well (16 Syl., +1) ...*

**Anita.** Anita's WTC remained stable for almost the first minute of task one, but rose because of her background knowledge about the topic. She had read an article about nutrition shortly before the session, the lexical knowledge (e.g., organic foods & chemical substances) of which had improved her WTC to discuss the subject:

*... these organic foods are healthy (8 Syl.) (Silent .92) and I believe there are some artificial (11 Syl.) (Silent .32) chemical substances in a food (8 Syl., +4) ...*

**Mehrzaad.** In one case, Mehrzaad was impressed with his argument and whether he was able to retrieve appropriate vocabulary to communicate what he means. The idea of *workshops* was recalled and found relevant here and he was able to support his argument with this example and threw in words such as *international* or *access*, which, he said, were not commonly used words in his lexicon. Therefore, a combination of support ideas and vocabulary improved his WTC:

*... for example for some kind of international student that want to be on a (21 Syl., +2) (FP .60) special workshop and they couldn't access to that place (13 Syl., +2) (Silent .46) (FP .35) they can gather in a online meeting (10 Syl., +1) ...*

In a different case, his WTC improved because he was able to link a jotted down note to his discussion. He mentioned that he had previously read an article about Generation Z, which he used here. A combination of the idea and retrieval of the accompanying words (e.g. generation and spoiled), which he had learned from the article, led to the improvement in his WTC:

*... they call the they call them (6 Syl., +1) (FP .32) for example for new generation of people (13 Syl.) (Silent .37) they call them as a Z generation (10 Syl., +2) (Silent .45) (FP .49) people who are spoiled with technology (10 Syl., +1) ...*

In the next task, Mehrzad's WTC dropped as he struggled with lexical retrieval. In the following cluster, his WTC dropped because he was unable to retrieve the word *web* of the World Wide Web, and decided to replace it with *internet* in order to avoid a pause, which lowered his WTC. He also added that being recorded and being unable to use appropriate vocabulary caused a feeling of embarrassment in this case, causing inhibition and a low WTC:

*... and benefits like (FP .44) (Silent .44) the (Silent .70) (FP .76) worldwide (Silent .36) famous thing that is internet (8 Syl., -1) (Silent .72) (FP .43) all of us use internet for (8 Syl., +1) (Silent .33) finding some places (Silent .52) for searching for (FP 1.20) looking for everything that they (9 Syl., +1) ...*

In the last case, Mehrzad's high WTC declined due to inadequate linguistic resources. More specifically, the decline was due to not knowing the words for *stations* or other types of transportation like a port for ship or railway stations for train. He knew what he wished to say in Persian but not in English. He further explained that the feeling of not being able to thoroughly make his point as a result of lacking the lexical items had disappointed him, leaving him with an impression that a listener might no longer be interested in his talk:

*... cancelling the flight (+1) or (FP .56) you're missing your baggage in a airport (11 Syl., +1) (Silent .29) any station some kind of bus station or (10 Syl., +1) (Silent .46) (FP .81) the (FP .57) (-2) (Silent 1.12) another station ...*

**Akbar.** Akbar's WTC rose in one case because of being able to smoothly retrieve his reasons

for buying a cell phone and an iPad. While his WTC remained high at the outset of the cluster below, a decline in WTC occurred as he stumbled over articulating the word *transfer*, which had occurred as a result of him being subconsciously planning the structure of the subsequent sentence to introduce the upcoming reason:

*... the reason (FP .71) for using a cell phone beside (8 Syl., +2) (Silent .56) iPad (Silent .26) was that I could an iPad for (8 Syl.) (FP .53) reading (Silent .45) (FP 1.01) having kind of portable laptop with myself wherever I went (17 Syl., +1) (Silent .31) I have a (FP .29) just light device (Silent .31) with me (Silent .39) to (FP .39) (Silent .32) tran transfer (-2) our document specially the work-related document (16 Syl., +3) (Silent .39) present when whenever and whatever I want (12 Syl., +2) (Silent .52) and also reading a lot of book stuff that I (12 Syl.) ...*

Next time his WTC rose was because he reminisced about his good memories while traveling to Istanbul. However, immediately after, he shifted the focus of his talk to discuss a disadvantage of technology, in which he struggled with choosing a proper structure, leading to a reduced WTC and dysfluent speech:

*... having (FP) a cellphone (Silent) made me kind of like a professional Istanbul tourist (15 Syl., +1) I went wherever I want (7 Syl.) (Silent .41) I knew (Silent 1.73) which places and market I should go shopping (10 Syl., +3) (Silent .43) (FP .54) which places have off (+2) (Silent .48) even I went to the best restaurant in Istanbul even if I didn't (20 Syl., +1) any idea about Istanbul when I put my foot on the airport (Silent. .48 and (FP .41) there is (-2) (FP 1.52) beside the (Silent .45) advantages there is a ...*

### **Recapping interconnectedness**

As the instances above demonstrate, interconnectedness among the linguistic, cognitive, and affective factors, a property characterizing CDS, underpinned both WTC and fluency. The linguistic aspect mostly pertained to the knowledge of the language, mainly including lexical and grammatical aspects, which tended to affect cognitive or affective (or both) dimensions of speech production. The cognitive factor mainly involved the retrieval of lexical items or smooth structuring of sentences, and cognitive malfunctions would tend to affect the affective state of the participants, which manifested through WTC.

### Formation of attractor and repeller states, and self-organization

As discussed in the literature review, attractor states refer to periods of stability where no or little fluctuation is observed in the dynamics of a system. Repeller states, on the other hand, involve transient periods of perturbations to a system. In the context of this study, bitmap graphs were holistically analysed and periods of stability were identified as attractor states. On the other hand, whenever a temporary perturbation to a stable current was detected, it was identified as repeller. Table 12 provides details pertaining to 21 instances of attractor and repeller states detected in the bitmap graphs. Nine of these instances will be discussed below. The self-organization column in the table represents cases where participants' WTC self-organized from a repeller state to an attractor state. The last column provides information as to whether fluctuations in WTC interacted with speech fluency or not. In the following figures, attractor states will be highlighted green and repeller states will be displayed in orange.

Table 12.  
*Observed Instances of Attractor/Repeller States*

$\frac{\sigma}{Z}$	Participant	Formation of attractor & repeller states	Self-organization	Interaction with Fluency
1	Niki - task 1	Both	No	Yes
2	Niki - task 2	Both	No	Yes
3	Niki - task 3	Both	No	Yes
4	Niki - task 4	Both	No	Yes
5	Majid - task 1	Both	Yes	Yes
6	Sara - task 1	Both	No	Yes
7	William - task 1	Both	Yes	Yes
8	William - task 3	Both	No	Yes
9	William - task 4	Attractor state	N/A	No
10	Soha - task 2	Attractor state	N/A	No
11	Anita - task 3	Both	No	Yes
12	Anita - task 4	Repeller state	No	No
13	Hero - task 2	Both	No	Yes
14	Hero - task 3	Attractor state	N/A	No
15	Hero - task 4	Both	No	Yes
16	Lili - task 1	Both	No	Yes
17	Saba - task 1	Both	No	Yes
18	Sahra - task 2	Both	No	Yes
19	Sahra - task 4	Both	No	Yes

20	Mehrzad - task 2	Yes	No	Yes
21	Kami - task 2	Both	Yes	Yes

**Niki.** As Figure 23 illustrates, Niki remained highly willing until the 85<sup>th</sup> second of task one mainly because of reviewing and discussing her background about Persian food and her recent conversations with a friend over her father's blood sugar. However, after this period of stability, which led to the formation of multiple consecutive attractor states, she introduced the topic of dieting, about which she felt at a loss for support ideas, which perturbed her WTC system. She explained that this was due to the fact she had never been on a diet and thus was bereft of ideas. Her WTC dropped at this point to a low of -3, which was temporary and resembled a repeller state. Her speech became dysfluent before her WTC dropped, and subsequently, despite she was able to build an LR, she did not appear to present rich, meaningful content, most likely indicative of her lack of ideas. Immediately after, she was able to recall the idea of calories and her WTC rose and settled into another attractor state:

*...they they use (silence .27)(FP .44)(silence .64)(FP .55)(silence 2.14)(FP .28) different diet I don't know different program different schedule to check (21 syl., -3) (silent .55) be calorie that they use every day and what they are eating what (18 syl., +4) (silent .40) what I am eating what I should eat what should I buy (13 syl., +3) ...*

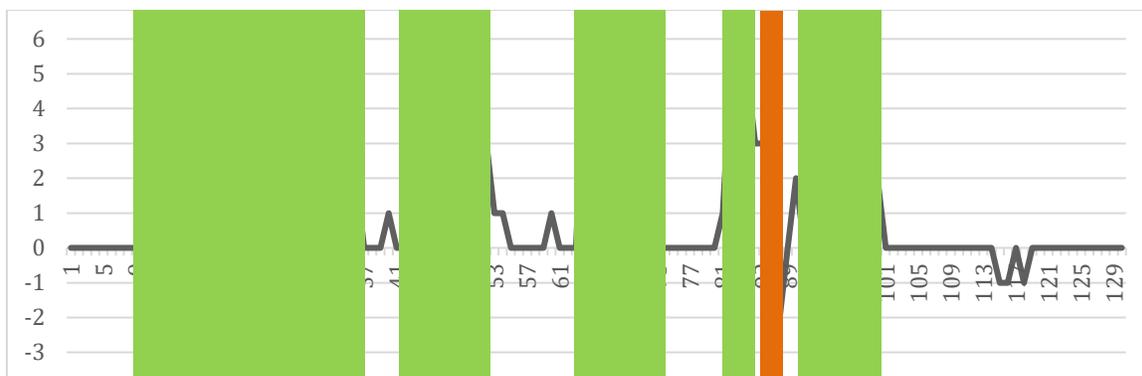


Figure 23. Niki's Task 1 - attractor state.

Niki's WTC also appears to enter a period of stability, or an attractor state in task two. As illustrated in Figure 24, her WTC improved at the outset and remained relatively high until it dropped in the 62<sup>nd</sup> second. The rise in her WTC was because she drew on her personal experience

and belief for support ideas. She managed to produce 15 LRs up to this point at a SR of 2.79 syl./sec., which is higher than her overall SR for the task (2.51 syl./sec.). Her WTC and fluency both seemed to enter a repeller state while she was in search of some academic fields of study to help her compare which fields of study could benefit from online or on-campus education. The lexical search took longer than expected and caused a long pause, lowering her WTC. Her SR for the period she struggled with lexical retrieval with a low WTC (underlined) went down to 0.94 syl./sec., which is significantly lower than her overall SR (2.41 syl./sec), and her speech was characterized by multiple long and short consecutive pauses. This seemed to mirror an unpleasant attractor state that lasted for 10 seconds before her WTC became stable and she was able to recall a supporting idea (language), whereby her WTC increased followed by a long run of 14 syllables. More specifically, she explained that once the idea of language crossed her mind, she thought of comparing it with math and relating both to the discussion of which method of education could benefit each of these majors:

*... and (FP .62) (Silent 4.96, -3) (FP .73, -1) (Silent 1.99) about (FP .85) (Silent 5.07) (FP .37) I think one of the (Silent 1.21) (FP .47) (Silent .28) fields (Silent .26) that maybe online education (Silent .42) will be OK for them (Silent .32) maybe (Silent .76) like the language (Silent .70, -1) because they need just to communicate just to talk but ( 14 syl., +2)...*

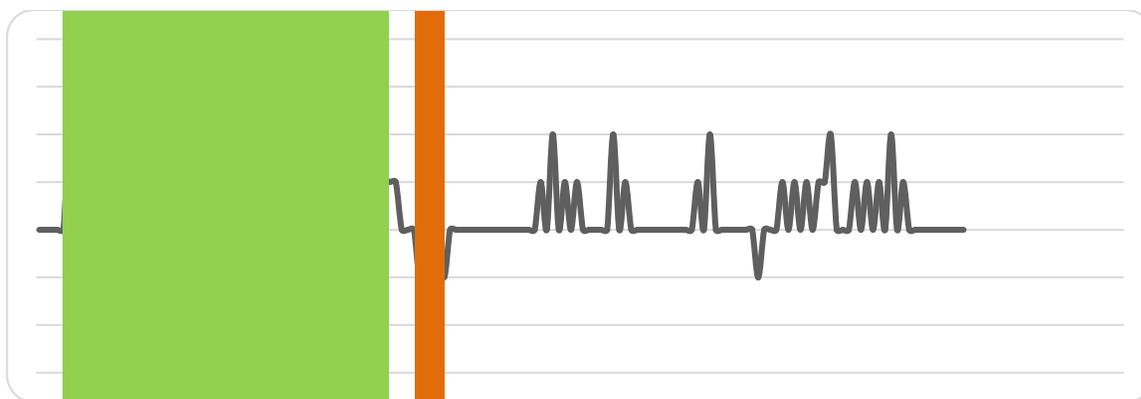


Figure 24. Niki's Task 2 - attractor and repeller states.

Another pattern of WTC change resembled an attractor state in Niki's task three (Figure 25). She studied electrical and computer engineering and believed that her educational background had

triggered more willingness to discuss the topic of technology because she had more experience and knowledge about it. In the following instance, her WTC remained stable and relatively high for almost a minute at the outset of the task, suggesting formation of a prolonged attractor state. Essentially, her WTC did not drop for a better part of the task. The reasons she gave for this ranged from possessing support ideas, experience with online shopping, to discussing her daily routines. Her WTC, however, entered a repeller state as she failed to retrieve relevant words and felt uncertain about the appropriacy of a lexical item she used. It took her a silence and a filled pause to retrieve the word *united*. She added that, even after this, she was uncertain and remained preoccupied whether she had successfully communicated her point, which might explain the following broken and short utterances, and the pauses. She had produced 20 LRs before her WTC entered the repeller state at a SR of 2.90 syl/sec. which is higher than her overall SR (2.79 syl/sec.). Her fluency, however, during the repeller state period, dropped to 2.23 syl./sec. and her speech contained multiple silent pauses:

*... you know I think it it helps the world will be (11 Syl., +2) (Silent .54) (FP .47) united (-2)(Silent .42) or (Silent .70) something like this (Silent .36) I think (Silent .28) and (FP .52) (Silent .58)...*



Figure 25. Niki's Task 3 - attractor and repeller states.

**Saba.** Saba's WTC entered into an attractor state and a series of consecutive repeller states as can be observed in Figure 26. Her WTC and fluency seemed to enter an attractor state from the 26<sup>th</sup> second until it dropped (the 86<sup>th</sup> second). Her high WTC was mainly because she was discussing her

personal belief, possessed support ideas, and felt prepared to explain them further. The following fluent cluster of runs, containing four LRs, began in the middle of the task (the 72<sup>nd</sup> second), whereby she discussed her personal belief according to which people should not be on diet and should prevent a situation that would necessitate this as losing weight through diets is always a challenge not many people can overcome. This seemed to look like an attractor state with respect to both WTC and fluency:

*... so much weight because I know that it's gonna be really difficult and tough to lose the weight (24 Syl, +5) (Silent .55) so I just try to control my weight instead of (Silent .41) eating a lot of food and then (Silent .40) trying to be on a diet to lose the weight (Silent .32) so I just try to control what I am eating what I am drinking however it's really difficult because sometimes you cannot avoid you know eating sweet things because I really love (49 Syl, +5)*

Later, however, when she ran out of ideas, both her WTC and fluency entered a repeller state; her WTC dropped to a low of -4, and her fluent speech turned dysfluent. She explained that in a conversation, other interlocutors would contribute to the talk, while here, she was the only one in charge of keeping the monologue going; therefore, whenever there was silence dominating the talk, she would feel uncomfortable, which rendered her unwilling to continue the task:

*... not to gain a lot of weight (Silent .75) (FP .65) other thing that (Silent .33) I can say about healthy food (-4) (Silent .46) (FP .45) (Silent .32) I think eating fruit fruits and vegetables ...*

Towards the end of the task, her WTC rose and fell because of success and failure in retrieving relevant vocabulary to the context, which happened to be during a long run. She explained that she had been searching for the name of some snacks to support her ideas on healthy eating and, when this happened, her WTC began to rise. However, when she tried to contrast it with some unhealthy snacks, she failed to retrieve any, resulting in a series of pauses and repetitions of *to*, which lowered her WTC:

*... fruits in your bag and then whenever you feel that you are hungry you can just have it as a snack like banana like apple (31 Syl, +5) (Silent .27) I think they are really good and (FP .67) also they are really healthy (Silent .40) so (Silent .67) I think it's good just (FP .29) try to (Silent 1.17) to (Silent .47) (FP .67)(Silent .25) to avoid eating like snacks (Silent .34) they have (-4) a lot of like sugars a lot of ...*

After the attractor state, both WTC and fluency seemed to temporarily settle into three consecutive but intermittent repeller states. It is noteworthy that all cases of high and low WTC coincided with fluent and dysfluent speech, respectively.

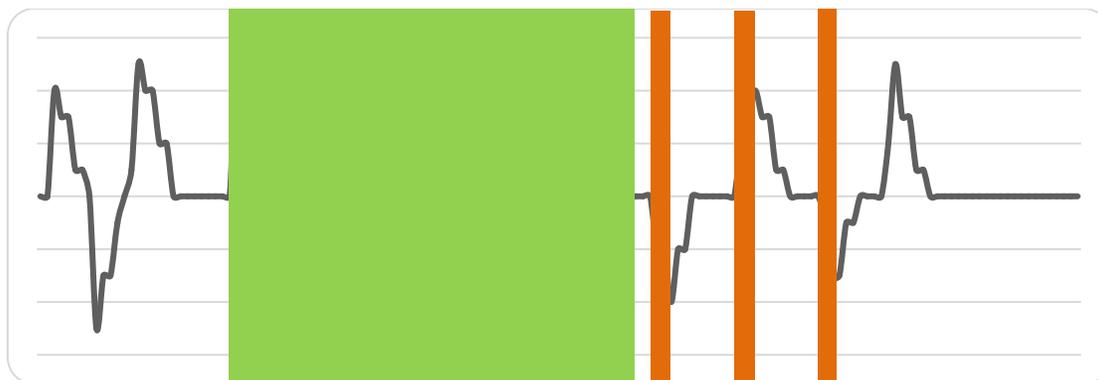


Figure 26. Saba's Task 1 - attractor and repeller states.

**Sahra.** Sahra's mainly high WTC in task two dropped after a long settlement into an attractor state. As can be seen in Figure 27, she was relatively willing to talk at the outset until the 86<sup>th</sup> second where her WTC dropped due to a failure in lexical retrieval. Reasons for her WTC ranged from having background knowledge, relevant lexical items, to discussing personal preferences/interests, apparently helping her with ideas and linguistic resources and thus keeping her willing to continue. Her WTC, however, dropped as her search to retrieve a word related to technology failed, resulting in a long pause, prompting the interviewer to make a lexical suggestion:

Sahra: ... *I can't say which is exactly is more efficient in a specific field of study (Silent .74) (FP .71) but (Silent .34) I (FP .70) (Silent .51) nowadays (Silent .42) were going to ours this (FP .89) (FP .76) (-4) (Silent 2.29) (FP .56) (Silent 1.43) (Silent 1.22)*

Interviewer: *this trend?*

Sahra: *(FP .68) maybe (Silent .37) this point of view that (FP .44) online education is better...*

She mentioned that the low WTC and the lexical search lasted for a while, preoccupying her subconscious. She added that was also true about occasions where she produces grammatically inaccurate speech.



Figure 27. Sahra's Task 2 - attractor and repeller states.

**Anita.** Anita's stable and high WTC in task three lasted for over two minutes, which resembled a settlement into a long-lasting attractor state (Figure 28). Main factors that improved her WTC included discussing personal interests, a personal experience, having support arguments, and easy access to the vocabulary required for the task because of her relevant educational background. The last time her WTC rose was because of recalling a personal experience, which had happened to her and she was willing to share as a disadvantage of technology. The cluster below contains four LR's with a SR of 2.92 syl./sec., which is higher than her overall SR of 2.76 syl./sec., despite the consecutive pauses towards the end:

*... but it also has some disadvantages for example when (15 Syl.) (FP .65) (Silent .38) your data will be lost (Silent .55) or as a one time it happened to me (10 Syl., +2) (Silent .44) (FP .63) like three years or two years ago (Silent .26) my cell phone was stolen (Silent .44) and I was just like (Silent .27) (Silent .39) I lost (Silent .27) (FP .48) (Silent .42) (FP .56) (Silent .28) really wide range of my life. I lost everything I didn't have access to any of them I haven't backup (29 Syl., +3) ...*

A few runs later, however, her WTC entered into what resembles a repeller state after she ran out of support ideas and lost WTC. She explained that she should not have gone through her notes very

quickly and should have elaborated on them further. She thought she would have had enough to discuss for the entire three minutes of the task. However, at this point, she realized that she had no more to say. While the last negative rating coincided with a LR, the SR for the cluster below is 2.73 syl./sec., which is slightly lower than her overall SR:

*... those datas again (Silent 1.34) and (FP .52) about (FP .56) other (FP .92) (Silent .71) when for example (FP .33) even (FP .81) when I am using (FP .34) the (-1) my cell phone or the computer (Silent .69) I I use (FP .34) I try to use (Silent .28) even all the thing I did it manually by them (13 Syl.) (Silent .38) such as for example (.85) (Silent .43) for example when I want to study something (13 Syl., -1) ...*



Figure 28. Anita's Task 3 - attractor and repeller states.

**Majid.** Majid's WTC settled into a series of attractor and repeller states during task one (Figure 29). The first repeller and attractor states were formed at the outset. The short-lived repeller state of low WTC took place as a result of slow retrieval of the phrase *healthy diet* causing two pauses, but it appeared to self-organize immediately into an attractor state when he retrieved relevant ideas and appropriate words, which improved his WTC and fluency for almost the entire cluster:

*Ok. let's now talk about our food our (FP .41) any (-1) (Silent .44)(FP .55) healthy diet we have or not (+3) (Silent .45) so (FP .60) at first I wanna ta I wanna talk about myself because I really I really like (23 Syl., +5) I really like to (Silent .44) eat a lot and especially when there is delicious food (16 Syl., +2) (Silent .38) whenever my when my wife (Silent .34) cooks (+5) (Silent .48) for me but (FP .35) in terms of talking about diet I have never been on diet (15 Syl., +1) but (Silent .61)(FP .58) sometimes I choose to stop eating some specific things like coke like sugar (19 Syl., +3) (Silent .57)(FP .57) these kinds of things I always like to drink these kinds of things (14 Syl., +3) (Silent .94) it depends...*

A few utterances later, another repeller state came about whereby he lost WTC due to the slow retrieval of the word *jam*, a failure to retrieve further vocabulary related to the context (e.g. other breakfast meals), and uncertainty about the pronunciation of the word *artificial*. His fluent speech also turned dysfluent:

*... improve our diet or way of eating every day for example for breakfast we are choosing foods and you know natural things in terms of instead of (Syl. 38) (Silent .70)(FP .49)(Silent .28) jam or (-4) (Silent .28) you know (Silent .74) anything has any artificial flavour (-5) in it (Silent .52) ...*

Immediately after, his WTC entered into another short-lived repeller state once he recalled more ideas, which improved his WTC and fluency. Subsequently, however, his WTC significantly dropped due to lack of support ideas and having to improvise to avoid pausing. Discussing the impromptu ideas was a challenge as he struggled with smoothly planning and structuring sentences and retrieving ideas, explaining settlement of his WTC into a long negative attractor state from the middle to the end of the following cluster, where his speech became relatively dysfluent compared to the outset:

*...in it (Silent .52) but it (Silent .26) it depends on the situation sometimes we're gathering together we are you know we are in party we are not choosing whatever we are eating (40 Syl., +2) (Silent .28) I cannot (Silent .26) prevent myself to touch that so I am going to pick that one (15 Syl.) (Silent .26) yeah (Silent .26) but (FP .55) in our home when we are choosing whatever we are gonna eat yeah we choose (19 Syl. +1)(FP .43) the healthier one (Silent .66) (FP .35) (-5) (Silent 2.08) (FP 1.11) (Silent 2.65) (-5) most of the time because we are from a country (silent .27) who know (Silent .28) (-5) the people in my country (-7) cook different kind of foods we are using meat (-2) we are using (Silent .58) (FP .33) (Silent .33) different (Silent .58) you know we are using (-5) (Silent .74) herbs we are ee. different kinds of (-4) (Silent .42) foods (-4) (FP. 54)(Silent .39) I cannot say I am in specific kind of food but sometimes (Silent .33) can say (Silent .29) I do not (Silent .36) eat (Silent .66) specific seafood (Silent .47) but (FP 1.07) I eat for example I can say I do not eat ham or pork but (Silent .49) you know (Silent .76) (FP .48) so (FP .48) (Silent 1.53) what else (-2) (Silent .50)(FP 1.42)(Silent .47) ...*

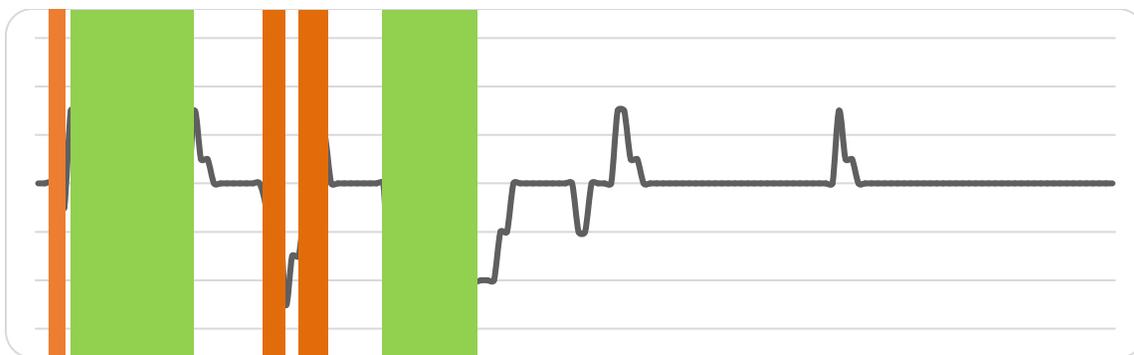


Figure 29. Majid's Task 1 - attractor and repeller states.

**William.** William's WTC settled into an attractor and then a repeller state. As illustrated in Figure 30, William's WTC remained relatively high and stable for the better part of task 1, suggesting WTC's settlement into an attractor state. The factors that triggered his WTC included having a plan, relevant support ideas, and appropriate vocabulary. He also perceived his speech as fluent, which improved his WTC. In one instance, his WTC dropped and seemingly entered into a repeller state due to lack of support ideas and vocabulary to express his true opinion. More specifically, his WTC dropped here as he wished to provide further reasons why the quality of food at university food courts was not high, but he not only lacked reasons why, but also did not feel confident about his own vocabulary knowledge. Therefore, he was not able to fully communicate what he meant due to ideas and lexical shortage, which lowered his WTC. While he was able to produce two LR's in the cluster below, a more holistic view of the cluster demonstrates the presence of many pauses and short utterances as well as his lower than average SR (2.79 syl./sec.):

*... some other (FP .59) dining halls that it has (Silent .47) the (Silent .28) quality of the food there is not (Silent .29) so high (-1) (Silent .63) so I prefer to bring my own food (Silent .1.49) the (-1) other thing is that (FP .28) I like (FP. 41) (Silent .56) ...*

Immediately after the above segment, he shifted to discussing a familiar topic and managed to produce several long runs, during most of which he was very willing to communicate. This resembles a system's self-organization into a stable state, whereby he exhibited agency in deliberately

avoiding the discussion of what he did not feel confident about and turning to discussing a topic he was more familiar with. To be more specific, he felt much more knowledgeable to discuss Persian ethnic foods and his likes and dislikes than quality of foods in universities' food courts:

*... sweet foods and relating to my cultural backgrounds I (14 Syl., +4) (Silent .53) would like to have my (Silent .58) (FP .53) traditional food which I cannot find it here (12 Syl., +2) (Silent 1.33) but my taste is currently changing to (10 Syl., +2) (Silent .76) some sour food so I don't prefer sweet food anymore (14 Syl., +2) (Silent .25) perhaps it's because of the climate here (11 Syl.) ...*



Figure 30. William's Task 1 - attractor and repeller states.

In another instance, William's WTC entered into two long-lasting attractor states in task three, and a repeller. The reasons his WTC remained high and stable ranged from discussing personal interest in the topic, ease of vocabulary retrieval, perception of fluent speech, to the fact that he was simply thinking and producing English speech, and not translating from Persian. His SR and MLR were 3.43 syl./sec. and 9.11 syl./run, respectively, both of which were significantly higher than the same measures for the other three tasks. He managed to produce 20 LRs, during all of which his WTC was rated high. The only time his WTC dropped was due to what he called an *irrelevant idea to the topic*, and even though he had found the topic irrelevant, he was still able to maintain fluent speech (see Figure 31).

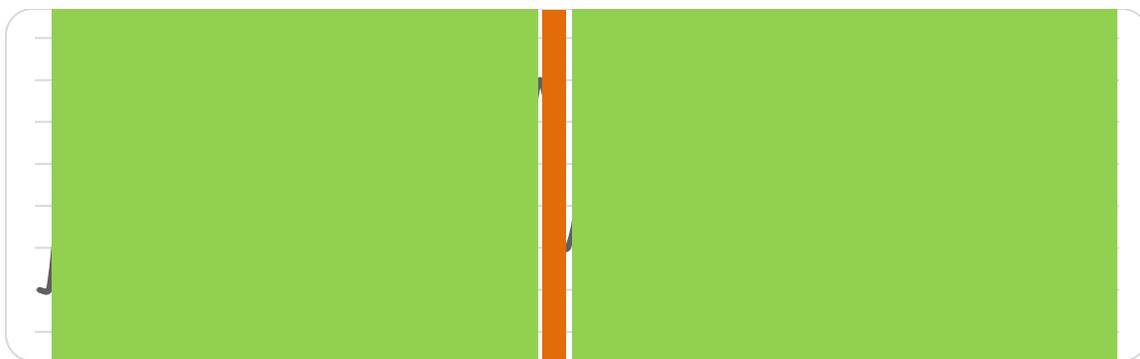


Figure 31. William's Task 4 - attractor and repeller states.

**Kaami.** As illustrated in Figure 32, Kaami's WTC remained relatively high and stable at the outset, but later underwent a fall and rise, which resembled repeller states. Towards the end, his WTC entered into an attractor state in the sense that it dropped and remained low for the rest of the task. Main factors that contributed to his high WTC in the beginning included jotted-down notes, being prepared, and recalling support ideas from a personal experience. The following fluent cluster shows how his WTC rose in the beginning:

*... a semester I like took a semester online and have done one online (19 Syl.) (Silent .44) and (FP .25) (Silent .27) I think (Silent .38) on campus education is more efficient because (14 Syl., +2) (Silent .70) in on campus (FP .48) (Silent .35) on campus we you have the face (8 Syl.) (Silent .52) face to face interaction with your like (10 Syl., +2) (Silent .39) instructor ...*

His high WTC was further maintained when he recalled more features of the two types of education from his experience and his WTC rose once again during two LRs at the beginning of the cluster below. However, a moment of hesitation (underlined) over how to continue his discussion lowered his WTC, which emerged in consecutive pauses and a case of repetition in the middle of the cluster, settling his WTC in a repeller state. However, he decided to revert to discussing the features of the types of education and his personal experience that he felt secure discussing and; therefore, his WTC rose again shortly after. This may be perceived as an example of deliberate self-organization, as a result of which his WTC rose from a low level and he managed to produce eight LRs:

... and other people ideas and you can ask always can ask questions (17 Syl., +2) (Silent .96) (FP .40) (Silent .42) but in (FP .46) online education you don't have that you can't ask question you don't have those interactions (26 Syl.) aside from that I believe that (Silent .99) (FP .46) (-2) (Silent 2.28) there're there are more (Silent .41) to on campus education the social interaction that comes with it (19 Syl.) (Silent .69) that has its own assets (Silent .34) also (Silent 1.00) that social interaction would affect people life so (14 Syl., +1) (Silent .60) I am imagining myself like having (11 Syl.) (Silent .91) like four years of online education I think it's (14 Syl.) (Silent .33) really tough cause you are always on your own (11 Syl.) (Silent 1.36) you have to do everything online (10 Syl.) (Silent .28) there are so many times that (7 Syl.) (Silent .58) like (Silent .57) usually on online education (10 Syl.) ...

His WTC entered multiple consecutive attractor states after the 75<sup>th</sup> second due to a number of reasons. One case of stuttering lowered his WTC, but did not affect his WTC:

... like there are so many more inter. dist. distraction (10 Syl., -2) (Silent .43) compared to on campus education (10 Syl.) ...

After the above segment, his WTC dropped significantly and remained low to the end of the task. He felt very frustrated by his performance in the cluster below, explaining that he had run out of ideas and had to simultaneously improvise new support ideas as well as put them in words, which was the main reason for his lowered WTC, maybe because this was too much to handle and caused a cognitive overload. There were six cases of word or phrase repetitions (underlined) as a result of the uncertainty over ideas. He used the filler 'like' six times in the cluster below. He also hesitated over structuring the sentence and had to fill the pause using a question. Finally, the word *community* was not the item he deemed appropriate and he had to repair. All these caused a low level of WTC for a period of approximately a minute with a SR of 2.36 (syl./sec.), which is significantly below his average SR for this task (2.99 syl./sec.):

... aside from (Silent .55) (FP .4.) social interaction (Silent 1.55) interaction between instructor and (Silent .49) (FP .57) (Silent .48) students (Silent .66) so many people have (-3) (Silent .59) (FP .46) (Silent .67) hearing (Silent .27) like have have have (-3) stronger (Silent .32) hearing memories rather (-2) than reading memories (Silent .41) and in (Silent .80) on campus education there are more to (Silent .50) (FP .33) (Silent .61) there are (Silent .32) more (Silent 1.06) how should I say it? (FP .39) (Silent 1.28) like conversation (Silent .94) conversations going like comparted to like (-2) (Silent .60) (FP .35) online (Silent .26) which (Silent .36) there are most (Silent .33) aside from that (Silent .67) like class time which is in an app (Silent .64) (FP .34) (Silent .24) usually (Silent .32) there are more to reading (-1) and (Silent .27) like (Silent .69) people with (Silent .68) (FP .39) (Silent 1.23) it (Silent .36) people with (Silent .26)

*strong hearing memory (Silent .58) would get would be more successful in that (Silent 1.06) (FP .31) (Silent .27) community in that (Silent 1.12) environment (-3).*



Figure 32. Kaami's Task 2 - attractor and repeller states.

### Recapping attractor/repeller states

As illustrated above, attractor and repeller states formed in both WTC and fluency systems. The attractor states were mainly formed whenever every subsystem of WTC and fluency functioned properly, settling the system into stable, and in some cases, long-lasting attractor states. However, in two cases where the subsystems malfunctioned for a while, the WTC and fluency systems entered into negative attractors. On the other hand, in many cases, abrupt malfunctions of sub-systems seemed to perturb the stability of WTC or fluency, causing them to move to a repeller state. There were also a few instances wherein the repeller states involved the system's temporary settlement into positive repeller states. Interestingly, both WTC and fluency reacted very similarly to the dynamics.

## Chapter 6: Interpretations and Discussion

This exploratory qualitative study adopted a dynamic systems approach to monitor the dynamics between WTC and L2 speech fluency. The four research questions were, therefore, developed to examine this interaction from different angles. As illustrated in Figure 33, research questions one and two approached the interaction through the fluency units of analysis. The third research question monitored WTC changes exclusively to gain insights into the factors that triggered change to WTC in order to better explain the interaction between WTC and fluency. The fourth research question involved examining this interaction and discovering whether or not it characterizes the properties of complex dynamic systems.

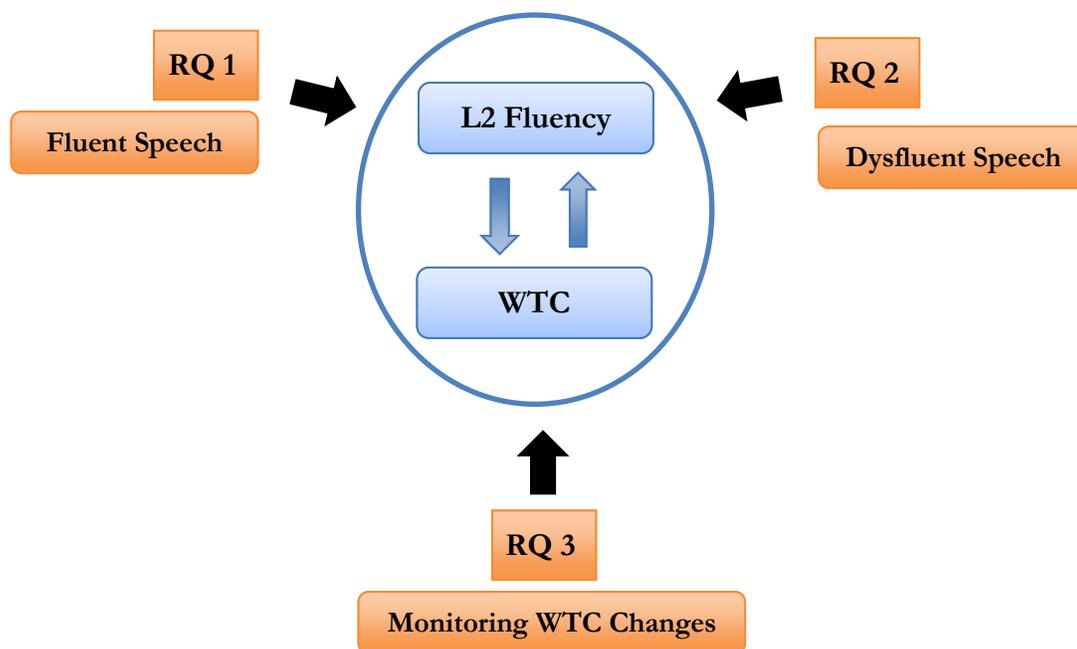


Figure 33. Investigating the interaction between WTC and L2 fluency.

### Research Questions 1 and 2

RQ1: How do WTC and L2 fluent speech interact with each other on mostly monologic picture description tasks?

RQ2: How do WTC and dysfluent speech interact with each other on mostly monologic picture description tasks?

The first research question set out to investigate the interaction between fluent speech and low/high WTC. The second research question concerned the extent to which WTC interacted with dysfluent speech. As illustrated in Figure 13, 76% of the investigated LRs coincided with a high level of WTC. Also, in 14% of the investigated cases, low WTC coincided with dysfluent speech. While these numbers are by no means conclusive, they are meaningful and carry certain implications. Therefore, to answer the above research questions, it can be argued that fluency and WTC, and low WTC and dysfluency interact to a certain extent, and that this interaction can be two-way, direct and indirect, unpredictable, and interdependently multi-layered. These findings largely mirror the findings reported by Nematizadeh and Wood (2019).

This interaction retains a two-way nature in that no specific directionality was identified. There were instances whereby fluent speech improved WTC and instances whereby WTC facilitated fluent speech production. Additionally, it was discovered that dysfluency almost always triggered low WTC, and in a few instances, low WTC brought about dysfluency.

The interaction can be sometimes direct, but mostly indirect. The direct interaction is based on the evidence that participants gained or lost WTC merely due to the perception of fluent and dysfluent speech, respectively. There were also instances wherein fluency and dysfluency were found to be the direct result of high or low WTC, respectively. Interestingly, however, it turns out that the interaction is mostly indirect in view of the fact that the factors lowering WTC could subsequently bring about dysfluency as well. By the same token, the factors that troubled speech fluency could further lower WTC. For instance, the data demonstrated that low WTC was sometimes the result of a glitch in the cognitive or linguistic processing, retrieval, and production, which would inevitably cause pauses. Another example pertained to declines in WTC due to lexical retrieval failure, which

entailed having to wait for the retrieval to occur, or changing plans and moving on with another item, which would require further retrieval and restructuring, in some cases. In either case, speech would turn dysfluent due to cognitive processing failure or an unexpected change of plans, which would further affect WTC.

The interaction is sometimes unpredictable, or non-continuous, mainly because the themes that appeared to underlie WTC or fluency did not seem to behave in a linear fashion. The fact that the same themes sometimes exerted an effect and sometimes did not shows the non-continuity (e.g., retrieval issues sometimes lowered WTC and sometimes did not) associated with this interaction. As an illustration, of the four patterns that emerged, 90% involved a positive interaction (e.g., fluency and WTC or dysfluency and low WTC); however, the remaining two patterns involved the cooccurrence of low WTC but fluent speech or high WTC but dysfluent speech, highlighting the fact that the interaction may not always be predictable, or there might not be an interaction at all. These two nonlinear patterns will be further discussed in light of the theory of CDS.

The multi-layeredness property, consistent with previous research (Cao, 2011; Kang, 2005) findings, was on the grounds that the interaction occurred as a function of an interdependent interplay between multiple factors mostly including affect and cognition; a finding which is also consistent with previous research (de Saint Léger & Storch, 2009; MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019). More specifically, many of the themes that emerged as drivers of positive change in WTC seemed to similarly exert positive effects on L2 fluency through cognitive and affective channels. As an example, the most recurring sub-theme that improved WTC during the LRs pertained to situations where participants discussed personal experiences. Previous research has also pointed to the role that personal experience plays in shaping WTC (Kang, 2005, Nematizadeh & Wood, 2019) and fluency (Segalowitz, 2010). In one instance, Akbar said: *when I talk about my personal experiences, I do not have to create ideas. I only need to be myself and genuinely retell all that's happened to me. I only*

*need to use correct structure, but when I am discussing something new, I should identify the structure, think in English, and create ideas; I need to do three things, here I only do one of them.* What Akbar explained in plain language seems to explain what happens in reality. In more technical terms, he is obviously referring to cognitive processes that involve retrieval of supporting ideas and their corresponding linguistic resources. Interestingly, it turns out that success with cognitive processing and retrieval produce positive affective states and emerge in the form of high WTC as was the case in this study, maybe because it helped the participants maintain fluid speech and avoid pausing. The cognitive dimension pertains to the fact that discussing personal experiences saves interlocutors the demand of generating ideas, which is likely to facilitate fluent speech production. In other words, the preverbal stage of planning what to say, or what Levelt (1990, p. 90) called “macroplanning” is facilitated when a speaker attempts to recall personal experiences. This stage is believed to play a significant role in facilitating fluent speech. For example, in researching the fluency of English native speakers, Roberts and Kirsner (2000) concluded that speech “does not become fluent until the macroplanning process is complete and the system’s resources are available solely to speech preparation and production processes” (p. 153). What Roberts and Kirsner refer to as speech preparation and production processes corresponds to Levelt’s (1999) notion of “microplanning” where the surface form of the message is constructed, which can get more demanding when speaking a L2 (Segalowitz, 2010). This evidence also lends support to Oviatt’s (1995) investigation and findings of spoken dysfluencies in human-computer interactions, in which she found higher dysfluency rates due to increased planning demands.

On the other hand, dysfluent speech, and specifically long and/or consecutive silences, seemed to create awkward moments, negative affective states, and thus low WTC. This was, for example, the case with Saba who said: *... in everyday conversations, other interlocutors contribute to the talk, while here, I am mainly in charge of keeping the discussion going; therefore, whenever there is a silence dominating the*

*talk, I feel uncomfortable and that renders me unwilling to continue the task.* Additionally, it was found that participants displayed WTC when reminiscing about and/or sharing pleasant experiences with others such as memories. The participants might have discussed their life experiences in English elsewhere, which would have served as an opportunity for practicing and using the linguistic resources they required to carry out the tasks in this study. In one instance, Akbar mentioned that he had a very similar conversation to one of the topics used in this study with a friend in English and this had given him confidence to talk about it again. In other words, this linguistic preparedness appeared to have improved his confidence to try the linguist items again. In another instance of using ideas that arose from a personal experience, Mo mentioned that: *once I got stuck in the King Edward traffic and later had to explain to my supervisor why I was late, and here I was reusing the same words and structures.* As can be deduced, this experience also seemed to have served as language practice, which, as Mo stated, not only gave him a feeling of security and confidence that improved his WTC to bring the subject up, but also assisted him with fluent production of ideas.

In support of this, Segalowitz's framework (2010) points to the perceptual and cognitive experiences as one of the four influences that is in dynamic interaction with the other three. He posits that experiences of engaging in L2 communication bears direct relevance to L2 speakers' cognitive and perceptual systems, which indeed affect fluency. More specifically, he refers to the opportunities L2 speakers may have been exposed to, whereby they have heard and produced certain L2 lexical items, which facilitate automatic lexical retrieval. While Segalowitz's argument mainly concerns the lexical retrieval from experiences, it seems plausible to argue that retrieving ideas from experiences also involves some form of cognitive effort and memory retrieval, specifically in a L2 where retrieval challenges extend beyond merely ideas. It is reasonable to make the same argument with regards to all the other individual factors that were found in this study to improve the participants' WTC, including discussing personal beliefs/views, daily routines, interests,

accomplishments, background knowledge, or educational backgrounds, or even a recent relevant discussion. L2 learners are very likely to discuss such themes in their everyday life, an experience that serves as an opportunity for practice and exposure to context-relevant language.

Some of the individual-relevant themes that emerged in this study have also been found in the literature as contributing factors to fluency or WTC. Another individual sub-theme, for instance, was background knowledge, including educational background, which, according to Bachman and Palmer (1996), serves as “the information base” (p. 65) that speakers access during communication. The literature also supports the facilitative role of background knowledge in L2 performance mainly because of imposing lesser cognitive demand, facilitating smoother access to information, requiring less attention, and making it easier to retrieve materials needed for fluent production of speech (Skehan, 1998). In one example, Lili’s WTC rose significantly during a number of LRs when she drew on her knowledge of an article: *I wanted to discuss what I meant by immorality and who might be a target of this on social networks, drawing exactly on a paper I had read before regarding how youth might be negatively affected by technology and social networks, in particular; I mean the corrosive impact of social network.* In another instance where Mehrzad recalled the idea of Z-generation and the lexical item, his WTC rose and he produced fluent speech: *it was because of the idea of Z-generation. Because it was an advanced word, a strong word.*

Previous research has also found the effects of presenting one’s views/beliefs (Nematizadeh & Wood, 2019; Pawlak & Mystkowska-Wiertelak, 2015) and discussing one’s interest (Kang, 2005; Peng, 2012), which Kang (2005) perceived as an affective factor. In an instance of presenting personal views, Mehrzad’s WTC rose during a number of LRs when discussing his views on online vs. on-campus education and retrieving related vocabulary: *here a plan came to my mind that the topic was not absolute to say which type of education I preferred and which one I didn’t. Also, the words “depend on situation” or “absolute” and other words were smoothly coming to my mind, so I was excited.* In another instance, Saba’s

WTC rose significantly during a number of LRs and she stated: *personally, I believe that people should not be on a diet and should prevent a situation that necessitates this as losing weight through diets is always a challenge not many people can meet.* Another instance of personal belief improving WTC took place when Sara discussed her preference for hiring employees who have completed online programs: *I am personally a team-worker and as an employer, I would like to hire someone who is self-motivated and can work independently, thereby complementing me. I think that those who experience online education learn to work independently.*

One case of discussing personal interest occurred with Mo where his WTC rose and his speech became fluent. Mo recalled his interest in dining out, explaining: *the sharp increase in WTC was because I recalled the idea of dinning out and I love eating out and it is something I can talk and have a lot of ideas about. I have been to a lot of restaurants and tried different dishes, so I began to be interested in this part. I know many words about the names of different types of dishes or fast food. Knowing more words helps me speak more fluently. As I mentioned earlier, we discuss topics of our interest more frequently, so we are more familiar with the relevant vocabulary, but if I discuss subjects like “health”, since I have not discussed it a lot, I do not have as many as ideas and will struggle with language, too.* Mohsen also gained WTC when discussing his personal interest: *technology is my favourite topic and quite relevant to my field of study. It has improved the way and the comfort with we travel, I know quite a few things about it. I have recently taken a trip where I experienced convenience because of it. So, I am willing to talk about it.*

### **A provisional model of the WTC-fluency interactions**

The observed interaction between WTC and L2 fluency as sub-components of a greater system called speech production can be conceptualized in the following provisional model<sup>1</sup> (see Figure 34) wherein the multi-layeredness and complexity of this interaction may be better illustrated.

---

<sup>1</sup> The models in this chapter are all provisional and meant to better illustrate the data collected.

The dynamics in speech production may be viewed as a three-phase process: pre-production, during-production, and post-production, which may overlap or stand apart on small time-scales; in many cases, a fraction of a second. In each phase, there are themes that were found to affect both WTC and speech fluency.

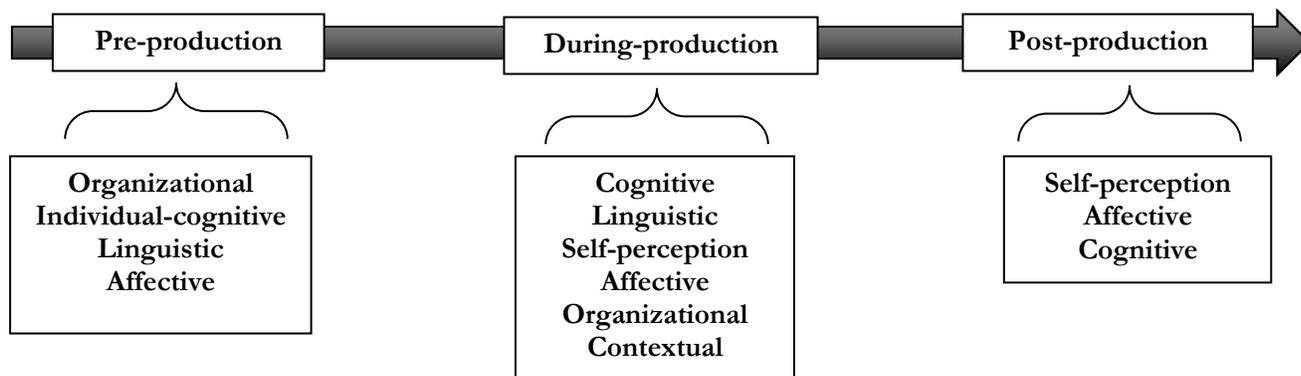


Figure 34. Provisional three-phase model of WTC and fluency interactions in speech production.

**Pre-production phase.** This phase involves the planning stage of the task and included organizational, individual, linguistic, and affective themes. The organizational theme concerned jotting down notes and outlining a plan shortly prior to the tasks, both of which contributed to both WTC and fluency during the tasks. Participants would take notes or go about categorizing ideas and planning the order in which they intended to present them. For instance, when discussing travel problems, Linda said: *I had planned to categorize my ideas into international and urban transport, which gave me a feeling of security about doing the task.* Individual-cognitive factors pertained to the search, recall and use of personal experiences, background knowledge, recent conversations, accomplishments, views/beliefs daily routines, which participants brought with them to the tasks and turned out to be the most recurring themes to improve WTC. The linguistic factors mainly concerned the knowledge of vocabulary and grammar, which had been mastered prior to the task.

Interestingly, it appears that there is interdependence between these themes as well. During the one-minute preparation time, participants engaged in a process of pre-planning what to discuss (organizational), which would not only involve a search for ideas and argument (Individual-cognitive), but also determine whether their repertoire of lexical and grammatical resources would be sufficient to discuss the ideas (linguistic). The interdependence of these themes would likely render a participant willing or unwilling (affective) to discuss the idea. For instance, it was observed that participants would choose to discuss topics they felt prepared for, or avoid discussing topics they were not linguistically confident about, which is in line with some previous research (Dörnyei & Kormos, 1998; Kahng, 2014; Kormos; 2000). Another piece of evidence for such an interdependence in the pre-production stage was shown in instances where knowledge of linguistic resources with respect to a given topic would improve participants' WTC to discuss it. For instance, Mehrzad mentioned: ... *the idea of food pyramid on the vocabulary sheet looked familiar to me, I remembered a few words which was why I felt willing to discuss it.* As a fitness trainer, Mehrzad possessed a decent knowledge of nutrition. Therefore, the food pyramid had triggered quite a few ideas in his mind accompanied by a number of words associated with it, all of which had encouraged him to discuss this topic.

***During-production.*** The picture tends to become more complex during speech production as more themes appear to come into play. The linguistic and cognitive resources needed to cooperate for successful online speech production; that is, not only did the participants need to possess the knowledge of grammar and words, but also, they had to smoothly access them and simultaneously construct sentences and use relevant lexical items as the communication was taking place. Conversely, failure in each of these processes could bring about dysfluent speech and a low affective state, which manifested in low WTC. One instance was when Sahra, who spoke both English and

French, struggled with retrieval of lexical items and had to pause momentarily. She stated: *I was first recalling the words in French and then English*, which seemed to increase her cognitive load, caused pauses, and lowered her WTC. This offers a piece of evidence for the interplay between cognitive and affective states, which is also consistent with previous research (MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019).

Added to the above complexity was the effect of self-perception in that the participants self-monitored their speech and depending on how they perceived it, their WTC fluctuated. Some of the participants would lose WTC over dissatisfaction with low quality of the language they produced, while gained WTC after perceiving high quality speech. In one instance, Sahra stated: *I did not like the sentence I made. I felt like the structure was the exact Persian-to-English translation. In fact, I was thinking in Persian and simultaneously translating it to English. It caused a pause. In everyday talks, if I notice a weakness in my speaking, I lose my willingness to continue*. Likewise, from the fluency side, self-monitoring imposes great cognitive demand and causes speakers to interrupt the fluidity of their speech (Segalowitz, 2010). In an instance of this, Lili said: *I tried to self-correct and had to stop and think, but I couldn't do it and I lost WTC*. In this case, she produced four consecutive pauses. While it can be concluded that speakers may strive for accuracy at the expense of fluency and WTC (Seyfeddinipur, Kita, & Indefrey, 2008), the data of this study provided evidence that the issue of self-monitoring may extend beyond the obsession with grammatical accuracy. In addition to perception of grammar errors, if participants perceived their vocabulary as inappropriate/repetitious or even their ideas irrelevant, they would form negative impressions due to not being able to successfully communicate their points and felt concerned about how their speech had sounded to the interviewer, which not only imposed a cognitive overload but also affectively preoccupied them and lowered their WTC.

Participants' affect seemed to also be affected by contextual subthemes such as topic familiarity and interlocutor, both of which are consistent with Kang's (2005) findings. In one

instance, where Mehrzad's WTC rose significantly, he stated: *as soon as I saw the topic of food on the sheet, I got excited because I had read widely on foods and their calories, because I exercise and count the percentages of proteins, the topic was familiar to me.* In this case, Mehrzad most likely meant he possessed an abundance of ideas as well as lexical resources, which might have also played a role in giving him confidence and improving his WTC. In another instance in regards to the interlocutor effect including approvals, Linda's WTC improved, about which she mentioned: *in daily conversations, it is very important to receive confirmation from my audience, which typically improve my WTC.* As indicated, both of these contextual subthemes can play a role in shaping an interlocutor's WTC during the communicative events.

In addition to the role of the organizational subthemes of jotted down notes and outlining a plan in the pre-production phase, it appeared that the topic transition subtheme played a role in shaping WTC and fluency during the production phase. In one instance, Akbar said: *I felt I had been discussing too much of the topic of my interest and might have digressed from the main topic, so I decided to think of another idea and had to pause to recall something relevant.* This is a decision he willingly made, which led to dysfluent speech and lowered his WTC. This is in line with the investigation of L2 speakers' dysfluency by Roberts and Kirsner's (2000), who discovered that topic shifts could reduce fluency because, as Segalowitz (2010) argued, the cognitive capacity is exhausted by macroplanning (planning what to say next) and therefore resources for microplanning (converting thoughts into speech) become inaccessible.

The above instances have shown how the interplay between varieties of factors that have to successfully operate for the purpose of fluent speech production. I have also tried to demonstrate the interdependence between cognitive/affective aspects of speech production and linguistic, organizational, contextual, and self-perception themes.

***Post-production.*** This stage pertained to the time immediately after speech had been

produced and involved an interaction between self-perception and affect. As discussed earlier, participants monitored their speech as it was being produced in the during-production stage. It appeared that speech self-monitoring process continued beyond the previous stage, the effects of which remained in participants' subconscious for a while, a piece of evidence that was also observed in the pilot study (Nematizadeh & Wood, 2019). The perception, in some cases, concerned the participants' satisfaction with the linguistic resources (e.g., grammar structures or vocabulary) they used, the performance (e.g., fluency or pronunciation) they delivered, or successful argument they presented. Such a positive self-perception seemed to form positive impressions in the participant's mind of their 'self-image' before the interviewer, setting the tone for high and stable WTC and production of good quality speech. In support of this, in explaining his high WTC, Pouya said: *I was willing not because I had something in mind and was excited to share it, but because I was happy with what I had already discussed, you know sometimes you encourage yourself?*, or in another instance where Kammi's WTC improved because of a fluent introduction in task two and using a less frequent word, he said: ... *vocabulary is influential indeed, even in real life. For example, I still remember an infrequent word I used earlier today with an Indian friend and I did it very fluently. This happened at 4 or 5:00 pm, but it is 7:00 now and I still recall it.* Kaami is referring to how the positive affect generated through the use of a less frequent word and fluent speech production could have a long-lasting effect on his affect.

On the other hand, negative self-perception would bring about low WTC and dysfluency; when participants were not satisfied with words, grammar structures, or arguments. This seemed to not only have negative effect at the time of speech production but preoccupied their mind for a while, which is also consistent with the findings of Nematizadeh and Wood (2019). For example, in search of a word that lasted for a few seconds, Sahra failed to retrieve it and had to explain what she meant. A few utterances later, she was still distracted and making grammar errors with a low WTC, explaining: *I was making grammar errors because I was still thinking to retrieve the word I had not retrieved a few*

*utterances ago*. Perception of an inappropriate lexical item and the continued lexical search as a result of self-monitoring (self-perception) preoccupied her subconscious for a while (cognitive) and not only lowered her WTC (affective) but also increased her cognitive load and troubled the fluent production of subsequent utterances. In another similar instance, after Pedi had a very dysfluent introduction to a task, his WTC eventually dropped. He explained that: *I perceived my introduction to the task very fragmented due to lack of and being simultaneously searching for ideas, and I knew that I would eventually run into problem with the task*. He was apparently dissatisfied with his introduction and fluency, which finally lowered his WTC.

Overall, the provisional three-phase model of the interactions between WTC and fluency in speech production is a synthesis of the evidence gathered on the multiple themes that influenced this interaction in three different phases and in an interdependent way. The model may potentially open up opportunities for future investigations into the nature of this interaction.

### **Research Question 3**

RQ3: What attributes (e.g., cognitive, linguistics, etc.) might influence the interaction between WTC and L2 fluency?

In addressing the above research question, the stimulated recall interviews were *in vivo* coded and seven themes, including 31 subthemes, emerged as producing changes in WTC. The themes included, in order of frequency:

- 1) possession of support arguments/ideas,
- 2) individual factors,
- 3) lexis-related factors,
- 4) contextual factors,
- 5) organizational factors,
- 6) grammar-related factors, and
- 7) self-perceived performance.

While these were the reasons provided by the participants to explain their WTC changes, quite a few of them were observed to simultaneously affect speech fluency and thus the overall interaction between the two variables. First, I will briefly frame the findings in the WTC literature. Afterwards, to elaborate on the interaction between WTC and L2 fluency, I will return to the continuum-like model of self-perception as a mediating variable between WTC and L2 fluency, which I presented in chapter one, and highlight the role of cognitive processes (recall and retrievals) as another mediating variable between WTC and fluency.

An important theme that influenced both WTC and fluency concerned the possession or lack of support ideas/argument. Possession or retrieval of support ideas seemed to facilitate speech fluency and helped avoid silence, which gave participants a feeling of satisfactory performance. Interestingly, possession or retrieval of appropriate/relevant support ideas was a more recurrent theme than the access to or knowledge of L2 linguistic resources to express oneself, a finding consistent with that of Pawlak and Mystkowska-Wiertelak (2015) who looked at WTC in pair tasks. Conversely, running out of ideas tended to lower WTC, which mirrors the findings of Kang (2005) and Mystkowska-Wiertelak and Pawlak (2014). Kang argued that the fear of halting conversations due to lack of ideas brings about a feeling of insecurity that reduces WTC. Having nothing to say was mostly followed by pauses or lowered SR, which L2 speakers perceive as dysfluent and are sensitive to (Bosker, Pinget, Quené, Sanders, & de Jong, 2013). Therefore, it might have been this perception of dysfluency and sensitivity to pauses that lowered WTC.

One important contributor to the above theme – possession of support ideas – was the individual factors, which involved instances whereby participants took advantage of relating the tasks to their personal experiences, beliefs/views, interests, accomplishments, or conversations they had shortly prior to the data collection. Kang (2005) also found that discussing personal interests or experiences would create a feeling of excitement that is an antecedent to situational WTC. This can

be justifiable since individuals are expected to feel more comfortable when discussing issues related to themselves. Individual factors seemed to generate ideas, be easier to retrieve, and have most likely been discussed prior to the sessions, which would likely prepare the participants both grammatically and lexically, all the reason for better fluency. Drawing on Levelt's (1989) speech production model that includes *conceptualizer*, *formulator*, *articulator*, using one of the individual sub-themes would significantly save the participants a lot of cognitive processing, as macroplanning of the content message is effortlessly performed in the *conceptualizer*. With respect to WTC, this could be explained by the notion of state communicative self-confidence (MacIntyre et al., 1998), which is contingent upon perceived communicative competence and low anxiety (Clement, 1986). The communication competence may have developed as a result of factors such as previous experiences in similar situations, or recent relevant conversation experiences, both of which were indicated by a number of participants to have prepared them grammatically and lexically, thereby facilitating the automaticity of speech production, which would improve their WTC.

The lexical knowledge and cognitive retrieval of vocabulary, as the third theme, and grammar knowledge and structuring sentences, as the sixth theme, had also an effect on both WTC and fluency. In Levelt's (1989) model, once the content of the message is prepared in the *conceptualiser*, lexical knowledge would facilitate the subsequent stage of speech production, called the *formulator*. The formulation stage mainly involves selecting the "form/meaning pairs called lemmas" (Wood, 2010, p. 64); that is, deciding on appropriate lexical items and grammatical structure for speech. This not only concerns the knowledge but the successful online structuring of sentences, or retrieval of vocabulary; a factor consistently found to improve WTC (MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019; Peng, 2012; Wood, 2016). One reason why the lexis-related theme has played such an important role in promoting WTC might be the fact that communication is facilitated mostly through vocabulary, rather than any other type of linguistic resource. Participants were 'picky' over

their choice of words, self-monitored, and reworded in case they felt they had not successfully made their points. On the other hand, if the act of retrieval did not take place smoothly, participant failed to communicate what they had in mind and thus felt frustrated and disappointed, which mostly led to low WTC.

Contextual factors such as topical knowledge, familiarity, transition, as well as the interviewer and camera affected WTC. The same argument made for support ideas should hold true for topic-related themes and justify why both WTC and fluency were enhanced wherever participants felt familiar with or knowledgeable about the topics. It appears that participants' prior topic knowledge or familiarity would equip them with sufficient support ideas to the point where they felt secure and confident to speak up rather than avoid talking. This would also facilitate the conceptualization stage. This theme also appeared to have supplied the linguistic resources they would require to carry out the tasks. The topical knowledge or familiarity was mostly acquired through reading materials, courses taken, or their program of study, all of which have likely provided the participants with sufficient learning opportunities for practice and exposure to resources required to fluently perform the tasks.

Topic transitions occurred for two reasons mainly; participants either had to shift focus due to running out of ideas (e.g., Linda & Mehrzad), or they intentionally did so to save themselves when struggling with language or ideas (e.g., William & Akbar). In the former case, the participant would encounter an unexpected, unplanned state and had to improvise ideas. In such cases, the *conceptualiser* would have undergone significant cognitive load as the processes of preparing content message and converting it to appropriate lexical and syntactic form would have to be performed simultaneously and efficiently, which could affect fluency and, in turn, WTC. In the later cases, topic transitions caused low WTC and dysfluent speech. In William's cases, he intentionally shifted focus to a topic he was more willing and knowledgeable about to discuss, which could be likened to the concept of self-

adaptation in CDS where systems self-organize to a preferred state. Akbar, however, struggled with formulating his message and turned dysfluent, despite the fact that he had already planned his speech and was past the conceptualization stage. The closest study that looked at the same phenomena was that of MacIntyre and Legatto (2011), who observed speakers' WTC fluctuations while consecutively presenting eight topics. However, WTC changes owing to the topic transitions that occur at participants' own will remain to be explored.

The interviewer and camera effects were both found to lower participants WTC mainly because they would increase the self-monitoring load as a result of being listened to or recorded, which would impose extra demand on their cognitive capacity specially in a L2 (Segalowitz, 2010) whereby speech production is assumed to be less automatic. The desire to produce accurate speech or correct pronunciation might have been due to the fear of being judged by the interviewer, causing a feeling of insecurity and lowering WTC (Kang, 2005).

The organizational theme, including jotted down notes and having a discussion plan, mostly improved WTC and fluency, a finding closely in line with Pawlak and Mystkowska-Wiertelak (2015) who found an effect of planning time on WTC. This theme mainly involved planning and outlining the content to present, deciding what to say and what not to say, and making lexical choices or even grammar structures in a few cases. Regarding fluency, since this stage took place prior to embarking on the tasks, participants had the opportunity to carry out the conceptualization and formulation stages of the speech production ahead of time, which would have saved them the cognitive load of planning while talking, mostly leading to fluent speech. Regarding WTC, this stage saved the participants in situations where they ran out of ideas and helped them avoid long pauses.

## A continuum-like model of the interdependent and multi-layered interaction between WTC and fluency

Interestingly, as was partly illustrated by the continuum-like model in the introduction chapter, the results of this study revealed the mediating effect of self-perception and cognitive factors on the interaction between WTC and fluency, which may be better visualized in Figure 35. Below, I will elaborate on this.

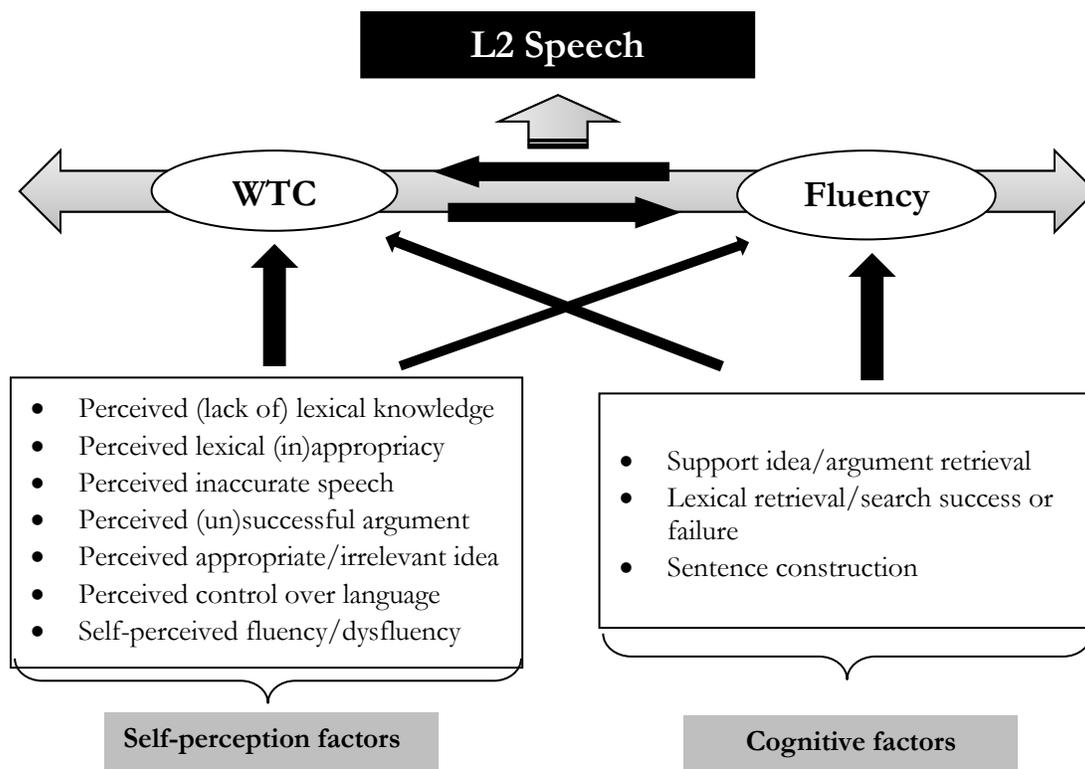


Figure 35. A continuum-like model of multi-layered interaction between WTC and fluency.

### Self-perception

With respect to trait WTC, there is abundance of literature in support of the effect of self-perceived competence on WTC (Cameron, 2013; Cetinkaya, 2005; Hashimoto, 2002; MacIntyre, 1994; MacIntyre & Charos, 1996; McCroskey & Baer, 1985; Matsuoka, 2005; Matsuoka, Matsumoto, Poole, & Matsuoka, 2014; Peng & Woodrow, 2010; Yashima, 2002) and self-perceived ability to

speak (Weaver, 2010). There is apparently a lack of literature on self-perceived fluency in L2. However, positive self-perception of speaking skill has been found to promote WTC (de Saint Léger & Storch, 2009). With respect to L1 and stuttering, a study by Blood, Blood, Tellis, and Gabel (2001) found that experiences of fluency breakdowns caused communication apprehension, which may negatively affect WTC (Cameron, 2013; MacIntyre, 1994; MacIntyre, Babin, & Clement, 1999; MacIntyre & Doucette, 2010; Yu, 2011). In the present exploratory study, however, self-perception extended beyond the notion of one's perception of his/her language competence and entailed more specific concepts such as perceived control over language, perceived (dys)fluency, perceived (lack of) lexical knowledge, perceived lexical (in)appropriacy, perceived accuracy, perception of (in)appropriate or (ir)relevant support ideas, and perceived (un) successful argument, each of which belongs to different themes. In a process of self-monitoring, participants judged their speech production not only in terms of how fluent it was, but also other qualities associated with oral performance (e.g., accuracy, pronunciation, etc.), which, in many cases, resulted in self-corrections/repairs, repetitions, hesitations, all as markers of dysfluency (Götz, 2013; Lennon, 1990; Segalowitz's, 2010; Wood, 2010). Dysfluency markers in this study almost always coincided with low WTC. As an example, Kammi's WTC dropped during a case of lexical repair that led to a pause of 1.12 seconds to retrieve a new lexical item. One case of low WTC and dysfluent speech occurred with Niki when she hesitated over the accurate preposition collocating with a word, pausing before production that showed her uncertainty, and after the word, showing her preoccupation with it. Even if self-correction takes place successfully, since it involves repetition of a given structure (or pronunciation of a word), it is still considered dysfluent speech. A majority of self-monitoring instances interrupted the fluidity of speech; therefore, it is plausible to consider self-monitoring as a marker of dysfluency perhaps because it is cognitively demanding, particularly with respect to speaking a L2. In support of this, Segalowitz (2010) argues that:

... in some circumstances it may be especially important to display optimal proficiency in the L2 and hence maximal self-monitoring may be called for. Speech rate in the L2 may also be reduced relative to the L1, perhaps to make it easier to self-monitor, or when self-monitoring reveals that more time is required to allow various encoding processes to operate accurately. Self-monitoring is thus another potential locus of dysfluency” (p. 16, 17).

The negative effect of self-monitoring on WTC and L2 fluency is consistent with previous research (Nematizadeh & Wood, 2019; Wood, 2016).

On a broader scope, the interaction between low WTC and self-perception, and self-monitoring as a dysfluency marker, may be explained by behavioural studies into self-monitoring in social interactions (not languages), which suggest that individuals self-monitoring are more concerned with their own positive self-affect, one reporting that “high self-monitors act self-consciously to manage the impressions they create and that they devote substantial cognitive and emotional resources to their social performances” (Ickes, Holloway, Stinson, & Hoodenpyle, 2006, p. 681). As suggested, self-monitoring appears to perform a social function, which resonates with social and communication variables like WTC. Self-monitoring, a dysfluency marker which emerged in the form of repairs, self-corrections, hesitations, have their roots in the perception of one’s identity in interaction with society. In social psychology of personality and motivation, Dörnyei (2009) contends that individuals’ motivational L2-self, comprising *ideal L2 self* - what L2 speakers wish to become -, and *ought-to L2 self* - what individuals believe others expect them to become, shapes their L2 behaviour. Drawing on this, Segalowitz (2010) argues that L2 communication, like that of L1, involves sending and receiving messages about identity, social status, and emotional states, most of which occur below the individuals’ conscious awareness. The perception of self could impact one’s L2 behaviour in using L2 in terms of seeking opportunities to use or strategies to avoid using a L2,

which are highly pertinent to WTC. Is there an interaction between self-monitoring, as a dysfluency marker, and (un)WTC? The results of this study suggest they interact through self-perceived fluency, particularly in light of the fact that fluency retains social bases (Segalowitz, 2010), too, as discussed in the introduction; however, further investigations are needed to address this question more comprehensively.

### **Cognitive retrieval and processing**

As Figure 35 shows, the other factor that appeared to interact with both WTC and fluency pertained to the cognitive retrieval/recall or processing while performing the tasks. The cognitive retrieval/processing related successes or failures were observed in support idea/argument search, lexical searches, sentence-structuring, and most of the individual factors. Possession and retrieval of support idea turned out to be the most recurring sub-theme that affected WTC. Individual factors, discussed earlier, would link to the support idea/argument theme, which, in most cases, improved WTC and fluency, most likely because participants would exclusively have to deal with and overcome linguistic challenges of communicating their readily available ideas. More specifically, it was discussed that speakers would be in need of an information base during communication, and that their background knowledge serves as one (Bachman & Palmer, 1996). Participants were most willing to communicate when they possessed and/or successfully retrieved support ideas/arguments, which mainly originated from the self-related individual factors, and this appears to be justifiable from both affective and cognitive perspectives. The existence of a knowledge base could equip them with a feeling of security (Kang, 2005) to engage in communication, knowing they can embark on and carry on the task for a while. Conversely, their fear of engagement in the tasks was mainly due to the fact that they might blank out half way through and struggle to continue, in which case they would lose WTC. From a cognitive point of view, blanking out would mean committing an extensive memory

search and recall that would most likely lead to having to pause and retrieve, which causes dysfluent speech. In cases where participants didn't feel secure about ideas, they would be constantly struggling with a feeling of ambivalence of 'what to say next?'. This was not comfortable and would involve them in simultaneously producing speech and planning what to say next, or in more technical terms, performing the Levelt's (1989) phases of conceptualization, formulation, and articulation simultaneously. Another justification for using individual factors would be owing to the likelihood of having previous exposure to and practice of the linguistic resources (Segalowitz, 2010) required to communicate the ideas, which would create a feeling of security and confidence to willingly and fluently try out the linguistic resources.

The next cognitive factor was success or failures in lexical search, both of which affected WTC and fluency. Sentence structuring issues while performing the tasks were found to use up cognitive capacity in a few cases and lower WTC and fluency. The cognitive demand posed by lexical retrieval and sentence structuring occurred when speakers were past the conceptualization stage; that is, they had decided on the content of the message and were busy with syntactic and lexical planning, which poses a real challenge to L2 speakers. Some of the participants indicated that they translated word for word to overcome this challenge, indicating a short-cut L2 speakers resort to when struggling with structuring sentences. Performing monologic tasks may have also added to the cognitive demand of speech production as such tasks involve simultaneous tasks of content planning and spontaneous formation of utterances (Wood, 2010), all contingent upon successful retrieval of ideas, lexical items and sentence construction.

### **Segalowitz's framework for dynamic relationship among sources influencing fluency**

This study employed the Segalowitz's (2010) framework for explaining the dynamic relationship between the sources of influence on L2 fluency and it appears that the findings can be

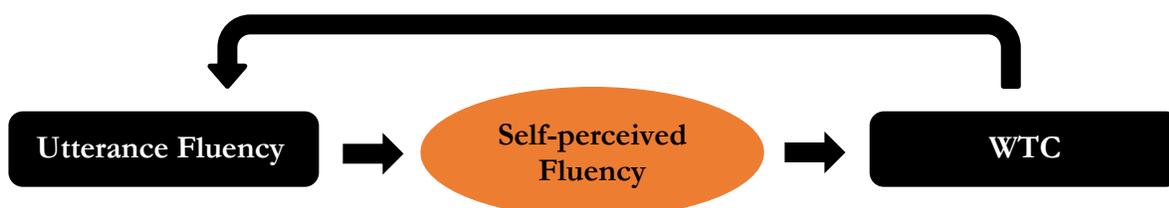
potentially interpreted in light of this framework. To recap, the four influences that dynamically interact include an individual's cognitive and perceptual processes, one's motivation to communicate, social context, and cognitive/perceptual experiences of L2 speakers.

A theme that emerged pertained to how successfully participants performed the cognitive retrieval of ideas or lexical items during the tasks. It turns out that speakers make great efforts to maintain fluent speech, which explains the reason why tools they need during communication such as ideas and linguistic resources should be retrieved at a fairly high speed so as to avoid pausing. However, failure of cognitive processing of any functions results in dysfluent speech, which in many cases perturbed WTC. This interplay among cognitive processing, speech fluency, and WTC was also suggested by Wood's (2016) representation of the relationship between utterance fluency, cognitive fluency, and WTC, and points to the role of the belief system of the speaker including WTC (the third influence in Segalowitz's framework) in speech production. The third influence, the context dimension, involved the social context whereby the communication takes place. While the task employed in this study was mainly monologic (for the reasons discussed in the method section) and did not encompass the features of authentic communication, the role of contextual factors such as interlocutor and topic familiarity, which formed 8% of the themes triggering change to WTC, were still observed. This is not only one of the influences believed to play a role in speech production and fluency (Segalowitz, 2010), but is consistent with the cognitive-affective level and the social situation components of the pyramid model of MacIntyre et al. (1998), wherein topics and participants of a discussion may drive one's willingness to engage in communication. Interestingly, as participants of this study became more acquainted with the interviewer from one session to another, their WTC began to exhibit smaller variability. The averaged SD for each task (see Table 11) demonstrated that the magnitude of change in participants' WTC grew smaller task after task (T1  $SD = 1.48$ , T2  $SD = .78$ , T3  $SD = .68$ , T4  $SD = .55$ ), which may be attributed to the growing familiarity of the

participants with the interviewer (interlocutor familiarity) and/or other factors such as context. In language assessment literature, there is evidence that L2 learners may vary their language depending on their familiarity with other speakers (O'Sullivan, 2002), and this variability may impose greater or lesser cognitive and/or linguistic demands on L2 speakers (Segalowitz, 2010) and most likely their speech production. In support of this, the average temporal measures of speech for each task including MLR, SR, and AR (see Table 4), with the exception of the second task, show an upward trend from tasks one to four (T1 average MLR & AR = 7.41/2.60; T2 average MLR & SR = 8.21/2.76; T3 average MLR & SR = 7.51/2.64; T4 average MLR & SR = 7.89/2.75). The fourth influence, the perceptual and cognitive experiences, emerged also as a theme that drives both WTC and fluency. Within individual factors, relevant conversations and past experiences were highlighted by participants as having contributed to their WTC, which in many cases, facilitated fluent speech production. Such experiences, as discussed earlier, seemed to have provided adequate exposure to and opportunities for practicing the linguistic resources required for fluently carrying out a task, in addition to assisting with support ideas. Just like feeling confident to do a presentation after several days of rehearsal, such experiences helped the participants to feel control over the linguistic resources they chose to use, not only because they had used them and were thus able to produce them fluently, but also because this control over the language appeared to render them more willing to speak and show off their language skills.

Therefore, the findings of this study support the Segalowitz's framework regarding all the sources influencing fluency. However, it appears that the findings go slightly beyond the framework with respect to the interaction between WTC and utterance fluency. While Segalowitz (2010) points to a one-way path from L2 speakers' WTC to utterance fluency, suggesting that greater WTC may "energize" (p. 22) speakers to commit to communicating with optimal fluency, this study provides evidence that there is a two-way interaction between WTC and speech fluency. More specifically,

production of fluent/dysfluent speech was found to influence one's WTC through self-perception. Perception of fluent speech in the majority of the cases improved the participants' WTC, and perception of dysfluent speech, likewise, lowered WTC. Figure 36 illustrates this interaction, highlighting the two-way path and the role of self-perceived fluency in determining WTC.



*Figure 36.* Interaction between WTC and utterance fluency through self-perceived fluency.

#### **Research Question 4**

The fourth research question was an examination of the interactions between WTC and fluency from a dynamic systems perspective:

RQ4: How does the theory of complex dynamic systems account for the interaction between WTC and fluency?

Based on the observations made in this study, this interaction bears close resemblance to most of the properties that characterize CDS, including the phenomenon of change, interconnectedness amongst subsystems, and formation of attractor states.

#### **Change**

Dynamic WTC ratings and the bitmap graphs showed fluctuations of different sizes on a moment by moment basis, an observation consistent with previous research investigating WTC dynamics (e.g., MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019; Pawlak & Mystkowska-Wiertelak, 2015; Wood, 2016). The WTC changes observed in this study were also found, in many

cases, to bring about positive or negative changes within the L2 fluency system and vice versa. A complex dynamic system is characterized by its “continuously changeable state”, which has at least two key interlinked key elements that change over time (Waninge, Dörnyei, & de Bot, 2014, p. 706). WTC may be viewed as a core system that has several underlying sub-systems that either cooperate flawlessly and create WTC, or fail to cooperate and set the tone for low WTC. The sub-systems of WTC involved individual, linguistic, cognitive, organizational, contextual factors, or reasons relating to participants’ self-perception or possession of supporting ideas/arguments. Changes to WTC were brought about by some form of dynamic interaction between two or more of these factors. Whenever such sub-systems (e.g., linguistic & cognitive) functioned properly and efficiently, positive affect emerged in the form of high WTC. Conversely, once a sub-system or two malfunctioned (e.g., failure to smoothly structure a sentence or retrieve vocabulary), the collective state of the WTC system was perturbed. This very much resembles two concepts associated with CDS: 1) the ‘butterfly effect’ wherein small changes somewhere in a system could bring about significant change(s) elsewhere (Larsen-freeman, 2015), and 2) the dependence on initial/previous condition, according to which a previous state determines the subsequent trajectory a system chooses to take, suggesting nonlinearity of the systems.

Another interesting point to note was the emergence of the above themes (layers) and their role in the co-construction of WTC; this multi-layeredness feature of WTC very closely resembles what MacIntyre et al. (1998) proposed in their pyramid model. While most of the above themes have already been discussed earlier in this chapter, what is worth discussing further is how the participants’ WTC changed as a result of their self-perceived control over their language use, and interestingly, their perception of fluent or dysfluent speech, a theme which closely corresponds to what MacIntyre et al. (1998) called “situation-specific, state-perceived competence” (p. 551) under L2 confidence in their pyramid model and described as a judgment made by the L2 speakers about their language

skills. This corresponds to how fluency and WTC, sometimes, interacted in an unmediated fashion. In an instance where Saba became silent, she mentioned: *in a conversation, other interlocutors contribute to the talk, while here, I am mainly in charge of keeping the monologue going; therefore, whenever there is silence dominating the talk, I feel uncomfortable that rendered her unwilling to continue the task.* In another instance, Saba gained WTC during a number of LRs and stated: *having ideas and being able to fluently make and support arguments without too many pauses or interruptions make me more willing to carry out the task.*

**Nonlinearity.** The phenomenon of change observed in this interaction was also characterized by its nonlinearity, whereby there are no “automatic and predictable cause-effect relations governing the system’s behaviour” (Waninge, Dörnyei, & de Bot, 2014, p. 706). In the context of this study, while 90% of the interactions exhibited a positive interplay between WTC and fluency; that is, cooccurrence of high WTC and fluent speech (76%), or low WTC and dysfluent speech (14%), the remaining 10% of the interactions displayed a lack of interplay, which is indicative of the CDS’ nonlinearity and consistent with previous WTC literature (MacIntyre & Legatto, 2011). In other words, despite the large number of instances whereby a positive interaction was observed, a number of instances exhibited a negative or no interaction; low WTC but fluent speech or high WTC and dysfluent speech; a type of nonlinearity which might have been random or systematic (Verspoor, Lowie, & Dijk, 2008). This by no means suggests that there has to be a positive interaction; however, given that WTC and fluency are presumed to be sub-systems of a bigger dynamic system called speech production, small changes in one sub-system (e.g., WTC) is expected to cause changes in another sub-system (e.g., fluency), which reflects the two concepts of dependence on a previous condition and butterfly effect, and is characteristic of the first two patterns of positive interactions. However, when it comes to the second two patterns with negative/no interactions, the nonlinear behaviour of the interplay emerges. What follows is an explanation of this nonlinearity.

One pattern of interaction, which constituted 8% of the total, was when fluent speech was produced when WTC was low mainly due to linguistic or cognitive reasons, or support idea and self-perception issues. Despite a low affective state that was mostly caused by linguistic uncertainty, quality of the speech produced, or preoccupation with macroplanning of subsequent utterances, it appeared that some participants still managed to maintain fluency owing to a number of reasons. One would be the fact that the macro and microplanning of the LRs had already been completed prior to the production of the utterance, but participants were struggling with planning the subsequent utterances, which lowered their WTC. As an example, while Pedi was fluently discussing why he wished to gain more weight, he was also concerned about retrieving more ideas to complete the task as she was only halfway through it. Another factor that helped the participants maintain fluent speech while their WTC was low pertained to their ability to keep speaking fluently despite negative affective states and low WTC due to subconscious preoccupation with making poor arguments, ambivalent feelings about impromptu ideas, lack of interest in the topic, or use of inappropriate or repetitious lexical items. For instance, Sahra failed to think of an equivalent for the 'warmth of family' and had to use *privacy in family*, which helped her maintain fluency. However, she was aware of the inappropriacy of the chunk, which evoked a self-perceived sense of dissatisfaction that manifested through low WTC. In another example, Linda managed to build an LR through using the word *example* and the discourse marker *for example*, which measured up to seven syllables and, along with the rest of the lexical items, qualified the run as a LR. However, she felt discontent with not recalling another lexical alternative to avoid using the word a second time, and this lowered her WTC. In another instance, Linda uttered: *abroad or within city inside the city*, where she hesitated over choosing an expression that would communicate the idea of urban transport, leading her to try out two phrases back to back to ensure she communicated what she meant. This redundant

repetition of the ideas qualified the utterance as a LR while she remained undecided which would fit the context best.

High WTC did not necessarily coincide with fluent speech. The factors that improved or kept WTC at a positive level during dysfluent runs (2%) had to do with either possessing support ideas (e.g., discussing personal accomplishments, jotted-down notes, or personal experiences) or lexical knowledge or retrieval. Either of these seemed to evoke a feeling of security that encouraged the participants and improved their WTC. Therefore, they were not affectively concerned about ending up pausing or not being able to complete the tasks, and even though their speech was dysfluent, they were speaking nonetheless. Pauses occurred mostly because they were dealing with sentence-structuring and retrieval challenges, which is typical of L2 learners. In a number of other cases, the participants seemed to be content with the slow retrieval of lexical items, which involved making pauses but eventually retrieving the items. In such cases, the WTC system would not be perturbed as they managed to realize the goal of retrieval. In one instance, Pouya recalled a personal accomplishment to support his argument of dieting, which meant he was past the macroplanning stage and about to perform the microplanning. He paused many times, but since he was excited to share an experience he was proud of, his WTC was quite high. In another instance, Linda was slowly retrieving food-related lexical items such as *beans* and *seafood* with a pause between each. However, since the retrieval was taking place anyways, she would not lose WTC.

Given the two types of nonlinear patterns discussed above, it might not be unreasonable to argue that such a form of variation might be systematic and not random. While there is no evidence, to my knowledge, of such systematic variation in WTC research, it has been the subject of debate with respect to instructed second language acquisition (Dörnyei, 2014), language development (Larsen-Freeman & Cameron, 2008), and interlanguage syntax (Huebner, 1983).

## Interconnectedness

While the interactions discussed in the first section of this chapter highlighted the roles of seven different themes in shaping the interaction between WTC and L2 fluency, this section will solely focus on the interconnectedness between the linguistic, cognitive and affective themes, which have been found in previous research too (MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019, Wood, 2016). The data of this study demonstrated interactions between:

- 1) Linguistic and affective,
- 2) Cognitive and affective, and
- 3) Linguistic, cognitive, and affective factors.

The linguistic theme mainly involved participants' knowledge of and control over grammar and lexical resources; grammatical accuracy and ability to self-correct, lexical appropriacy, and lexical knowledge of the topics. The cognitive theme concerned the memory and retrieval demands of accessing lexical knowledge, grammar structuring, and accessing the declarative knowledge while maintaining accurate and fluent speech. The affective variable mainly involved WTC - or their tendency to carry on or terminate the task. What follows is an account of the dynamic interaction between the variables that led to the emergence of the above patterns.

***Linguistic and affective.*** The knowledge of lexical and grammatical resources and confidence in accuracy of grammar structures and appropriacy of lexical items tended to be important factors causing perturbation to the affective states of WTC during the communicative tasks. Typically, when participants possessed or assumed they possessed the lexical knowledge (perceived competence) required to support their arguments or perceived their lexical choices appropriate for the context, their WTC tended to increase. This knowledge might have originated from previous courses taken, reading material (e.g., newspaper articles), or previous discussions of the same topics, which contained relevant ideas and vocabulary that appeared to provide the

participants with a feeling of security and the confidence to approach a topic more willingly. In case of relevant previous conversations, this appeared to be the case because they had engaged in opportunities for use and practice or had received feedback (e.g., approval or disapproval) from other interlocutors on the quality of their lexical choices. Depending on the success or failure they have with communicating their thoughts using the lexical items, their WTC would fluctuate.

While lexical resources appeared to be the major linguistic component shaping WTC, availability of or uncertainty about grammar structures were also mentioned as factors affecting WTC. In a few cases, participants' struggles with structuring sentences led to a reduced WTC. In one case also, a combination of lexical and grammatical issues lowered a participant's WTC.

***Cognitive and affective.*** The interplay between cognition and affect, which is consistent with previous research (de Saint Léger & Storch, 2009; Waninge, 2015), revolved around how successfully the participants were able to retrieve and smoothly use their learned linguistic resources or background knowledge relevant to the context. In fact, the linguistic variable discussed in the previous section and the cognitive variable at issue here seem to very closely resemble declarative and procedural knowledge (Levelt, 1989). To recap, the declarative knowledge broadly represents the knowledge of the language, while the procedural knowledge involves the automaticity with which the cognitive capacity handles the retrieval of the declarative knowledge.

Lexical retrieval has consistently proved to affect WTC (MacIntyre & Legatto, 2011, Nematizadeh & Wood, 2019, Wood, 2018). When considering why lexical retrieval plays such a critical role in causing shifts in WTC, it appears as though the participants benchmark their speech against temporal measures of pause and rate. Given this, perception of dysfluent speech, or whatever causes it, would lower their WTC. As a result of failure of lexical retrieval, some ended up repeating a previously used lexical item; some felt frustrated because of not retrieving words they would typically

use; and some failed in retrieving a lexical item and had to move on despite a poor lexical choice, all of which resulted in delays in speech production and reduced WTC. Another case involved retrieval delay causing a stutter in articulating a word and lowering WTC. It is worth pointing out that the cognitive delay, in some cases, brought about subsequent cognitive sentence structuring issues where the participant hesitated around the correct word order. In terms of directionality, sometimes low WTC occurred as a result of dissatisfaction with speech production (e.g., quality of structures, lexical appropriacy etc.) in general, which was followed by dysfluent speech, while sometimes dysfluent speech lowered WTC.

Some other cases involved situations where ideas were or were not retrieved successfully. For one thing, participants were particularly impressed when they were able to maintain an acceptable speech rate as a result of successful retrieval of ideas. William, for instance, believed that a factor improving his fluency involved avoiding constant Persian-to-English translation, which he typically struggled with when speaking English. However, once ideas were readily available, fluent expression was likely to occur, encouraging him to continue. In support of this, Mohsen would feel impressed upon perception of fluent speech, or Akbar mentioned that rehearsed structures were easily constructed in real-life communications, so he would not need to *do a lot of thinking*, which increased his WTC. The same participant lost WTC when stumbling over the articulation of a word, which was due to simultaneously maintaining speech and planning the structure of an upcoming sentence where the cognitive demands of his speech seemed to have troubled his production system.

***Linguistic, cognitive, and affective.*** A recurring pattern that emerged was that an individual's WTC or affective state is primarily shaped by the possession of language knowledge (linguistic) and how successfully they manage to access and use the knowledge (cognitive). These two could improve one's WTC whereas a failure in each or both could cause a drop in WTC. One typical

pattern of this interconnectedness pertained to cases in which uncertainty about linguistic resources resulted in prolonged cognitive search for an alternative (e.g. grammar structure or lexical item) causing delays and lowering WTC. In one case, for example, Niki felt unsure of the correctness of a preposition which preoccupied her mind, imposing some additional cognitive demand to retrieve a lexical choice, all of which resulted in delay in speech production and lowered his WTC. Another case concerned the lack of lexical resources about a topic and resulting delays for lexical search causing dysfluent speech, both of which lowered WTC. In one instance, Sahra did not perceive her sentence structure as proper because she was translating from Persian to English. While she knew that word-for-word translation was not an effective method of L2 production, she had no other choice. This incompetence and the cognitive processing required for translation caused delays in production and lowered her WTC. In one last situation, participants' perception of accurate language and fluent production improved their WTC. For instance, William perceived his speech highly fluent and this improved his WTC throughout the entire task two.

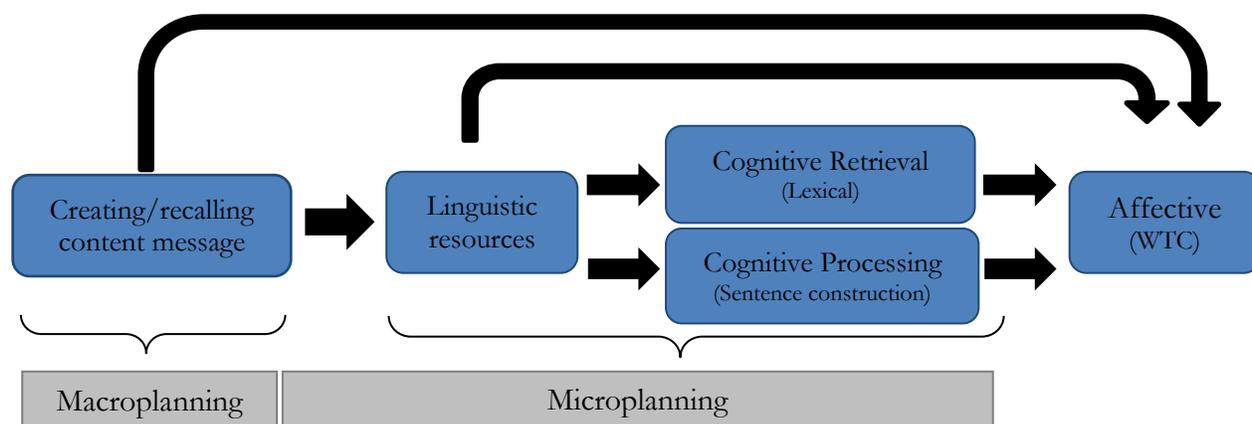
The other situations involved reciprocal interactions between the variables. In one case, after a lexical search that caused some pauses, Pouya felt uncertain whether a phrase he had retrieved communicated his thoughts. At some point, he realized that he did not have the knowledge of the word, and the whole dynamic lowered his WTC. In another instance, Lili detected inaccurate speech and made an unsuccessful attempt to self-correct, which led to dysfluent speech and lowered WTC. The third instance was when Hero had assumed he would have had no issues discussing a topic. However, a few seconds into the task, he realized that, while he possessed the background knowledge, he lacked the lexical and grammatical resources to express his thoughts. Therefore, he had initiated a process of word-for-word translation, whose cognitive demand turned out to be above his processing capacity and affected his SR significantly. The whole dynamic lowered his

WTC. One last case involved Anita discussing a familiar topic for which she had the required lexis. She found it unchallenging to access and retrieve the linguistic resources, which increased her WTC.

### **Formation of attractor states, repeller states, and self-organization**

Instances of attractor states, defined as states which systems settles into at a particular point in time (de Bot & Larsen-Freeman, 2011), were observed in this study. It has been argued that attractor states may be formed as a result of feedback a system receives from external and internal sources (Hiver, 2015a). In the context of this study, the interviewer may have initiated external feedback; positive or negative, which would have potentially caused changes to some of the participants' WTC (see, for instance the interviewer's effect in Chapter three). The effects of such external resources would have presumably been greater and more complex had the study engaged multiple participants simultaneously. On the other hand, feedback could originate from the internal interactions between sub-systems, which was mainly the case with the observations made in this study. In the interconnectedness section, I elaborated how the interactions between the linguistic, cognitive, and affective subsystems manifested through high or low WTC. A common type of internal feedback observed in this study was the participants' perception and impressions of their own speech. In a process of self-monitoring, perceiving a successful argument accompanied by successful retrieval of linguistic resources would bring stability to the WTC system for a certain period of time. In such cases, participants' satisfaction with their speech would render them willing to continue, and access to and retrieval of linguistic resources would not only contribute to their WTC but also assist them to maintain fluency. Overall, in this study, it was observed that when WTC and L2 fluency as complex dynamic systems, including its sub-systems, functioned effectively, positive attractor states would be formed. Figure 37 is meant to visualize how subsystems underlying WTC and L2 fluency (e.g., content message, linguistic resources, retrieval etc.) operate in an

interconnected way, and in case they cooperate smoothly, positive attractor states are expected to form. On the other hand, if a subsystem malfunctions (e.g., lack of supporting idea, shortage of linguistic resources, unsuccessful retrieval etc.), the system is perturbed and likely to enter a repeller state. On the occasion that the malfunctioning is not resolved immediately and lasts for a while, the system may transition into a negative attractor state.



*Figure 37.* Interconnectedness and formation of attractor states in WTC and L2 fluency as dynamic systems.

An implication that can be drawn is that both WTC and fluency are subsystems of a larger system called speech production. Subsystems of WTC may facilitate fluency, and subsystems of fluency can bring about WTC. In other words, WTC and fluency share some subsystems that simultaneously contribute to both of them, and once this occurs, the system tends to self-organize into a stable state, or an attractor state. While most of the attractor states observed in this study were characterized by high WTC, in seven cases (see Majid and Kaami in the results chapter), WTC dropped and remained low for a while due to a sub-system or two not contributing to the collective behaviour of the system. It appeared that the longer this lack of interaction persisted, the longer the attractor state lasted. In the case of Majid, lack support ideas and having to improvise and retrieve ideas brought about content planning and sentence structuring challenges and thus settled his WTC system into a negative attractor state, which lasted for approximately 15 seconds. In this particular

case, his fluency gradually lost quality and entered into a period of silent and filled pauses. From a CDS perspective, in Majid's case, the subsystems of WTC ranged from availability of supporting ideas, to cognitive processes of macro and microplanning new messages. Both of these factors, or so-called WTC sub-systems, triggered a decline in his WTC as it took him a while to generate ideas and convert them into speech. This whole dynamic negatively affected his WTC, which remained low until he managed to execute the process.

Fairly similar dynamics triggered the settlement of Kaami's WTC into multiple consecutive attractor states and a period of dysfluency. Kaami's WTC dropped due to struggling in the macroplanning stage, which inevitably got him into a process of simultaneously macro and microplanning speech. This imposed a great cognitive overload and lowered his WTC and fluency.

Participants' WTC seemed to enter into repeller-states, too, which are highlighted on the bitmap graphs of the results chapter. While it is believed that repeller states may be pleasant (Hiver, 2015a), this study solely observed cases of repeller states that were characterized by low WTC, which would typically occur after a period of stability characterized by high WTC. During the attractor states, fluency and WTC systems and their subsystems functioned efficiently, however, due to unexpected, sudden glitches, mostly issues with timely and efficient lexical/idea retrieval, their WTC dropped and entered into a temporary repeller states. In cases of WTC entering a repeller state, participants, in an attempt to gain WTC, would try hard to retrieve ideas/vocabulary or alternative ideas/vocabulary and carry on the tasks, a behaviour that demonstrate the system's self-organizing quality.

## Recap

As demonstrated in this chapter, the results of the present study carry meaningful and illuminating implications with respect to the variables of WTC and L2 fluency, as well as the interaction between them. To summarize, it is reasonable to argue that WTC and L2 fluency interact in positive and negative ways, and that this interaction is two-way, direct and indirect, unpredictable, and interdependently multi-layered. Based on these characteristics, this study used a provisional model to better illustrate the interactions between the two variables. The model stresses three phases of speech production, including pre-production, during-production, and post-production, each of which incorporates multiple cooperating factors. Additionally, as illustrated in Figure 34, we now may argue that WTC and L2 fluency are subsystems of a bigger system called speech production. As subsystems, they tend to work in tandem and contribute to each other, or fail to function and exert negative effects upon each other during communicative events. Furthermore, each subsystem is comprised of a second level of subsystems such as cognitive, linguistic, contextual, organizational, self-perception factors, two of which (cognitive and self-perception) underlie and simultaneously feed into WTC and L2 fluency. Drawing on the above arguments alongside the observations made concerning the properties of CDS, we may now begin to view both variables as complex dynamic systems.

## Chapter 7: Conclusions

This chapter is divided into five sections that will briefly summarize the study and its findings, how the results can inform L2 pedagogy, limitations of the study, suggestions for future research into WTC and L2 fluency, and a final note on using CDST to view L2 variables.

This study was mainly motivated by the fact that there is a gap in literature investigating the interaction between WTC and L2 fluency. Another motivation came from a recent direction that L2 research has taken; that is, the emergence and application of the CDST in L2 research as well as Segalowitz's (2010) framework of the dynamic relationship between sources influencing fluency, one of them being motivation or willingness to communicate. Lastly, as shown in the continuum-like model in the introduction, there appeared to be a number of variables that underlie both WTC and L2 fluency; a fact that justifies researching the interaction between the two. Therefore, this study took on an exploratory design mainly to monitor the interaction between WTC and L2 fluency, and the factors that may play a role in shaping the dynamics between the two.

### What Did I Do?

This research set out to explore the interactions between WTC and L2 speech fluency through monitoring changes of WTC during fluent and dysfluent speech. Twenty participants attended four individual sessions wherein the idiodynamic method was used. The method mainly involved recording the participants during three-minute monologic picture description tasks, and then having them view video-recordings and rate their WTC changes immediately after in a retrospective process. Finally, participants participated in stimulated recall interviews in which the video-recordings and video-captured ratings of WTC were played back to them, prompting them to recall the factors that had triggered change in their WTC. Their audio recordings of the tasks were then analysed for the temporal measures of fluency, which allowed for distinguishing fluent from

dysfluent speech and also informed the interpretations of the dynamics between speech fluency and WTC changes. Next, stimulated recall interviews were analysed and coded to discover the variables that brought about change in WTC. Finally, the patterns that developed out of WTC and fluency changes were further investigated for the purpose of identifying evidence of properties associated with complex dynamic systems.

### **What Did I Find?**

This study was guided by four research questions, with the first being an investigation of fluent speech and WTC changes, while the second involved monitoring WTC changes during dysfluent speech. To address these research questions, a total of 882 fluent and dysfluent runs were studied in connection with WTC changes and four patterns emerged. The four patterns involved, in order of frequency, the cooccurrence of:

- 1) Fluent speech and high WTC (674 cases, 76%)
- 2) Fluent speech and low WTC (70.5 cases, 14%)
- 3) Dysfluent speech but high WTC (13 cases, 8%)
- 4) Dysfluent speech but low WTC (125 cases, 2%).

The above patterns and their frequency pointed to a possible interaction. Therefore, the stimulated recall interviews, including reasons for WTC shifts, along with the fluent and dysfluent runs were studied in relation to each other.

One important finding of this study pointed to the discovery of the two-way, direct and indirect, unpredictable, and interdependently multi-layered interaction that characterized the dynamics between WTC and L2 fluency. Another important finding, which was also presented in the form of a provisional three-phase model of WTC and fluency interactions (Figure 34), concerned the

three phases of speech production in which both WTC and fluency, and their underlying components, operated and cooperated in an interdependent way to produce speech.

The third research question dealt with the underlying variables that shape this interaction. The continuum-shaped model that had been presented in the introduction began to take on a more vivid form after unveiling more pieces of the puzzle. The findings revealed the effect of seven themes, including 31 sub-themes that shaped the WTC changes. When sources of influence on fluency were explored, it was found that not only did WTC and L2 fluency interact in a direct way, but also multiple underlying variables exerted a simultaneous effect on both, which shaped the dynamics between the two. It was also found that the underlying variables operated and cooperated in an interdependent fashion, and WTC and fluency would be influenced depending on the success or failure of the operations among these underlying variables.

The fourth research question involved examining this interaction in light of the properties exhibited by complex dynamic systems. The dynamic WTC measured through the idiodynamic application displayed characteristics such as change and dynamicity, nonlinearity, interconnectedness, and settlement into attractor or repeller states. While these specifically related to WTC behaviour as a dynamic system, fluency behaved similarly in many cases. The direct and indirect interaction discussed earlier lend support to the fact that changes to WTC could affect L2 fluency, and vice versa. This study, therefore, appear to show that both variables may be viewed as complex dynamic systems, which is consistent with previous research (MacIntyre & Legatto, 2011, Nematizadeh & Wood, 2019; Segalowitz, 2010, Wood, 2016). In addition, the interaction between the variables was found to exhibit the properties associated with the CDS.

## **Pedagogical Implications**

This research carries a number of implications for L2 pedagogy. MacIntyre et al. (1998) proposed that L2 WTC should be the primary goal of language pedagogy. This seems to be plausible mainly because in spite of competence in a L2, learners who are unwilling to communicate and demonstrate their L2 skills tend to experiment less with the language, as was the case with low-input generating learners who created fewer opportunities for interactions, language practice, hypothesis formation and testing, and self-corrections (Seliger, 1980, 1983). The results of this study demonstrated how some 30 dynamics could trigger positive and negative fluctuations to WTC. This certainly offers insight into the complexity and multi-layeredness of this communication variable and a lead for L2 instructors who may encounter silent, unwilling-to-communicate students in class. One of the reasons causing low WTC and dysfluent speech involved issues like lack of support ideas or background knowledge. This implies that classroom tasks and topics should be developed and selected based on whether or not L2 learners are familiar with and knowledgeable about the topics or not. It should be noted that L2 learners already struggle with all sorts of challenges associated with speech production in a new language; therefore, teachers and course developers should make meticulous choices with regards to the topics of classroom discussions, or at least ensure that students are provided with some background knowledge through some input-providing tasks. It was also observed that participants monitored their speech for quite a few factors like grammar, vocabulary, quality of arguments, etc., and depending on their self-perceptions or even the fear of being judged by the interviewer, their WTC and fluency could be affected. Therefore, teachers are encouraged to closely monitor learners' oral performance, and consistently provide positive verbal and facial feedback to ensure trivial language mistakes do not lower students' WTC or discourage them from participation in class activities. Instructors are also encouraged to raise their students' awareness with regards to the fact that language development is a long-term process and making

mistakes, using incorrect lexical items, and mispronunciations, etc., are integral stages of language development, which is not realized if students display low WTC or avoid experimenting with their L2s.

On a different note regarding self-monitoring and in view of the observed fluctuations in WTC for very minor reasons, teachers should keep reminding students to move on and not to get fixated on weaknesses in their linguistic performance. In many of the cases of repair or self-corrections, the observed issues were not significantly noticeable and would not have hindered the communication of ideas; therefore, it appears that participants of this study, who represented a group of L2 learners, self-judged their performance more aggressively than the interviewer would.

Another theme promoting WTC had to do with individual factors; that is, when participants discussed their personal experiences, interests, beliefs/views, daily routines, or accomplishments. Therefore, one recommendation for L2 instructors and even course developers, specifically those teaching lower level learners, would be to engage students in activities that provide ample opportunities to discuss topics that resonate with them, such as the ones above. Students are assumed to approach such topics with more ease mainly because the content of the message (declarative knowledge) is available and linguistic resources are presumably less complex (e.g., first person singular) and have most likely been practiced previously, all of which would facilitate proceduralization of the declarative knowledge. Availability of both declarative and procedural knowledge will not only improve students' WTC and engagement in class activities, but will more likely facilitate fluent production of ideas, which is yet another factor promoting WTC. Teachers may specifically find this useful in their first days of contact, during which students tend to be most unwilling to communicate; therefore, icebreakers such as topics that involve discussing personal interests or accomplishments will potentially encourage student engagement early on.

Given the role that organizational and linguistic factors among others can play during the pre-production stage in the provisional three-phase model, L2 course developers and instructors are encouraged to include some planning time, during which students can brainstorm ideas and even participate in pair or small group discussions before engaging in speaking activities in front of the class. Such opportunities will give student a chance to perform in a rather stress-free atmosphere before they find themselves in front of a class talking to a larger group. Additionally, the fact that some of the participants of this study were concerned about being judged by a native speaker or someone with better proficiency and thus lost WTC, carries implications for teachers when pairing students with others. Based on this finding, student-pairing procedures should be performed carefully and ensure partners' competencies are not vastly different. This would not only avoid the loss of WTC in students with poorer proficiency, but would encourage greater engagement and confidence to try out linguistic resources without having to worry about making errors and being judged.

Given that lexical knowledge and retrieval, or lack thereof, were found to improve or lower WTC and fluency, and that vocabulary sheets were almost always used to avoid pauses, oral tasks should be preceded and accompanied by vocabulary-specific activities. For instance, before introducing pair-works or group discussion tasks, teachers could provide students with a list of relevant vocabulary to the topic of the activities and teach or review them before embarking on the task. The vocabulary sheets could also contain thought-provoking questions and images relevant to the activities' topics, which would not only assist learners with ideas, but would ensure that lack of lexical knowledge or cognitive retrieval challenges would not render them unwilling or dysfluent during communication.

## **Limitations of the Study and Future Directions**

While the present exploratory study was an attempt to bridge some gaps in the WTC and fluency literature, it was not without limitations, which I will discuss below followed by suggestions to address them in future research.

### **Task**

This study employed monologic tasks to elicit data for reasons mostly accounting for speech fluency. However, it appeared as though that such tasks involved situations of a less communicative nature, which fell short of engaging participants in a truly authentic communication experience. It appears that in dialogues and dialogic communication or exchanges, this might be less of an issue as the interlocutors make compromises and fill the gaps and silences. Additionally, given the social bases of fluency (Segalowitz, 2010), and the importance of the interactional competence in L2, future research is encouraged to incorporate dialogic tasks in interactional settings (see Peltonen, 2017).

Another issue that seemed to render the tasks less authentic pertained to the one-minute preparation time the participants were given prior to performing the tasks. This is not typical of authentic communication. Additionally, since the participants had the experience of preparing for and performing the IELTS or TOEFL speaking tests, they were rather familiar with the procedures like taking and discussing notes, which might have affected the ecological validity of the data collected. Also, this study used vocabulary sheets, as in previous research (MacIntyre & Serroul, 2015), in order to uncover additional variables that trigger change in WTC other than issues with lexical search and cognitive retrieval, which were found in previous studies (MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019; Wood, 2016). However, from a communication perspective, the

use of vocabulary sheets may have rendered the tasks less communicatively challenging and less authentic as individuals rarely have access to a vocabulary source during real-life communications.

The role of context may have also had an impact on the changes of WTC. Due to the practicality constraints imposed by the idiodynamic software, this study conducted laboratory-based examinations of WTC, which has certainly some merits to it. However, there is more value to examining WTC in its most authentic form.

### **Design**

Another issue pertained to the use of a repeated measures design, which was initially presumed to provide additional and richer information about the WTC changes. For one thing, it appeared that as participants became more familiar with the interviewer and the data collection procedure, they developed a skill to predict what would happen next. This turned the third and the fourth tasks into predictable procedures, which might explain why fewer fluctuations of WTC were reported in these tasks. This is interesting particularly in view of the fact that topics had been correlated in terms of difficulty. This can be meaningful and may also suggest that the participants might have developed an understanding of the use of the idiodynamic software or even their WTC changes. It may also be explained by the fact that the participants became acquainted with the interviewer and thus felt lesser degrees of anxiety when performing the tasks. However, authentic communications engage L2 learners in unfamiliar or less familiar situations and with unfamiliar interlocutors, both of which bring about some level of communication anxiety, which could perturb WTC. To address this, future research is encouraged to recruit different interviewers in order to collect more ecologically valid data.

## Participants

This study recruited participants with specific characteristics mainly for homogeneity purposes. For instance, participants had achieved a score between 6.0 and 7.0 on the 1-9 IELTS scale, which corresponds to B2 proficiency level on CEFR (Common European Framework of Reference) scale. However, it was observed that participants' control over language tended to render their WTC more stable, while linguistic weaknesses tended to lower their WTC. Therefore, it is presumed that investigating the WTC of participants across different levels of proficiency may reveal more level-specific information with regards to variables that bring about change in WTC. Also, since this study was focused on Persian-speaking participants who spoke English as a L2, the results of this study may not be generalizable to other contexts and participants with other cultures/nationalities.

While this study found that WTC and L2 fluency may display properties associated with complex dynamic systems, future research is encouraged to develop more refined research methods with a focus on each property, in order to gather more powerful evidence with regards to the dynamic and complex nature of these variables. This study mainly took advantage of the qualitative component of the idiodynamic system, which is developed as mixed-methods study toolbox; however, it is likely that collecting both qualitative and quantitative data, which can be juxtaposed and triangulated, can shed further light on our conceptualization of WTC and its interaction with L2 fluency.

A majority of recent studies on dynamic WTC have monitored the variable on micro-timescales ranging from moment by moment (MacIntyre & Legatto, 2011; Nematizadeh & Wood, 2019; Wood, 2016), 30 seconds (Pawlak & Mystkowska-Wiertelak, 2015), or five minutes (Mystkowska-Wiertelak & Pawlak, 2014; Pawlak, Mystkowska-Wiertelak, & Bielak, 2015). This study

was no exception. Despite the possibility that the use of a micro timescale might have captured the tiny nuances of the variable, it has certainly overlooked changes over longer spans of time. An interesting study of dynamics of self by Mercer (2015) explored the variable on different timescales, including seconds, minutes, weeks, and months. While adopting such a procedure would have presented certain challenges in the context of this study, wherein cognitive processes underlying speech production were at the heart of investigations, it can at least be presumed that investigations with differing timescales would have revealed quite a few interesting findings with regards to patterns of and reasons for change in WTC. Hence, future research needs to monitor WTC more longitudinally as change within the context of L2 learning is believed to occur over longer spans of time. Macro-timescales, coupled with micro investigations, should shed further light upon the yet-to-be-explored dimensions of the construct.

### **Idiodynamic method**

While the idiodynamic method appears to elicit information that is invisible to a researcher, it is not flawless. An issue seems to be the fact that the idiodynamic method can only capture a fairly limited amount of data and the communicative tasks need to be short. The longer the communicative tasks are, the heavier the demand on the participant's memory and the more likely the participant is to forget the causes of shifts in their WTC. This was the case in a few instances, whereby the participants did not recall the reasons for their high WTC, even though the intervals between the task and the stimulated recall did not extend longer than three to four minutes. Another drawback associated with the idiodynamic method is that it hardly lends itself to classroom-based research, and any study using it would have to simulate a communicative setting and would be considered laboratory-based, which is believed to be incapable of capturing authentic data. One last

limitation pertains to the fact that participants may become self-critical and report what they see on the screen rather than what actually happened during the communicative task.

### **Self-perceived fluency**

One of the important findings that emerged from this study is the notion of self-perceived fluency. While the fluency literature abounds with studies on utterance fluency, or perceived fluency; that is, fluency perceptions by other listeners, little has been done, to my knowledge, to investigate how speech fluency is perceived by the L2 speakers themselves or what may be termed as *self-perceived fluency*. For instance, in a study that investigated how L2 speakers manage and overcome difficulties in L2 communications, Dörnyei and Kormos (1998) identified four sources of problems in L2 communications, one of which involved perceived deficits in one's own language outputs. By this, they referred to self-corrections, such as error repairs, appropriacy repairs, different-repair<sup>1</sup>, and rephrasing repairs. Another study by Kormos (2000) looked at the role of attention in monitoring L2 production, with a focus on the distribution of self-repairs and the correction rate of errors at different levels of L2 competence and in L1 speakers. In a more recent study, Kahng (2014), using a stimulated recall procedure to investigate cognitive fluency, had 17 participants explain the factors that caused pauses or moments of hesitations in their speech.

The studies reported above have mainly been concerned with cognitive explorations of L2 production and/or dysfluency markers such as self-corrections, self-monitoring, or pausing phenomena and, therefore, there is a clear gap in the literature exploring the concept of self-perceived fluency and its cognitive dynamics with affective variables such as WTC, and the present study appears to have taken one step in that direction.

---

<sup>1</sup> This refers to situations in which a speaker decides to encode different information.

## A Note on CDST

A L2 researcher I met at a conference recently commented that: *we, as researchers of ELT (English language teaching), should be in search of solid, generalizable results that can carry pedagogical implications, which we can then take right into the L2 classroom and inform language educators. CDST does not give us that; it is all about change and complexity.* It appears concerning to describe L2-related systems/variables as having many different elements that are in continuous flux and subject to change any moment. From a researcher perspective, it is also challenging to come up with a research method that is considerate of multiple and dynamic components, and as Dörnyei (2014) puts it:

Limited predictability is one of the greatest challenges to researchers: if the behaviour of a system is unpredictable or random, we cannot research it – there is no point: ‘random’ means unsystematic, so no amount of research can uncover underlying systematic elements in the situation. If, however, the system’s behaviour is predictable, then we can find systematic trends underlying its behaviour and can analyse those meaningfully. (p. 80)

From this small-scale research experience, however, it appeared that viewing L2-related variables, like WTC and speech fluency, as dynamic systems offered the potential to provide a more vivid picture simply through putting a magnifier on a given construct and making observations of the tiny and rather invisible nuances that shape the collective behaviour of a system over time, which would otherwise be overlooked. In support of dynamically-informed methods, MacIntyre (2012) argues that once a microscopic approach to explore communication traits like WTC is adopted, “it is astonishing to consider how quickly characteristics of the individual converge with features of the situation to create communication behaviour” (p. 362). Application of CDST to L2 development research, as de Bot (2008) argues is a “shift away from large-scale comparative studies of single-

factor effects and from the type of experimental reductionism that has dominated parts of our field in the last decades” (p. 173). CDST is a toolbox (P. MacIntyre, personal communication, March 6, 2019), which can be used to model and simulate language development (de Bot, Lowie, Thorne, & Verspoor, 2013). This study provided evidence of how this toolbox served as an exploratory measure to investigating and adequately explaining a rather underexplored interaction.

## **Final Word**

Investigating WTC and L2 fluency in relation to each other and as dynamic systems is a very interesting yet underresearched area of inquiry. Both variables play important roles in L2 communications and, in light of the findings offered by the present study and the literature (McCroskey & Richmond, 1991; Segalowitz, 2010), retain social and cognitive bases. This research used three figures based on the evidence gathered to better highlight the findings of this study. The first, called *a provisional three-phase model of WTC and fluency interactions in speech production*, highlights the fact that speech production is likely to undergo three main stages, each of which is the result of seemingly interdependent interactions among multiple underlying factors, which could directly or indirectly influence both WTC and fluency. The second, called *a continuum-like model of the interdependent and multi-layered interaction between WTC and fluency*, accounts for the influences of cognitive processes and self-perception as determinants of both, and the dynamics between, WTC and fluency. The third, called *interaction between WTC and utterance fluency through self-perceived fluency*, underscores the affective role of self-perception, and self-perceived fluency in particular in shaping the WTC dynamics. While these models were developed based on the data, it should be acknowledged that they are preliminary and provisional in nature and should, therefore, be tested and validated using robust research methods.

## References

- Bachman, L. F., & Palmer, A. S. (1996). *Language testing in practice*. Oxford: Oxford University Press.
- Baddeley, A. D. (1988). *Working memory*. Oxford: Oxford University Press.
- Baker-Smemoe, W., Dewey, D. P., Bown, J., & Martinsen, R. A. (2014). Does measuring L2 utterance fluency equal measuring overall L2 proficiency? evidence from five languages. *Foreign Language Annals*, 47(4), 707-728. doi:10.1111/flan.12110
- Baker, S. C., & MacIntyre, P. D. (2003). The role of gender and immersion in communication and second language orientations. *Language Learning*, 53(S1), 65-96. doi:10.1111/0023-8333.00224
- Bernard, H. R. 1. (2006). *Research methods in anthropology: Qualitative and quantitative approaches*. Lanham, MD: AltaMira Press.
- Biber, D., Johansson, S., Leech, G., Conrad, S. & Finegan, E. (1999). *Longman grammar of spoken and written English*. Harlow: Pearson Education.
- Blake, C. G. (2006). *The potential of text-based internet chats for improving ESL oral fluency*. (Unpublished doctoral dissertation). Purdue University, USA.
- Blood, I. M., Blood, G. W., Tellis, G., & Gabel, R. (2001). Communication apprehension and self-perceived communication competence in adolescents who stutter. *Journal of Fluency Disorders*, 26(3), 161-178. doi:10.1016/S0094-730X(01)00097-3
- Boschetti, F., Hardy, P., Grigg, N., & Horwitz, P. (2011). Can we learn how complex systems work? *Emergence: Complexity and Organization*, 13(4), 47-62.
- Bosker, H. R., Pinget, A., Quené, H., Sanders, T., & de Jong, N. H. (2013). What makes speech sound fluent? the contributions of pauses, speed and repairs. *Language Testing*, 30(2), 159-175. doi:10.1177/0265532212455394
- Bortfeld, H., Leon, S., Bloom, J., Schober, M., & Brennan, S. (2001). Disfluency rates in conversation: Effects of age, relationship, topic, role, and gender. *Language and Speech*, 44(2), 123-147. doi:10.1177/00238309010440020101
- Broos, W. P. J., Duyck, W., & Hartsuiker, R. J. (2016). Verbal Self-Monitoring in the second language. *Language Learning*, 66(S2), 132-154. doi:10.1111/lang.12189
- Burgoon, J. K. (1976). The unwillingness-to-communicate scale: Development and validation. *Communication Monographs*, 43(1), 60-69. doi:10.1080/03637757609375916
- Burgoon, J. K., & Burgoon, M. (1974). Unwillingness to communicate, anomia-alienation, and

- communication apprehension as predictors of small group communication. *The Journal of Psychology*, 88 (1st Half), 31-38. doi:10.1080/00223980.1974.9915710
- Cameron, D. (2013). Willingness to communicate in English as a second language as a stable trait or context-influenced variable: Case studies of Iranian migrants to New Zealand. *Australian Review of Applied Linguistics*, 36(2), 177–195.
- Cameron, D. (2015). 'In New Zealand I feel more confidence': The role of context in the willingness to communicate (WTC) of migrant Iranian English language learners. *International Journal of English Studies*, 15(2), 61-80.
- Cao, Y. (2011). Investigating situational willingness to communicate within second language classrooms from an ecological perspective. *System*, 39(4), 468-479. doi:10.1016/j.system.2011.10.016
- Cao, Y. (2014). A sociocognitive perspective on second language classroom willingness to communicate. *TESOL Quarterly*, 48(4), 789-814. doi:10.1002/tesq.155
- Cao, Y., & Jiaotong, X. (2012). Willingness to communicate and communication quality in ESL classrooms. *TESL Reporter*, 45 (1), 17-36.
- Cao, Y., & Philp, J. (2006). Interactional context and willingness to communicate: A comparison of behavior in whole class, group and dyadic interaction. *System*, 34, 480–493. doi:10.1016/j.system.2006.05.002
- Cetinkaya, Y. B. (2005). *Turkish college students' willingness to communicate in English as a foreign language* (Unpublished doctoral dissertation). Columbus, OH: Ohio State University.
- Chang, C. F. (2018). *Exploring factors influencing the willingness to communicate among English-as-a-second language university students* (Unpublished doctoral dissertation). The University of San Francisco, San Francisco, CA.
- Charos, C. (1994). *Personality and individual differences as predictors of second language communication: A causal analysis*. (Unpublished honors thesis), University of Ottawa, Canada.
- Clark, H. H., & Fox Tree, J. E. (2002). Using uh and um in spontaneous speaking. *Cognition*, 84(1), 73-111. doi:10.1016/S0010-0277(02)00017-3
- Clément, R., Baker, S. C., & MacIntyre, P. D. (2003). Willingness to communicate in a second language: The effects of context, norms, and vitality. *Journal of Language and Social Psychology*, 22, 190–209. doi:10.1177/0261927X03022002003
- Council of Europe. (2001). *Common European framework of reference for languages: Learning, teaching, assessment*. Cambridge, U.K.: Press Syndicate of the University of Cambridge.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks: SAGE Publications.

- Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Los Angeles: SAGE Publications.
- Cucchiaroni, C., Strik, H., & Boves, L. W. J. (2002). Quantitative assessment of second language learners' fluency: Comparisons between read and spontaneous speech. *Journal of the Acoustical Society of America*, *111*(6), 2862-2873. doi:10.1121/1.1471894
- D'Amico, M. L. (2012). L2 fluency and Willingness to communicate: The impact of short-term study abroad versus at-home study. *US-China Foreign Language*, *10*(10), 1608-1625.
- de Bot, K. (2008). Introduction: Second language development as a dynamic process. *The Modern Language Journal*, *92*(2), 166-178. doi:10.1111/j.1540-4781.2008.00712.
- de Bot, K. & Lowie, W., Thorne, S., & Verspoor, M. (2013). Dynamic Systems Theory as a comprehensive theory of second language development. In M. Martínez Adrián, M. J. Gutierrez Mangado, & M. P. García Mayo (Eds.), *Contemporary approaches to second language acquisition* (pp. 199-219). DOI: 10.1075/aals.9.13ch10.
- de Bot, K., Lowie, W., & Verspoor, M. (2007). A dynamic systems theory approach to second language acquisition. *Bilingualism: Language and Cognition*, *10*(1), 7-21. doi:10.1017/S1366728906002732
- de Bot, K. & Larsen-Freeman (2011). Researching second Language development from a dynamic systems theory perspective. In W. Lowie, W., K. de Bot, & M. Verspoor (Eds.), *A dynamic approach to second language development: Methods and techniques* (pp. 5-23). doi:10.1075/llt.29
- de Saint Léger, D., & Storch, N. (2009). Learners' perceptions and attitudes: Implications for willingness to communicate in a L2 classroom. *System*, *37*(2), 269-285. doi:10.1016/j.system.2009.01.001
- Dechert, H. W. (1980). Pauses and intonation as indicators of verbal planning in second-language speech productions: Two examples from a case study. In H. W. Dechert & M. Raupach (Eds.), *Temporal variables in speech* (pp. 271-285). The Hague: Mouton.
- Derwing, T. M., Rossiter, M. J., Munro, M. J., & Thomson, R. I. (2004). Second language fluency: Judgments on different tasks. *Language Learning*, *54*(4), 655-679. doi:10.1111/j.1467-9922.2004.00282.x
- Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford: Oxford University Press.
- Dörnyei, Z. (2014). Researching complex dynamic systems: 'Retrodictive qualitative modelling' in the language classroom. *Language Teaching*, *47* (1), 80-91. doi:10.1017/S0261444811000516
- Dörnyei, Z., & Kormos, J. (1998). Problem-solving mechanisms in L2 communication. A psycholinguistic perspective. *Studies in Second Language Acquisition*, *20*(3), 349-385. doi:10.1017/S0272263198003039

- Dörnyei, Z., MacIntyre, P. D., & Henry, A. (Eds.). (2015). *Motivational dynamics in language learning*. Bristol: Multilingual Matters.
- Duck, S., & McMahan, D. T. (2015). *Communication in everyday life: the basic course education with public speaking*. Thousands Oakes, CA: Sage Publications, Inc.
- Duncan, H., Segalowitz, N., & Phillips, N. (2016). Differences in L1 linguistic attention control between monolinguals and bilinguals. *Bilingualism-Language and Cognition*, 19(1), 106-121. doi:10.1017/S136672891400025X
- Fayer, J. M., & Krasinski, E. (1995). Perception of hesitation in nonnative speech. *Bilingual Review/ Revista Bilingue*, 20(2), 114-121.
- Fillmore, C. J. (1979). On fluency. In C. J. Fillmore, D. Kempler & W. S-Y. Wang (Eds.), *Individual differences in language ability and language behavior* (pp. 85-101). New York: Academic Press.
- Freed, B. F. (1995). What makes us think that students who study abroad become fluent? In B. F. Freed (Ed.), *Second language acquisition in a study abroad context: Studies in bilingualism* (pp. 123-148). Amsterdam: John Benjamins.
- Gass, S. M., & Mackey, A. (2007). *Data elicitation for second and foreign language research*. New York: Routledge.
- Gelo, O., Braakmann, D., & Benetka, G. (2008). Quantitative and qualitative research: Beyond the debate. *Integrative Psychological and Behavioral Science*, 42(3), 266-290. doi:10.1007/s12124-008-9078-3
- Ghonsooly, B., Khajavy, G. H. & Asadpour, S. F. (2012). Willingness to communicate in English among Iranian non-English major university students. *Journal of Language and Social Psychology*, 31(2), 197–211. doi: 10.1177/0261927X12438538
- Ginther, A., Dimova, S., & Yang, R. (2010). Conceptual and empirical relationships between temporal measures of fluency and oral English proficiency with implications for automated scoring. *Language Testing*, 27(3), 379-399. doi:10.1177/0265532210364407
- Goldman-Eisler, F. (1951). The measurement of time sequences in conversational behaviour. *British Journal of Psychology*, 42, 355-362.
- Goldman-Eisler, F. (1961). Hesitation and information in speech. In Colin Cherry (ed.), *Information theory*, (pp. 162-174). London: Butterworths.
- Goldman-Eisler, F. (1968) *Psycholinguistics: Experiments in spontaneous speech*. London: Academic Press.
- Götz, S. (2013). *Fluency in native and nonnative English speech*. Amsterdam: John Benjamins Publishing Company.

- Griffiths, R. (1991). Paedagogical research in a L2 context: A rationale, and review of selected studies. *Applied Linguistics*, 12(4), 345-364.
- Gut, U. (2009). Non-native speech: *A corpus-based analysis of phonological and phonetic properties of L2 English and German*. Frankfurt: Peter Lang.
- Haken, H. (2006). *Information and self-organization: A microscopic approach to complex systems*. New York: Springer.
- Hashimoto, Y. (2002). Motivation and willingness to communicate as predictors of reported L2 use: the Japanese ESL context. *Second Language Studies*, 20(2), 29-70.
- Heylighen, F. (1989). Self-organization, emergence, and the structure of complexity. In *Proceedings of the European Congress on Systems Science* (pp. 23-32). Paris: AFCET.
- Hiver, P. (2015a). Attractor states. In Z. Dörnyei, P. D. MacIntyre and A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 20-28). Bristol: Multilingual Matters.
- Hiver, P. (2015b). Once burned, twice shy: the dynamic development of system immunity in teachers. In Z. Dörnyei, P. D. MacIntyre and A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 214-237). Bristol: Multilingual Matters.
- Hsu, L. L. (2005). *The relationship among teachers' verbal and nonverbal immediacy behaviors and students' willingness to speak in English in central Taiwanese college classrooms* (Unpublished doctoral dissertation). Oral Roberts University, Tulsa, OK.
- Huebner, T. (1985). System and variability in interlanguage syntax. *Language Learning*, 35, 141-163.
- Irie, K., & Ryan, S. (2015). Study abroad and the dynamics of change in learner L2 self-concept. In Z. Dörnyei, P. D. MacIntyre and A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 343-366). Bristol: Multilingual Matters.
- Ickes, W., Holloway, R., Stinson, L. L., & Hoodenpyle, T. G. (2006). Self-monitoring in social interaction: The centrality of self-affect. *Journal of Personality*, 74(3), 659-684. doi:10.1111/j.1467-6494.2006.00388.x
- Kang, S. J. (2005). Dynamic emergence of situational willingness to communicate in a second language. *System*, 33(2), 277-292. doi:10.1016/j.system.2004.10.004
- Kahng, J. (2014). Exploring utterance and cognitive fluency of L1 and L2 English speakers: Temporal measures and stimulated recall. *Language Learning*, 64(4), 809-854. doi:10.1111/lang.12084
- Khabbazzashi, N. (2017). Topic and background knowledge effects on performance in speaking assessment. *Language Testing*, 34(1), 23-48. doi:10.1177/0265532215595666
- Khajavy, G. H., Ghonsooly, B., Hosseini Fatemi, A., & Choi, C. W. (2016). Willingness to

- communicate in English: A microsystem model in the Iranian EFL classroom context. *TESOL Quarterly*, 50(1), 154-n/a. doi:10.1002/tesq.204
- Koponen, M., & Riggenbach, H. (2000). Overview: Varying perspectives on fluency. In H. Riggenbach (Ed.), *Perspectives on fluency* (pp. 43-61). Ann Arbor: The University of Michigan Press.
- Kormos, J. (2000). The role of attention in monitoring second language speech production. *Language Learning*, 50(2), 343-384. doi:10.1111/0023-8333.00120
- Kormos, J., & Dénes, M. (2004). Exploring measures and perceptions of fluency in the speech of second language learners. *System*, 32(2), 145-164. doi:10.1016/j.system.2004.01.001
- Larsen-Freeman, D. (1997). Chaos/Complexity science and second language acquisition. *Applied Linguistics*, 18(2), 141-165. doi:10.1093/applin/18.2.141
- Larsen-Freeman, D. (2006). The emergence of complexity, fluency, and accuracy in the oral and written production of five Chinese learners of English. *Applied Linguistics*, 27(4), 590-619. doi:10.1093/applin/aml029
- Larsen-Freeman, D. (2012). Complex, dynamic systems: A new transdisciplinary theme for applied linguistics? *Language Teaching*, 45(2), 202-214. doi:10.1017/S0261444811000061
- Larsen-Freeman, D. (2015). Ten lessons from complex dynamic systems theory: What is on offer. In Z. Dörnyei, P. D. MacIntyre and A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 11-19). Bristol: Multilingual Matters.
- Larsen-Freeman, D., & Cameron, L. (2008). Research methodology on language development from a complex systems perspective. *The Modern Language Journal*, 92(2), 200-213. doi:10.1111/j.1540-4781.2008.00714.x
- Lennon, P. (1984). Retelling a story in English. In H. W. Dechert, D. Möhle, & M. Raupach (Eds.), *Second language productions* (pp. 50-68). Tübingen: Gunter Narr Verlag.
- Lennon, P. (1990). Investigating fluency in EFL: A quantitative approach. *Language Learning*, 40(3), 387-417. doi:10.1111/j.1467-1770.1990.tb00669.x
- Lennon, P. (2000). The lexical element in spoken second language fluency. In H. Riggenbach (ed.), *Perspectives on Fluency* (pp. 25-42). Ann Arbor MI: The University of Michigan Press.
- Levelt, W. J. M. (1989). *Speaking: from intention to articulation*. Cambridge, MA: MIT Press.
- Levelt, W. (1999). Producing spoken language: A blueprint of the speaker. In C. Brown and P. Hagoort (Eds.), *The neurocognition of language* (pp. 83-122). Oxford, UK: Oxford University Press.
- Logan, G. D. (1988). Towards an instance theory of automatization. *Psychological Review*, 95,

492-527.

- Lorenz, E. (1963). Deterministic non-periodic flow. *Journal of Atmospheric Sciences*, 20, 130 – 141.
- Luoma, S. (2004). *Assessing speaking*. Cambridge: Cambridge University Press.
- MacIntyre, P. D. (1994). Variables underlying willingness to communicate: a causal analysis. *Communication Research Reports*, 11(2), 135-142.
- MacIntyre, P. D. (2007). Willingness to communicate in the second language: Understanding The decision to speak as a volitional process. *The Modern Language Journal*, 91(4), 564–576. doi:10.1111/j.1540-4781.2007.00623.x
- MacIntyre, P. D. (2012a). The idiodynamic method: A closer look at the dynamics of communication traits. *Communication Research Reports*, 29(4), 361. doi:10.1080/08824096.2012.723274
- MacIntyre, P. (2012b). Currents and waves: examining willingness to communicate on multiple timescales. In H. M. McGarrell, & R. R. Courchene (Eds.), vol. 38/2. Special research symposium issue of CONTACT. Refereed proceedings of TESL Ontario research symposium, October 2011 (pp. 12-22).
- MacIntyre, P., Babin, P. A., & Clément, R. (1999). Willingness to communicate: Antecedents and consequences. *Communication Quarterly*, 47, 215–229. doi:10. 1080/01463379909370135
- MacIntyre, P. D., Baker, S. C., Clément, R., & Conrod, S. (2001). willingness to communicate, social support, and language-learning orientations of immersion students. *Studies in Second Language Acquisition*, 23(3), 369-388. doi:10.1017/S0272263101003035
- MacIntyre, P. D., Baker, S. C., Clément, R., & Donovan, L. A. (2003). Talking in order to learn: Willingness to communicate and intensive language programs. *Canadian Modern Language Review/ La Revue Canadienne Des Langues Vivantes*, 59(4), 589-608. doi:10.3138/cmlr.59.4.589
- MacIntyre, P., Baker, S. C., Clément, R., & Donovan, L. A. (2002). Sex and age effects on willingness to communicate, anxiety, perceived competence, and L2 motivation among junior high school French immersion students. *Language Learning*, 52(3), 537–564. doi:10.1111/1467-9922.00194
- MacIntyre, P. D., Burns, C., & Jessome, A. (2011). Ambivalence about communicating in a second language: A qualitative study of French immersion students' willingness to communicate. *The Modern Language Journal*, 95(1), 81-96. doi:10.1111/j.1540-4781.2010.01141.x
- MacIntyre, P. D., & Charos, C. (1996). Personality, attitudes, and affect as predictors of second language communication. *Journal of Language and Social Psychology*, 15(1), 3-26.

- MacIntyre, P. D., Dörnyei, Z., Clément, R., & Noels, K. A. (1998). Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal*, 82(4), 545-562.
- MacIntyre, P. D., & Doucette, J. (2010). Willingness to communicate and action control. *System*, 38(2), 161-171. doi:10.1016/j.system.2009.12.013
- MacIntyre, P. D., & Legatto, J. J. (2011). A dynamic system approach to willingness to communicate: Developing an idiodynamic method to capture rapidly changing affect. *Applied Linguistics*, 32(2), 149-171. doi:10.1093/applin/amq037
- MacIntyre, P. D., & Serroul, A. (2015). Motivation on a per-second timescale: Examining approach-avoidance motivation during L2 task performance. In Z. Dörnyei, P. D. MacIntyre and A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 109-138). Bristol: Multilingual Matters.
- Mackey, A., & Gass, S. M., (2005). *Second language research: Methodology and design*. Mahwah, NJ: Lawrence Erlbaum. doi:10.4324/9781410612564
- Maclay, H., & Osgood, C. E. (1959). Hesitation phenomena in spontaneous English speech. *Word*, 19, 19-44.
- Marshall, C., & Rossman, G. B. (2016). *Designing qualitative research*. Thousand Oaks, California: SAGE.
- Matsuoka, R. (2005). *Japanese college students' willingness to communicate in English*. (Doctoral dissertation). Retrieved from ProQuest Dissertations. (3233454)
- McCroskey, J. C., & Baer, J. E. (1985). *Willingness to communicate: The construct and its measurement*. Paper presented at the annual meeting of the Speech Communication Association, Denver, CO. (ERIC Document Reproduction Service No. ED265604)
- McCroskey, J. C., & McCroskey, L. L. (1986). *Correlates of willingness to communicate*. Paper presented at the annual convention of the Western Speech Communication Association, Tucson, AZ.
- McCroskey, J. C., & Richmond, V. P. (1991). Willingness to communicate: A cognitive view. In M. Booth- Butterfield (Ed.), *Communication, cognition, and anxiety* (pp. 19-37). Newbury Park, CA: Sage.
- Meisel, J. (1987). A note on second language speech production. In H. W. Dechert & M. Raupach (eds.), *Psycholinguistic models of production*, (pp. 83-90). Norwood, NJ: Ablex Publishing Corporation.
- Menzel, K. E., & Carrell, L. J. (1999). The impact of gender and immediacy on willingness to talk and perceived learning. *Communication Education*, 48(1), 31-40. doi:10.1080/03634529909379150

- Mercer, S. (2015). Dynamics of the self: A multilevel nested systems approach. In Z. Dörnyei, P. D. MacIntyre and A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 139-163). Bristol: Multilingual Matters.
- Mitchell, S. (2003). *Biological complexity and integrative pluralism*. Cambridge: Cambridge University Press.
- Möhle, D. (1984). A comparison of the second language speech production of different native speakers. In H. W. Dechert, D. Möhle, and M. Raupach (Eds.). *Second language productions* (pp. 26-49). Tübingen: G. Narr Verlag.
- Matsuoka, R., Matsumoto, K., Poole, G., & Matsuoka, M. (2014). Japanese university students' willingness to communicate in English: The serendipitous effect of oral presentations. *Journal of Pan-Pacific Association of Applied Linguistics*, 18(1), 193-218.
- Mystkowska-Wiertelak, A. (2018). Fluctuations in willingness to communicate during a semester: A case study. *Language Learning Journal*, 1-12. doi:10.1080/09571736.2018.1469660
- Mystkowska-Wiertelak, A., & Pawlak, M. (2014). Fluctuations in learners' willingness to communicate during communicative task performance: Conditions and tendencies. *Research in Language*, 12(3), 245-260. doi:10.2478/rela-2014-0019
- Nematizadeh, S., & Wood, D. (2019). Willingness to communicate and L2 speech fluency: An investigation of affective and cognitive dynamics. *The Canadian Modern Language Review*, 73(3), 197-215. doi:10.3138/cmlr.2017-0146
- Newman, L. (2009). Human-environment interactions: Complex systems approaches for dynamic sustainable developments. In R. Meyers (ed.), *Encyclopedia of Complexity and Systems Science* (pp. 4631-4643). New York: Springer.
- Nooteboom, S. G., & Quené, H. (2017). Self-monitoring for speech errors: Two-stage detection and repair with and without auditory feedback. *Journal of Memory and Language*, 95, 19-35. doi:10.1016/j.jml.2017.01.007
- O'Sullivan, B. (2002). Learner acquaintanceship and oral proficiency test pair-task performance. *Language Testing*, 19(3), 277-295. doi:10.1191/0265532202lt205oa
- Oviatt, S. (1995). Predicting spoken disfluencies during human-computer interaction. *Computer Speech & Language*, 9(1), 19-35. doi:10.1006/csla.1995.0002
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, Calif: Sage Publications.
- Pawlak, M., and Mystkowska-Wiertelak, A. (2015). Investigating the dynamic nature of L2 willingness to communicate. *System* 50, 1-9.
- Pawlak, M., Mystkowska-Wiertelak, A., & Bielak, J. (2015). Investigating the nature of

- classroom willingness to communicate (WTC): A micro-perspective. *Language Teaching Research*, doi:10.1177/1362168815609615
- Pawley, A., & Syder, F. H. (2000). The one-clause-at-a-time hypothesis. In H. Riggenbach (Ed.), *Perspectives on fluency* (pp. 163–199). Ann Arbor MI: The University of Michigan Press.
- Peng, J. E. (2007). Willingness to communicate in the Chinese EFL classroom: A cultural perspective. In J. Liu (Ed.), *English language teaching in China: New approaches, perspectives and standards* (pp. 250–269). London: Continuum.
- Peng, J. E. (2012). Towards an ecological understanding of willingness to communicate in EFL classrooms in China. *System*, 40(2), 203–213. doi: 10.1016/j.system.2012.02.002
- Peng, J. (2013). The challenge of measuring willingness to communicate in EFL contexts. *The Asia-Pacific Education Researcher*, 22(3), 281–290. doi:10.1007/s40299-012-0053-x
- Peng, J. E., & Woodrow, L. (2010). Willingness to communicate in English: A model in Chinese EFL classroom context. *Language Learning*, 60(4), 834–876. doi: 10.1111/j.1467-9922.2010.00576.x
- Piniel, K., & Csizér, K. (2015). Changes in motivation, anxiety and self-efficacy during the course of an academic writing seminar. In Z. Dörnyei, P. D. MacIntyre and A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 164–194). Bristol: Multilingual Matters.
- Préfontaine, Y. (2013). Perceptions of French fluency in second language speech production. *The Canadian Modern Language Review / La Revue Canadienne Des Langues Vivantes*, 69(3), 324–348.
- Raupach, M. (1980). Temporal variables in first and second language speech production. In H. W. Dechert & M. Raupach (Eds.), *Temporal variables in speech* (pp. 263–270). The Hague: Mouton.
- Raupach, M. (1984). Formulae in second language speech production. In H. W. Dechert, D. Möhle, & M. Raupach (Eds.), *Second language productions* (pp. 114–137). Tübingen: Gunter Narr Verlag.
- Rehbein, J. (1987). On fluency in second language speech production. In H. W. Dechert & M. Raupach (Eds.), *Psycholinguistic models of language production* (pp. 97–105). Norwood, NJ: Ablex.
- Riggenbach, H. (1991). Toward an understanding of fluency: A microanalysis of nonnative speaker conversations. *Discourse Processes*, 14, 423–441.
- Roberts, B., & Kirsner, K. (2000). Temporal cycles in speech production. *Language and Cognitive Processes*, 15(2), 129–157. doi:10.1080/016909600386075
- Rochester, S. R. (1973). The significance of pauses in spontaneous speech. *Journal of Psycholinguistic Research*, 2(1), 51–81. doi:10.1007/BF01067111

- Rossiter, M. J. (2009). Perceptions of L2 fluency by native and non-native speakers of English. *The Canadian Modern Language*, 65(3), 395-412. doi:10.3138/cmlr.65.3.395
- Skehan, P. (1998). *A cognitive approach to language learning*. Oxford: Oxford University Press.
- Saldaña, J. (2013). *The coding manual for qualitative researchers*. Los Angeles: Sage Publications.
- Segalowitz, N. (2010). *Cognitive bases of second language fluency*. New York: Routledge.
- Segalowitz, N. (2016). Second language fluency and its underlying cognitive and social determinants. *International Review of Applied Linguistics in Language Teaching*, 54(2), 79-95. doi:10.1515/iral-2016-9991
- Segalowitz, N., & Freed, B. (2004). Context, contact, and cognition in oral fluency acquisition – learning Spanish in at home and study abroad contexts. *Studies in Second Language Acquisition*, 26(2), 173-199. doi:10.1017/S0272263104062023
- Segalowitz, N., & Frenkiel-Fishman, S. (2005). Attention control and ability level in a complex cognitive skill: Attention shifting and second-language proficiency. *Memory & Cognition*, 33(4), 644-653. doi:10.3758/BF03195331
- Seliger, H. W. (1980). Data sources and the study L2 speech performance: Some theoretical issues. *Interlanguage Studies Bulletin*, 5(1), 31 – 46.
- Seliger, H. W. (1983). Learner interaction in the classroom and its effect on language acquisition. In H. W. Seliger and M. H. Long (Eds.), *Classroom oriented research in second language acquisition* (pp. 246 – 266). Rowley, MA: Newbury House.
- Schmid, M., & Beers Fägersten, K. (2010). Disfluency markers in L1 attrition. *Language Learning*, 60(4), 753-791.
- Seyfeddinipur, M., Kita, S., & Indefrey, P. (2008). How speakers interrupt themselves in managing problems in speaking: Evidence from self-repairs. *Cognition*, 108(3), 837-842. doi:10.1016/j.cognition.2008.05.004
- Spradley, J. P. (1979). *The ethnographic interview*. New York: HOH.
- Steenbeek, H., Jansen, L., & van Geert, P. (2012). Scaffolding dynamics and the emergence Of problematic learning trajectories. *Learning and Individual Differences*, 22(1), 64-75. doi:10.1016/j.lindif.2011.11.014
- Strauss, A. L. (1987). *Qualitative analysis for social scientists*. Cambridge: Cambridge University Press.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for*

- developing grounded theory*. Thousand Oaks, CA: Sage.
- Stebbins, R. A. (2001). *Exploratory research in the social sciences*. Thousand Oaks, London: SAGE.
- Surkamp, K. (2014). Non-verbal communication: Why we need it in foreign language teaching and how we can foster it with drama activities. *Scenario: Journal for Drama and Theatre in Foreign and Second Language Education*, 8(2), 28-43.
- Tavakoli, P., & Skehan, P. (2005). Strategic planning, task structure, and performance testing. In R. Ellis (Ed.), *Planning and task performance in a second language* (pp. 239–276). Amsterdam: John Benjamins.
- Thelen, E., & Smith, L. (1994). *A dynamic systems approach to development of cognition and action*. Cambridge: MIT Press.
- Towell, R. (1987). Variability and progress in the language development of advanced learners of a foreign language. In R. Ellis (Ed.), *Second language acquisition in context*. (pp. 113-127). Toronto: Prentice-Hall.
- Towell, R., Hawkins, R., & Bazergui, N. (1996). The development of fluency in advanced learners of French. *Applied Linguistics*, 17(1), 84 -119.
- Yousef, R., & Jamil, H. & Razak, N. (2013). Willingness to communicate in English: A study of Malaysian pre-service English teachers. *English Language Teaching*, 6(9), 205-216.
- Yu, M. (2011). Effect of communication variables, affective variables, and teacher immediacy on willingness to communicate of foreign language learners. *Chinese Journal of Communication*, 4(2), 218-236. doi:10.1080/17544750.2011.565678
- van Geert, P. (1994). Vygotskian Dynamics of Development. *Human Development*, 37, 346-365.
- van Geert, P. (2007). Dynamic systems in second language learning: Some general methodological reflections. *Bilingualism: Language and Cognition*, 10(1), 47-49. doi:10.1017/S136672890600280X
- Verspoor, M., Lowie, W., & Dijk, M. v. (2008). Variability in second language development from a dynamic systems perspective. *The Modern Language Journal*, 92(2), 214-231. doi:10.1111/j.1540-4781.2008.00715.x
- Waninge, F., Dörnyei, Z., & Bot, K. D. (2014). Motivational dynamics in language learning: Change, stability, and context. *The Modern Language Journal*, 98(3), 704-723. doi:10.1111/j.1540-4781.2014.12118.x
- Weaver, C. (2010). Japanese university students' willingness to use English with different interlocutors (Unpublished doctoral dissertation). Temple University, Tokyo, Japan.

- Wen, W. P., & Clément, R. (2003). A Chinese conceptualization of willingness to communicate in ESL. *Language, Culture and Curriculum*, 16, 18–38. doi: 10.1080/07908310308666654
- Wood, D. (2001). In search of fluency: What is it and how can we teach it? *The Canadian Modern Language Review*, 57(4), 571-589.
- Wood, D. (2006). Uses and functions of formulaic sequences in second language speech: An exploration of the foundations of literacy. *Canadian Modern Language Review*, 63, 13–33. doi:10.1353/cml.2006.0051
- Wood, D. (2010). *Formulaic language and second language speech fluency: Background, evidence and classroom applications*. London: Continuum.
- Wood, D. (2012). Willingness to communicate and L2 fluency: complexity and variety in a corpus of Japanese and Chinese ESL learner speech. *Contact Magazine*, 38 (2), pp. 23-39.
- Wood, D. (2015). *Fundamentals of formulaic language: An introduction*. London: Bloomsbury Publishing Plc.
- Wood, D. (2016). Willingness to communicate and second language speech fluency: An idiodynamic investigation. *System*, 60, 11-28. doi:10.1016/j.system.2016.05.003
- Wray, A. (2008). *Formulaic language: Pushing the boundaries*. Oxford, UK: Oxford University Press.
- Yashima, T. (2002). Willingness to communicate in a second language: The Japanese EFL context. *The Modern Language Journal*, 86(1), 54–67. doi: 10.1111/1540-4781.00136
- Yashima, T., Zenuk-Nishide, L., & Shimizu, K. (2004). The influence of attitudes and affect on willingness to communicate and second language communication. *Language Learning*, 54, 119–152. doi:10.1111/j.1467-9922.2004.00250.x

## Appendices

### Appendix A. Carleton University REB Clearance

Office of Research Ethics and Compliance  
 5110 Human Computer Interaction Bldg | 1125 Colonel By Drive Ottawa, Ontario K1S 5B6  
 613-520-2600 Ext: 2517  
[ethics@carleton.ca](mailto:ethics@carleton.ca)

#### CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE

The Carleton University Research Ethics Board-A (CUREB-A) has granted ethics clearance for the research project described below and research may now proceed. CUREB-A is constituted and operates in compliance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2).

Ethics Protocol Clearance ID: Project # 107238

Project Team Members: Mr. Shahin Nematizadeh (Primary Investigator)

David Wood (Research Supervisor)

Project Title: Willingness to communicate and second language speech fluency; an investigation of cognitive and affective dynamics. [Shahin Nematizadeh]

Funding Source (If applicable):

Effective: August 24, 2017

Expires: August 31, 2018.

#### Restrictions:

This certification is subject to the following conditions:

- 1 Clearance is granted only for the research and purposes described in the application.
- 2 Any modification to the approved research must be submitted to CUREB-A via a Change to Protocol Form. All changes must be cleared prior to the continuance of the research.
- 3 An Annual Status Report for the renewal of ethics clearance must be submitted and cleared by the renewal date listed above. Failure to submit the Annual Status Report will result in the closure of the file. If funding is associated, funds will be frozen.
- 4 A closure request must be sent to CUREB-A when the research is complete or terminated.
- 5 Should any participant suffer adversely from their participation in the project you are required to report the matter to CUREB-A.

Failure to conduct the research in accordance with the principles of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans 2nd edition* and the *Carleton University Policies and Procedures for the Ethical Conduct of Research* may result in the suspension or termination of the research project. Please contact the Research Compliance Coordinators, at [ethics@carleton.ca](mailto:ethics@carleton.ca), if you have any questions or require a clearance certificate with a signature.

CLEARED BY:

Andy Adler, PhD, Chair, CUREB-A

Bernadette Campbell, PhD, Vice-Chair, CUREB

Date: August 24, 2017

## Appendix B. University of Ottawa REB Clearance

File Number: 09-17-20

Date (mm/dd/yyyy): 09/25/2017



**Université d'Ottawa**  
Bureau d'éthique et d'intégrité de la recherche

**University of Ottawa**  
Office of Research Ethics and Integrity

## Ethics Approval Notice

### Social Science and Humanities REB

#### Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
David	Wood	Linguistics / Carleton University	Supervisor
Shahin	Nematizadeh	Linguistics / Carleton University	Student Researcher

File Number: 09-17-20

Type of Project: PhD Thesis

Title: Willingness to communicate and second language speech fluency; an investigation of cognitive and affective dynamics

<b>Approval Date (mm/dd/yyyy)</b>	<b>Expiry Date (mm/dd/yyyy)</b>	<b>Approval Type</b>
09/25/2017	08/31/2018	Approval

Special Conditions / Comments:

N/A

File Number: 09-17-20

Date (mm/dd/yyyy): 09/25/2017



**Université d'Ottawa**  
Bureau d'éthique et d'intégrité de la recherche

**University of Ottawa**  
Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement (2010) and other applicable laws and regulations in Ontario, has examined and approved the ethics application for the above named research project. Ethics approval is valid for the period indicated above and subject to the conditions listed in the section entitled "Special Conditions / Comments".

During the course of the project, the protocol may not be modified without prior written approval from the REB except when necessary to remove participants from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the project (e.g., change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, including consent and recruitment documentation, should be submitted to the Ethics Office for approval using the "Modification to research project" form available at: <http://research.uottawa.ca/ethics/submissions-and-reviews>.

Please submit an annual report to the Ethics Office four weeks before the above-referenced expiry date to request a renewal of this ethics approval. To close the file, a final report must be submitted. These documents can be found at: <http://research.uottawa.ca/ethics/submissions-and-reviews>.

If you have any questions, please do not hesitate to contact the Ethics Office at extension 5387 or by e-mail at [ethics@uOttawa.ca](mailto:ethics@uOttawa.ca).

**Signature:**

Riana Marcotte  
Protocol Officer for Ethics in Research  
For Barbara Graves, Chair of the Social Sciences and Humanities REB

### Appendix C. Invitation Email (Social media)



Dear Iranians of Ottawa,

My name is Shahin Nematizadeh and I am a PhD Candidate in Applied Linguistics and Language Studies. My PhD project investigates second language speech fluency and to do that, I need twenty Persian ESL (English as a second language) participants who have entered Canada and begun a Master's or PhD program in an engineering field in the past year. It is hoped that this study will contribute to the teaching methods of speech fluency to ESL speakers and Iranians, in particular.

If you match the requirements are interested or know anyone, please let me know. Participants will receive an honorarium of 80\$ upon the completion of four hours of data collection.

**Please note that this research has been cleared by Carleton University Research Ethics Board-A (CUREB-A clearance # 107238).** For more details, please send me an empty email to the following email address: shaahinnematizadeh@cmail.carleton.ca

Regards,  
Shahin Nematizadeh

درود،

شاهین نعمتی زاده هستم، دانشجوی مقطع دکتری دپارتمان زبان شناسی و مطالعات زبانی. برای پروژه تحقیقاتی دکتری ام نیاز به ۲۰ نفر فارسی زبان دارم که در طول یک سال گذشته به هدف تحصیل در مقطع کارشناسی ارشد یا دکتری وارد کانادا شده اند. این تحقیق در راستای درک بهتره متغیرروایی زبانی یا همان Fluency است و امیدواریم بتوانیم در نهایت به منتهای تدریس زبان انگلیسی تقویت روایی گفتار فارسی زبانان کمک کنیم. اگر احيانا این شرایط را دارید و مایل به شرکت در این پروژه میباشند و یا کسی را می شناسید با این شرایط کمک بزرگی به من کردید. شرکت کنندگان در نهایت پس از شرکت در ۴ ساعت مبلغ 80 دلار هدیه خواهند گرفت.

برای جزئیات بیشتر راجع به پروژه، یک ایمیل خالی به آدرس ایمیل من بفرستید.

با تشکر

شاهین نعمتی زاده

ShaahinNematizadeh@cmail.carleton.ca

SCHOOL OF LINGUISTICS AND LANGUAGE STUDIES  
358 ST. PATRICK'S BUILDING  
1125 COLONEL BY DRIVE  
OTTAWA, ON, K1S 5B6  
PHONE: 613-520-6612  
FAX: 613-520-6641

## Appendix D. Participant Recruitment Email



Dear Sir/Madam,

SCHOOL OF LINGUISTICS AND LANGUAGE STUDIES  
358 ST. PATRICK'S BUILDING  
1125 COLONEL BY DRIVE  
OTTAWA, ON, K1S 5B6  
PHONE: 613-520-6612  
FAX: 613-520-6641

My name is Shahin Nematizadeh and I am a PhD student in the School of Linguistics and Language Studies at Carleton University. I am emailing you to invite you to be a participant in my PhD research project, supervised by Dr. David Wood. I will provide a brief overview of my study and what you will be required to do.

### My Proposed Research Overview

It is believed that language learning, and second/foreign language in particular, can be influenced by a number of factors. Some of these factors include confidence, motivation, anxiety, etc. The factor that I am proposing to investigate as a variable is willingness to communicate (or WTC - general individual's tendency to engage in communication when there is opportunity (McCroskey and Richmond, 1987)). The other factor that I will investigate in this study is speech fluency. Speech fluency has been defined as the ability to talk at length without many pauses and avoid silence. (Fillmore, 1979). I am proposing to explore the possible interaction between willingness to communicate and second language speech fluency. The knowledge to this offers a myriad of advantages to language learners, teachers, and assessors.

### Tasks

If you agree to participate in the study, there will be four meetings for data collection that will last for a maximum of an hour each. These sessions will take place at Carleton University Library. The times will be flexible and arranged based on your availability. Each session, there are three phases to data collection:

You will first be given the informed consent form to complete. You will be informed that you will be able to withdraw up to 20 days after the data collection date. If you agree to sign the form, you will be asked to complete a questionnaire that mainly asks for your willingness to talk in different situations. This takes between 10-15 minutes.

You will then be given a picture and asked to describe it orally for approximately 3 minutes. The picture description task (monologue) will be video-recorded. There will be an interviewer to talk to, but the interviewer will not interrupt you or interfere with your talk.

You will be asked to view the recorded video immediately after you have described the picture and click a computer mouse to rate your willingness to talk from 1 to 10 using a computer application. The instructions will be given to you in Persian so that the language barrier will not influence the communication of thoughts. This may take up to 20 minutes.

Please note that you will only complete the consent form once where you will be assigned pseudonyms for confidentiality purposes.

### Benefits

If you are interested, you will be provided with feedback on your fluency and your overall oral proficiency. You will also receive a report of the findings once the study is complete. You will also receive an honorarium of 80\$ for your time.

Please feel free to contact me if you have any your questions. If interested, please reply to this email and express your interest. If not, simply ignore this email. Please note that this research has been cleared by Carleton University Research Ethics Board-A (CUREB-A clearance # 107238).

Regards,

Shahin Nematizadeh

Contact Info.: [shaahin.nematizadeh@carleton.ca](mailto:shaahin.nematizadeh@carleton.ca)

## Appendix E. Picture Description Tasks

### Food and Healthy Eating

- 1) Do you think you eat healthy? What are healthy and junk foods? Why?
- 2) Do you care about what you eat or do you avoid certain foods?
- 3) Are you or have you ever been on a diet? Why? Is it dangerous?

- Eating healthy/nutritious junk foods
- Counting calories
- To be or to go on a diet
- To lose/gain weight
- To watch what one eats
- Meat/seafood/vegetables/fruits
- Protein/Carbohydrates
- Delicious/tasty
- Organic vs. Genetically modified foods
- Food Pyramid

**Images blurred due to copyright**

## Online vs On-campus Education

- 1) Which one is more efficient or successful? Why?
- 2) What are the advantages and disadvantages of each?
- 3) Which one do you prefer or have you tried before?
- 4) Is online education more practical for specific fields of study?  
Which fields? Why?

- Student-teacher/professor interaction
- Online/virtual or traditional classrooms?
- Classmates/schoolmates
- Course assignments or term papers
- Individual or group work
- Degree, diploma, or certificate
- Campus dormitory
- Lectures and seminars
- Major, department, and curriculum
- Enroll in a course or take a credit
- Graduate/graduation party

Images blurred due to copyright

## Technology

- 1) What technological devices/gadgets do you own/use?
- 2) What are the advantages of technology in your life?
- 3) Does technology offer any disadvantages? If yes, what?

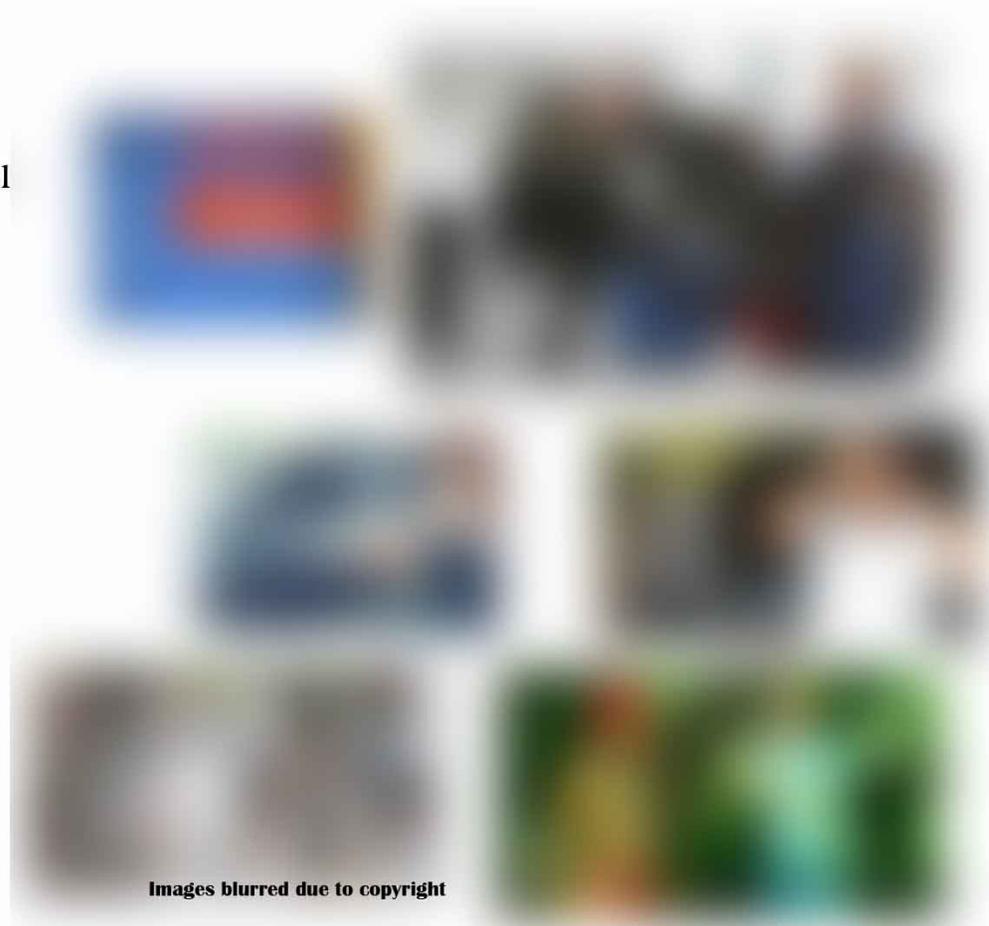
- Latest/major innovations
- Technological revolution/breakthrough
- Modern technology vs outdated trends
- IT (information technology)
- Applications/eBooks
- Internet connection/access
- Online world
- Device/equipment
- Robots

Images blurred due to copyright

## Transportation Problems

- 1) How serious are travel problems?
- 2) What can people do to avoid them?
- 3) What do you need before you can travel to another country?

- Itinerary or travel plans
- Traveling abroad
- Departure
- Arrival
- Luggage
- Traffic jam
- Foreign language
- Jet lag
- Flight delays/cancellations



Images blurred due to copyright

Appendix F. Background Questionnaire

Pseudonym: .....

- 1) Strongly Disagree
- 2) Disagree
- 3) Agree
- 4) Strongly Agree

		Topics															
No	Statement	Food and Healthy Eating				Online vs. On-campus Education				Technology				Transportation Problems			
		SD	D	A	SA	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA
1	This topic is familiar to me.																
2	The questions about this topic were easy to respond to.																
3	I know <i>A LOT</i> about this topic, i.e., I have <i>MORE THAN ENOUGH IDEAS</i> to talk about this topic.																
4	It was easy for me to produce enough ideas for this topic from memory.																
5	If I were to talk about this topic in my first language, I would have <i>MORE IDEAS</i> to talk about.																
6	I had appropriate words to express my ideas about this topic easily.																
7	I thought this was an interesting topic.																
8	I performed very well on this task.																

## Appendix G: Figure 3 Publisher's Consent

### JOHN WILEY AND SONS LICENSE TERMS AND CONDITIONS

Aug 13, 2019

This Agreement between Shahin Nematizadeh ("You") and John Wiley and Sons ("John Wiley and Sons") consists of your license details and the terms and conditions provided by John Wiley and Sons and Copyright Clearance Center.

License Number	4647210853856
License date	Aug 13, 2019
Licensed Content Publisher	John Wiley and Sons
Licensed Content Publication	Modern Language Journal
Licensed Content Title	Conceptualizing Willingness to Communicate in a L2: A Situational Model of L2 Confidence and Affiliation
Licensed Content Author	KIMBERLY A. NOELS, ZOLTÁN DÖRNYEI, RICHARD CLÉMENT, et al
Licensed Content Date	Oct 20, 2011
Licensed Content Volume	82
Licensed Content Issue	4
Licensed Content Pages	18
Type of use	Dissertation/Thesis
Requestor type	University/Academic
Format	Electronic
Portion	Figure/table
Number of figures/tables	1
Original Wiley figure/table number(s)	Figure 1
Will you be translating?	No
Title of your thesis / dissertation	WTC and L2 fluency, A complex dynamic systems perspective.
Expected completion date	Aug 2019
Expected size (number of pages)	300
Requestor Location	Shahin Nematizadeh, <span style="border: 1px solid black; display: inline-block; width: 200px; height: 1.2em; vertical-align: middle;"></span> Canada Attn: Shahin Nematizadeh
Publisher Tax ID	EU826007151
Total	0.00 CAD

## Appendix H: Figure 4 Publisher Consent



**Copyright  
Clearance  
Center**

**Welcome, Shahin**  
Not you?

Log out |  Cart (0) | [Manage Account](#) | [Feedback](#) | [Help](#) | 

---

**Get Permission / Find Title**

Go

[Advanced Search Options](#)

---

[Back to view orders](#)

Copy order >

 [Print this page](#)  
[Print terms & conditions](#)  
[Print citation information](#)  
[\(What's this?\)](#)

**Confirmation Number: 11841995**  
**Order Date: 08/15/2019**

---

**Customer Information**

**Customer:** Shahin Nematizadeh  
**Account Number:** 3001501922  
**Organization:** Carleton University  
**Email:** shaahinnematizadeh@cmail.carleton.ca  
**Phone:** +1 [REDACTED]

---

Search order details by:   Go

This is not an invoice

**Order Details**

**The cognitive bases of second language fluency**

Billing Status:  
**N/A**

**Order detail ID:** 71981465  
**ISBN:** 9780805856620  
**Publication Type:** Book  
**Publisher:** Routledge  
**Author/Editor:** Segalowitz, Norman

**Permission Status:** ✔ **Granted**  
**Permission type:** Republish or display content  
**Type of use:** Thesis/Dissertation  
**Order License Id:** 4650280621765

[View details](#)

**Note:** This item was invoiced separately through our **RightsLink service**. [More info](#) \$ 0.00

---

**Total order items: 1**

**Order Total: \$0.00**

## Appendix I: Interview Transcript and Translation Sample

### Akbar Task 1

- مصاحبه کننده: خوب میشه بگید چرا همین تقریبا اوایل ثانیه 11 این همه تمایل به ارتباط.....
- شرکت کننده (اکبر): دلیلش این بود که پاراگراف و بخش اول صحبتیم چی باشه رو تو ذهنم در نظر گرفته بودم که پیام بگم که قبل اینکه بخوام پیام کانادا فکر میکردم غذام سالمه ولی اومدم اینجا غذای چینی و کره ای رو خوردم فهمیدم که نه. ولی موقعی که اومدم استارت بزنم اینکه structure اولیه جمله و باز کردن سر صحبت رو به چه صورت انجام بدم توی ارائه structure توی represent کردن اولیش دچار مشکل شدم.
- مصاحبه کننده: یعنی مثلا عملا شک داشتی که از چه گرامری استفاده کنی و از چه ساختاری استفاده کنی.
- شرکت کننده (اکبر): من دقیقا سر اینکه ساختار چی باشه مثلا بعد که نشستم فکر کردم مثلا باید میگفتم .... first of all مثلا میخواستم این چنین چیزی بگم ولی موقعی که اومدم شروع به صحبت کنم اصلا یادم رفت چی میخواستم بگم.
- مصاحبه کننده: خوب پس انگار حتی موقعی که داشتی آماده میشدی واسش ساختارت هم آماده کرده بودی، نه نه ایده بلکه ساختارت رو هم آماده کرده بودی ولی اون لحظه به ذهنت نیومد
- شرکت کننده (اکبر): همش یک حالتی میشه که انگار نیاز دارم که برای هر بخش جمله improvise بکنم. هم structure رو هم کلماتی که میخوام بگم. میدونم چه موضوعی میخوام صحبت کنم
- مصاحبه کننده: این improvisation کلا تمایل به ارتباطت رو تأثیری داره روش؟
- شرکت کننده (اکبر): خیلی تأثیر منفی میذاره. یکی از بزرگتری مشکلات من همینه که یک جاهایی یک لحظه باید فکر کنم چی میخوام بگم چه ساختاری چه کلمه ای.

- مصاحبه کننده: خوب این اذیتت میکنه توی communication های روزانت.
- شرکت کننده (اکبر): خیلی اذیتم میکنه. چون من یک گروهی که باهاشون ارتباط دارم همشون کانادایین. موقعی که میخوام باهاشون صحبت کنم احساس میکنم و متوجه میشم که فرق و تفاوت بین من و اونارو قشنگ حس میکنم که اونا در مورد اون موضوعی که ما داریم صحبت میکنیم خیلی راحت کلمه رو میگن. من دارم صحبت میکنم جمله اول جمله دوم جمله سوم، یهو کلمه یا ساختار رو گیر میکنم، قشنگ تفاوت رو دارم متوجه میشم.
- مصاحبه کننده: خیلی عالی ممنونم. چی شد که مثلا از منفی 3 یکدفعه اومدی به مثبت 4
- شرکت کننده (اکبر): به ذهنم رسیدم چی میخوام بگم.
- مصاحبه کننده: چی با چطور؟
- شرکت کننده (اکبر): چه جور بگم. ...How to
- مصاحبه کننده: گرامر یا vocab؟
- شرکت کننده (اکبر): Structure
- مصاحبه کننده: توی مکالمات روزمره وقتی داره با دوستای native صحبت میکنی و بعداز یک breakdown که به ذهن نیاوردی، یهو یک چیزی به ذهنت میرسه که این تمایل به ارتباطت رو این همه میبره بالا یعنی از منفی 3 میاره به مثبت 4. اوکی
- شرکت کننده (اکبر): صحبت بعدی اینجا به ذهنم رسید.
- مصاحبه کننده: یا شایدم همین مثال غذای چینی یا کره ای واقعا چیزی بوده که خیلی مربوط بوده به بحث و حس میکردی support argument خوبه.
- شرکت کننده (اکبر): چیزایی بود که اتفاق افتاده بود برام. وقتی این رو گفتم دقیقا میدونستم که در مورد چی صحبت کنم. یک اتفاقی بود که قبلا برای من افتاده بود، اون رو چون میخواستم تشریح کنم خیلی راحت میتونستم در موردش صحبت کنم.

- مصاحبه کننده: آیا قبلا در مورد این موضوع با کسه دیگه ای هم صحبت کردی؟ به انگلیسی؟
- شرکت کننده (اکبر): بله به انگلیسی
- مصاحبه کننده: آیا با اینکه با کسه دیگه به انگلیسی زبان در رابطه با این موضوع صحبت کردی که احتمالا همین یک ماه گذشته هم بوده ، تو 2 هفته گذشته هم بوده، باعث شده که الان توی بیان کردنش تو انگلیسی راحت تر باشی؟
- شرکت کننده (اکبر): بله دقیقا
- مصاحبه کننده: پس نه تنها personal experience هست، بلکه prep هم شدی، حداقل یک بار دیگه در مورد این موضوع صحبت کردی.
- شرکت کننده (اکبر): من خیلی از ..... رو دو هفته پیش زدم. به جورایی انگار دارم همونایی که قبلا ..... زدم دوباره نیاز نداره که منو من کنم و بخوام در موردش صحبت کنم. حتی داشتم به این فکر میکردم چند جا که همون بحث رو بیام صحبت کنم، میتونستم در مورد همون غذای کره ای خیلی بیشتر صحبت کنم شاید 2 دقیقه میتونستم صحبت کنم، ولی چون مرتبط کامل به ..... منحرف میکردم مجبور میشدم دوباره برگردم اینجا. همین باعث میشد که دوباره نیاز داشته باشم ایده ای مطرح کنم که کامل در مورد این تایپیک باشه صرفا.
- مصاحبه کننده: پس این اینجوریه که واقعا personal experience چطور باعث میشه که شما بتونید prep تر و آماده تر در مورد این موضوع صحبت کنی.
- شرکت کننده (اکبر): دقیقا
- مصاحبه کننده: و حتی fluent تر. مرسی.
- شرکت کننده (اکبر): دقیقا اومده بودم در مورد این صحبت کنم که ما توی رژیم غذایی ایرانی خیلی از موارد تغذیه سالم رو نقض میکنیم. ولی نمیدونستم که این رو چجوری توی یک structure چهار پنج جمله

ای بیارم این بحث رو که ما ضعف داریم، این ضعف تو چه موارد اصلی ای است، به عنوان مثال توی این و این. داشتیم در مورد این سه چهار تا جمله پشت سر هم فکر میکردم اینجا که باعث شد back of کنم و یه خورده منو من میکردم که چی ها رو میخوام بگم.

مصاحبه کننده: اوکی مرسی. اما نیگا کن من فکر میکنم روی fluency تاثیر نداشت، درسته میگی که willingness to communicate اومده پایین، تمایل به ارتباطت رو اینجا منفی واسه من rate کردی، اما الزاما تو این مورد خاص fluency ت دچار مشکل نشده.

شرکت کننده (اکبر): بخاطر اینکه اصلا کلا طبیعت کاری قبل من یک جوری بود که باید همش خیلی مواقع بداعه حرف میزد، و اینجا خیلی مواقع حرف میزد، یعنی خودم عادت دارم حرف بزنم. خیلی ببخشید اینجوری میگم هر چرت و پرتی به ذهنم برسه میگم برای اینکه استاپ نکنم. ولی مطلب سر اینه که اگر فکر میکردم خیلی مطالب مرتب تر و دقیقتری رو میگفتم، حتی میومدم در مورد ارزش ویتامین و ارزش کالریش و اینا صحبت میکردم.

مصاحبه کننده: خوب این چرت و پرت هایی که میگی ما توی انگلیسی اسم داریم ازش، توی فیلد ما بهش میگی formulaic sequences یعنی یکسری جملات یکسری phrase ها، یکسری کلماتی که fill میکنن، filler هستند، یعنی بهت کمک میکنه که شما استاپ نکنی، pause نداشته باشی و ادامه بدی، اما معنای خاصی ندارند، مثلا as far as my personal experience has concerned، مثلا من این رو حفظ کردم، چیزی نگفتم، زمان خریدم، فکر کردم. این ها رومیگی یا نه واقعا حرف میزنی که درست هم شاید نباشه.

شرکت کننده (اکبر): نه نه معمولا اینجور موارد رو میگم. حرف نامربوطی نمیزنم، ولی حرفم خیلی سطحیه خیلی superficial هست، واقعا اون content که مد نظرم هست رو نمیتونم به زبان بیارم.

مصاحبه کننده: خوب پس language هست؟

شرکت کننده (اکبر): دقیقا

مصاحبه کننده: یعنی ایده هست ولی conversion به انگلیسی نیست.

- شرکت کننده (اکبر): کامل ایده هست.
- مصاحبه کننده: منظورم اینه که ایده رو داری ولی نمیدونی به انگلیسی چطور بیانش کنی.
- شرکت کننده (اکبر): دقیقا
- مصاحبه کننده: پس language هست، ایده که وجود داره.
- شرکت کننده (اکبر): دقیقا ایده وجود داره. بیشتر هم میشه گفتش که توی اون structure من مورد دارم که چجوری بخوام یک ایده رو توی چهار پنج جمله بیارم. اینکه به این فکر میکنم به هم میریزم.
- مصاحبه کننده: آیا هیچ وقت توی همین planning ساختاری به این نتیجه رسیدی که داری ترجمه میکنی از فارسی به انگلیسی.
- شرکت کننده (اکبر): متاسفانه. متاسفانه هر جا فارسی فکر میکنم منو من میره بالا، هر جا انگلیسی فکر میکنم خیلی راحت تر صحبت میکنم. ولی مشکل اینه که هنوز نتونستم راحت انگلیسی فکر کنم به طور کامل.
- مصاحبه کننده: آره همون که مشکل اکثر ما است.
- شرکت کننده (اکبر): اینایی رو که میخواستم بگم، میخواستم خیلی بیشتر از این توضیح بدم، نمیخواستم صرفا این رو بگم.
- مصاحبه کننده: دلیل این که توضیح ندادی چی بود.
- شرکت کننده (اکبر): دلیل اینکه توضیح ندادم دوباره همین بحث بود که من ایده رو داشتم، و ایده رو به فارسی تو ذهنم داشتم، قرمه درست میکنم، گوشت رو خورد میکنم، میذارم غذا جا بیاد، حالا این غذا جا بیاد رو چجوری تو انگلیسی بگم.
- مصاحبه کننده: آیا این ..... آیتم رو اگر الان بهت 5 دقیقه وقت بدیم یادت میاد یا نمیدونی اصلا؟
- شرکت کننده (اکبر): نه میدونم.

- مصاحبه کننده: اون لحظه به ذهنت نمیرسه. اوکی مرسی.
- شرکت کننده (اکبر): خیلی در موردش صحبت شد. خیلی صحبت کردم غذا چی درست کنم، چیجوری درست کنم، روغن کمتر مصرف کنم، سبزیجات بیشتر استفاده کنم. قشنگ به ذهنم میومد.
- مصاحبه کننده: با کی؟
- شرکت کننده (اکبر): با همخونه ایم. ایرانی کاناداییه. این الان 17 ساله تو کاناداست، قشنگ فارسی صحبت میکنه ولی درعین حال، انگلیسی هم خیلی داره روون صحبت میکنه چون از بچگی اینجا بوده. بعد خیلی از مواقع همین موضوع به من کمک میکنه. یک جایی فارسی صحبت میکنیم، یکدفعه از فارسی convert میکنیم به انگلیسی، و خیلی تاثیر گذاشت روی rate fluency خیلی تاثیر مثبتی گذاشت. این موضوع هم موضوعی بود که با هم صحبت کردیم.
- مصاحبه کننده: خیلی با هم صحبت کرده بودیم. اوکی.
- شرکت کننده (اکبر): دقیقا ایده تو ذهنم بود که چی موردی رو میخوام بگم. همین باعث شد که
- مصاحبه کننده: تمایل به ارتباطات بیاد بالا.
- شرکت کننده (اکبر): دقیقا
- مصاحبه کننده: چی شد اینجا دوباره اومد پایین.
- شرکت کننده (اکبر): اینجا داستان این بود که من میخوام بگم ... یعنی در ظاهر شاید بگی که خوب این الان در مورد liver fat داره صحبت میکنه ولی این drop افتادنش بخاطر این جمله ای که الان میخوام بگم نبود، در مورد این بود که من داشتم فکر میکردم این جمله بعدش چی میخواد بگه. و یک مشکلی بود همش خیلی از این drop هایی که داشتم بیشتر سر این بود که من داشتم در مورد یک موضوعی صحبت میکردم، خوب میرفتم جلو ولی وسطش باید یک pause میزدم چون داشتم از مسیر اصلی منحرف میشدم، یک جا مجبور بودم یک ترمز بزنم ..... چند تا از این drop ها بخاطرهمونا بود.

- مصاحبه کننده: که بهو off topic نشی. اوکی
- شرکت کننده (اکبر): ... فارسی بود اومد تو ذهنم، oops این ایدست، بعد خوب، convert میخواستم بکنم، چجوری convert کنم.
- مصاحبه کننده: همیشه دقیق بگی ساختار گرامری بود یا واژگانی یا هر دو.
- شرکت کننده (اکبر): .... پایین اومدن بخاطر اینه که ..... بالارفتن دوبارش بخاطر این بود که علاوه بر اینکه ساختار گرامری دستم اومد که به چه صورته ، جمله بعدی که میخواستم بگم هم تو ذهنم اومد.
- مصاحبه کننده: پس ایده رو داشتی، جملش هم اومد.
- شرکت کننده (اکبر): بله
- شرکت کننده (اکبر): گرامر رو میدونم، ساختار رو میدونم ولی اینکه به سرعت پیام ایدم رو توی این ساختارها پیاده کنم جمله به جمله، این هنوز دچار مشکله.
- مصاحبه کننده: چی شد اومد پایین؟ ..... خوب یعنی همین دودلی بین ایده ها مثلا؟
- شرکت کننده (اکبر): دقیقا . اینجا همین که نمیدونستم کدوم این ها رو وارد بحث بکنم. شاید توی conversation عادی خیلی راحت تر صحبت کنم ولی اینکه اینجا میدونم زمان داره تموم میشه خودش باعث میشد که دچار شک بشم. میگم متاسفانه مشکل این بود که من میدیدم در مورد یک بحثی بخوام خیلی عمق بدم شاید تو این زمان 3 دقیقه نشه انجام داد.
- شرکت کننده (اکبر): یک حالت مدنظر و مطلوبی برای بیان کردن داشتم، ولی متاسفانه چون به فارسی داشتم فکر میکردم، convert کنم به انگلیسی این وسط یک سری چیزا میپیرید. بخاطر اینکه من میخواستم اینجا در مورد ..... صحبت کنم ولی یک لحظه تو ذهنم نبود ..... یک لحظه به خودم گفتم که تو تا حالا ده بار گفتی vegetable, fruit ، بعد این اذیتم کرد، دقیقا موقعی که میخواستم این کلمه رو بگم، گفتم کاش این کلمه رو به کار نمی بردم.
- مصاحبه کننده: همش منفیه. این همونه.

شرکت کننده (اکبر): نه. اینجا بخاطر این بود که دیدم زمان داره تموم میشه میخواستم بحث رو جمع بکنم.

### English Translation

Interviewer: Can you tell me why at about the first 11 seconds the degree of willingness is this much...?

Interviewee: The reason is I had to consider how to begin my first paragraph like “before I come to Canada I thought I have a healthy diet but when I tried Chinese and Korean food I changed my mind”. But as I wanted to start I was in doubt how to make a better structure in representing my first sentence.

Interviewer: You mean u doubted what grammatical structure to use

Interviewee: I exactly doubted in structure I needed to use. For instance, after thinking carefully I had decided to use “first of all” but as I started I completely forgot what I wanted to say.

Interviewer: So, you mean u were truly prepared both for the idea and the structure but in action you failed to use them.

Interviewee: I kind of felt I needed to improvise both the structure and the words also as long as I know what topic I’m going to talk about.

Interviewer: Does the WTC affect your improvisation at all?

Interviewee: It does but negatively. It’s one of my biggest problems that I need to improvise what I have to say, to use what structure or words

Interviewer: so, it bothers you in your daily communication?

- Interviewee: yeah it really does. Especially when I'm talking with my Canadian friends. They speak really fluently on a topic but when its my turn I go with the first, second sentence but I get stuck with the third as I don't know what structure or words could be good to use. This difference between me and them really bothers me.
- Interviewer: Great, what happened that it rose from 3 to +4???
- Interviewee: I found what I wanted to say.
- Interviewer: How?
- Interviewee: How can I say?
- Interviewer: Grammatically or word choice?
- Interviewee: Structure
- Interviewer: While talking to your native friends, after experiencing a breakdown suddenly you make what you were searching for and that's the part your WLC increases this much from 3 to +4. Right?
- Interviewee: Here is what came to my mind.
- Interviewer: Or maybe you thought Korean or Chinese food example was a really topic related and a good argument support.
- Interviewee: It was exactly what I knew about cause I myself experienced it and was sure what I was going to talk about easily.
- Interviewer: Have you talked about it with anyone else?
- Interviewee: Yeah, in English.

Interviewer: Do you think talking about the same topic before which might be last month or two weeks ago help your speech this time?

Interviewee: Yes, sure

Interviewer: So, it was not only your personal experience but also you were prepared enough for talking about it?

Interviewee: Yeah. I talked about them two weeks ago and it was like I was repeating without hesitating. I was even thinking to talk about the same topic as Korean food so that I could talk for 2 minutes but it would be irrelevant. That is why I had to stop and move back to the main topic.

Interviewer: So, it can be deducted that personal experiences make a speaker much more prepared on the topic?

Interviewee: Exactly.

Interviewer: Even more fluent. Thanks.

Interviewee: I was trying to say how we define healthy diet in our country but I did not know how to put it in a nice structure made of three or four sentences pointing to the weak points. I was thinking how to make this set of sentences which made me back off and hesitate what I wanted to say.

Interviewer: Ok thanks. But I think it did not affect your fluency. Of course, you rated your WTC negative but it did not influence your fluency.

Interviewee: Based on my previous job I used to improvise a lot actually I am used to talking a lot as well. Sorry I talk nonsense sometimes just in order not to stop. What I mean is if I had thought more I could have talked more

specifically and carefully, I could even mention the nutritional value and calories as well.

Interviewer: What you mean with talking nonsense is the phrases we call “formulaic sequences” as fillers in order not to pause, they do not even have meaning, such as “far as my personal experiences concerns” which are mostly memorized or you really talk irrelevantly and incorrectly?

Interviewee: No, I don't talk irrelevantly, I just talk superficially. I cannot say what I really think of.

Interviewer: So that's language!!??

Interviewee: Exactly...

Interviewer: You have the idea but you are not able to communicate it in the target language?

Interviewee: Sure. there is always an idea.

Interviewer: I mean you know what to say but you don't know how to put it into English.

Interviewee: Yeah exactly, there is the idea but as I'm thinking how to say it in four or five sentences with the correct structure makes me doubt if I should use it.

Interviewer: Have you ever felt what you are doing with the structure is exactly translating Persian to English?

Interviewee: Unfortunately, yes. When I do it, hesitation increases, but when I think English, everything goes well. The problem is I still cannot think in English enough.

Interviewer: This is what we mostly have problem with.

- Interviewee: I really meant to explain more not only that much.
- Interviewer: So why didn't you?
- Interviewee: Why I didn't explain more was exactly what I just talked about. I had the idea in Persian "the process of cooking" but I couldn't make the last sentence in English (expression in cooking).
- Interviewer: If you had 5 minutes, would you be able to do it?
- Interviewee: I don't know it.
- Interviewer: You would not be able to do it then?
- Interviewee: I have talked about cooking a lot; what to make, how to make, use less oil but more vegetables. I knew what I wanted to say.
- Interviewer: Who did you talk with?
- Interviewee: My flatmate, she is a Canadian Iranian. She's been living here for about 17 years. She speaks Persian very well and is also really fluent in English. She's been here since she was a child. And it really helps me. We speak Persian and suddenly convert to English. It has really influenced me positively recently. We talked about this topic together as well.
- Interviewer: We talked about this topic together as well. Ok.
- Interviewee: I exactly knew what I wanted to say and that's why.
- Interviewer: That's why your WTC increased.
- Interviewee: Exactly.
- Interviewer: What happened here that decreased?

Interviewee: ??????????

Interviewer: Ok, not to get off the topic.

Interviewee: The idea which was Persian came to my mind and then I had to convert it but how?

Interviewer: Would you say if it was grammatical or lexical or both?

Interviewee: I know both the grammar and the vocabulary. But putting my ideas immediately into the correct structure still is a problem.

Interviewer: Why did it drop? The dilemma you had between two ideas?

Interviewee: Exactly. I couldn't choose one. In regular conversions I feel freer than the ones with time limitation which made me doubtful which to pick. I wasn't sure how to wrap up my ideas in three minutes if I wanted to go deep in them. I had whatever I needed to say but in Persian unfortunately and I knew when I try to convert them some will tear apart. I wanted to say something but a second later it was faded. Later I told myself not to repeat the words fruit and vegetables again and again, which was very distracting. And when I had no other choice I thought of how I wish I could use some other words instead.

Interviewer: It's negative.

Interviewee: Not here. Here I noticed time was running out so I decided to wrap it up ASAP.

- مصاحبه کننده: این دوتای اول داستانشون چی بود؟
- شرکت کننده (اکبر): در این دوتای اول من دقیقا میدونستم که جمله اول و دوم را چی بگم، دیگه مثل دیروز نبود که گیر کنم که جمله اول رو چی میخوام بگم.
- مصاحبه کننده: پس هم ایده داشتی و هم ساختار رو plan مشخص کرده بودی.
- شرکت کننده (اکبر): آره امروز به جورایی سعی کردم که اول اشتباهات دیروز رو انجام ندم و اشتباهات رو تصحیح کنم. اینکه گفتم پروفیسور و staff این دقیقا تجربه ای بود که خودم تو دوره لیسانس داشتم تو ذهنم اومد. با دانشجویها یکی از رفیقام که تونستم کار پیدا کنم، با یکی از استادام که تونستم کار انجام بدم و ریکامند بگیرم، با یکی از استف که مسئول کامپیوتر بود و خیلی توی بحث کامپیوتر و آی تی به من کمک کرد دقیقا این ایده درست میومد توی ذهنم
- مصاحبه کننده: پس توی Daily Conversation هم وقتی که همش داری از تجربه هات استفاده میکنی تمایل به ارتباطت ...
- شرکت کننده (اکبر): وقتی بحث سر تجربه میشه تمایلیم واسه صحبت بسیار زیاد میشه چون مواردی هست که نیاز ندارم ایده پردازی کنم. فقط کافیه خودم باشم و چیزی رو که اتفاق افتاده صادقانه باید بگم. فقط باید استراکچر رو درست کنم ولی وقتی در مورد یک چیز دیگه نو و جدید صحبت میکنم هم باید استراکچر رو تعیین کنم هم باید به ایندیش فکر کنم هم باید ایده رو بپرورونم سه تا کار رو باید انجام بدم.
- مصاحبه کننده: اگر چیزی هست بگو من استاپ کنم اگر چیزی توی ذهنت اومد.
- شرکت کننده (اکبر): من به ذهنم اومد که ما یک دروه ای داشتیم مربوط HR بود. Human resource بود. نکات مثبت به خاطر بحث example بود ما یک استاد داشتیم که میومد میزها را دور کلاس میچید و خودش میومد وسط کلاس و صرفا در مورد تجارب صنعتی صحبت میکرد. این بحث رو که داشتم میکردم همش اون کلاس توی ذهنم میومد. که این کلاس خوب بود، مثال میزد، همینطور که جلو رفتم اون شرایط توی ذهنم میومد. مطلبی که من متوجه شدم، امروز متوجه

شدم که من بیشتر تمایل به ارتباط برقرار کردنم زمانیکه که در مورد تجارب پرسنالیم صحبت میکنم، چون زمانیکه این کارو انجام میدم صرفا باید غالب جمله رو درست بگم. نیازی نیست ایده پردازی کنم یا غالب جمله رو کانورت کنم و فکرم از فارسی به انگلیسی اتفاق نمی افته. چیزایی که برای اتفاق افتاده جلوی چشمه و کاملا visualize و من صرفا باید visual کنم مثل یک screen جلوی چشم و داره یک چیزی نشون میده، من فقط باید کافیه این رو براشون تشریح کنم بگم اینجا این اتفاق میفته جای دیگه اتفاق دیگه. دیگه لازم نیست اسکرینی که اتفاق میافته رو خودم خلقش کنم و این باعث میشه که تمایل به صحبت خیلی بیشتر بشه.

مصاحبه کننده: و زیادی استراگل نمیکنی توی زبان

شرکت کننده (اکبر): دقیقا

مصاحبه کننده: آیا در مورد این مسائل هم قبلا به انگلیسی صحبت کردی یا نه دفعه اولته.

شرکت کننده (اکبر): آره صحبت کردم.

مصاحبه کننده: توی مصاحبه شغلی یا با استاد یا توی شرایط کاری

شرکت کننده (اکبر): یکی از مواردی که روی من تاثیر گذاشت من یک بار رفیق چینی داشتم که مترجم شرکت

چینی بود ما با هم خیلی بیرون میرفتیم، هایکینگ میرفتیم، رستوران میرفتیم و در مورد personal experience ها صحبت میکردم، همین باعث شد که مدت زیادی با هم حرف بزنیم که چیکاری میخواستیم بکنیم.

مصاحبه کننده: پس یک جورایی prep هم هستی.

شرکت کننده (اکبر): آره دقیقا و اینکه یک سری مسائل هست که خودم هم در موردش برای خودم نوشتم، یکی از مواردی که خودم تونستم انگیزش ایجاد بکنم در مورد اهداف زندگیم برای خودم بنوسیدم برای خودم حتما ثبت کنم و این چیزایی که برای خودم بطور روزمره نوشتم.

مصاحبه کننده: پس این باعث میشه نه تنها به ایده خوب تسلط داری بلکه روی زبان هم تسلط داری در مورد این موضوع از کلمات خاص هم استفاه میکنی.

شرکت کننده (اکبر): از اون مهمتر نوشته.

مصاحبه کننده: به انگلیسی مینویسی

شرکت کننده (اکبر): بله چون نوشتن در یادآوری لغات کمکم میکنه. اسپیکینگ 30% کمکم میکنه، 70% نوشتن کمکم میکنه چون وقت داشتم اون بار معنایی که میخواستم تا حد امکان اونجا نوشته بودم. لغات سنگین و عبارات سنگین رو بیشتر اونجا بکار میبردم. Deduction ..... در موردش نمی نوشتم نمیتونستم چون خودم نوشتم و تایپ کردم بهتر تونستم به یاد بیارم و خیلی راحت تر توی ذهنم. این .... هم تجربه منه. اینجا که قرمز شده 2 بار قرمز شده این به خاطر اینه که دقیقا کاری که من الان دارم اینجا انجام میدم دوتا course دارم یکی دوزار نمی ارزه ولی در کنارش کار complementary انجام میدم که دقیقا نقش شخصیمه و هیچ ربطی به course نداره و یعنی چیزیه که من بطور روزمره دارم باهش برخورد می کنم.

مصاحبه کننده: در موردش با کسی صحبت کردی یا نه.

شرکت کننده (اکبر): آره هم به انگلیسی و هم به فارسی. اینجا یک لحظه یک پازی افتاد بین ایده هایی که من میخواستم بکار ببرم.

مصاحبه کننده: پاز زمانی.

شرکت کننده (اکبر): آره پاز زمانی داشتم فکر میکردم که الان من در مورد چی صحبت کنم. یک مشکلی که اینجا برخوردم این بوده که .....

مصاحبه کننده: در لول ایده بود یا زبان بود این پاز؟

شرکت کننده (اکبر): پازش در لول زبان بود. میدونستم که چه چیز هارو میخواستم بگم و می گفتم اگر بخوام بگم

در مورد آن از صحبتتم کنم از بحث اصلی جدا میشم. گفتم خوب برگردیم به بحث اصلی

انحراف کم بشه. گفتم خوب پس من چی بگم. یک لحظه این وقفه ایجاد شد.

مصاحبه کننده: خوب public transition بوده.

شرکت کننده (اکبر): دقیقا.

مصاحبه کننده: بعد باعث میشه که fluency هم بیاد پایین. یعنی پاز میخوره.

شرکت کننده (اکبر): دقیقا.

شرکت کننده (اکبر): این بخاطر اینه که من دوروبرم چند آدم رو میشناختم که رفتن دوره آنلاین گرفتن و دقیقا

میدونستم بخاطر اینه که زیاد جدی نمیگیرن. فقط یک مدرکی میگیرن. باز این یک چیزی بود

که بارها دیده بودم و درموردش صحبت کرده بودم. ولی به فارسی. ولی چون یک موضوع

فانی هم بودش خیلی راحت تو ذهنم بود و تونستم در موردش صحبت کنم. این فان بودن

خودش یک جذابیت ایجاد کرده بود. سر همین قضیه بارها سربه سر اونها گذاشتم یعنی دقیقا

درسته که در موردش به انگلیسی صحبت نکرده بودم ولی چون یک خاطره خنده دار و

خوشی داشتم خیلی با علاقه در موردش صحبت کردم.

مصاحبه کننده: چی شد.

شرکت کننده (اکبر): آره اینجا دقیقا این رو گفتم خوب. گفتم که جدی نمیگیرن و اینا. بعد پیش خودم گفتم جدی

نمیگیرین من یکی دو تا عبارت به ذهنم اومد که درست نبود به کار بردن اون کلمات. گفتم

خوب الان تو این فضا من نمیتونم، یعنی اینکه یک مشکلی که من دارم اینه که دارم در مورد

یک موضوعی به فارسی صحبت میکنم، الان من میخوام به انگلیسی صحبت کنم خوب، یک

فضایی هست که خیلی از افراد رو نمیشناسم، بخاطر همین بعضی از این حرفا رو نباید تو

انگلیسی بیارم، ولی موقعی که دارم صحبت میکنم یک لحظه گیر میکنم که خوب این رو نباید

بگم، تو فارسی باشه انقدر نیاز به فکر کردن نداره، ولی اینجا چون مجبورم فکر کنم این رو بگم این رو نگم...

مصاحبه کننده: ایده یا کلمه؟

شرکت کننده (اکبر): هم کلمه هم ایده. ببخشید خیلی عذرخواهی میکنم مثلا میخوام بگم طرف گشاد هست، اینو میدونم تو فارسی توی محیط های رسمی نباید بگم. ولی توی انگلیسی میام میگم homework رو میده کسه دیگه انجام میده و مثلا یک خورده آدم تنبلیه و .. ولی اینجا جاش نیست این رو میگم. من میام فکر میکنم این رو بگم این رو نگم، این وسط یک وقفه میافته خوب، یعنی این رو که نمیخوام بگم خوب بعدش چی باید بگم. این convert کردن از فارسی به انگلیسی من رو دچار مشکل میکنه. هنوز دارم به فارسی فکر میکنم خیلی از جاها و همین من رو دچار مشکل میکنه. به سرعت فارسی نمیتونم کلمات و عبارات درست رو در موقعیت به کار ببرم. تو فارسی میدونم که تو این موقعیت نباید این جمله رو بگم. حتی توی فارسی سعی میکنم موقعی که دارم صحبت میکنم درباره چیزی 5 ثانیه قبل فکر میکنم. توی انگلیسی هنوز به این مرحله نرسیدم. همون لحظه باید بهش فکر کنم.

مصاحبه کننده: پس همین hesitate کردن بین ایده ها باعث میشه تمایل به ارتباطت توی اون لحظه خاص یک drop بیافته.

شرکت کننده (اکبر): اینجا میخوام در مورد dormitory صحبت کنم باز گفتم در مورد dormitory چه چیزایی رو باید بگم.

مصاحبه کننده: خوب یعنی چی کلمه dormitory رو نوشتی اینجا.

شرکت کننده (اکبر): کلمه dormitory رو نوشتم بعد یک لحظه موندم، از این بابت که dormitory چه ربطی به campus داره. میخوام این دو تا ربط بدم دچار مشکل شدم. اینجا ایده دچار مشکل شد.

مصاحبه کننده: یعنی یادت نیومد چرا note برداشته بودی؟

شرکت کننده (اکبر): دقیقا. اینجا این اتفاق افتاد.

شرکت کننده (اکبر): اینو میخواستم بگم. الان یادم اومد چی میخواستم بگم. اونجا یک لحظه یادم رفت چی میخواستم بگم. بیشتر این ran out of idea رو که میشم دلیلش convert کردن فکر از فارسی به انگلیسیه. این باعث میشه ایده رو خوب نتونم خوب بیرونم و یادم میره چی بگم، یک وقفه ای تو خیلی از مواقع ایجاد میکنه.

مصاحبه کننده: چی گفتی؟

شرکت کننده (اکبر): خوب اینجا میدونستم چی میخوام بگم حتی جمله بعدش رو هم میدونستم چی میخوام بگم. مخصوصا که نکته اینجا بود که اینجا خیلی تایم رو تونستم مدیریت کنم، سرزمان تونستم تمام کنم، این یک آرامشی بهم داد، دیروز یک لحظه تایم دچار مشکل شد که من رو دست پاچه کرده بود.

مصاحبه کننده: چی بود؟

شرکت کننده (اکبر): اینجا داستان سر این بود که عینا تجربه شخصی خودم رو میخواستم بگم. چیزی بود که عملا لمس کرده بودم خودم، و این باعث شد که دقیقا بدونم چه چیزی میخوام بگم و بخاطر همین کلمات و عبارات خوبی به ذهنم اومد که بتونم اینو در موردش توضیح بدم.

مصاحبه کننده: چرا مگه در موردش قبلا صحبت کردی؟

شرکت کننده (اکبر): یک چیزی بود که به طور روزمره در موردش فکر میکنم. مجبور نیستم زیاد بهش فکر کنم

مصاحبه کننده: آیا استفاده از کلمه deduction تاثیری روی تمایل به ارتباطت گذاشت. مثلا اگه توی daily conversation بتونی یکی دو تا کلمه استفاده کنی که به هر حال کلمات regular نیستند، این تاثیری میذاره روی تمایل به ارتباطت؟

شرکت کننده (اکبر): آره. این باعث میشه یک آرامشی پیدا کنم ببینم به اون حدی از آرام بودن و تسلط رسیدم که بتونم کلماتی که irregular هست رو به کار ببرم، این خودش خود به خود باعث آرام شدنم میشه. یه خورده عبارات اسلنگی چیزی استفاده کنم یک جور دارم به خودم تلقین میکنم که

آروم باشی، خیلی راحت داری کار رو میبری جلو. یعنی دارم برای خودم یک challenge ایجاد میکنم. دقیقا بخاطر این بودش که بازم personal experience خودم بود، کاری بودش که خودم انجام دادم، موقعی که تصویرم کامل شد بلافاصله وارد کار شدم، عینا اسکرین جلم بود دقیقا کاری که خودم کردم رو داشتیم میدیدیم. انگار داشتم یک فیلمی رو که میدیدم رو توضیح میدادم. بارها هم درمورد این موضوع که ایمیل میزدم به استاد انگلیسی مینوشتم. دقیقا میدونستم چی دارم میگم فقط کافی بود استراکچر رو مرتب کنم.

اوکی. مرسی.

مصاحبه کننده:

### English Translation

Interviewer: What were the stories of the first two?

Interviewee: I knew exactly what to say for the first and second sentences. It wasn't the same as last session that I didn't know what to say for the first one.

Interviewer: So, you had both idea and the plan for the structure.

Interviewee: Today I tried to avoid the problems I had made last session and correct them. What I said about the professor and the staff was completely I had experienced in bachelor period. I could find a job with a friend who was a student, could work with a professor and got some recommendations, could get help in IT from one of the staffs who works in a computer department. It came to my mind thoroughly.

Interviewer: So in your daily conversations when you are talking about your experiences your WTC increases.

Interviewee: When I talk about my personal experiences, I do not have to create ideas. I only need to be myself and genuinely retell all that's happened to me. I only need to use correct structure, but when I am discussing something new, I should identify the structure, think in English, and create ideas; I need to do three things, here I only do one of them.

Interviewer: If you have something in your mind and need to say tell me to stop.

Interviewee: I remembered we had a course on Human Resource. The positive points go to the example part. I had a professor who used to set the chairs semicircle around the class and talk about industrial experiences. As I was talking, the condition of that class which was filled with lots of nice examples was in my mind as going on. What I found out today is that talking about my own experiences makes my WTC increase. That's because I have the idea and I only have to focus on the structure. I do not need to convert Persian to English at all, it happens itself. As I visualize everything just like a screen in front of my eyes. I just need to describe what I'm seeing, no need for making that screen anymore.

Interviewer: Then no struggle for the language?

Interviewee: Exactly

Interviewer: Have you talked about these before or it's the first time?

Interviewee: I have.

Interviewer: In a job interview or with your professor or at work atmosphere?

Interviewee: I once had a Chinese friend who was an interpreter for a Chinese company. This really helped me. We used to go hiking, eat out and talk a lot about personal experiences. It really made me talk a lot about what we were going to do in the future.

Interviewer: So, you are prepared enough!!

Interviewee: Yes absolutely. And I also write things about myself. One of the things that could motivate me to achieve my goals was writing so as to record every daily thing.

Interviewer: So, it makes you not only have a focus on idea but also on the language and you use new words as well.

Interviewee: Writing is more important.

Interviewer: Do you write in English?

Interviewee: Yes, because writing helps me remember the words well. Speaking 30% but writing 70% helps me. Because I had enough time to write what I meant. Advanced words and complicated phrases were used like “deduction”. Because I myself wrote it and typed it, I could remember it more easily. They’re all my experiences. Here it rises twice, it’s because what I’m exactly doing right now, I have two courses really worthless but beside that I’m doing a complementary job which is totally my personal experience and is not related to the course at all. Something I do in my daily routine.

Interviewer: Have you talked to someone about it?

Interviewee: Yes, both in English and Persian. Here between my ideas a pause occurred.

Interviewer: Time pause?

Interviewee: Yes, I was thinking what to talk about...

Interviewer: Was it because the idea or language?

Interviewee: I felt I had been discussing too much of the topic of my interest and might have digressed from the main topic, so I decided to think of another idea and had to pause to recall something relevant. Here was the part the pause happened.

Interviewer: So, it was public transition.

Interviewee: Exactly.

Interviewer: So, it decreased the fluency and caused pause.

Interviewee: Sure. There were some people around who passed online courses and I knew they took it for granted just for a certificate. I have seen this a lot and talked about but in Persian. And because it was also fun I could remember and talk about it so easily. Being fun made it interesting to me. I made fun of them about it. Although I hadn't talked about it in English, I could talk about it eagerly because I had good memories about it.

Interviewer: What happened?

Interviewee: Yes, I said it exactly. I said they don't take it seriously. To say these two or three phrases came to my mind which weren't nice to use. I told myself I cannot use it in this context, it means I have a problem that when I'm talking about a topic in Persian, and I want to speak in English. Sometimes I don't know some people and I shouldn't say some of the words in English but

when I'm talking I get stuck that I shouldn't say that. If it's in Persian it's easy to decide but in English It's hard to decide what to say what not to say.

Interviewer: Idea or words?

Interviewee: Both idea and words. Excuse me for saying this, for example I want to say he is a lax (taboo word) person but I find it really inappropriate in a formal conversation, so I say he doesn't do his homework and he is a bit lazy and ... But it doesn't really communicate my thoughts. Deciding what to say what not to say makes a pause like when I want to avoid saying this what to say instead then? This conversion from Persian to English annoys me. I'm still thinking in Persian in most places which puts me in trouble. The same as my first language I cannot use words or phrase immediately in an appropriate condition. I know I must not use this phrase in such a context while speaking in Persian. I even think about things I want to say 5 seconds earlier in Persian. But I do not act the same in English. I have to think about it exactly the same time.

Interviewer: So, such hesitations between your ideas lowers your WTC at that specific time.

Interviewee: Here I wanted to talk about dormitory but was deciding what to say.

Interviewer: What did you write the word "dormitory" for?

interviewee: I wrote it down then got stuck about how the dormitory can have something in common with campus. I tried to make a connection between these two but couldn't. Lacking idea was the problem.

Interviewer: You mean you didn't remember why you wrote it down?

interviewee: Exactly here it happened. I wanted to say this. I now remember what I wanted to say. I forgot what I wanted to say for a moment during the task. Whenever I'm trying to convert Persian to English I run out of ideas. It makes me not able to talk about my idea and I forget it, which makes me pause lots of times.

Interviewer: What did you say?

interviewee: I knew what I wanted to say here. I even knew the next sentence. Specially I could also manage the time. I could finish on time which made me calm. Last session, I couldn't do it and it made me confused.

Interviewer: What was it?

Interviewee: Something I think about daily. I do not need to do a lot of thinking here.

Interviewer: Did using the word "deduction" affect your WTC? For instance, if you use words which are rarely used to use in your daily conversations it influences your WTC?

Interviewee: Sure, it makes me feel relaxed when I see I'm that confident that I can use infrequent words. When I use slangs, I keep inculcating myself to be calm, that I'm doing well and I'm putting myself in challenge. That was only because it was my own personal experience. It was what I had done. As I was done with imagining I started, it was like a screen in front of my eyes. I could exactly see what I had done. As I was explaining a movie I was watching. Lots of times I sent emails to my professors about it in English. I exactly knew what I was saying if I use the structure correctly.

Interviewer: Ok thanks.

### Akbar Task 3

مصاحبه کننده: داستان چی بود اینجا؟

شرکت کننده (اکبر): اینجا دقیقا بحثی که داشت میشد نیاز روزمره من بود، یک لحظه احساس کردم رفتم توی اون

شرایطی که همون موقع داشتم، مثلا دلیل اینکه چرا رفتم گوشی cellphone گرفتم کنار  
ipad. کاملا تجربه شخصی بود. نیازی به ایده پردازی نداشتم. نیازی به انتقال ایده از فارسی  
به انگلیسی نداشت. صرفا باید استراکچر رو مشخص میکردم. عملا جاهایی که به جای 3 تا  
تسک یک تسک رو انجام میدم تمایلیم برای ارتباط برقرار کردم بیشتر میشه.

شرکت کننده (اکبر): دقیقا دلایل اینکه چرا من گوشی میخواستم ipad میخواستم رو برای خودم مینوشتم اون موقع،

اینجا داشت اونا یادم میومد دونه دونه، همون موقع که نوشته بودم، عادت دارم همیشه note یا  
reminder رو به انگلیسی مینویسم. یک جورایی نت هایی که الان اینجا مینویسم رو اونجا  
نوشتم، همه دونه دونه جلو چشم اومد یادم اومد.

مصاحبه کننده: چی شد اینجا؟

شرکت کننده (اکبر): یک لحظه اینجا تو درست کردن استراکچر دچار مشکل شدم.

مصاحبه کننده: توی اسپیکینگت مشخص میشه یا نه؟

شرکت کننده (اکبر): یک مقدار احساس میکنم مشخص میشه.

مصاحبه کننده: میشه دقیقتر بگی چون متوجه نشدم.

شرکت کننده (اکبر): من میخواستم در مورد چهار پنج تا آیت صحبت کنم، اینکه من موقعی که ipad گرفتم چه

منفایعی داشت، اینکه میتونم پرزنت کنم، اینکه هر جا میرم میتونم کتاب بخونم و اینا، مثلا سه

چهار تا رو گفتم، حواسم به این نبود که همین سه چهار تا آیتم گفتم کفایت میکنه برم جمله

بعدی. یجورایی داشتم همش فکر میکردم که دیگه چی بود، خواستم برم جمله بعدی یک لحظه گیر کردم.

مصاحبه کننده: اوکی. توی تصمیم گیری واسه ساختار بعدی که میخواستی استفاده کنی؟

شرکت کننده (اکبر): دقیقا. تو تصمیم برای ساختار بعدی دچار مشکل شدم.

مصاحبه کننده: اوکی.

شرکت کننده (اکبر): خودم احساس میکنم جاهایی که نیاز دارم که فکر کنم برای اینکه ساختار رو تعریف کنم دچار مشکل میشم.

مصاحبه کننده: بعد روی تمایل به ارتباطت تاثیر میذاره؟

شرکت کننده (اکبر): دقیقا جاهایی که خیلی نیاز به فکر کردن نیست، انقدر دربارش حرف زدم و گفتم، که بدونه اینکه فکر کنم ساختار رو میگم و میرم جلو خیلی راحت تمایل به ارتباط برقرار میشه، ولی جایی که باید فکر کنم این یخورده باعث میشه محتاط تر برم جلو.

مصاحبه کننده: ولی دوباره دستت اومد؟

شرکت کننده (اکبر): آره. دستم اومد. یجورایی excited ام میکنه موقعی که ایده رو میگیرم و میتونم دوباره صحبت کنم در موردش.

شرکت کننده (اکبر): اینجا داستانی که بود این بودش که من اومده بودم در مورد کتاب و اینایی که داخلش هستش صحبت کنم، یک لحظه گیر کردم که صحبت کنم. مثلا اومدم گفتم ..... یک لحظه کلمات و عبارات و استراکچر رو نمی دونستم. آخر گفتم ..... میدونستم این رو نمیخوام بگم ولی مجبور شدم برای اینکه استاپ نکنم این رو بگم، همین باعث شد یک خورده تمایل .....

مصاحبه کننده: میشه بگیم چون از ساختاری که استفاده کردی راضی نبودی؟

شرکت کننده (اکبر): دقیقا داشتم به دلایلی که به موبایل نیاز دارم فکر میکردم، و دلایل داشت میومد جلوش چشم، چیزی هم بود که بارها در موردش صحبت کرده بودم، انقدر در موردش صحبت کرده بودم که نیاز نبود در موردش فکر کنم که یادم بیاد.

مصاحبه کننده: به انگلیسی.

شرکت کننده (اکبر): به فارسی.

شرکت کننده (اکبر): دقیقا یادم اومد که چقدر این کاری رو که انجام داده بودم بهم کمک کرده بود، چه جاهایی همین قضیه نجاتم داده بود، که ترکیب mobile, ipad, چقدر یکسری جاها من رو نجات داده بود واقعا، همین باعث میشد که با هیجان و اشتیاق در موردش صحبت کنم.

شرکت کننده (اکبر): اینجا الان 3 تا رفت بالا بعدش 4 تا و 5 تا میره بالا. به چند دلیل. یکی اینکه موقعی که من رفته بودم استانبول، نیاز نداشتم که از شب قبل برای فرداش برنامه ریزی کنم. خیلی راحت همه کارها رو انجام میدادم و بحث بعدی این بودش که دقیقا در مورد خاطرات خوشی که در استانبول داشتم افتاده بودم و کافی بود همه اونها را به صورت ویدئو الایز بیام فقط در موردش صحبت کنم. کاملا ویدئو ال اون خاطرات خوب رو داشتم، همین که تجربه کرده بودم و خاطره خوبی بود، به صورت مضاعف این ها باعث شد که با اشتیاق در موردش صحبت کنم.

شرکت کننده (اکبر): وقتی در مورد رستوران و غذا صحبت میشه خیلی با اشتیاق صحبت میکنم. یک لحظه گیر کردم چی بگم. چطور جملات قبلم رو ربط بدم به اینجا. میخواستم در مورد disadvantage صحبت کنم اما نمیتونستم چجوری advantage هایی که تا الان گفتم رو بگفتم، یعنی اینکه رفته بودم اون بالا به اوج رسیده بودم چجوری down رو بزنم، disadvantage های این دو تا چطور ربط بدم. یک خورده باعث شد منومن کنم.

مصاحبه کننده: الان من و من کردی؟

شرکت کننده (اکبر): من و من که نه. بیشتر حالت hesitation هست.

مصاحبه کننده: خوب پس topic transition هست.

شرکت کننده (اکبر): گیر کرده بودم چجوری بخوام استراکچر رو یک خورده توی ذهنم مرتب کنم. نیاز به فکر داشتم در حد 1 ثانیه 2 ثانیه.

این یک مواردی بود که من خیلی دیده بودم. یعنی میتونستم قشنگ در موردش صحبت میکردم، در مورد چند تا از اطرافیانم میخواستم صحبت کنم. بخاطر همین یک لحظه اومدم با اشتیاق صحبت کنم چون میدونستم ایده دارم چی میخوام بگم.

مصاحبه کننده: ولی یک پازه کوچولویی داشتی . بخاطر این بود که داشتی فکر میکردی.

شرکت کننده (اکبر): آره داشتم فکر میکردم.

مصاحبه کننده: پس ایده تا ساختار واست مهم تره؟

شرکت کننده (اکبر): من کلا خودم همیشه عادت دارم موقعی که به فارسی هم صحبت میکنم قبل از اینکه جملات رو بگم به حرفم فکر می کنم، خیلی سعی کردم اینکار رو بکنم. این عادت رو به انگلیسی هم منتقل کردم ولی مشکل اینه که توی فارسی من 1 دهم ثانیه نیاز باشه فکر کنم ولی تو انگلیسی این عادت فکر کردن قبل جمله رو دارم ولی خوب بازه فکر کردنم طولانی تر میشه. همین باعث میشه hesitation بیشتر بشه.

### English Translation

Interviewer: What was the story?

Interviewee: Here what was discussed was exactly my daily need. Once I felt I was in that situation then. For example, why I bought a cell phone when I have an iPad. It was a completely personal experience. I did not need to create an idea. I didn't need to change the idea from Persian to English I had to only make the structure where I had to use. Doing 1 task instead of 3 improves my

WTC increases. I used to write why I needed my iPad or cell phone. Here I was remembering one by one I had written. I always take notes or reminder in English somehow what I am writing. Here I had written before. They just were in front of my eyes one by one.

Interviewer: What happened here?

Interviewee: Here I had a problem with making the structure.

Interviewer: Is it clear in your speaking or not?

Interviewee: Yes a bit I feel.

Interviewer: Can you explain more?

Interviewee: I wanted to talk about 4 or 5 items. Such as, if getting iPad had any benefits or not. Like I can make presentations with or I can read wherever I go or whatever. I talked about 3 or 4 items. I didn't notice that these 3 or 4 items would suffice and I can move on the next sentence. I was thinking about what items are left, then I decided to go to the next sentence I got stuck.

Interviewer: OK. In deciding for the next sentence structure that you wanted to use?

Interviewee: Exactly I had a problem in deciding for the next structure.

Interviewer: OK

Interviewee: I myself feel where I need to think about making the structure I got a problem.

Interviewer: It affects your WTC?

Interviewee: Exactly, where I don't need to think. I talked a lot about it that without thinking about the structure I speak and move on. And WTC rises easily. But when I need to think a bit makes me move carefully.

Interviewer: But you got it again?

Interviewee: Yes, I did. It makes me excited when I have the idea and I can again talk about it. Here the story is that I was going to talk about the books when suddenly I got stuck. For example, I said I Knew I didn't want to say it but I had to so as not to pause. That's what made my WTC....

Interviewer: Can we say that's why you weren't satisfied with what you used?

Interviewee: I was exactly thinking about the reasons I need a phone and they were in front of my eyes and it was also the thing. I had talked about thousands of times. I had talked about it a lot that I didn't need to think of it any more.

Interviewer: In English

Interviewer: In Persian.

Interviewee: I exactly remembered how it helped me. It saved me sometimes, that the mixture of mobile and iPad has had helped me a lot and it made me to talk about it eagerly.

Interviewer: Here it went up to 3 then to 4 and 5 for some reasons.

Interviewee: First when I was in Istanbul I didn't need to plan for next day from the night before. I could do everything easily. I remembered the good time I had then and I only needed to visualize and talk about them. I completely visualized these good memories. I experienced and I had good memories. Totally it made me talk about then avidly. When it's time to talk about restaurant and food I talk eagerly. I got stuck a little what to say. How to connect my Persian sentence to here. I wanted to talk about disadvantages but didn't know how to link advantages now. It means I was high above with

advantages and I didn't know how to come down to disadvantage. How to link the advantages to disadvantages that made me mutter.

Interviewer: You muttered now?

Interviewee: Not muttering actually. Mostly it was like hesitating.

Interviewer: So that is topic transition.

Interviewee: I was starting on how to make the structure in my mind. I needed to think for 1 or 2 seconds. It is what I have seen a lot. It means I could talk about it well. So, I once wanted to talk about it eagerly because I knew the idea and what I wanted to say.

Interviewer: But you had a small pause. That is because you were .....

Interviewee: Yes, I was thinking.

Interviewer: So, structure is not as important as idea for you.

Interviewee: In my real life I always think before start talking even in Persian. I really try to do this. I really try to make this habit in English as well. But the difference is in Persian I only need 1/10 of second to think but in English it takes longer time. That leads to hesitation.

#### Akbar Task 4

شرکت کننده (اکبر): اینجا یک لحظه تو اینکه چیجوری بخوام تو این ایده هایی که نوشتم رو در حال به، موقعی که داشتم صحبت رو شروع میکردم داشتم به این فکر میکردم که چیجوری این ایده ها رو در قالب یک پاراگراف بیارم.

مصاحبه کننده: یعنی بازم استراکچر زبانی؟

- شرکت کننده (اکبر): دقیقا استارکچر بود، ایده داشتم میدونستم درمورد چی میخوام صحبت کنم، حتی تجربه جلوی چشم بود، ولی اینکه اینارو در قالب استراکچر بخوام بیارم، قایده و جمله بندی رو، این رو یک خورده دچار تردید شدم.
- شرکت کننده (اکبر): من قرار بود اولش صحبت کنم بگم که ..... ولی یک لحظه اینجا به خاطر اون شکی که کرده بودم، مجبور شدم موارد دیگه رو هم که میخواستم تو پاراگراف های بعد در موردشون صحبت کنم همینجا بگم.
- مصاحبه کننده: یعنی اون لحظه متوجه شدم که داری اشتباه میکنی و حرفی رو هم نداشتی، باید میگفتی دیگه.
- شرکت کننده (اکبر): دقیقا باید میگفتم. مشکل این بودش که شاید من یک خورده دامنه ایده هام رو گسترده گرفتم ولی حواسم نبود که تو اون یک دقیق اول پیام مشخص کنم که هر ایده رو تو کدوم پاراگراف بگم، و در مورد اون ایده چجوری بخوام پیام بیشتر توضیح بدم چطور elaborate کنم. این کار رو توی اون یک دقیقه نکردم و باعث شد که تو همون لحظه دربارش فکر کنم.
- شرکت کننده (اکبر): خوب من اومدم الان اونارو گفتم، گفتم سه چهار تا مورد رو در نظر گرفتم. ولی خوب قرار بود بعدش صحبت کنم، حالا مطلب سر این بود که دوباره اینجا به این شک افتادم که من که درمورد اینا صحبت کردم، آیا پیام بگم که ..... یا نه، فعلا همین ها رو بسط بدم یا نه. شاید بزرگترین اشتباه من توی این 3 دقیقه این بود که اون اول همه چی رو لو دادم. این باعث شد که همه چی به هم بریزه. یعنی همون اول که ساختار رو درست در نظر نگرفتم کلا همه چیز رو به هم ریخت. بعدش در خلال صحبت باید دنبال ایده میگشتم که چجوری صحبت کنم، ایده رو داشتم یعنی الان که دارم حساب میکنم میبینم هم امشب و هم شبهای دیگه چیزی که واقعا به صورت trend بود این بودش که ایده همیشه تو ذهنم خوب بود، ولی اینکه چجوری این رو در قالب ساختار تعیین کنم، این دچار مشکل شد یعنی اینکه من توی فارسی آگه باشه میتونم پیام بگم که توی 3 دقیقه میتونم اینقدر صحبت کنم در مورد هر موضوع، پس انقدر همیشه صحبت کرد، ولی توی انگلیسی واقعا ایده ندارم، یعنی من یک چیز تاریکیه جلوم که من واقعا

نمیدونم تو 3 دقیقه میتونم 10 تا جمله بگم 20 تا بگم 30 تا بگم، اینو هنوز نمیدونم که واقعا در چه حدی میتونم هر کدوم از این ایده ها رو گسترش بدم و صحبت کنم، بخاطر ناآشنا بودن با ساختار جملاته، ساختار خود زبانیه، اون مترایز کردن جملات و توضیحات رو هنوز ضعف دارم داخل زبان.

مصاحبه کننده: اینجا که میری عقب هم این توی جسپریت مشخصه؟

شرکت کننده (اکبر): دقیقا. وقتی میرم عقب یک جورایی دارم فکر میکنم چی میخوام بگم دوباره.

مصاحبه کننده: این پازیتو ها دلیل خاصی داشت.

شرکت کننده (اکبر): تونستم این گندی که زده بودم رو جمع کنم.

مصاحبه کننده: پس این تا چندین ثانیه ادامه پیدا میکنه، واسه 3 دقیق نیستش نه؟

شرکت کننده (اکبر): نه. مثلا توی تقریبا همون 40 ثانیه اول این اتفاق افتاد. ولی بک جورایی باعث شد اون ذهنیتی

که داشتم در مورد چی میخوام کجا صحبت کنم، ولی خیلی خوب confirm نکرده بودم با خودم، توی ثانیه های بعدی هرز چند گاهی این اشتباهی کردم سراغم میومد ولی نه به اندازه 30 ثانیه اول.

شرکت کننده (اکبر): این تجربیات قبلیم بوده. واقعا توی استانبول که بودم تماس گرفتنام دچار مشکل شده بودم،

میدونستم در مورد چی میخوام صحبت کنم. یعنی ایده تو ذهنم بود. دقیقا ایده رو برای اینکه اینجا میخوام چه چیزی صحبت کنم.

مصاحبه کننده: قبلا در موردش به انگلیسی با کسی صحبت کرده بودی؟

شرکت کننده (اکبر): بله. خوب اینجا من اومدم یک چیزو صحبت کردم، ایده رو داشتم. ولی نکته این بودش که تو

اینکه چجوری پیام همرو توضیح بدم، دوباره اینکه چجوری تو ساختار برم یک لحظه دچار شک شدم. یعنی اینکه من اومدم گفتم برای تماس گرفتن و اینا با ... مشکل داشتم، با اینکه با خانوادم تماس بگیرم مشکل داشتم، معمولا تو زبان فارسی باشه میگم میخواستم زنگ بزنم به

خانواده، یک روز او دم بزم جایی تماس بگیرم مشکل بر خوردم. اما توی انگلیسی اینکه بخوام سه چهار تا فریز رو هم ردیف کنم استراکچر رو درست کنم دچار مشکل شد. فریز اول و دوم اومد، سر فریز سوم یک دفعه گیر کردم چی میخواستم بگم در مورد چی میخواستم صحبت کنم، چیجوری این فریز رو بیارم. جمله که طولانی بشه این ضعف خودش رو نشون میده.

مصاحبه کننده: آیا این ضعف باعث drop توی تمایل به ارتباط یا drop توی تمایل به ارتباطه که باعث این ضعف میشه.

شرکت کننده (اکبر): یک جورایی همدیگه رو تشدید میکنن.

مصاحبه کننده: پس همیشه بگیم کدوم اول اتفاق می افته؟

شرکت کننده (اکبر): آره جفتشون به هم dependant هستن. یک لویی درست میکنن، این اون رو تضعیف میکنه اون این رو تضعیف میکنه.

مصاحبه کننده: همیشه بگیم به صورت مثبت هم همین اتفاق می افته.

شرکت کننده (اکبر): دقیقا.

مصاحبه کننده: یا مثلا vocab رو بلدی ولی اون لحظه نمیداد!

شرکت کننده (اکبر): مشکل اینه که من vocab میدونم چیه. ولی مساله اینه که من phrase رو نمیدونم چی بگم.

مصاحبه کننده: یک ذره دقیق تر باشیم. Phrase یا ساختار گرامری؟

شرکت کننده (اکبر): همین رو میخوام بگم. من میدونم مثلا میخوام اینجا در مورد historical monument صحبت

کنم، ولی اینکه چجوری این رو توی یک جمله بذارم و جمله رو ارائه کنم، توی این میلنگم.

مصاحبه کننده: توجه که کردم جمله نبود، عبارت بود.

شرکت کننده (اکبر): این بالازدن رو اشتباه کردم. بخاطر اینه که من موقعی که استانبول رفته بودم، دقیقا یک

مشکلی که داشتم همینه که واقعا چه چیزی بیشترین کیفیت رو داره، یعنی اون ساختار و

اینارو دقیقا تو ذهنم اومد میخوام در مورد چی صحبت کنم. مخصوصا که اصلا در مورد این موضوع ..... از خیلیا تو استانبول پرسیده بودم، یعنی صحبت هایی بود که با عالم و آدم اونجا انجام دادم و همش میگفتن نمیدونم.

شرکت کننده (اکبر): اینجا داستان این بود که چیزی رو که من میتونستم توی یک جمله کوتاه بگم، بیخود و بی جهت کش دادم. توی یک جمله بلندتر گفتم بخاطر اینکه در عین حال داشتم به این فکر میکردم که جمله بعدی رو چجوری بگم، همین باعث شد یک پازی این وسط اتفاق بیافته.

مصاحبه کننده: خوب 2 تا موضوع. یکی اینکه اون جمله ای که همون لحظه داشتی میساختی خودت میدونستی که جمله ساختار طولانی داره و میتونست کوتاه تر باشه و 2 داشتی دوتا کار هم انجام میدادی، داشتی پلن میکردی واسه ساختار بعدی.

شرکت کننده (اکبر): شاید اگه این عادت رو نداشتم که وقتی به یک جمله دارم صحبت میکنم همزمان به جمله بعدی فکر میکنم، خیلی روان تر میتونستم صحبت کنم.

مصاحبه کننده: به ساختار جمله بعدی؟ ایده که هست؟

شرکت کننده (اکبر): ایدش که هست. مشکل ساختاره. الان این یک خورده که جلوتر بره کاملا مشخصه که این جمله رو خیلی بد بیان کردم.

مصاحبه کننده: خودتون اون لحظه متوجه شدی؟

شرکت کننده (اکبر): آره دقیقا. مثلا میخواستم بگم که ..... بعد این رو نتونستم خیلی خوب بیان کنم. یعنی شاید توی یک موقعیتی که مثلا یک کامپیوتر اینجا نباشه بخوام خودم راحت صحبت کنم، فکر کنم خیلی راحت تر بتونم جمله رو بیان کنم. ولی اینکه یک کانتری باشه و مخصوصا که من تمرین اسپیکینگ و اینارو انجام نداده بودم. بعد همین حالت اسپیکینگ که مثلا حالت آیلنس داره و تاحالا انجام ندادم، این خودش یک خورده من رو دچار استرس میکنه توی فکر کردن و صحبت کردن.

مصاحبه کننده: مرسی. بخاطر همین ساختار دچار استرس میشی؟

- شرکت کننده (اکبر): دقیقا. در حالت عادی معمولا انقدر سخت صحبت نمیکنم.
- مصاحبه کننده: ببخشید من متوجه نشدم، الان توی این شرایط دچار استرس میشی. چون حس میکنی داری رکورد میشی؟
- شرکت کننده (اکبر): امروز این حالت قشنگ مشخص بود، همش سعی میکردم تا زمان رو ببینم تا زمان بندی درستی داشته باشم. تو حالتی که خودم باشم خیلی راحت تر و روون تر میتونم صحبت کنم. دقیقا این حالت رو دو هفته پیش تو کلاس اومدم برم present بکنم دوباره یک مقدار داشتتم، خیلی شاید 20 درصد امروز، خیلی کم.
- مصاحبه کننده: یعنی present جلوی چند نفر استرسش نسبت به اینکه داشتی با یکی رکورد میکردی کمتر بود.
- شرکت کننده (اکبر): من آره. کلا جلوی جمع مثلا 300 نفر خیلی راحت میتونم صحبت کنم، اذیتم هم نمیکنه.
- مصاحبه کننده: جالبه، ولی یک camera باشه اذیت میشی.
- شرکت کننده (اکبر): شاید خود camera تاثیری نداشته باشه ولی چون خیلی shorter من باید پیام یک چیزی رو جمع کنم این اذیت میکنه.
- مصاحبه کننده: احتمال داره توی اون representation یک ساعته توی 10 دقیقه اول یک استرسی داری بعدش خوب میشه.
- شرکت کننده (اکبر): اون 3 دقیقه بود، ولی خوب موضوع رو میدونستم.
- مصاحبه کننده: شاید prep بودی؟
- شرکت کننده (اکبر): اطلاعات داشتم
- مصاحبه کننده: احتمالا یکی دوبار هم با خودت تمرین کرده بودی؟
- شرکت کننده (اکبر): یک بار تمرین کردم ولی چون موضوع رو بلد بودم به خودم اطمینان داشتم، اینجا نمیدونم کلا نسبت به این سیستم IELTS, TOEFL صحبت کردن یک خورده anxious هستم، راحت

نیستم یعنی خودم قشنگ تاثیرش رو متوجه میشم. اینجا دیگه ایده داشتم و میدونستم در مورد چی میخوام صحبت کنم.

مصاحبه کننده: آیا استفاده از کلمه jetlag تاثیری داشت؟

شرکت کننده (اکبر): بله تاثیر داشت. ایده رو داشتم تو ذهنم رشد میدادم میدونستم که جمله بعدی رو میتونم بگم. اینجا داشتم درباره سفری که به پکن داشتم فکر میکردم، اتفاقی که برای من افتاده بود جلوی چشم بود میدونستم که دارم راجع به چی صحبت میکنم. کلا اینجا اگر دقت کنی در مورد language که صحبت میکنم 10 ثانیه بعدیش خیلی روان تر از قبله.

مصاحبه کننده: به خاطر personal experience؟

شرکت کننده (اکبر): آره دقیقا به خاطر personal experience

مصاحبه کننده: در کل این جمله آخر یک خورده مثبت تر بود.

شرکت کننده (اکبر): چون دقیقا میدونستم چجوری میخوام بحث رو ببینم و جمعش بکنم.

### English Translation

Interviewee: When I started speaking I was thinking how to put all these ideas in a single paragraph.

Interviewer: Language structure again?

Interviewee: Yeah Exactly. I had the idea I knew what I wanted to speak about I could visualize it but using them in a correct grammatical way made me hesitated.

Interviewer: At that moment you realized you're wrong and you have nothing to say, you had to say.

Interviewee: Yes, I had too, the problem was the extent in my ideas. at the first minutes I had to make it clear what to say in each paragraph and how to elaborate each idea. I didn't do so in that one minute so it made me think about it at the moment. Well I mentioned 3 or 4 things then I wanted to talk about them but here I doubted if I talked about the biggest problem was that I revealed all in the first 3 minutes. Not paying attention to the structure at first made everything out of order. Tonight, and the previous ones having the idea but not being able to put them in correct structure have been a trend which put me in trouble. In Persian it would be really easy to talk about an idea in 3 minutes but in English I'm not sure if I can say 10, 20 or 30 sentences in 3 minutes, how to extend it. And that's because of not being familiar with the structure. These are my weak points in English yet.

Interviewer: Here it is clear in your gesture that you draw back?

Interviewee: Exactly when I draw back I'm thinking what I want to say again.

Interviewer: These positives have special reasons.

Interviewee: I could make it after what I had made wrong.

Interviewer: So, it lasts couple of seconds it is not for 3 minutes, right

Interviewee: Yes, it happened in the first 40 seconds, but somehow it caused what I had in mind what to talk about where. I haven't confirmed with myself I repeated making this problem but not as bad as the first 30 seconds. They are my previous experiences. I even had problem calling someone in Istanbul. I know what I wanted to talk about. I had the idea for what I wanted to talk about.

- Interviewer: Had you talked about it before in English?
- Interviewee: Yes, Here I wanted to talk about something, I had the idea, But the point here is I didn't know how to explain everything. I doubted in making a good structure. I was ok with the first and second phrase but I got stuck with the forth one about what I wanted to say. In long sentences the problems occur.
- Interviewer: Does dropping in WTC make this happen or this leads to WTC drop?
- Interviewee: Both affect each other.
- Interviewer: So, we cannot say which happens first?
- Interviewee: Both are dependent on each other. They make each other decrease.
- Interviewer: Can we say they make each other increase as well?
- Interviewee: Exactly.
- Interviewer: Or you have the vocabulary but it doesn't happen then?
- Interviewee: I know the words; the problem is I don't know the phrase.
- Interviewer: Let's be a bit more precise. Phrase or grammatical structure?
- Interviewee: I see for example I know I want to say something about historical moment but not knowing how to put it correctly in a sentence puts me in trouble.
- Interviewer: As I noticed it was phrase not a sentence.
- Interviewee: Here I was wrong with pressing high. When I was in Istanbul I had a problem to decide what the good quality is. I had all those conversations in my mind. What I wanted to talk about. I asked a lot of people about it and they all didn't know. Here I could say a short sentence instead of saying it

that long. I said it longer because I was thinking about the next sentence.

That made me pause.

Interviewer: Two things here. One is the sentence you were making, you yourself know it has a long structure when could be shorter and the second you were doing two things together planning for next structure.

Interviewee: I think I would be more fluent if could only think about what I was talking about not the next structure as well.

Interviewer: Next sentence structure? There is the idea.

Interviewee: Yes, there is the idea. The problem is the structure. If this goes a bit forward it is completely obvious that it gets worse.

Interviewer: Did you understand then?

Interviewee: Exactly. For example, I wanted to say: 'Then I couldn't say that well. I can speak much better when there is no computer. I didn't have speaking practice as well. Especially this IELTS-like speaking that I had never done before made me nervous in thinking and speaking.

Interviewer: Thanks, you get stressed for this structure?

Interviewee: Exactly, Normally I don't speak that difficult.

Interviewer: Sorry. I didn't get that. You get stressed because you know you are being recorded.

Interviewee: Today it was obvious enough. I was trying hard to manage my time. I talk more fluently and easily on my own. Two weeks ago, in my class when I wanted to present I had the same feeling about 20% of today, a lot less.

Interviewer: It means presenting in front of other is less stressful than being recorded.

Interviewee: Sure. I'm ok with talking in front of 300 people. It doesn't bother me

Interviewer: But only one camera does.

Interviewee: Not the camera. Maybe it is because I need to speak shorter.

Interviewer: It might be the first 10 minutes of your representation that you are stressed then you get well.

Interviewee: It was 3 minutes but I knew the topic.

Interviewer: Maybe you were prepared for that?

Interviewee: I had information.

Interviewer: You have rehearsed once or twice for that. Right?

Interviewee: Once. But because I had information about the topic. I was sure of myself. I'm a bit anxious when it's all about IELTS and TOEFL. I'm not comfortable. I mean I see the effect I had idea here I knew what I wanted to talk about.

Interviewer: Using the word "jet lag" helped?

Interviewee: Yeah indeed. I had the idea. I knew the next sentence. Here I was thinking of my trip to Beijing. What happened to me was in front of my eyes. If you pay attention here I when I'm talking about language 10 second later I'm more fluent.

Interviewer: Because of personal experience?

Interviewee: Yes exactly.

Interviewer: Totally the last sentence was more positive.

Interviewee: Because I exactly knew how I wanted to close it up.