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A Dyadic Autoethnography of a Learner of English via Chinese

by

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DEDICATION

This dissertation
is dedicated to my daughter and son,
Justina and Justin,
as in their future,
their children
(and children and grandchildren of others)
may have a more efficient way
of learning and using
one or more additional languages.

ABSTRACT

The plethora of research on ESL, L1, L2 and ethnography has left under-reported autoethnographies borrowing mathematics as a tool for thinking. In response to the multiplicity, this dissertation explores personal and academic experiences to expose my own development of an L2 learner, in transcultural, translingual, and transnational identity formation and construction, via the learning and teaching of a second language.

The methodology I have chosen to use is autoethnography, a relatively new momentum-gaining research tool that combines characteristics of ethnography and autobiography in the latter part of the twentieth century. It is very useful in writing about the dialectical personal and professional creative experiences of fixity and fluidity because, in autoethnographic writing, the observer and observed, the researcher and the researched, the emic and the etic, or the insider and the outsider, are the same.

The central issue in this dissertation lies in three questions: In what ways has a person with a Chinese cultural background formed his thoughts and ideas about his English language learning and teaching experiences via exposure to English as a linguistic system and culture? How have the said thoughts and ideas influenced how he performs or reveals his learning and teaching experiences? In what ways can the efficiency of learning an additional language be reached or at least improved based on the dyadic relation between a first language and a second language?

The transcultural, translingual and transnational adjustment to a foreign culture in keeping my growth in academia, started with an aim to understand

changes in human nature wired by culture and language. Such life-altering cultural and linguistic changes forced the formation and construction of an identity to speed up with presentable performances. By using reflective and available tools for thinking, the speed of gaining quality performance can be efficiently reached. Thus, this research endeavours to provide a model for the development of a critically self-reflexive tool for thinking, so that a second or additional language, and the superstructure of a cultural identity that changes with a new culture, can be organically advanced with synergy and efficiency.

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There was once a saying in China about ‘exposed rafters’ that are the first to rot. Such traditional wisdom has always been the accepted way of conducting oneself in Chinese society for several thousands of years. Almost everyone knows this expression, but there are always some that know it better. For those I first acknowledge, all who have encouraged my academic explorations of language learning and teaching, the Jing and Coral Chen family, the Jock and Myrna Fyfe family, the Defeng and Chunling Li family, the Shuying and Shar Li family, the Chunlei and Xiaojian Lu family, Yizhu Wang, Mianmian Xie, and the Bing and Catherine Zuo family.

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Thanks to the patience and understanding of my parents and my parents-in-law, as the four of them in their septuagenarian years saw my wife’s doctorate degree and waited so long into their octogenarian years to expect mine. I hope they all can manage into their nonagenarian years to witness my son’s doctorate.

Last but never the least, I owe all my said and unsaid gratitude to my family, and especially my doctorate wife, who almost tried all means of fistfight and wordfight to help me finish my doctorate. This degree is sharable with her.

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List of Symbols and Abbreviations

a	Active
ALM	Audiolingual Method
aT/cT	Adult/Child target language (second language)
BICS	basic interpersonal communicative skill
C, -C	correct and incorrect Matches
CALP	cognitive academic language proficiency
CP/CPH	Critical Period/Hypothesis
CPA	Chinese Phonetic Alphabet or Hanyu Pinyin
d	Degenerative
D&C	Divide and conquer, instead of mixing L1 and L2
E	average number of L1-Equivalents to each L2-word
EBN Rule	Either, Both, or Neither Rule
Ei	Number of causes of errors, or input-causing errors
En	Number of errors made in both L1 and L2 in recognisable styles
η	Efficiency
ELLs/NESs	English language learners/Native English speakers
ESL	English as a Second Language
g	Generative
G	Grammar/ing, linking ${}^{H}_{R}G^{S}_{W}$ as a whole
GTM	the Grammar-Translation Method
h	Hearing/Listening factor
H	Entropy
Hn	the nth harmonic number
${}^{H}_{R}T^{S}_{W}$, *H/LSRW*	Four Target language skills of Hearing/Listening, Speaking, Reading and Writing
I	the value of Information or Interlanguage
In	Number of interlanguages in recognisable styles
IL	Interlanguage
iToT	input Think in target language, output Target language
KonK	Knowledge new builds on knowledge known, knowledge built on knowledge
L	Literacy or a learner
L1, M, ${}^{H}_{R}M$ *or* M^{S}_{W}	First language, usually Mother tongue, input or output
L2, T, ${}^{H}_{R}T$ *or* T^{S}_{W}	Second language, usually Target language, input or output
LLE	Law of Least Effort
LSRW or HSRW	Order of acquiring Mother tongue
LAD	Language Acquisition Device
LMC	Language Making Capacity
m, t	Subset of L1 used, or of L2 learned
$m_k, m_u, m_{u_m}, m_{u_t}$	m known or unknown, unknown in L1 or in L2
MOI	Medium of instruction
MiMo	More input, More output
NiNo	No input, No output
NS	Native Speaker/s
o	Oracy or orality
P	Proficiency, p=RSLW or p=RSHW; or probability; or passive
P_0, P_T, P_M	The (Steady)/State Vector, in L1 or in L2
$R_m, \overline{R_m}$	match Rate and mismatch Rate
s	Speaking factor
SCT	Sociocultural Theory

List of Symbols and Abbreviations

S_T^x, S_M^x	The Transition Matrix, in L2 or in L1
${}_R^H T \; into \; M_W^S$	Target language into Mother tongue
T&I	Translation and Interpretation
TiTo	Target language in, Target language out
TM	the Translation Method
U	Understanding
UG	Universal Grammar
ULL	Union of the language and the learner
USS	Union of the speech and the speaker
USSR	Union of Soviet Socialist Republics, former name for Russia
VOA	Voice of America
w	Writing factor

Chapter 1
Introduction

Prologue

With the dissemination of information and more inclusion of the self in qualitative research such as autoethnography, a word of warning is definitely called for at the outset. This autoethnography is concerning the developmental formation and construction of mainly a single English language learner and teacher in the field of Second Language Acquisition (SLA). His personal understanding of how an additional language is learned and applied in his identity development may not include all or even most of the possibilities that have been covered in literature, such as language loss (Hinton, 1999), or endangered languages (Spolsky & Hult, 2008). Readers of such a more personalised research are advised to read at their own discretion and only pull the information contained that will benefit their personal development of their identities.

A cognitive scientist, Steven Pinker, expanded the study of cognition to the study of human nature, likely via the scientific cognition or recognition of the gathered and accumulated fact, and concluded that the past was much worse (2012-11). Thus, the conclusion could mean that today we may be living in the most peaceful time in human existence. Most if not all of the people around us are becoming more empathetic, caring, and helpful, though perhaps, such characteristics have been developing very slowly through thousands of years. Pinker's approach, equally as he claimed before (Pinker, 1997), is scientific in the broad sense of seeking explanations for 'why' things happen (2012-11, p. xxiii). We as readers are convinced that at the same time most of human beings are wired for violence, even if in all likelihood we will never have an occasion to use it (2012-11, p. 483).

Pinker was not alone.

Rushton's theories of personality, individual differences, and social psychology are compared with Einstein's theory of relativity (Templer, 2012). The reason is that his gene-based evolutionary models put forward in his book to explain ethnocentrism and racial group differences may provide a catalyst for understanding individual differences and human nature (Rushton, 2000-1995, p. xiv). Human nature is linked to physically existing genes, instead of the mind, which Pinker would do, as the latter is a psychologist. However, Pinker also believes that language is not just a window into human nature but a fistula, and a fistula is an open wound through which our innards are exposed to an infectious world (Pinker, 2007, p. 425). The world is infectious, so is our language, or maybe the language is wounded itself. Anyhow, the learning of an additional language is exactly the learning of the human nature, good or bad, of those who speak that language. Linguist Berlitz contends, on the world island where we all live it is increasingly important for us to understand the cultures and languages of our neighbours and, through this, how they think (Berlitz, 2005-1982, p. xi). Language learning and teaching, as part of any individual's education, has to be in one way or another closely related to human nature, for unless it makes a difference, a very real difference, in the systematic procedure of human nature, it is not education (Moore, 1915, p. 151).

Other than the gene-based and cognition-revealed, human nature is also neuron-based (Ramachandran, 2011) and is definitely reflected or even influenced by culture (Dei, 2001). Every aspect of education is in fact enculturation. The learning of an additional language is also enculturation, as well as the teaching of an additional language. As language users and learners, once we are born into this world, we were pressed by nature to learn and use at least one language, as human nature tells us to learn more, and sometimes, want more (N. Hill, 1979). Ridley contends that culture can determine itself, but it cannot determine human nature (2003, p. 207), part of which is, to learn a language.

Considering that a language, verbal or nonverbal, is maintained and sustained in the history of a life, and is made by nature and developed by culture, this research will explore the formation and construction of an identity of a language learner, teacher, and user, through the learning of a second language, using an autoethnographic approach, which is:

> … research, writing, story, and method that connect the autobiographical and personal to the cultural, social, and political. Autoethnographic forms feature concrete action, emotion, embodiment, self-consciousness, and

introspection portrayed in dialogue, scenes, characterization, and plot. (C. S. Ellis, 2004, p. xix).

Statement of Purpose

Language learning and teaching, for either native speakers or speakers of other languages, at least in the past one hundred years or so, has been viewed as being full of problems. Those problems range from oral reading (Bassett, 1917), to efficiency in communication and education (Chao 赵元任, 1946), to translation when meanings are concerned (Lyons, 1968), to vocabulary learning caused by lack of equivalence between lexical items of different languages (Wilkins, 1974-72), even to differences in age or nationality (Quirk, 1978).

The solutions to those problems have been constantly and earnestly sought. For instance, in secondary schooling, it has been found that academic preparation and track placement may contribute to academic success (Valdez & Callahan, 2011). Academic preparation could refer to simultaneously using the target language to study content knowledge in addition to the learning of the target language per se, or having studied background content in the mother tongue before coming to target language schooling. There are also other problems, such as speech production in consideration of the Critical Period Hypothesis (CPH), where some adolescent language learners have an accent for many years or the rest of their lives. Some adult language learners instead display no trace of an accent, which may take a long time to see some light in solutions (Pickering, 2012) to CPH.

One way to look at the salient characteristics of language learning and teaching, explore and describe the processes and procedures as such, is to distinguish between two settings. Those two educational settings are schools or a classroom, and natural settings such as the family, the street, or the workplace (R. Ellis, 2008-1994).

In the language classrooms, especially in those in native-speaking countries, teachers teaching English, for example, as a Second Language, or to Speakers of Other Language, are all professionals. They also use what is termed an authentic language, or used authentically, the targeted English language that they know only, to teach language learners. However, for one thing, those professional teachers mostly involved in the language learning lives of students spend only very brief moments in language-specific teaching and learning activities, compared to the time that language learners spend at home with their parents and/or siblings and/or friends. For another, as indicated by Widdowson (1998, p. 715):

> As TESOL professionals, we need to make language and language learning a reality for learners, and we cannot do so by bland reference to "real English." It can only be done by contrivance, by artifice. And artifice, the careful crafting of appropriate language activities, is what TESOL is all about. Note that I say appropriate, not authentic. By that I mean language that can be made real by the community of learners, authenticated by them in the learning process.

Sometimes even in the eyes of the professionals there is a lack of professionalism in the TESOL fields. Examples include too many amateurs around (who think that it is enough to know English in order to teach it, resulting in lowering of teaching standards), or too many academics telling teachers how to teach, or too many 'technician' teachers, or even also too many laypersons in positions of authority, taking or causing ill-informed decisions on the management of the learning of English in schools or on teacher training (Ur, 2008, pp. 391-392).

Even with occasional lack of professionalism, professional language teachers, including TESOL professionals, should know more about the characteristics of their students, the languages they are assigned to teach. For teaching K-12 students, language teachers perhaps even should know the characteristics of the parents of the students, as well as a general understanding of the community the students live in.

The purpose of this autoethnographic research is to explore the experiences, feelings, and conceptualisations of an English language learner and teacher, in a span of decades, on his formation from a more monolithic identity, via a cultural hybridisation process, to a professional educator in another language.

Although a highly personalised account of one almost lifelong second language learner and user about his own complexities and problems from one stage to the next, this researcher hopes that this research also serves the purpose of enabling other colleagues and language educational professionals to reflect on their own teaching careers in language education. At the same time, current and future language learners and users may also gain some insights against the pitfalls along the way of learning an additional language that this researcher has already fallen into, so that those pitfalls may be avoided at an earliest possible time and space.

Significance of the Research

The year 1978 marked my first year at university in Harbin, Heilongjiang, China, and ten years later, in 1988, I came to Edmonton, Alberta, Canada, to take my master's degree in adult education. Prior to that, I had been in another master's program leading to an M.A. in English linguistics and literature, which was the first M.A. program at my university after the Great Proletarian Cultural Revolution (GPCR), from 1966-1976. In 2004, my wife received her Ph.D. in secondary education after 15 years in Canada, and I was preparing to apply for a Ph.D. in secondary education, at the age of 46. Exactly in that same year, an epitomic volume on positive psychology was published, *Character Strengths and Virtues: a Handbook and Classification* (Peterson & Seligman, 2004), and was sold out not long after its first printing. I later ordered myself a copy for $150.00 Canadian and started to form a positive Canadian Ph.D. identity with strengths and virtues, in possession or to be rediscovered, in English, my second language.

In view of strengths and virtues in an English-speaking environment, my second home and hometown, this research is significant in the following three sectors.

First, current knowledge about how students educated in a cultural and linguistic background vastly different from those of the target society is inadequate. My personal goal is that my autoethnographic research on my own thoughts, supported with notes, vignettes and experiences of cohorts, will help me strengthen my pursuit of knowledge personally and professionally as a language learner and teacher, and also help other language learners and teachers to examine reflectively their own identity formation and construction.

Second, although my account of my personal thoughts that I had collected will be highly personalised and reveal both positive and negative challenges, I hope that this research will provide some food for thought that will empower other language learners and users to take charge of their own life and transform not only their transcultural identities (Higgins, 2011a), but their identities in line with strengths and virtues.

Third, the formation and construction of my own identity is closely intertwined with the learning and teaching of a second language that is linguistically distant (Chiswick & Miller, 2004; Koda, 2012) from my own mother tongue. That is obvious with Mandarin Chinese and English. However, we should never take the obvious for granted (Ramachandran, 2011, p. xvii), as we can be blind to the obvious, and we are also blind to our blindness (Kahneman, 2011, p. 24). In seeking the formation and construction of my identity, this research also explores the relation between the first and second languages in an effort to examine and seek the efficiency of learning and teaching an additional language.

Research Questions

The eleven steps suggested by Flick (2009-1998) have been referenced in the definition and formulation of the research questions. Before simply stating the research questions, I would expand on what had led to (Flick, 2009-1998) the three research questions, which is also part of this research per se, i.e., the formation and construction of an identity in becoming.

I had not majored in mathematics, but I can be considered not too weak in mathematics, as I personally strongly believe that mathematics trains the brain, as one tool for thinking, and it empowers the mind (Kenschaft, 1997). I often browse books on mathematics as well. What happened around the turn of the century or millennium was that I had the opportunity to have browsed some of the local high school mathematics textbooks while teaching computer studies and other CTS strands, and discovered that I could do more than eighty per cent of the math problems. That experience also reminded me of a possession of about thirty copies of Schaum's outline series I collected between 1982 and 1988. Then I started teaching mathematics to high school students and discovered that most of my students did not like the idea of math journal, claiming that they could do math but find it problematic writing down their own thoughts or thinking processes. My initial move was to find some answers in a research on how students have done word problems in local provincial diploma examinations in mathematics, using discourse analysis (Brown & Yule, 1983; Jørgensen & Phillips, 2002; Pimm, 2004, 2007). However, that thought fell short as one of my co-supervisors retired.

Following my own mind-set that mathematics may help in the seeking of solutions to many of the research problems where one item is related to another, such as mother tongue, L1 and second language, L2, I switched to looking for the relation between L1 and L2, but was challenged by my committee in many aspects.

As I was reconsidering my directions in my Ph.D. studies, I recalled and recollected several anecdotes leading to the research questions in this dissertation. The first was an email from my supervisor, mentioning the autoethnographic touch I used in my writing. The second was a time when I was preparing to write an ethnographic novel about my observations and experiences from China to Canada. The third was a project that did not finish when I was assigned to translate David M. Fetterman's *Ethnography: Step by Step* (Fetterman, 1998-89) into Chinese, for which project I did some preparatory work, reading the book and researching some background information. The fourth was a teatime when a couple of professors and some of us students were chatting. One of the male professors mentioned that one of the authors whose book this professor wrote a book review about, not so nicely, had met the author personally at a conference, and the author noted that this professor was a nice person. Then I commented that the style does not make the man. Another fellow student present, a native speaker of the English tongue, commented and asked how I could have thought of such a very appropriate comment. On several occasions people have told me, usually after hearing my ideas about the learning of a second language, that they are (somewhat) interested in me. It seems that I can be an object of research; therefore, let me research on me, hence this dissertation.

In concrete terms, this research defines and formulates the following three research questions.

1. In what ways has a person with a Chinese cultural background formed his thoughts and ideas about his English language learning and teaching experiences via exposure to English as a linguistic system and as a linguistic culture? In this research, the phrase “thoughts and ideas” may be envisioned as conceptualisation and comprehension of the formation of a closely-knit identity of an English language learner and teacher.

2. How have the above thoughts and ideas influenced how he performs or reveals his learning and teaching experiences? Considering other English language learners and teachers, another way of asking this question is “In what ways does learning a language become and form a new identity to particular performances or behaviours of a self, specifically in L2 learning and teaching, and why?” In this research, “performances and behaviours” reference speech acts and non-verbal behaviours or backgrounds that index identity while “revelation” may be a specific type of performance where an individual makes his or her identity known to others.

3. In what ways can the efficiency of learning an additional language be reached or at least improved based on the dyadic relation between a first language and a second language? In this research, the phrase “dyadic relation” refers to a relation that connects two and only two identities or elements, while such a relation can be expressed linguistically, mathematically, logically, and conceptually.

Definition of Terms

Some terms are used interchangeably, such as English language learners (ELLs), English as a second language (ESL), English as an additional language (EAL), and non-native English speaker (NNES), as generally recognizable in research literature over the past and are used in this research as general terms to refer to either the group of people, or the processes and procedures. As exemplification of the relation between two languages, the mother tongue (*M*) or first language (L1), and the target language (*T*) to be learned or the second language (L1), symbols are chosen to represent their relations in a formulaic manner as a tool for thinking.

For clarity of the terminology or nomenclature, some of the terms used in the context of this research are defined as follows, with citations of sources for the terms provided whenever possible.

Culture. Culture is an integrated system of learned behaviour patterns that are characteristic of the members of any given society. Culture refers to the total way of life of particular groups of people. It includes everything that a group of people thinks, says, does, and makes—its systems of attitudes and feelings. Culture is learned and transmitted from generation to generation (Kohls, 2001-1979, p. 23).

Dyadic. A dyadic relation may be defined as one which can occur in propositions containing only two other terms, i.e. as one such that the simplest propositions in which it occurs contain only two other terms (Mumford, 2003, p. 87). Relations, like operations, can be classified according to the number of elements involved. Here, however, it is customary to use Greek derivatives instead of Latin derivatives, and we call a relation connecting two elements a dyadic relation (Eves, 1997-90, p. 133).

Identity. Norton uses the term identity to refer to how people understand their relationship to the world, how that relationship is constructed across time and space, and how people understand their possibilities for the future (Norton, 1997, p. 410).

Miseducation. E. C. Moore used miseducation to refer to that which is destructively costly to students (1915, p. 25).

Transcultural identity. That which "blends the preservation of the affective ties of the home culture with the acquisition of instrumental competencies required to cope successfully in the mainstream culture" (Suarez-Orozco 2004: 193, cited in Higgins, 2011b, p. 23).

My Journey into an Inquisitive Mind in the Forming

In a cold winter of 1958, I was born into a family of engineers. My father was a metallurgical engineer working at Harbin No. 1 Tool Works, and my mother was a civil engineer working at Harbin City Planning Bureau. Both of them moved to Harbin, the capital city of the northern Heilongjiang Province, around the founding year of the People's Republic of China in 1949, to study as the first generation of New China's own university students at the then Harbin Polytechnic University (Industrial University or Harbin Polytechnic, according to different translations from the Russian language), the currently Harbin Institute of Technology (HIT), the name of which has been an imitation of MIT, Massachusetts Institute of Technology.

When I was about three years old (1961-62), I started to go to a week care located in the centre of the city, and stayed there twenty-four hours a day, six days a week, from Monday to Saturday. The week care system in China was established for working couples. Every week the happiest day for me was Friday afternoons, when youngsters all had the best of food, then, steamed dumplings.

At age seven (1965-66) I started to go to school, one of the primary schools in the neighbourhood, Southern Ridge Primary School, in the eastern part of the city, at the end of a long ridge. Most of the teachers at that time used the so-called 'chalk and talk' and 'teacher-centred' method to teach us fifty-some kids in one classroom. Perhaps 'school-centred' was a better name at that time. The student-centred activities now so popular in the North American context, are spreading rapidly into China. Our teachers taught us all they knew, and they really knew a lot, extracted and accumulated from 5,000 years of Chinese history plus translations from western literature since the 1800s. In our classroom, we could not even move around our chairs since most of them were double-desks and/or double-chairs. A boy and a girl might sit together but many of them usually drew a line in-between on their desks and chairs, carefully measured to mark his or her special territory. An invading elbow, either from a girl or a boy, was usually pushed back to its own territory immediately by the owner of the territory.

Reading-aloud and intensive writing (or writing-a-lot, a Double-A Method, as I would call it) were the major activities in our primary school life; we read every day of every month of every year, at school and even at home. When we read aloud in unison at school it seemed like all of the sound came from one single big mouth with a young voice, instead of fifty or sixty little mouths. In this practice we learned to pronounce correctly by both saying words and phrases ourselves and hearing others read them aloud. What we did most was reading and writing to the extent that after many times of reading and writing we could easily recite almost the whole textbook, about 100 pages long, from cover to cover. The teacher explained each Chinese character very carefully, and checked on some of us randomly for our understanding.

My homeroom teacher never smiled to the best of my memory. She could not let any of us talk in class as it would waste our precious class time. The teacher's reasoning or axiom, as it has been repeated to me and my classmates many times for many years, was that if one pupil wasted one minute, for a class of fifty or sixty pupils, it is a total of accumulated fifty or sixty minutes wasted. I was then too young, or too afraid, to argue with the teachers, that if all the fifty or sixty pupils altogether wasted one minute at the same time, it is still one minute wasted, not fifty or sixty. That is the idea of simultaneity. Looking back on it, I now understand more why I am personally very much concerned with the efficiency of learning a language, especially an additional language.

The teacher seldom made any positive comments to us or on us or for us, or perhaps, about us. I guess that was what killed my appetite to think or reason correctly and logically so that I totally had forgotten to argue with them about simultaneity. It was our responsibility to do well. I believe this to this very day. Our parents supported the idea as well.

We studied the textbooks, copied from the textbooks, read the textbooks, and recited against the textbooks. We always had the textbooks to refer to, for the teachers, the youngsters, as well as the parents. The only thing we did at school was to study, not have fun. Working hard was more important than anything else. Because of that attitude and approach we accumulated a lot of intellectual, or book, or even bookish, knowledge. We could hardly forget what we went through, even if we wanted to. I still believe that knowledge and skills learned well accumulate to form a solid foundation for future and further learning.

Every single school subject was taught in Chinese, and the only deviation remotely different from Chinese characters, “the square script”, as each character looks like a square. Here are some examples, ‘field’田, or ‘to apply’申, or ‘first’ 甲, or ‘because’由, or ‘electricity’电, or ‘a turtle’龟. We also learned a system of Latin or Roman letters used to represent Chinese pronunciation called Hanyu Pinyin (Chinese Phonetic Alphabet or CPA). I personally found this system amazing since I happened to have found in our family library hundreds of books in the Russian language on metallurgy or civil engineering. I found many similar letters in the two systems. I also learned later that both my parents were educated by the ‘Russian experts’ before 1955 from the then USSR. Those are real experts at Harbin Institute of Technology (HIT), where my parents were for a total of six or seven years.

I stayed at my primary school for five or five and a half years, without possessing an iota of knowledge of what English was, and went to Harbin 3rd Middle School. My alma mater was the best school in the province, and one of the best in the three north-eastern provinces of Heilolngjiang, Jilin, and Liaoning in China, to start learning English as a school subject.

Coming into the 1970s, China was back into the United Nations and President Richard Nixon visited China. Around the same time, the English language learning started to boom in China, and some newer English course books started to be imported into China.

In my hometown of Harbin, the average city resident now had 2.28 square meters of residential space to live in, compared with 3.62 square meters at the time of the founding of the PRC in 1949 (MacFarquhar & Schoenhals, 2006, p. 376), a shrinkage of 37%. There was less room for residents now but more room for the English language. One of the course books available then was *English 900*© (English Language Services, 1964, p. 8). It was broadcast by Voice of America (VOA) for many years. As indicated by Schultz (2006) later, ‘it [VOA] even broadcast a formal "English 900" language training program to China in the 1970s that was the most widely listened-to single program in the country'. I was one of the listeners then, despite the fact that listening to VOA was considered 'secretively listening to the enemy's broadcasting station'. Listening to VOA was good and helpful for me, since I did not find anything 'enemy-like' in the process of learning English, at least not in the English language or the course book per se. Interestingly or perhaps fortunately for many 'secretive listeners', most of the radios in China then had been equipped with short wave receptions capable of receiving VOA, BBC, Radio Japan, or even Voice of Free China from Taiwan.

I could not recite the complete book of *English 900*© now, with about 3,600 sentences in total, but I can anyway recall some sentences: 'You have your point of view and I have mine.' 'It's difficult to make a decision without knowing all the facts.' Some of the sayings might be true universally, in China or elsewhere, though I would never expect anybody to know all the facts before making a decision.

Figure 1 Cover of English 900©, 1964

I also learned from that book that Samuel Langhorne Clemens is Mark Twain's real name, and 'Everybody talks about the weather but nobody does anything about it' was also credited to him. My bad experience out of learning *English 900*© is that many of the English words in a 'real English textbook' from the USA could not be found in the then available English-Chinese dictionaries (Hornby, Gatenby, & Wakefield, 1970; Zheng 郑易里 & Cao 曹成修, 1990-57), either the dictionaries being out of date or *English 900*© was too 'new' or too real (authentic). The good experience is that listening to normal speed or slightly faster speed is much better than listening to slowed-down speech, as VOA resorted to deliver a few years later their *English 900*© at a slower speed.

Other than *English 900©*, a few more English textbooks also contributed to my understanding of the language and its learning. One of them was published in 1962 (Chen 陈建耕, Zhou 周芳, Huang 黄次栋, Xu 徐小鲁, & Zhou 周惠麟, 1962), when I was only four years old. I picked this book in my family library. The texts in the book, intended for science students, dealt with scientific method (p. 21), of observation, reasonable thinking, and careful verification; with new methods of computation (p. 55), of measuring and counting; with stories about M. V. Lomonosov and J. P. Pavlov (pp. 115, 161), both Russian scientists, in the 'Big Brother' country of the then USSR; and with artificial satellites and space rockets (p. 84), obvious after the Sputnik in October 1957. There was a short interview with Yuri Gagarin, after he came back to earth from Vostok spaceflight. Those texts seemed to tell me that the English language was supposed to be learned as a tool to be applied in the study of science and technology, or for the application of 'other' subjects rather than a language per se. It also taught me that English grammar labels almost all go with the definite article 'the', such as 'The Subject', 'The Link Verb', which I learned later on, is not always the case, nor was the article necessary.

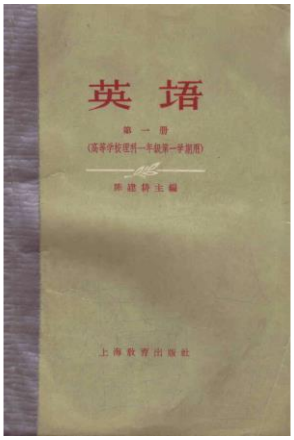

Figure 2 Cover of an English textbook, 1962

Another English textbook that helped me greatly was not from our family library, but was one I bought in 1972 or 1973 (English Teaching and Research Section. China Foreign Affairs University 外交学院英语教研室, 1972-60). This book, intended for students majoring in foreign trade and diplomacy, used about twenty pages to talk about English pronunciation, another eleven pages on 'reading rules' as termed in many of the English textbooks published in China then, or 'orthoepy' as defined by Daniel Jones in his renowned *An Outline of English Phonetics* (Jones, 1972-50, p. 3),

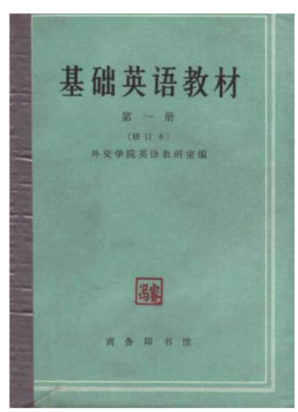

Figure 3 Cover of an English textbook, 1972

'the relation between pronunciation and conventional spelling'. The earlier publication in 1962, *英语 English* (Chen 陈建耕, et al.) used fifteen pages to deal with English pronunciation, together with pronunciation exercises in each of the twelve lessons. Both books obviously stressed pronunciation, while the latter may get some future diplomats with excellent oral English out of it, or at least intended to.

This latter book taught me that 'The Subject' can be 'the Subject', i.e., 'the' does not have to be capitalised all the time. It also taught me what is generally termed 'China English' since all the texts were teaching different aspects of Chinese culture and ideology, not a single text was selected from publications outside of China. In other words, all the texts were translated into English from original Chinese sources.

I learned from such translations that it is the least efficient if a monolingual learns the same content in the mother tongue (L1) at least once, then relearns the same content in a target language (L2) at least once. That to me was wasting precious time and life, repeating the same content and knowledge, and perhaps skills, more than once in two, or even more, different languages.

Neither of the two English textbooks talked much about writing in English as a foreign language, though there were abundant exercises on translation from Chinese to English, and vice versa. Using such textbooks to learn English, as well as some others I acquired or borrowed later, I studied English for the first three years in secondary school mainly by myself, along with classroom English taught by my English teachers, and listening to Voice of America at home.

In a province of a population of over thirty million at that time in the 70s, the reputation of my alma mater, Harbin 3rd Middle School, was pretty similar to that of Beijing University (a Harvard-similar) or Qinghua (Tsinghua) University (an MIT-similar) in the whole of China, which then had a population of one billion. My homeroom teacher was an English major, graduating from a university in Shanghai, a city noted for its proficiency in English, and broken English, even in the thirties. It was fortunate for me to have her as my homeroom teacher. However, she was not our first homeroom teacher, but was one who replaced another teacher who did not even know how to remove brackets in a mathematical calculation with division sign both in front of the brackets and within them, such as $24 \div (8 \div 2) = 24 \div 8 \times 2 = 6$, but $24 \div (8 \div 2) \neq 24 \div 8 \div 2$. The answer is six, not 3/2.

As my English was much better than that of all of my classmates and schoolmates in general, my homeroom teacher acted as my mentor to let me teach English to my own classmates for two and half years until the end of 1977. This was an effort to motivate me, as well as to motivate my classmates. That really promoted my studies of the English language. For some unknown reason, I wanted to be a teacher who can and does, so I had to learn much more than my classmates in order to be able to teach them. Many of my teachers used to tell me that in an effort to help pupils to gain a bucket of water (i.e., knowledge or skills), a teacher must have twenty buckets of water readily prepared. Then there is a good teacher.

I worked even harder to prepare myself, going through any books I could lay my hands on. The ones I used included those on the structure of English (Fries, 1952; Hornby, 1975-54; Sack, 1954), oral English (Palmer & Blandford, 1963), textbooks totally in English (Eckersley, 1942; Eckersley & Eckersley, 1971), which used direct method and helped me with all the different ways to talk about the English language and its grammar, and even browsed the then best, perhaps only, available English dictionary (Hornby, et al., 1970). I also tried to read more in Chinese about the English language. The old books in Chinese I used included: one on Calculus (Granville, Smith, & Longley, 1948), in which the translator added English terminology in brackets, thus making it easier for me to learn both Chinese and English glosses at the same time. A glossary of Chemistry terms (Chinese Chemical Society 中国化学会化学名词研究委员会, 1953) taught me some special vocabulary used in chemistry. Other glossaries at the back of some of the old textbooks on physical chemistry (Huang 黄子卿, 1955), or some of the Latin names of chemical elements. Anything that was English helped me to pave the way of my long road to work as an educator in English, at least a learner in it.

I was wearing my teaching hat very well. I also learned to explain to my classmates, in as intelligible a manner as I could manage, in plain Chinese words, what we learned in our school subjects, other than the English language, for example, mathematics, physics, and chemistry. My teaching career began back then in the seventies when I was a high school student myself.

A few of my best-memorised anecdotes included the teaching of fractions, from which I figured out that the so-called ordinal numbers in English also represent a unit fraction. Another good memory was the time when I, with another four of my schoolmates at my school, from among three classes of about 200 students, was selected to sit for the university entrance examination and also passed it in 1977 (the first generation of China's university students after the GPCR enrolled via a university entrance examination), when I gave my last lesson to my classmates. I was reading the Chinese translation of a preface by Harold E. Palmer and Francis George Blandford in their *Everyday Sentences in Spoken English* (1963), sharing with my classmates how the English language is to be learned as English. One of the authors frequently used the following test in his classes, which was to ask his students to imagine a given situation and write down what they might say in such circumstances. However, the students often wrote sentences which no English-speaking person would ever use, and, in many cases, there are no actual violations of English grammar. Then the author wrote, as one of my favourites, the following:

Figure 4 Cover of Everyday Sentences in Spoken English

> You have invented these sentences. You have either translated them or have evolved them out of your inner consciousness. You have strung a lot of words together in the hope that the sentence will be intelligible. But you have not asked yourselves whether these are sentences which you have actually heard fall from the lips of native speakers. (Palmer & Blandford, 1935-22, p. vii)
>
> I make no claim that this is the classical English of the grammar-books, that it is the "best" English, or even "correct" English. I merely state that it is the sort of English which I actually hear used in ordinary conversation

> by those whose speech is generally considered beyond criticism. (Palmer & Blandford, 1935-22, p. ix)

I was really feeling, at that moment, after that many years of preparation, that I was going to be using English to teach.

Another of my lived experiences grounded my interest in understanding writing in a new language. At secondary school, about age 14 to 15, I found myself deciding not to write a single sentence, in any language, leaving no ‘black characters on white papers’ behind me, for my child(ren) or any animals called Homo sapiens, since they are already intelligent enough. Some of them are even more intelligent than they can properly handle. Then at age 15-16 I started two things that were important in my life. One was to teach myself several different Chinese Romanisation Systems, variously called Chinese Phonetic Alphabet (CPA), Hanyu Pinyin (Chinese spelling), Guoyu Romazi (National Romanisation), pinyin (spelling sound), Wade-Giles Romanisation, etc. The other, of course, was that I started to teach English to my classmates.

Chinese Romanisation bore fruits. In about half a year, I could write comfortably in a pinyin system that none of my classmates could read or understand without some efforts, and I am sure not many of my teachers, even language arts teachers, could understand it either. Then I started writing about the behaviours of my classmates and teachers, transactions between live people and the ideas behind their dialogues or conversations: what the hidden agenda could be and how they revealed their true intentions when they actually tried to hide them as deeply as possible. I also recorded how I came to the conclusion and kept my own writing to myself, not for everybody else to read and understand. One of the good examples was that one of my classmates kept bragging about how he was good at a certain school subject, how his father taught him such and such about the subject, and how successful he was, thus revealing his true intention to be selected as the ‘student representative’ of that subject, a prestigious ‘position’ showing him to be better than others. That was a time when I had not even heard of either Sigmund Freud or psychoanalysis.

I used a lot of Chinese aphorisms, accumulations of thousands of years of human intelligence in Chinese, largely based on overcoming cases of absurdity and stupidity. Buffon's words, 'style is the man himself,' or *Stilus virum arguit*, of course, it was all in Chinese then, has always been a timely reminder to me on many occasions. It told me that whenever one decides to write or speak, one is sure to be revealed, partially or completely, some day. We might say, the more concealed one wants to be, the more revealed one actually is. Writing is at best openness to oneself as a writer, unless one is sure the writing will not anger all other people who can easily be angered when they get a chance to read a piece of writing by somebody else. Are there not many who become angry so easily by the sight, the sound, the words, or the image? That is why, as I learned many years later when I was in Canada, that viewer discretion is advised, or even strongly advised. Some of those people will take things personally, even if the writer is carefully but eloquently not to mention names. The reader may not want to follow the writer or try to understand the writer, but be carefully vigilant, or over carefully cautious, in finding fault with the writer, not the writing, but the writer, partially because the writer may have reflected sarcastically the reader or their behaviours or their true nature, that they have been working so hard to hide.

My English improved a lot in teaching my own classmates for the two and half years. I developed my personal methods of learning and teaching the English language which are vastly different from learning and teaching the Chinese language and gained some rarely learned and hard-found knowledge or insight (at a time when the Internet was not yet created) which I shared with my classmates. For example, I learned that 'family' and 'class' are also terms used in Biology, the chemical symbol for 'iron' is not related to 'iron' but is Fe because the symbol was taken from Latin, which is *Ferrum*. There are also Latin words behind potassium (K from *kalium*), mercury (Hg from *hydrargyrum*), copper (Cu from *cuprum*), gold (Au from *aurum*), silver (Ag from *argentum*), and sodium (Na from *natrium*).

Those two somewhat contrastive and conflicting experiences, i.e., hiding and showing in words, taught me that language has both the ability to reveal and to conceal, depending on how human beings are deciding to use it. Writing, as one application of language, also functions in the same universal way. I definitely needed to understand more about language learning and usage, thus to university I went.

My university days (1978-1982), when I was an English language major, were different from most of my English cohort or contemporaries. While most of them were reading novels, novelettes, novellas, poetry, anthologies, etc., I was reading science-related materials in English: Boolean algebra (Goodstein, 1963), analytical geometry (Pogorelov, 1980), Chemistry (Deming, 1933) (I still had the book with me up to 2010, when I had to throw it away before moving), political economy (Campbell, 1954), criminal investigation (Horgan, 1974). I was mainly browsing old, older, English books available then, such as Dale Carnegie's *How to Win Friends and Influence People* (1947-36), at the same time, keeping in mind how to explain the ideas I read to my classmates and my tutees. One important rule I learned from Carnegie is 'Do not nag'.

After graduation I started to work at my alma mater, Harbin Teachers University (HTU) or Harbin Normal University (HNU), teaching English to English language majors and teachers from other departments preparing for the TOEFL (Test of English as a Foreign Language) so that they could go abroad to study in other countries. In 1986 I enrolled in an M.A. (Master of Arts) programme in modern English linguistics and literature and finished my courses. After teaching the English language for about ten years, supported by a TOEFL score of 603, the highest in my province on that testing date at that testing centre, I came to Canada in 1988.

For the twenty-two years I have been in Canada, I have been trying in every way to be an educator as well, a teacher who 'can and does and teaches' (after George Bernard Shaw, in Oxford University Press, 1981). By learning from the voices of other teachers in Canada or the USA, whose culture I had to start to learn from zero or almost zero by living it and reading it myself personally, I learned that English is 'one of the more difficult languages ever encountered by adult students' (Dennis, 1997, p. 32). I also learned 'it wasn't always possible to find a hook upon which to hang the learning experience' (Dennis, 1997, p. 24), though, 'the system of education was, after all, built upon the military-industrial model.' (Dennis, 1997, p. 8), 'A view unblemished by the harsh and limited judgements of teachers represents the narrow norms of the school system.' (Tompkins, 1996, p. 197), not only cruelty is shown by youngsters, it is also shown among teachers. For example, a teacher took a joke seriously and threatened to report to the Federation of Teachers (McLaren, 1980, p. 108), a warning sign for me if I choose to become a teacher, and 'school, by its existence, militates against the very thing that education is for—the development of the individual.' (Tompkins, 1996, p. xix) However, this sentiment may not be experienced by all teachers working in North America, but what I have read from other teachers all contributes to my understanding of my new culture and country in Canada.

As a cultural hybrid, defined as 'a person whose background is a blend of two diverse cultures or traditions' (Merriam-Webster, 2002-1994), I learned to observe and compare two of the 'Great Three' (Smart, 1999)—China and the West. Other cultures may be equally great, but I was not lucky enough to come into contact with these yet. I might as well start with the two I happened to be thrown into.

Wilson contends that for several millennia the ruling spirit of China was harmony and conformity, under which circumstances, it was most unlikely that claims of individual freedom would make much headway (1997, p. 197). In other words, the individual was subordinate to the family and the family to the clan (p. 207). A clan, according to one of the meanings of *Oxford English Dictionary* (1993), is 'a collection of people having common attributes; a fraternity, party, "set", "lot"'. In other words, clans are bound by 'common attributes', shared by the people of the clan, not necessarily bound by rules or laws. I learned later that in a clan-heavy society effort is given more weight than ability (Newton, 2007). A specialist approach is favoured, rather than a generalist approach, in which a teacher 'is able, does, and teaches a little' of many subjects, or a case of he or she teaches ill who teaches all.

What about my Canadian location, which is somewhat shadowed by the US? In my mind before 1988, the western world was 'technically advanced'. A

Canadian scholar, Heather-Jane Robertson (1998, p. 120), argues that technology is not only the conduit that drains power from citizens to corporations, but also the religion that keeps us in a coma. I could see truly that there are ‘two sides’ to everything. Therefore, others believe that the structure of schools could not and cannot support new technologies and new work for students (Schlechty, 1997, p. 168). This is telling me that some people are for technology, while others are not so in favour of technology, even in a technologically advanced society. As an educator, one has to be more careful with one’s words and deeds, weighing as many factors as possible. Perhaps one should let one’s words be few and one’s deeds be due on time and properly.

Here I am somewhat caught between two cultures or rather, between parts of the two cultures. However, I can try to bring the better part, the part I learned from both cultures, of each of the Great Two, together, helping each side somewhat to understand the other side, in education, since education is part of a culture. One definition of curriculum is that it is only ‘a course, a regular course of study or training, as at a school or university’ (Simpson, et al., 1993). Curriculum is only a part of education. I have to keep in mind, though, in any culture, there is always the good, the bad, and the ugly.

Being caught between two cultures also means touching both cultures, and being touched by both. One thing I need to keep in mind is the avoidance of bringing some aspects of one culture into criticism against another culture. A vantage point, though, is to view a culture deeply. As writer Clarence Major says, ‘the culture stuff is fairly superficial; all you can do is understand what it means. The stuff that truly counts is beneath it.’ (Neubauer, 1994, p. 187) Another writer, Eve Shelnutt (Neubauer, 1994, p. 199) says that writers (and for that matter, all of us) have a problem of being locked into his or her culture, and we need to ask how we can get a perspective that questions that culture. I need to question myself on both cultures, a tedious job to do, a curriculum development with me being both caught and taught.

On the Chinese horoscope, I was born in the Year of the Dog and one of the characteristics of being a Dog is a strong sense of being just, on top of being stubborn (Somerville, 2005). Most of the compelling problems that bother me are rooted in the Chinese culture. Being the most populous country on the globe, 'China's geography imposes a remarkable degree of self-sufficiency and isolation from outside influences.' (J. W. Hall & Kirk, 2002, p. 142) One of the remarkable phenomena is that the introduction of foreign culture never changed the system and structure of traditional Chinese culture (Zhang 张岂之, 2004, p. 293), or using the ideas from Stigler and Hiebert (1999), anything that relates to culture will change very slowly. More likely than not, foreign cultures, or alien cultures, or barbarian cultures, as they were called at different historical periods in China, have been absorbed into the Chinese culture, almost without a trace left, such as Buddhism during the Han Dynasty (206 BC-220 AD), which created a more purely 'vegetarian Buddhism' in China, or democracy and science about a hundred years ago. Many of the Buddhist ideas, democratic and scientific ideas, become part of the Chinese daily life already, though modified, creating new challenges or controversies. However despite the current controversy over 'global consciousness' and 'national consciousness' or 'roots-finding consciousness' (Zhang 张岂之, 2004, p. 300), I believe one culture is always a difficulty to another culture, since the same signifier that is a cultural carrier is at the same time also a cultural barrier, such as a language. There is a need for someone like me, having lived in both cultures long enough, to compare and contrast cultures, maybe using the Kluckhohn Model (2007), to first of all understand the two cultures, and then to explain either one to the other, when some inquisitive minds would like to know a little more about one culture or the other. For this perhaps 'hard struggle' I will definitely need to bring myself well read widely, even wildly.

In order to do that, I need some deeper understanding of human nature and how communication of ideas via languages can help with the promotion of a mutual understanding of other cultures. For human nature, I have many more cases depicting what Francis Bacon wrote about 400 years ago:

> A man's nature is best perceived in privateness, for there is no affectation; in passion, for that putteth a man out of his precepts; and in a new case or experiment, for there custom leaveth him. (Bacon, 1625-1612)

What interests me most is especially the ‘new case or experiment’, where I’ve seen many who moved into a new culture and had their ‘nature’ expanded and extended, especially exposed, in at least two directions, good, better, best, and bad, worse, worst. I believe in ‘knowing myself’, as Socrates, I also believe in knowing others in order to know oneself more, and knowing more to help others, when they need it and want it, especially linguistically. In order to see what some eyes do not see (when they need and want help to see), in order to understand what some minds do not understand (when they need and want help to understand), I need to bring my personal learning up to date, or even ahead of time if possible, so that I can, at least, promote just-ness around me. In curriculum inquiry and education, just-ness, to both immigrants and native speakers alike, may mean meet or beat the competitive examinations and break various learning blocks.

Having personally experienced the Great Proletarian Cultural Revolution (GPCR) and how people behaved to the extreme in events happening in the GPCR, during which there were beaters beating the beaten to death (Wang 王友琴, 2006-1996), I need to look into the essence of things, alive or otherwise, the true nature of animate and inanimate subjects all, so that I can or may understand why people could have behaved to the extreme. It is still being revealed that during the GPCR, there were the beaters, of other humans, and the beaten, by other humans, a lot more than the beaters. Why so? What is that nature of humans that led to that? One interesting human character of Homo sapiens is summarised in Martin’s understanding of the Principle of Uncertainty: “It is often the case that the end user does not know what he [sic] wants until he [sic] gets it. When he [sic] gets it, he [sic] wants something different.” (J. Martin, 1984, p. 45) The beaters, all of a sudden, turned to be welcomed by the beaten and the unaware. If one does not learn from history, one may be doomed to relive it. This is where education may offer some help, start with language learning, if not changing the beaters some of whom are born to beat, at least recognising and revealing them via languages.

Confucius, The Master, said, a gentleman does not accept men because of what they say, not reject sayings, because the speaker is what he is (Analects XV: 22) (Pelikan, 1992, p. 197). To follow this example, I need to put my ignorance (of understanding the beater-beaten magic) before me, thinking everybody else has something for me to learn from, the Other or others, though not part of me, has some conception that is part of me, or not part of me, from which I can always learn. To learn not only from what people say, not from how people behave, not from what people are, but from something deeper, not superficial. In other words, it is education that can help both me and the Other or others to understand ourselves and one another deeper and better, to understand the mind behind the mask.

One of the problems that have been interesting me in understanding the Other or others is the mutual assistance between languages and mathematics, which is likely to reveal some useful patterns in understanding language learning, or the mutual assistance between one language and another.

Overview

My personal experiencing and remembering self (S. Harris, 2010; Kahneman, 2011) during the 1970s when I was teaching English to my classmates started in me an important question regarding the learning of English or another language other than the mother tongue with two sides: what is the essential problem that prevents many language learners from learning an additional language up to a proficiency when they can use the additional language comfortably in their profession, chosen or assigned. The two sides of the question are the promoter or promoting factors for learning an additional language, and the demoter or demoting factors for learning an additional language.

Personally, I have been learning the English, as a tool, and inadvertently, as a language, and also teaching it, though in more wrong ways initially, perhaps, than in right ways. In this process, my identity, not known at that time, was already being formed. In the next chapter, related literature on the research approach or method, autoethnography, and theories on identity, as well as the use and learning of an additional language in specific cultural milieu, will be reviewed.

Chapter 2

Review of the Literature

It is the purpose of this chapter that an overview of scholarly literature related to my current autoethnographic research will be provided, so that research can be positioned within the body of available literature and a foundation can be laid that my dissertation is intended to develop on. The main tool of the trade for this research is the newly taken up autoethnography, according to Richards (2011), citing Kennedy (2000), or in the same volume, the one term that has only recently gained currency in Education (Nunan & Choi, 2011), which will be the focus next.

According to H. Chang (2008, p. 48), autoethnography should be ethnographic in its methodological orientation, cultural in its interpretive orientation, and autobiographical in its content orientation. Therefore, I will focus on a review of theories related to racial identity and ethnic identity in the next section, leading into the interplay of both language and culture.

Citing the English 4th Baron Raglan, Pagel (2012, p. 1) amuses that culture is roughly everything we do and monkeys don’t, and as human beings, we do a lot with languages, verbal or visual. It is true that learning a new language also involves learning the culture associated with it (Sousa, 2011, p. 43), so obviously true bilingualism implies the assimilation of two cultures (Lyons, 1968, p. 434). Identity formation at the mutual influence of both language and culture will be the focus of this section.

The next section will provide a brief survey of literature on cultures, those that I have discovered will closely influence my research and my identity formation and construction. At the same time, I will try to detect some vacancies that my research will endeavour to fill in.

Finally, I will give a summative overview of the English language, as my identity is formed, in the latter part of my life, mainly by English, as both a cultural and linguistic system. Within this section, another language, mathematics, is also reviewed as one of the tools for thinking.

Autoethnography

Nunan and Choi (2011, pp. 226, 228, 229-230) give a succinct summary of autoethnography that is related to education, language learning and teaching, and research in second language learning and teaching. That summary approximates my dissertation research. Here is my brief summary of their summary, in an effort to make it more ‘succinct’ before citing and adding other authors.

As a genre or an approach or a framework, autoethnography is gaining currency by being used in about a dozen disciplines, as well as looking into about half a dozen of issues in L2 learning and teaching. The style of writing centres around the perception of the researcher as he or she experiences the world, and varies so much so as to cover a wide range of formats, the support of which is cited from Ellis and Bochner (2000-1994, p. 739). Book-length publications have been available since the late 1980s interrogating postmodern issues of writing, theorizing and judging qualitative research, as researchers may have multiple interpretations of the data. Despite some concerns such as the use of the ‘self’ in conducting such research and the multiple uses of the first person ‘I’ when composing such research, changes in qualitative research are continuing to be developed. The subjectivity of such research is starting to be viewed as more of an opportunity than a problem.

In the multi-volume *Encyclopedia of Sociology* (Borgatta & Montgomery, 2000-1992), autoethnography is described as a particularly controversial narrative writing practice and form, defined as an autobiographical genre of writing and research that displays multiple layers of consciousness as it connects the personal to the cultural. Three genres are listed: reflexive ethnographies, native ethnographies, and personal narratives (p. 2293).

To summarise other authors, autoethnography is a highly personalized account (Creswell, 2005-02, p. 266), in which the researcher/s and the researched are normally the same people, as exemplars of the research and professional ethic of engaging with and reporting on something first hand rather than vicariously (Short, Turner, & Grant, 2013). Autoethnography reveals concretely realized patterns in one's own actions rather than the actions of others (Roth, 2005, p. 4), in which educators can expose their pre-judgments (prejudices) that they bring to the understanding of issues in teaching and learning (Roth, 2005, p. 9).

Other than the definition, or a brief answer, cited at the beginning of Introduction, Chapter 1, by Carolyn Sue Ellis, the other two defining paragraphs approximating my research are from H. Chang (2008):

> Autoethnography should be ethnographic in its methodological orientation, cultural in its interpretive orientation, and autobiographical in its content orientation (p. 48)

> Select and chronologically list major events or experiences from your life…. Select one event/experience from your timeline, which led to significant cultural self-discovery. Describe its circumstances and explain why it is important in your life (p. 74)

As a dissertation, this research will select several events instead of one, the data of which will be expanded in the next chapter on methodology and procedures. Also as an autoethnographic research, I will explore how I would develop my understanding of autoethnography as a building block of my identity. A couple of decades ago when I first started to use all-English dictionaries of etymology, when online versions were unheard of, I would have to use *The Oxford Dictionary of English Etymology* (Onions, Friedrichsen, & Burchfield, 1966), a copy of which is still with me, shipped from China to Canada to the USA. Currently my favourite research or search into the origin of words is much easier, with so many sources available online. Some paper-based ones are *Word Parts Dictionary: Standard and Reverse Listings of Prefixes, Suffixes, Roots, and Combining Forms* (Sheehan, 2008), or *Dictionary of Word Roots and Combining Forms Compiled from the Greek, Latin, and Other Languages, with Special Reference to Biological Terms and Scientific Names* (Borror, 1960), or *A Dictionary of Prefixes, Suffixes, and Combining Forms from Webster's Third New International Dictionary, Unabridged* (Merriam-Webster Inc., 2002), to name just a few.

The word autoethnography comes from obvious roots. *Auto*- means self or self-moving, or solitary. *Ethno*- means people, race, nation, or culture. –*graph* means that which writes or draws or describes, or is written or drawn. –*y* as a suffix means having the characteristic of, or small (Sheehan, 2008). To put it simply, autoethnography is putting a solitary self, either fixed or flowing, into a bigger picture of people, race, nation or culture, for a brief description, and writing it down in a scientific manner to reveal the trait, or 'smallness' of a person.

I will now turn to other related terms in the theoretical framework I have chosen for this dissertation.

Racial and Ethnic Identity Theories

For the purpose of this research on identity formation and construction, it is vital to discuss some identities first.

The word identity has it basic form coming from the Indo-European root i-, the neuter form of which is *idem*, which means the same (Houghton Mifflin Company, 1992), or according to Orel (2010), a structure of things, which do not change and preserve their essence with all transformations. If it (*idem*) does not change, it will be the factor determining other changes, such as how the animate being, a person possessing an identity, to observe the reality and try to understand it, as well as to observe and understand the person per se, and change the self. With the bombardment of ideas and information, an identity could be torn between different kinds of isms, thus rendering it eventually changeable. Identity theory suggests that identities are most likely to change in the face of persistent changes in the environment (Borgatta & Montgomery, 2000-1992, p. 1003). Nurture works here.

One of the changes incurred to identity is surely achieved by language, first or second or both. The sameness and oneness of the identity, once mixed up with an add-on, a language, will change, and sometimes, there are chances when students learning another language, and even the mother tongue, can be damaged psychologically or socially, during the process of teaching (Saville-Troike, 1976, p. vii) and learning.

The following single paragraph now divided into three sections in this dissertation, vividly depicts the definitions of 'identity theory', 'identity salience', and the 'fundamental proposition' of identity theory:

> Identity theory takes hierarchy as a principal mode of organization of identities; in particular, it assumes that identities, given their properties as cognitive schemas, will vary in their salience, and that self is a structure of identities organized in a salience hierarchy.

It seems a single self may have several different identities, or transformations (Orel, 2010), and one or more of the identities may be leaping forward, or coming out in front of other identities.

> Identity salience is defined as the probability that a given identity will be invoked, or called into play, in a variety of situations; alternatively, it can be defined as the differential probability, across persons, that a given identity will be invoked in a given situation.

So sometimes, some identities of a self may come out sooner or more frequently than others, or in a group, one similar identity may come out from different people.

> Identity theory's fundamental proposition hypothesizes that choice between or among behaviours expressive of particular roles will reflect the relative location in the identity salience hierarchy of the identities associated with those roles (Borgatta & Montgomery, 2000-1992, p. 1254).

It is also suggested in identity theory that social interactions with others will be the origin of one's identity, which once established, will be maintained and confirmed (Borgatta & Montgomery, 2000-1992, p. 2783).

Social identity theory emphasizes the ways in which self-categorizations hinge on salient properties of the groups with which individuals align themselves, and once that happens as one perceives it, the mere perception of belonging to a discrete group is sufficient to produce intergroup discrimination (Borgatta & Montgomery, 2000-1992, pp. 1112, 2750).

Racial identity.

The word 'race' is a scientifically discredited term previously used to describe biologically distinct groups of persons who were alleged to have characteristics of an unalterable nature (Jary & Jary, 2005). Three roots that I find are related to 'race' including ethno- as in autoethnography, geno- as in genotype and phenotype, and phylo- as in the Ontogeny Phylogeny Model. It seems the word 'race' is related to organs or organisations. Racial identity can be influenced by some variables, such as educational level, income status, neighbourhood composition, etc. (Broman, Neighbors, & Jackson, 1988). It can limit the scope of what counts for being a reader (Liggett, 2007), or even shape people's lives (National Council of Teachers of English, 1996). Some language learners would resist assigned racial identity, while other would choose their specific racial identity to identify with (Murray & Christison, 2011).

Ethnic identity.

If ethno- means race, and race means ethno-, there is no difference between racial identity and ethnic identity. However, as ethno- also means people, nation, and culture, it seems ethno- has a meaning that is more related to the environment, or the Other or others. The difference is that ethnic identity is to indicate identity development that consists of an individual's movement toward a highly conscious identification with their own cultural values, behaviours, beliefs, and traditions, while racial identity is a surface-level manifestation based on what we look like yet has deep implications in how we are treated (Chávez & Guido-DiBrito, 1999).

In this research, my racial identity is Asian on a surface level, but my ethnic identity is Asian first, somewhat Canadian second, somewhat British third, and somewhat American last.

Language and Culture as Identity

Linguistic identity.

A speech community may have a strong sense of its own linguistic identity when language issues are exposed. When a multilingual person lives in such communities, it is necessary that the decisive role of language loyalty and prestige be taken care of (Coulmas, 1998-97). One linguistic identity, termed derivative linguistic identity, represents human capabilities to communicate at an intercultural level adequately with people from other cultures. Once an understanding of features of this linguistic identity is developed, it can be chosen to target strategically the teaching of a foreign language (Alexeyeva, 2010, p. 8).

My linguistic identity, in this research, can be a monoglot in either Chinese or English, and a bilingual when I engage in conference interpretation, consecutive interpretation, or translation.

Cultural identity.

A cultural identity can be maintained, or a new one can be adapted. In language learning and teaching, pronunciation and cultural identity are closely tied (Tarone, 2005, p. 496). If an L1-Chinese speaker learns L2-English but speaks English with a Chinese accent, it is likely the he or she is revealing a Chinese identity, instead of the English one. Cultural identity plays a significant role in communicating interculturally, and in such interactions with either a group or a culture, individuals would reveal their comprehension of cultural knowledge, and competence and skills acquired (Orel, 2010, p. 179).

My cultural identity started with Asian Chinese, to Chinese Canadian, to Asian American, or Canadian American, or American Canadian, at the moment. It may change again to some others.

Cultures: East and West

One of the aims of education, as Whitehead contends, is, that we should aim at producing men [sic] who possess both culture and expert knowledge in some special direction (1967-57, p. 1). In language learning and teaching, the language is the expert knowledge that the learner and teacher should be aiming at, while the culture is the culture or subculture that is closely related to the language to be learned and taught. Man [sic] creates culture but it, in turn, makes man [sic] (Lucas, 1972, p. 7). The expert knowledge, in this dissertation, refers to the four language skills.

What is culture? The base *cult-* means 'worship', and the suffix *–ure* means act or result of being; agent of, instrument of, scope of; state of being. Polysemy of the suffix also includes one or all of the following: aftereffect, condition, consequence, method, outcome, practice of, process of, quality of, routine of, technique of, or trait of (Sheehan, 2008). Culture, as the origin of the components of the word tells us, means 'the act or result of being worshiped or worshiping'. A simple and short definition of 'culture' can be that culture is the ideas, institutions, and interactions that tell a group of people how to think, feel, and act (Markus & Conner, 2013, p. xix), using their model of the Culture Cycle. Out of the many definitions of culture, I prefer the following one by Kohls:

> Culture refers to the total way of life of particular groups of people. It includes everything that a group of people thinks, says, does, and makes—its systems of attitudes and feelings. Culture is learned and transmitted from generation to generation (Kohls, 2001-1979, p. 23).

One of the reasons that I prefer this definition is the four verbs used by Kohls, i.e., to think, say, do, and make, that I think are closely related to the learning and teaching of any language. Markus & Conner's definition is not weak either, which uses to think, feel, and act.

To me, for any language learner and teacher, he or she needs to think, to say and do, to feel, and to act and make, or write and share an autoethnographic dissertation in a second language.

Understanding cultures.

Culture is learned or transmitted, but it is more lived than simply learning from textbooks or on the Internet or via watching movies in an additional language. When culture is transmitted from generation to generation, one is actually enculturated by all or most aspects of a culture, or a subculture. The difference between Western and Eastern cultures has been documented by some literature (Anderson, 1996; Canadian Global TESOL Training Institute, 1999; Gardner, 1995; Hofstede, 1980, 1983; Hofstede & Hofstede, 2005; Orel, 2010; Samovar, Porter, & Stefani, 2009-1998; Zhou, 1999). A brief summary of the differences is provided here.

One dimension is the difference between high- and low-context cultures (Samovar, et al., 2009-1998). For example, verbal message, or oral culture, is important in a low-context culture as people do not have the context and everything has to be explained clearly, and often orally. In a high-context culture, words are not as important, and even Shakespeare once used 'Men of few words are the best men.' Whereas low-context culture puts emphasis on concentration of the overt (mostly verbal, i.e., oral) message and expects a prompt reaction to it, the latter (high-context culture) puts emphasis on the perception and consideration of the whole context prior to understanding (Hidasi, 2004). The whole context, being lived and transmitted, is usually implicit.

Hofstede's (1980) Model of cultural dimensions is likely the most cited framework for cultural studies. Newer additions and revisions have been added and now the value orientation or dimension has, instead of four dimensions originally, six in total (Hofstede, 2011). Hofstede's own list is duplicated here in a table format.

	Six Dimensions
Power Distance	related to the different solutions to the basic problem of human inequality
Uncertainty Avoidance	related to the level of stress in a society in the face of an unknown future
Individualism versus Collectivism	related to the integration of individuals into primary groups
Masculinity versus Femininity	related to the division of emotional roles between women and men
Long Term versus Short Term Orientation	related to the choice of focus for people's efforts: the future or the present and past
Indulgence versus Restraint	related to the gratification versus control of basic human desires related to enjoying life

Table 1 Dimensionalising Cultures, G. H. Hoftstede, 2011.

There are some other less cited literature on value dimensions, cultural conflicts, or intercultural communication (F. Kluckhohn & Strodtbeck, 1973-61; Markus & Conner, 2013; Samovar, et al., 2009-1998), which I will refer to when analysing the autoethnographic data.

Cultures in autoethnographic research.

As a research method or approach, autoethnography is concerned with producing creatively written, detailed, local and evocative first person accounts of the relationship between personal autobiography and culture (Short, et al., 2013, p. 2). In other words, the autoethnographer is writing about the personal and its relationship to culture (C. S. Ellis, 2004, p. 37). However, autoethnographers as researchers have to reflexively explore their personal experiences and their interactions with others as well, as a way of achieving wider cultural, political or social understanding (Pace, 2012). The understanding of the culture has to be wider and in order to achieve such width, the writing of autoethnography demands high, rigorous, courageous and challenging levels of personal, relational, cultural, theoretical and political reflexivity (Short, et al., 2013, p. 5).

To view it from a different angle, the autoethnographers have to seek a wider cultural understanding of their autoethnographical experiences (Struthers, 2012). Quoted earlier, autoethnographic research is cultural in its interpretive orientation (H. Chang, 2008, p. 48), which eventually led to significant cultural self-discovery (H. Chang, 2008, p. 74) of the autoethnographer.

In second language teaching and learning, autoethnographic research looks into issues related to subjectivity, language, culture, gender, class, race and identity through the researcher's personal stories (Nunan & Choi, 2011).

Language to Reveal and to Conceal

All of the above-mentioned identities can be revealed by language. However, language does not only reveal, but also conceals. As the English poet Tennyson said, 'Words, like Nature, half reveal and half conceal the Soul within.' (cited in Samovar, et al., 2009-1998, p. 124), though the revelation and concealment do not always go 50-50, usually more of one or the other. Some authors even go so far as to claim that language … is the perfect medium for concealing, rather than revealing, meaning (McGilchrist, 2009, p. 106). That is likely one of the reasons provided in at least one of the theories about the creation of language 260,000 years ago that language was created to avoid the crisis of visual theft (Pagel, 2012, p. 71), when Homo sapiens, the one who knows, copied from what could be seen but not heard. As a matter of fact, our ability to copy and imitate is reason that our culture can accumulate knowledge and technology (p. 337). That is perhaps why copying is so popular in many fields, even in the academia (Stout, 2000-1999), since deception, competition, and exploitation are built into us because most of us rely on copying others most of the time (Pagel, 2012, p. 338). With the explosion of information, especially via language or languages on the Internet, many of us would make the same mistake of doing what is termed bad mathematics by relating bad news to our own life in decision-making, such as the simple case of a robbery that happened in the neighbouring community, which would heighten our own vigilance. We would then copy from our next-door neighbour by adding a home security system (which is exactly what I did) and installing several safety security lights outside the house (which I also did in 2013). Then after a very long time, perhaps for the life of the house, nothing happened to the house (So far very true). In other times, when we try to imitate someone doing something complicated, we get the task or the behaviour wrong the first time around (p. 61).

As language both conceals and reveals, in the learning and teaching of a language, if the learner simply copies blindly what is usually termed ‘the best method of learning a language’, one tends to make the same mistake of contagion, such as fads. All of such problems arise because we seldom have access to the truth, and we normally arrive at some guess as to what it is by copying others (p. 340). In the formation of my identity, what I have learned from language learning and teaching is to think one’s own thoughts, and trying it profoundly.

The significance of English as a linguistic system.

English is the most widely studied language in the world today (Berlitz, 2005-1982, p. 293), a conclusion drawn in the 1980s by a linguist who uses 25 languages. English is the world’s most important language, as well as the world’s most widely used language (Quirk, Greenbaum, Leech, & Svartvik, 1980-72, pp. 2, 3), two claims made during the 1970s by authors of an epitomic English grammar. English is the world’s current lingua franca (Woodward, 2008), a claim made in a report on an English learning programme, Li Yang’s Crazy English in China, and also by other authors (Higgins, 2011a; McCrum, 2005; Quirk, et al., 1980-72). Nations without English as a native language push to promote English as a second language (ESL) in their schools and workplaces in order to compete with economic and diplomatic demands (Woodward, 2008). Some even prophesy that by the year 2050, half of the world’s population will be using English in one way or another (MacGillivray, 2006, p. 259), though in the 1980s there was only one third (Crystal, 1985).

The English language uses an alphabet, and the alphabet was the most efficient writing system ever found, before or since (Sacks, 2003), because it needs fewer symbols to combine into a two-dimensional framework of human voices (Berlitz, 2005-1982; Karpf, 2006). As a cultural carrier, a language is considered a tool, as claimed in a textbook on technical writing, ‘language is the tool of man [sic], not man the tool of language (Pickett & Laster, 1996-75). We use English both as a spoken tool and a written tool. In oral communication, ‘every time you speak, you convey something of who you are and what you think’ (Karpf, 2006; Pickett & Laster, 1996-75), in other words, your identity. In many special fields, language is also very important as ‘each special field has its own language and one who would succeed in the field must learn its language’ (Pickett & Laster, 1996-75). Success can be shown by one’s position, ‘To rise to an executive position one must be able to present his [sic] ideas effectively, first on paper and then orally. If the ideas are not presented well on paper, the chances are that he [sic] will never get a chance to present them orally.’ (Sherman & Johnson, 1990-55) So, spoken and written language, or written and spoken if order matters, is closely linked in that one complements the other, and both are to be stressed, as representing a culture, a person, a person’s thinking, a person’s position, or, a person’s identity. Both literacy and oracy (Karpf, 2006; Wilkinson, 1966) or orality (Bigelow & Watson, 2012; Gleick, 2011; Ong & NetLibrary Inc., 2002-1982) count.

English as a Second Language (ESL).

This section of the literature review on English as a second language (ESL) is not to follow the traditional format in many of the chapters of dissertations written by doctorate candidates. The reason is that this dissertation is an autoethnographic research on the formation and construction of my identity via the learning and teaching of English as my second language. I will follow a pathway from how I, step by step, came to understand theories about English as a second language.

During a time when I, or many of us, had restricted access to books published in English by other countries than China and the USSR, I managed to collect a small library of my own in the 1970s. In it I had a little book entitled *a thousand sentences,* with no capitalisation (1974). Published English books took about three to five years to be republished in China at that time. This is based on my personal experience as I always kept the receipt of a book between pages where the price of the book was shown. For example, if a book cost me thirty cents, I would put the receipt between pages 30 and 31, with the front side of the receipt facing page 30 to indicate the cost. That little book had only 87 pages, and might not be even recognised by many native English speakers in the USA similar to my age. The book was written by none other but the famous educator Caleb Gattegno. In the preface, he mentioned the Silent Way, underscored, which I did not recognise at that time but vaguely sensed that it might be a method. He wrote, ‘a printed text cannot by itself guarantee that it will be understood by all readers’. It meant then for me that the readers might not understand what they read. My question then was: if I wanted to use English to understand what I could not read in Chinese, and if I could not understand English when I read English, what could I do? I did not know the word ‘dilemma’ in English then. Another point that Gattegno made was that the use of a dictionary … [is] an additional but not primary means of coming to terms with the English language. If I wanted to read English and might not understand it, and if I use a dictionary which was not a primary means, what could I do to understand English? I knew vaguely that I could and should not understand English in Chinese as I wanted to read English for what I had no access to in Chinese.

English is a second language, which is defined in the epitomic English grammar, in the 1970s, as ‘a language necessary for certain official, social, commercial or educational activities within their own country (Quirk, et al., 1980-72, p. 3), or ‘for the teaching of English to speakers of other languages in an English-speaking environment or in an area where English is widely spoken as a *lingua franca* (Rivers & Temperley, 1978, p. ix, Italics original). A foreign language was also defined in the same English grammar by Quirk, et al., as ‘a language as used by someone for communication across frontiers or with people who are not his countrymen [sic]: listening to broadcasts, reading books or newspapers, commerce or travel, for example.’ After that definition, the authors wrote: ‘No language is more widely studied or used as a foreign language than English.’

During the same period, I learned 'Direct Method' from *Essential English* (Eckersley & Eckersley, 1971), which proposes the use of the language to be taught only, very similar to the current STARTALK program in the USA in which 90 to 95% of the time is required to use the target language. In the Direct Method, the new 'idea' in the language to be learned and the word or phrase that stands for it, are to be directly associated, without a translation process. The authors contend that in the translation process another factor has entered (the mother tongue equivalent or equivalents), which blocks the direct line between the language unit (to be learned) and the concept (such as a picture) that represents it. The authors also quoted a very good student, a German girl living in England, who often received letters from her grandma in Germany, in saying:

> It's a funny thing. I received a letter from home this morning, and I have noticed that on the days I get a letter from home my English is worse.

That anecdote, which happened during the 1930s or 1940s, coincided with some more recent research in which heritage culture images disrupted L2 processing (Zhang, Morris, Cheng, & Yap, 2013). The 'worsening' of the target language is not only done by the mother tongue, but also by images related to the mother tongue culture.

The 'Natural' method was refuted by the authors of *Essential English* as such:

> I have known foreigners who have lived in England for thirty or forty years, who have married English wives and lived in English surroundings all that time and yet whose English speech was full of un-English sounds, un-English intonation, un-English stress and un-English constructions. (Eckersley & Eckersley, 1971, p. 9)

That is still true after 80 years, in Canada and the USA, including permanent residents and veteran immigrants, and may remain true for a long time. However, it does not mean that they need to 'de-un' anything, as long as they lived happily ever after or ever before.

Another source where I absorbed some ideas on the learning and teaching of English was from a set of course books by the Linguaphone Institute (1970, 1971), which claims that an ideal system of instruction for the learning of a foreign language should 'enable the learner to think in the foreign language, without any process of translation.' Obviously, translation is not easy, as Rivers & Temperley (1978, p. 325) consider 'translation … as both a skill and an art.' Both authors contend:

> It [translation] provides access for millions to the scientific and technical knowledge, the great thoughts, the artistic achievements, and the societal needs and values of the speakers of many tongues.

The authors here did not state clearly, that where 'the great thoughts' come from. In the context, it seems that 'the great thoughts' come from the 'source language' to be translate from, which may mean that the 'target language' to be translated into does not have enough 'great thoughts'. That raises a philosophical question whether one language has enough great thoughts or not, which cannot be easily answered. In later chapters, both authors also mentioned that courses set up to 'extract certain kinds of information from English texts (scientific, historical, political, philosophic, economic, sociological) … are useful to adult learners who wish to pursue a particular subject beyond the limits set by their own language' (Rivers & Temperley, 1978, p. 189). If a language, i.e., a native tongue, sets limits to its own adult users, it also sets limits to its young users. That is a point that proved my young mind: to learn another language to know something that my first language does not allow me to know, or limits my knowing.

Etymologists Weekley and Clark (1952-28) added some insights to my understanding of the English language, or languages in general, as well. When two languages come into close contact, each acts as a solvent upon the other (p. 67). Two languages do not contact each other, but the user of both touches both, making the two contact each other. Therefore, one language solves the other, that is, makes the other easier, or corrodes the other. Making a language easier does not have to use another language, the cause is termed linguistic laziness (p. 12).

Though we had limited resources during the 1970s, we did have access to some 'reference books' such as lists of terms in a dictionary format, one of which is Seaton's *A Handbook of English Language Teaching Terms and Practice* (1982). Some methods or theories of language learning and teaching are mentioned in this handbook, such as silent way or silent method by Caleb

Gattegno, suggestology or suggestopaedia by Lozanov, behaviourist theories by Pavlov and Skinner, structural linguistics by Bloomfield, Fries, and Lado, audio-lingual approach, cognitive theories by Bruner and Miller, and TG grammar by Chomsky. Many of the books were not available then, but some books in Chinese mentioned some of the relevant psychologists.

In late 1970s and early 1980s, my English identity had included the following ideas. As an English language teacher and learner I have to be bilingual at least in both my mother tongue, and English or the language to be taught, or vice versa, the language and English to be taught. I do not want to become what Shaw criticises as ‘He who can, does; he who cannot, teaches.’ (Oxford University Press, 1981). I need to learn the language to be taught myself, but my students have to learn it, too, as I cannot learn the language for them. My students and I all need to use imitation as much as possible, as it is very basic, but not for all adults. The product of the labour of learning is the autonomous and confident speaker of English. I need to use monolingual dictionaries instead of bilingual ones so that I need to fully understand the language I am going to teach, as I cannot teach what I do not fully understand. My mother tongue, and my students’, causes difficulty, so we all need to reduce it when learning and using English. If I want to reach an advanced level in English, all concepts should be in English and have no equivalents in Chinese. When I need to say or write anything in English, those should come from or be based on the English I have learned, not totally or mostly from my Chinese, since I cannot say or write about those in English. More likely than not, I have not learned about those in English yet. We cannot rely on our native sound system to understand English so we have to learn the new sound system one by one, morpheme after morpheme. We need to avoid the habit of translating everything we hear or say (or read or write), since it can become a hindrance to fluency. Once English is learned to a parallel proficiency, the art of translation can be added, since translation is an art which requires a sophisticated knowledge of the native language as well as of English. We all have chances to be English teachers, as being an English speaker does not of itself qualify one to be a teacher of English to speakers of other languages. As language learners and users, we must try not to carry over cultural views from the first language, but we need to learn to know a new culture, which is a lifetime work. (Based on Paulston & Bruder, 1976; Rivers & Temperley, 1978; Robinett, 1978).

I need to use the Ear, as well as the Eye. Both the Ear and the Eye approach the Mind. My mind needs to think in English, to understand English thought, instead of the Chinese thought. The Direct Method links the word or language unit to the concept or notion (Lin 林语堂, 1941, 1982-30), all in English, without any Chinese as an intervening factor. Living in a language context does not mean that the language can and will be learned, even the mother tongue. Many people do not even learn their own mother tongue well. (Based on Eckersley, 1942; Eckersley & Eckersley, 1971; Linguaphone Institute, 1970)

Aside from the above bit-by-bit information gathered through the 1970s and 1980s, I was able to eventually encounter some of the ‘sources’ on the theories in second language acquisition after coming to Canada. Here is a brief summary, not forty theories (Larsen-Freeman & Long, 2000-1991, p. 227) or methods, of a few of the theories and methods that I thought would be relevant to my current research.

Grammar-Translation.

As Alexander wrote many times, traditional methods of learning a foreign language die hard (L. G. Alexander, 1967b, 1993-67). The Grammar-Translation method (GTM) hardly dies, lingering on at least in Chinese and China since the 1970s (L. G. Alexander, 1978-73; D. Li, 1998; R. Li, 2007; X. Li, 2004; Silver, Hu, & Iino, 2002; Tang 唐力行, 1983), though the history of itself could go hundreds of years. GTM of course serves its purposes.

In GTM, the medium of instruction (MOI) (Escamilla & Hopewell, 2011; Gunderson, Odo, & D'Silva, 2011) is mostly the mother tongue, L1. Most of the L2 is translated into the L1 as well. It has been alive for so long and will keep lingering on in and out of classrooms for another long time. In this method, students memorise long lists of discrete items or units, be they words, phrases, sentences, and sometimes, paragraphs. They match the L2 with one or more of their L1. Some programmes may have, usually separately, lessons on speaking and listening added. However, GTM students are usually only able to translate L2 into L1. After some years of training on translations from L1 into L2, some students are able to ‘write’ excellent compositions and pass standard tests such as TOEFL or IELTS, a few with outstanding or even full marks on the writing section.

If those students are asked to ‘talk’ about what they themselves actually write in English, they usually produce Fractured (Rivers & Temperley, 1978) spoken English, and on many occasions, even un-English. In the frame of form-meaning (Collins, 1998; Nation, 2005; Ney, 1980), or sight-sense, those students accustomed to GTM have established the link from the English sight to the Chinese sense, but not necessarily to the English sense. Whatsoever is read, (not so much heard), is rendered into Chinese almost instantly. Direction-wise, this is mostly a monodirectional method, from L2 to L1, target language in, mother tongue out. Very few students can reverse the direction, mother tongue in, target language out, in writing.

If a theoretical support is needed, GTM may be linked with behaviourism, as the latter supports repeated drills.

Behaviourism.

I have never seen, except a drawn picture, or used a ‘teaching machine’ but I have, yes, I still have them, some course materials for those machines (Schaefer, Jeffries, Phillips, Harakas, & Glaser, 1962; Victor, 1972). The teaching machines and programmed learning are the products based on behaviourism. We may find similar principles on which the current day computer-assisted language learning (CALL) is based.

For repetition or habit formation, L2 heard is to be repeated orally, and L2 read is to be repeated in writing. Substitution drills used in many older English textbooks or exercise books are related to the stimulus-response (S-R) theory in behaviourism. I can see one valid application of this ism, that is, in learning and teaching a language that is alphabet-based and used in an oral culture. The reason is that an alphabet is easier to learn to write, perhaps within a couple of days. Oral repetition of the substitution drills trains the mouth, the eye, and the ear at the same time. If the mind works to think and remember, the response can be the L2, instead of the L1.

According to M. Johnson (2004, p. 18), '[B]ehaviorism undermined the role of mental processes and viewed learning as the ability to inductively discover patterns of rule-governed behaviour from the examples provided to the learner by his or her environment'. That is exactly what substitution drills do. Larsen-Freeman & Long (2000-1991, p. 250) consider that S-R models offer 'little promises as explanations of SLA, except for perhaps pronunciation and the rote-learning of formulae'. In second language learning and teaching, formulae are very important starters since novice learners of a new language may start to use formulae in daily interactions sooner than others, and pronunciation is also a helper if the language learners do not want to sound un-English.

Audiolingual Method (ALM) and Direct Method.

Audio- (Sheehan, 2008) for the ear to hear, and linguo- (Sheehan, 2008) for the tongue to twist, the ALM proposes to teach language learners to communicate in the target language by a lot of drill work that aims to form good language habits. Extensive conversation practice in the target language is used as students receive various linguistic stimuli and are asked to respond to them. Depending on whether the response is correct, i.e., nearing that of the native speaker, or not, learners or students will receive positive or negative reinforcements. Grammatical structures are learned by students inductively, and practised by repetition drills.

The teacher may not use the target language, but the students are encouraged to use the target language all or most of the time. In Direct method, both the teacher and the students are to use the target language all or most of the time. The language school chain, Berlitz schools, is now worldwide and continues to be successful, particularly with adult learners, and still uses Direct Method pedagogy (Fotos, in Hinkel, 2005, pp. 653-670). One difference between the ALM and Direct is that the latter has a much smaller number of students, as exemplified in the course book, *Essential English* (Eckersley, 1942; Eckersley &

Eckersley, 1971), in which the teacher only works with half a dozen students learning English with him.

Language Acquisition Device (LAD), and Making Capacity (LMC).

LAD is the capacity to acquire one's first language, when this capacity is pictured as a sort of mechanism or apparatus (J. C. Richards, Schmidt, Platt, & Platt, 2002-1992). This genetically inherited acquisition process or learning procedure functions the same way as any other biological function, working successfully before being slowed down at the time called the Critical Period (Lenneberg, 1967; Lightbown & Spada, 2006-1993, p. 19). The latter construct is controversial in that LAD is not turned off at puberty but some research indicates that the decline in the ability to learn a second language does not have a cut-off age but is related to aging (Hakuta, Biolystok, & Wiley, 2003).

Related to the LAD, as I see in this research, is the LMC, 'Language Making Capacity' (Lust, 2006; Meisel, 2011; Slobin, 1985), 'a set of procedures for the construction of language' (Slobin, 1985, p. 1159). The LMC contains universal principles, operating principles (OP) specifically for working inductively on the physical acoustic stimulus of a specific language to which children are exposed. As cited in Lust (2006) the LMC attempts to provide 'detailed examination of children's verbal interaction with others … across individual children and languages' in order to 'begin to form hypotheses about the underlying capacities that may be responsible for language acquisition in general' (Slobin, 1985, p. 1158). Slobin also considers the growth of perceptual and information-processing capacities to be 'operating in conjunction with innate schemas of grammar' (1985, p. 5).

Both of the LAD and LMC are innate language faculty. I think the LAD works for 'acquiring' while the LMC works for 'making'. Despite lack of further research, I may venture to comment that the LAD and the LMC may be related to the input-output dichotomy.

Larsen-Freeman & Long (2000-1991) framed their description of the theories in second language acquisition into three major classes: nativist, environmentalist and interactionist. In their section on nativist theories, two concepts are explored, Chomsky's Universal Grammar and Krashen's Monitor Theory. Chomsky started with L1 to develop his Universal Grammar (UG). Babies are born with an innate system of grammar already wired. UG is specific to language learning and does not account for other types of learning. UG contends that all languages share similar abstract qualities, but these abstract qualities are realized differently in different languages (Loewen & Reinders, 2011). Krashen's Monitor Theory or Model contains five hypotheses (1987-82). I personally would argue that the input hypothesis represented as i+1 does not sound right. If the number 1 (one) is used to represent the amount of input that is slightly above the current level of the learner, the language level or the interlanguage level (perhaps the i), it would be better to represent the same concept as 1+i, using the letter i to represent the variable. The numerals are usually used to represent constants while the letters are usually for variables.

One model is explored by Larsen-Freeman & Long under environmentalist theories.

Acculturation Model.

This environmental-oriented theory is proposed by John Schumman (Loewen & Reinders, 2011). The acculturation model argues that learners will be more successful in SLA contexts in which learners wished to integrate into the target culture. Full acculturation was seen as the ideal option if both the target culture and the original culture are maintained in certain balance. The option that more target culture is maintained is assimilation, while the rejection of the target culture but the original culture is maintained is preservation (Loewen & Reinders, 2011). This is a situation of Either (assimilation or preservation) or Both (balanced).

Interaction Hypothesis.

In introducing interactionist theories, Larsen-Freeman & Long (2000-1991, p. 266) argue that the interactionist views are more powerful than other theories 'because they invoke both innate and environmental factors to explain language learning'. Inter- means between or mutual (Sheehan, 2008), and act means to do. Interaction here means actions between that which is innate (to be born in) and that which is environed (to be cycled).

Literature exploring interaction hypotheses often quotes Long:

> I would like to suggest that *negotiation for meaning*, and especially negotiation work that triggers *interactional* adjustments by the NS or more competent interlocutor, facilitates acquisition because it connects input, internal learner capacities, particularly selective attention, and output in productive ways (2009-1996, pp. 451-452, Italics original).

One limitation of the Interactionist approach is that the language learners have to be in the environment with more competent interlocutors, e.g., native speakers.

Output hypothesis.

If I believe in Long's statement quoted above, I must also infer from such beliefs that the output hypothesis (Swain, 2005) is also true and valid. Sometimes the word comprehensible is added before Output Hypothesis, making it the Comprehensible Output Hypothesis. When the output is comprehensible, the language learners may not notice the gap between their language and the norm, or target language. When it is not comprehensible, the language learners may have a chance to notice and change if they want to. There is another limitation to the output, especially when it is comprehensible, as indicated over 90 years ago by Palmer & Blandford (1935-22, pp. 7-8):

> A few days after his [sic] arrival, the foreign student finds it necessary to fix up an appointment with somebody, and so he racks his memory to find a few words which seem to him appropriate to the occasion; he strings these together and says: "To-day in the evening you are occupied yes?" He succeeds in making himself understood, and makes a mental note of the fact that his sentence was intelligible. A few days later he finds himself in a similar situation, and has recourse to the same sentence. On this occasion he produces it with less effort; and after three or more repetitions he has perfectly memorized this atrocious specimen of pidgin-English.

It seems better for the output to be incomprehensible so that the interlocutor has a chance to correct it.

Putting both comprehensible input and output together, one valid quotation is from Jerome S. Bruner in a foreword written for *Obedience to Authority* (Milgram, 2004-1974, p. xii):

> Milgram's unnerving report provoked us into thinking anew about authority and obedience, even about human nature, how much of it was from inside out, and how much from outside in.

A language, any one, is exactly the most convenient tool to do all of the above, so as language learners and teachers, we all need to be very careful in working with it. What is in, and what is out.

Connectionism.

Another theory that seeks to explain SLA in terms of outside factors instead of innate endowment is connectionism. Any learning is understood as the connections similar to neural networks. Such processing is called Parallel Distributed Processing (cited in Larsen-Freeman & Long, 2000-1991, p. 250; Pinker & Mehler, 1988) where the signal being processed is distributed among a number of units.

Similar to fossilisation in which language learners ‘dig’ in the wrong language, i.e., L1, so that the L2 is fossilised by the wrong digging, connectionism demonstrated as well the wrong connections (R. Ellis, 2008-1994). Language learners connect most strongly among the L1, the L2 is not so much connected.

Sociocultural theory.

The sociocultural theory (SCT) or approach is grounded in Vygotskian thoughts, claiming that language learning is a socially mediated process. Lantolf and Thorne (2007) defend that the principles of the SCT can also apply to SLA, with mediation as the central construct of the theory. They explain that ‘SCT is grounded in a perspective that does not separate the individual from the social and in fact argues that the individual emerges from social interaction and as such is always fundamentally a social being’ (pp. 217-218). The language learner is the mediator and is also being mediated at the same time. The language, L2, also functions as the mediator. Another core concept equally important as mediation is internalisation, the key to which is imitation. The model for imitation can be adults or older peers in the Zone of Proximal Development (ZPD). Adults and older peers also provide mediation for younger children (Lantolf, 2011).

Although there are other theories or approaches (Atkinson, 2011; Hinkel, 2011; Loewen & Reinders, 2011; Marinova, 2012; J. C. Richards & Renandya, 2008; VanPatten & Williams, 2007), I have only selected the above that I think are more related to this research.

The significance of English as a linguistic culture.

A linguistic culture is understood as that which encompasses ‘behaviours, assumptions, cultural forms, prejudices, folk belief systems, attitudes, stereotypes, ways of thinking about language, and the religion-historical circumstances associated with a particular language’ (Schiffman, 2002-1996, p. 5). I will start with behaviours in language learning and teaching, and at the same time, summarise assumptions and stereotypes about language and language learning and teaching.

Interlanguage and errors.

When there are only two languages, L1 and L2, to be learned and used, the output can only be one of three languages. The most important language for language learners and teachers in language learning and teaching is neither the mother tongue (L1) nor the second language (L2) to be learned and used, but the third language, an interlanguage. Interlanguage was first introduced by Reinecke (1969/35) but became popular in L2 research due to the paper by Selinker, according to Meisel (2011). Selinker’s own definition of an interlanguage is:

> An “interlanguage” may be linguistically described using as data the observable output resulting from a speaker’s attempt to produce a foreign norm, i.e., both his errors and non-errors. (1992, p. 231)

Therefore, an interlanguage is both errors and non-errors. Obviously when the interlanguage accords with the foreign norm, it is a non-error; otherwise, it is an error.

Inter- as a prefix means ‘between’ and interlanguage simply means something between languages, which is neither. According to Gass and Selinker (2008-1994), interlanguage is a system composed of elements from the L2 and the L1, as well as elements that do not have their origin in either the L2 or the L1 (in this dissertation represented by the case of ?L2?L1), which Gass and Selinker called ‘new forms’. It can be easily concluded that there are four main styles of interlanguage when two languages are involved. As an interlanguage is neither L2 nor L1, it is better labelled simply as errors, or a ‘new version’ (Ostler, 2005), or a ‘third language’ since it looks like a language, no matter how systematic it appears (Maniam, 2010). Between two languages being learned and used, there are only three outcomes, two pure or mostly pure languages, a pure or purer L2 and a pure or purer L1, and the third one, a nonsensical language most of the time, or more nonsensical most of the time, just to make it sound better. If the three outcomes are represented by symbols, they are L2, L1, and ?L2?L1, neither. Mathematically, logically and conceptually, when there are only two entities or languages as input, L2 and L1, the only legitimate outcomes are only three in total, L2, L1, and ?L2?L1. If L2 and L1 are correct languages, or mostly correct languages, then ?L2?L1 is the interlanguage, or simply put, errors, which is not a correct language, or a wrong language, or mostly wrong. For example, ‘home economics’ became ‘family economy’, when a person was translating ‘home economics’ into Chinese and translated the Chinese back into ‘family economy’ in English. During the 1990s, family economy was not one of the courses offered in a university calendar. I knew it because it took me half a day, paging through a university calendar to look for ‘family economy’ so that I could apply to study some courses there.

The conclusion is simply that an interlanguage is an or the error.

Mathematics as Language and a Tool for Thinking

If L1 is deemed primary in the perspective of ‘knowledge builds on knowledge’ (KonK), mathematics is usually learned on top of L1, as well as L2. However, mathematics can be used as a tool to further develop L1 and L2, but not exactly mathematically.

Mathematics is accepted as a language (Finlow-Bates, 1996; Malara & Navarra, n/a; Organisation for Economic Co-operation and Development, 2006; Pimm, 1988), which helps as students develop higher-order thinking through language (Lim & Pugalee, 2004). The linkage between languages and mathematics has been explored by some researchers (McGinn, 1995).

Language learning, and for that matter, the learning of any new knowledge or skill based on previously known and old knowledge and skills, can be viewed as a dichotomy, a variable that has only two values (Borg & Gall, 1989-71, p. 341). There is a rule known by scientists as Occam ’s razor (Olson & Hergenhahn, 2009-1976): Faced with several competing hypotheses, scientists prefer the simplest one (A. A. Hill, 1980; Weiner, 1999, p. 68). Another name for Occam's razor is the rule of simplicity. In a dichotomy, one consideration is: which is the simplest one?

Using mathematics as an example, 'challenge words' made up about 25% of the text in seventh grade maths textbooks and is about 3,000 in total (Nair, 2007). For L2 learners, limited word knowledge is likely to affect academic performance in the content area classroom (Nair, 2008). Mathematical understanding is considered a shortcut to knowledge (Kenschaft, 2000). Similarly to language learning, when theories about how children learn moved from the mental discipline theory in the late nineteenth century to the constructivist perspective (Cathcart, Pothier, & Vance, 2000, pp. 1-2), declarative or conceptual knowledge is even more important than procedural knowledge since students have to understand the underlying concepts so that they can apply the procedures correctly (Kloosterman & Gainey, 1993, p. 10). Professor Askey indicated: if students do not learn the techniques of computation, they will not have a foundation on which to build concepts and theory (cited in Gross, 1999, p. 113). Waywood also claims that calculating is a key marker of mathematical activity, just as playing music is a key marker of musical activity (1992). The same rule applies in language learning and teaching. For this research, the mathematics I have chosen as tools for thinking included the following.

The harmonic series.

Each neuron in a brain has on average 70 synapses connecting it to other cells (Ridley, 2003, p. 182), and the connection is linear (Kandel, 2006). They are been connected in a very rapid manner. Therefore, two neurons also form a dyadic relation, either from Neuron A to Neuron B, or verse versa, in a linear manner, but not both at the same time. Such relation is termed an ordering relation. Two terms in two different languages, even if they correspond to each other equivalently if one can be translated into the other, are also related in a dyadic ordering manner. In the learning of an additional language, the procedure usually starts with some translation, i.e., matching an L2-term or L1-unit with one or more L2-terms or L1-units. Such matching ends up in a match rate that can be expressed as a harmonic sequence (Daintith & Rennie, 2005; Merris, 2003), defined as an ordered set of numbers, the reciprocals of which have a constant difference between them. The reciprocals of the terms in a harmonic sequence form an arithmetic sequence, and vice versa (Daintith & Rennie, 2005). In the learning of a second language, beyond the age of five or six, the translation or matching method are used to different degrees. As long as the translation method is applied, the rule governing the match rate dominates for a period of time, in which the language learner not only creates interlanguage, but may also be stabilised at some point. This phenomenon is explained in more detail in the last word hypothesis (Feng 冯睿 & Xu 徐弘, 2010), as an appendix in this research (Appendix A).

The Markov process.

A stochastic process is neither deterministic (the next event can be calculated with certainty) nor random (the next event is totally free). It is governed by a set of probabilities. Each event has a probability that depends on the state of the system and perhaps also on its previous history. If for event we substitute symbol, then a natural written language like English or Chinese is a stochastic process (Gleick, 2011, p. 225) as well. When an L1-speaker starts to learn a new L2, the L2 is usually translated into L1, or the learner would not understand what the L2 means. When another new L2-item is learned, the learning and understanding of this new item depends on what has been previously learned (or translated). Such stochastic process is named a Markov process. Besides, neurons behave in a stochastic way as well (Erard, 2012, p. 160). For a language learner, she or he can think either mostly in L1 or mostly in L2. Such thinking can be expressed by a Markov process as well.

Information and entropy.

An additional language is usually learned for a purpose, even if the purpose is self-interest. A very common question asked of a language learner and user is: “How many languages do you speak?” However, in a very recent book by linguist Michael Erard (2012), a more relevant question to be asked of a language user should be: “In how many languages do you live?” (p. 24). This is a more relevant question to any language learners if they are still alive and want to live better and longer, like me. One positive factor for a better life is the gaining of new and useful information through language, and the gaining of new and useful information is at the same time the reduction of entropy. Therefore, it is advisable to understand the learning of an additional language as the gaining of new information, or the reduction of entropy, both equally and equivalently. As defined in *OED*, entropy is a measure of the average information rate of a message or language in communication theory, which represents the average information rate per symbol. More entropy means less information, and vice versa. If the same information has been learned in L1 already and in the learning of L2, the same information is learned again, it is definitely a less cost-effective way of using time and life.

Language as a Tool, L1 and/or L2

Referring language, the word 'lingo' has two meanings, one is a foreign language, the other is a type of language that contains a lot of unusual or technical expressions (Cambridge University Press, 2003). I use lingo here to refer to individualistic use of one's personal preference of languages, sometimes unusual. Since education is moving from teacher-centred pedagogy to student-centred pedagogy, more emphasis is giving to the texts produced by students, their lingoes, instead of the language used in textbooks as a standard to be learned by students and teachers alike. In other words, the norm or norm of the NESs. This tendency is creating more confusion for English as an L2-learners (ELLs), whose number amounts to perhaps double or triple of that of native English speakers (NESs). As indicated in Morgan (1996), there is a growth of attention to the social relationships in mathematics education generally, and I would expand on that idea to include not only in mathematics education, but in the education of other subjects as well. According to sociolinguistics (Spolsky, 1998), language is also used to establish and to maintain social relationships, other than communicating meaning.

No matter how beautifully organised and tailored a lecture, it puts nothing into the heads of students. Only the students themselves can put information into their own heads (Farnham-Diggory, 1992, p. 570). Teachers cannot learn the language for their students (Rivers & Temperley, 1978, p. vii). Except in the case when a child is born in a multilingual family, a second language is usually learned or acquired on top of the first language or mother tongue. Based on the ideation that knowledge builds on knowledge (KonK), L1, the previous knowledge, is exerting influence on L2 (cross linguistic influence) while L2 is being built, and L2, when learned so well as to have reached a certain proficiency, may also exert influence back on L1 as well. Therefore, there are at least three elements or factors or parameters to consider in the dyadic relation of knowledge built on knowledge (KonK), the L1, the L2, and the interaction between the two, which could be well engaged in a bidirectional relation. Simply put, if there are only two languages, L1 and L2, there will be only three outcomes: either or neither.

Other related literature.

One of the periods defined by Erikson as being critical is between 18 and 25, during which critical developmental period young adults develop a subjective sense of identity through experimentation and explorations (1968). According to Erikson, cultural and historical change can prove so traumatic to identity formation: it can break up the inner consistency of a child's hierarchy of expectations (p. 159). Besides, the process of identity formation emerges as an evolving configuration—a configuration which is gradually established by successive ego syntheses and resynthesizes throughout childhood (p. 159).

Canadian-born children of immigrants may choose to attend programmes in their first language L1 and have delays or deficits in their English language L2 skills. Therefore, the local government may assist school boards in providing English as a second language programme to those students who are not fluent in English, and to those who have recently arrived in Canada and whose first language is not English (Alberta. Alberta Education. Learning and Teaching Resources Branch, 2007). Even if those students begin their schooling as early as kindergarten, they already have their L2 well established. In such cases they are learning English as an L2 in additional to their L1. It is generally accepted that by the age of five, children have control over most of their first language grammar, so their L2 is learned on different principles, or at least is going through a system filtered by their L1, or influenced by their L1. The knowledge built on knowledge (KonK) is working here, likely both positively and negatively, creating errors and/or non-errors (i.e., interlanguage).

Some literature suggests that the L1 should be used at home (Alberta. Alberta Education. Learning and Teaching Resources Branch, 2007), claiming that a strong L1 will make the L2 better. Of course the L1 should be used, as sometimes it cannot but be used for certain communication, but whether it should be forced to either be restricted or encouraged is dubious. As obvious as possible, if the same idea or concept is repetitively learned in two or more languages separately, or even at the same time, the efficiency of learning is greatly reduced, which is not cost-effective at all. For example, if the same subject, such as physics, is learned twice, once in L1 and once in L2, the efficiency is calculated to be less than 50%, as is to be detailed in this research.

Thinking in L1 is a lot faster than in L2. Therefore, to many people, writing down their thought is a waste of their precious time, as they believe, since writing is slower than thinking. In reality, more people listen and read (the interpretative mode), especially in L2 to gain information, rather than give a speech or write an essay (the presentational mode), even in L1. How the brain works is also closely related to language learning, such as the idea that the same brain is doing things differently, on different locations of the brain, as explained by the multiple intelligence theory (Gardner, 1993-83, 1999). Though a language may work differently in the brain, it is usually linear or one-dimensional, from one neuron to the next, one or all 70. Human beings, as a three-dimensional animate being, have problems visualising a three-dimensional space. Einstein…in his later years… remarked that he hardly ever thought about physics by using words (in Stein, 2008, p. 55). It is likely that not many other people can do it, but resort to words when thinking. How can one squeeze a two-dimensional or a three-dimensional idea or symbol into a one-dimensional linear space? If some of the L2-learners tend to think in more than one dimension, they may encounter more problems in learning an L2, or they may become Einsteins.

From my perspective of a second language learner and teacher, thinking in L1 and writing in L2 has the same problem of slowing down and writing nonsense, i.e., errors. Liedtke & Sales (2001) used ‘linguistic translation’ to describe changing algebraic expressions into words and vice versa, for example. This supports my understanding that mathematics and language are two different languages, very similar to L1 and L2. One has to translate from one into the other. In the process of translation, as one of the sixth graders wrote in a quoted story (Cohen, 1981, in Liedtke & Sales, 2001), the relation between a circumference and its diameter is totally lost.

Any learning must be caused by the learner (Novak & Gowin, 1984, p. vii). If the person does not want to learn, he or she is not a learner at all. Some literature suggests that ‘few people use standard American English as a matter of course’ (Whitesell, 1952, p. 307). When some people learn to use standard American [or British or Canadian, etc.] English, they ‘use reasonably standard English as a matter of habit because they have been exposed to it all their lives, have picked it up through extensive reading, or have had intelligent instruction in the classroom. If you are among their number, you are fortunate’ (Whitesell, 1952, p. 307). Perhaps there are not many people who actually used a standard language, especially native speakers in their L1. Every personal language (parole) is localised, personalised, and very idiosyncratic. Attention needs to be paid to the possibility of causing some people to be regarded as illiterate. Therefore, it is very important that our language students must have ‘intelligent instruction in the classroom’ in standard L2, preferably, and learn it as such.

Even if students have ‘intelligent instruction in the classroom’ some of them do not get a chance to have their spelling and grammar corrected and they may not have the means to cause their own learning. Those mistakes should have been avoided beforehand, since it can take months or years to repair the damage done to a student’s education (W. J. Bennett, Finn, & Cribb, 1999, p. 507).

If knowledge builds on knowledge (KonK), new mistakes or errors build on old mistakes or errors as well. Many second language L2-errors can be attributed to a first language (Alberta. Alberta Education. Learning and Teaching

Resources Branch, 2007). For the past practice of discouraging L1 in school or at home, there might be a reason. However, no literature that I have found so far deals with the efficiency of language learning, L2 or L1. I personally strongly believe that the same concept should never, if possible, be learned repetitively in several languages. The best efficiency is to use one language in one specific field or domain, and use another for a different purpose.

Summary

Language learning and teaching forms and constructs an identity. In the theorisation or conceptualisation of any collection or connection of ideas, most people tend to believe what they see or hear initially and draw conclusions intuitively immediately with overconfidence most of the time, which is named by Nobel laureate Kahneman as WYSIATI (what you see is all there is) (2011). Most of the language learners, as they start to learn an additional language, have no idea whether they are learning the language efficiently, nor do they know clearly whether they have learned the new language or not. When they hear or read in the target language they are supposed to learn, and they are able to talk about or write about what they have heard or read in their mother tongue, they tend to believe that they have learned the target language, which is far from the truth.

The following chapter will be expanding on the literature review in this chapter by choosing some of the research tools, methods, and procedures, applicable in this research. It will also provide information about data, data collection methods, treatment and analysis of data, and credulity and ethics regarding this autoethnographic research.

Chapter 3

Methodology and Procedures

In choosing or creating one method or many methods for a research study, the investigator needs to keep in mind that methods chosen properly may lead to theories, and:

> Theories propose explanations for phenomena. Theories try to tell us how things work, how parts are interconnected, how things influence each other. General theories propose explanations that can be applied to many phenomena; a measure of a theory's power is *the number of predictions* which can be derived from it. Theories may be conceived of as being on a continuum varying from highly detailed explicit statements of *relations between concepts* (with underlying assumptions specified), through to those at the other end of the continuum which offer an explanation of one particular relation. A theory may be viewed as an explanation accounting for *social* patterns or for *relationships*. (W. Jackson, 1988, p. 7, emphasis added)

With identity, autoethnography, and language learning and teaching in mind, the 'social' can be replaced by 'transnational', 'transcultural', 'interpersonal', and 'translingual', and the whole citation would fit perfectly for the aim of this research, which now starts with some concepts and their relations.

Autoethnography has been applied in the study of teachers, their memberships, positioning, as well as the identity of ESL learners via their stories. A variety of means to collect data has been used as well (Norton, 2001, pp. 160-161). As a method, autoethnographic research provides a means to describe and understand beliefs, behaviours and attitudes of the language learners and teachers.

As I write about my own ideas and thoughts on how I learned English as a second language, as well as taught it, I kept thinking about how this personal path to a new or transformed identity empowers me in this autoethnographic research. The whole process provided me with a retrospective, prospective, and critical analysis of my uniqueness, as well as the commonness with other language learners and teachers.

This chapter outlines the design of the research and provides details of the methodologies employed and procedures followed in this autoethnographic research. It also discusses confidentiality, ethics, trustworthiness, credibility, and limitations of the research.

Rationale for Theoretical Framework

In the first chapter, I provided a synopsis of my life story from a child in an engineers' family to a 'student-teacher' in my own high school to a teacher of the English language in a university in China. That background has brought me to the current research situation. A review of relevant information in the second chapter that I chose to think related to my path from scholarly literature leads to the focus of this chapter. Here I focus on the practical selection of methods and procedures regarding the collection of data drawn from my relationship with my past and with others. With the turn and twist from the initial intention to the current arrangements and decisions to work on autoethnography, I will be opening up new possibilities for me as a researcher to envision my identity via language learning and teaching in ways that I have not seen before. A strong feature of my approach is my decision to use thinking in and about mathematics as a tool to integrate my formation and construction of identity in understanding language learning and teaching.

A theoretical framework is to synthesise most if not all of the review of literature and findings from several fields and disciplines into one coherent holos, a large, creative, original conglomerate. However, the attempt to integrate my own practice and activities needs to be based on the theories of others as well.

According to Denzin and Lincoln (2000-1994, p. 3), "… qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meaning people bring to them".

The main method or approach used in this research is autoethnographic. It will incorporate the self as the main object of research. Natural settings would cover real lived experiences that I as the researcher considered contributed to the formation and construction of my own identity. People, or, ethnos, will include me as well as others, and the methods will be detailed below.

Methodological Orientation

The qualitative research method that has been selected and employed in this study is autoethnographic in nature, and should be ethnographic in its orientation, according to H. Chang (2008, p. 48). All ethnography entails a tension between representations of participants' emic perspectives and the abstractions and interpretations layered on them by the ethnographer's etic perspective (Harklau, 2005, p. 189, citing Eastson-Gegeo, 1988). Harklau further explains that ethnographic research varies between the traditional anthropological emically-oriented *what* of participant understandings and experiences, the interactional sociolinguist's etically-oriented *how* participants structure social realities through interaction (emphasis original). Other features of autoethnography may include that the autoethnographic writing resists Grand Theorizing and the façade of objective research that decontextualizes subjects and searches for singular truth, and autoethnographers argue that self-reflexive critique upon one's positionality as researcher inspires readers to reflect critically upon their own life experience, their constructions of self, and their interactions with others within sociohistorical contexts (Goodall, 1998).

In my orientation, my overall approach has been oriented towards pedagogic considerations of the learning and teaching of a second language above the first language, keeping in mind the needs and expectations and methods of my classmates and schoolmates, and my students and tutees with whom I have been working. My background in my own learning and teaching, as well as my current research in autoethnography will have laid the foundation for further research.

Not a single methodology tradition could be closely followed in this research, as my orientation towards seeking the efficiency of learning and teaching a second language, combined with identity discovery or rediscovery, with the help of mathematics as a tool for thinking, has not been situated, nor reported, as far as my search of literature goes. However, newer possibilities need to be explored.

Research Questions

My autoethnographical analysis of the autobiological data will particularly examine the following three research questions:

1. In what ways has a person with a Chinese cultural background formed his thoughts and ideas about his English language learning and teaching experiences via exposure to English as a linguistic system and as a linguistic

culture? In this research, the phrase “thoughts and ideas” may be envisioned as conceptualization and comprehension of the formation of a closely-knit identity of an English language learner and teacher.

2. How have the above thoughts and ideas influenced how he performs or reveals his learning and teaching experiences? Considering other English language learners and teachers, another way of asking this question is “In what ways does learning a language become and form a new identity to particular performances or behaviours of a self, specifically in L2 learning and teaching, and why?” In this research, “performances and behaviours” reference speech acts and non-verbal behaviours or backgrounds that index identity while “revelation” may be a specific type of performance where an individual makes his or her identity known to others.

3. In what ways can the efficiency of learning an additional language be reached or at least improved based on the dyadic relation between a first language and a second language? In this research, the phrase “dyadic relation” refers to a relation that connects two and only two identities or elements, while such a relation can be expressed linguistically, mathematically, logically, and conceptually.

Negotiating Access and the Researcher’s Role

With a few turns and twists, this developmental research starts with basic principles of autoethnography. In consideration of the access to data and resources, this researcher resorts to mostly personally available data due to a limited time. The role of this researcher is both the one conducting the research, the object of the research per se, as well as the coordinator of the research.

Selection of Data Sources

The formation of an identity is usually a lifelong process, interrupted or intertwined with other anecdotes represented by vignettes along a timeline of years or even decades. The collection and selection of data sources, in this long process for any individual, may pose some problems. However, memory data (H. Chang, 2008) can be applied in an autoethnographic research, so let me start with some features of memory and move on to the application of memory data in this research.

Memory is related to mind, etymologically and biologically. One bears or keeps in mind, or something crosses one's mind, so that one is reminded of an idea, a thing, a person, or an event one memorises. The capacity of the mind to remember happens in the brain, so one can have a person, an event, or a thing constantly on the brain or in one's mind.

It is wrong, conceptually wrong, to suppose that memory is always of the past, or to think that memories can be stored in the brain in the form of the strength of synaptic connections (M. Bennett, Dennett, Hacker, & Searle, 2007, p. 8), but memories and the brain are related. The brain is full of neurons, and each neuron has on average 70 synapses connecting it to other cells (Ridley, 2003, p. 182). However, because our brains lack the means of manipulating memory addresses in the way computers are able to do, and because each neuron is connected to only a small fraction of the others (70 synapses), memorization is unnecessarily difficult (Valiant, 2013, p. 59). Two principles of memory have been summarised by Nobel laureate Kahneman (2011): duration neglect and the peak-end rule. The definitions are:

> Duration neglect: The duration of the procedure had no effect whatsoever on the ratings of total pain.
>
> Peak-end rule: The global retrospective rating was well predicted by the average of the level of pain reported at the worst moment of the experience and at its end.

Two conclusions that can be drawn from the principles of memory are: It does not make sense to evaluate an entire life by its last moments, or to give no weight to duration in deciding which life is more desirable. The lesson we can learn is that both the process and product are equally, if not equivalently, important. One of Kahneman's advice is: The remembering self's neglect of duration, its exaggerated emphasis on peaks and ends, and its susceptibility to hindsight combine to yield distorted reflections of our actual experience. This is something we need to pay much attention to when collecting memory data.

Data collection and selection.

The main participant in this autoethnographic research is the researcher, so the focus is on my own vignettes, scenarios, memory data, marginalia, weblogs, and sometimes, thought experiments. All data are marked with both fixity and fluidity.

Identity formation and how it is formed has to include considerations of the self, the Other or others, and the interactions between self and the Other or others. In the process of data collection, anonymity is used for my students and acquaintances and tutees. Ever since I started to teach English to my classmates in the 70s, I have been concerned myself with questions related to the learning and teaching of a second language. Those questions have been accumulated for over forty years in the forming. Therefore, I have been talking to many people, new acquaintances and old ones. Although some of their names and the speech events were long forgotten, their 'peak' opinions have been integrated into my personal thinking and formation of my identity.

I used some personal marginalia saved well over three decades, shipped from China to Canada to the USA. In addition to going through all my hand-written marginal notes from the books or textbooks I used, I also referred to printed documents that I collected and perceived as relevant to my research.

After I started my Ph.D. programme at the University of Alberta, I also started a new 'hobby' of writing a few weblogs online occasionally. One of my sites, with only 63 weblogs, has over 79,252 visitors between 10 October 2011 and 10 December 2013, an average of 100 people or new hits per day. All my blogs have only one subject or topic, in Chinese mainly though, on How to Learn the English as a Language? As publically available data, weblogs also solicit comments and questions that contribute to the formation of my understanding of language learning and teaching, as well as the formation of my identity. To increase validity and reliability, a variety of data sets has been selected for triangulation.

More detailed explanations of my data follow.

Marginalia. The most famous data sample of this genre is the French mathematician Pierre de Fermat (1601-1665), who indicated in a marginal note in his copy of Diophantus's *Arimetica* that he had found a proof that these [sic] equation had no whole number solutions, but did not include a proof (Schlager & Lauer, 2000, p. 193, Vol. 1; Weisstein, 2003-1999). This selection of data has been used in the study of writing (Peikola, Skaffari, Tanskanen, & Hiltunen, 2009). I kept some of my old books and textbooks on which some marginalia or marginal notes are still intelligible to be used for this autoethnographic research.

Memory data. I have been often credited with a superb memory by some of my high schoolmates and other acquaintances all the way until today, it may start to deteriorate any time. This data records and highlights my transcultural and translingual experiences from a monoglot to a bilingual over the past few decades. Some well-kept documents and the currently online searchable machine-readable resources will be used to help with the accuracy of certain data for cross-referencing and triangulation.

Observational data. Observational data has been used in both qualitative and quantitative researches (Flick, 2009-1998; Teti, 2006-05), as well as in L2 learning and teaching (Kasper & Roever, 2005; Pica, 2005; Wyse, Andrews, & Hoffman, 2010). This set of data is closely related and sometimes mixed up with memory data, though what has been observed is not necessarily always what has been remembered, as memory often fails us.

Reflective data. This data are highly valued in the L2 approach termed Identity Approach to SLA (Atkinson, 2011), as well as in autoethnographic research (H. Chang, 2008).

External data. The external data are fortunate enough but can mainly be supportive from three sources. The first set is from exchange of conversations with my former schoolmate and fellow student that went through the junior and high school, and university years with me. From this source, some of my scenarios, vignettes, and memories can be verified and triangulated. The second set is from some of my past students, tutees, and acquaintances who were familiar enough with me to be able to talk, formally and informally, about language learning and teaching, as well as how to become a Canadian, or an American. The third set of data is from publicly available weblogs that I have kept strictly talking about the learning of a second language and feedbacks from readers.

Commentaries on textbooks. In the formation and construction of my identity, the language learning and teaching that I experienced has been mainly from the textbooks and for other books, and relying on textbooks for teaching (Pingel, 2010-1999) an additional language. Even though my own commentaries on textbooks or other books that I used will be limited, they all contributed to my identity and might be helpful in the writing of the autoethnography.

Proverbs and idioms. In modern business and politics the understanding of proverbs plays a major role, often being the key to the success or breakdown of communications (Mieder, 1986). These 'words of wisdom' endure, so that each generation learns about what a culture deems significant. Because proverbs are learned easily and repeated with great regularity, they soon become part of an individual's belief system (Samovar, et al., 2009-1998, p. 39). Proverbs are also a time-honoured genre that compresses in a nutshell some piece of common-sense knowledge (Caviglia, 2003). I will be using proverbs in this research to demonstrate my identity so that 'what the eye does not see the heart does not grieve for.' (Mieder, 1986)

Data analysis approach.

H. Chang (2008) suggested that the autoethnographic researcher continually goes back and forth between collecting and analysing data and interpreting the results. Qualitative data are different from quantitative data in that the latter usually falls into descriptive statistics such as means and standard deviations in statistical procedures. H. Chang contends that ethnographic data are primarily text-based, rather than number-based (2008, p. 67).

This research will follow what H. Chang (2008, p. 131) has provided, a list of 10 strategies that autoethnographers might consider using to keep themselves grounded in culture. As a personal preference, I will put them in a table format, and add a tick mark beside those strategies that will be used in this research, in a cyclical manner.

	Ten Strategies	Tick
1.	Search for recurring topics, themes, and patterns	✓
2.	Look for cultural themes	✓
3.	Identify exceptional occurrences	✓
4.	Analyse inclusion and omission	✓
4.	Connect the present with the past	✓
6.	Analyse relationships between self and others	✓
7.	Compare yourself to other people's cases	✓
8.	Conceptualize broadly	✓
9.	Compare yourself with social science constructs and ideas	✓
10.	Frame with theories	✓

Table 2 Ten strategies suggested by H. Chang in autoethnographic research

This table serves as a rubric, and my personal favourite is number 8, as a language learner and teacher has to understand the self, the Other or others, and the language, and conceptualise about how to learn, teach, both the self and the Other or others, in a language other than the mother tongue.

Identification of Themes across the Data Sources

The identification of particular themes from the data has the sole purpose of looking for answers to the question of 'Who am I?' (Muncey, 2010). The themes identified from the data analysis processes will be used to search further cultural themes closely related to the individuals, me as an object of research, acquaintances as expressing their opinions and understandings, that will connect the past to the present. Exceptional cases across the data sources that may be omitted will be ignored or reserved for further research. The representations of the self and others under cultural influences will be stressed. The parts of the data relating to the three research questions are considered in the view of current social and cultural studies. Specifically the theoretical frame will concentrate on the identity formation and construction of the self in reference to the ideas of the Other or others. (Based on H. Chang, 2008)

Confidentiality, Ethics, and Trustworthiness

Starting with 'What is the good of a person?' the question that the very first Greek philosophers asked over two millennia ago, slowly changed to 'What are the right things to do?' 'Virtue ethics' is the contemporary approach within philosophy to strengths of characters, and virtue, like the devil, is in the details. In the scientific study of the traits of a good person, trauma may or may not build character, but it probably is one of the best ways to reveal it. Based on the premise that people are moral equals, all ethical systems are built. (Based on Peterson & Seligman, 2004) However, confidentiality and trustworthiness are not listed as virtues or strengths. In the formation and construction of an identity, what should have been achieved is definitely a good person. The second in line other than a good person is good deeds.

Under the general guidelines of sociology, ethics, confidentiality, and trustworthiness are concerned with matters of how researchers go about doing research and what they owe those who become characters in and readers of their stories (C. S. Ellis, 1995). Many questions can be raised about issues of confidentiality and ethics, such as family members, what if those in stories do not agree, multiple voices, deception of readers. Other questions such as ‘What do we want the world to be?’, ‘How can we contribute to making it that way and, in the process, become better human beings?’, are also equally concerned. One point of view is that communication is easier if people share implicit premises regarding interaction and trustworthiness in the face of uncertainty is enhanced if partners can assume that they have shared interests and predispositions. (Based on Borgatta & Montgomery, 2000-1992)

Interpretation and Dissemination of Findings

Autoethnographic data are usually subjective and personal, rending them open to questions regarding reliability, validity, or comparability. However, every man [sic] is in certain respects, like all other men, like some other men, like no other man (C. Kluckhohn, Murray, & Schneider, 1962, p. 12). Therefore, if the analysis and interpretation of the findings are like all, some, or none of those of other findings, recommendations or insights aiming at the improvement of the learning and teaching of a second language can be as well presented or recommended.

Once a piece of qualitative research such as this autoethnographic one is written up (Wolcott, 2001-1990), the finished writing can be disseminated via many channels. For instance, one of the earlier chapters, now appended to this dissertation, was presented at the 8th Annual Hawaii International Conference on

Education. Many ideas in other sections have been published on my personal weblogs to seek feedback for triangulation, in the Chinese language though for ease of dissemination.

As the most important steps in conducting qualitative research, interpretation and dissemination of the results are somewhat based on how the audience will receive them. As a veteran second language learner and teacher, I also hope that my emic and etic perspectives can be accepted and appreciated by those who have been either the insiders or the outsiders concerning themselves with the learning and teaching of a second language.

Mathematics as a Tool for Thinking

As mentioned in the review of literature, mathematics can be used as a tool to further develop L1 and L2, as well as a tool for thinking, that helps as students develop higher-order thinking through language (Lim & Pugalee, 2004). This section will provide the reasoning and processes to use mathematics to consider the problem of language learning and teaching.

Interlanguage.

According to Gass and Selinker (2008-1994), interlanguage is a system composed of elements from the L2 and the L1, as well as elements that do not have their origin in either the L2 or the L1 (Eckman, 2012), a case of neither, which Gass and Selinker called ‘new forms’. If the interlanguage is a continuum, such as proposed by Stauble (cited in Doughty & Long, 2005-03), mesolang will cover the case of L2versusL1 (somewhat balanced), basilang will cover the case of L1overL2 (furthest from L2), and acrolang will cover the case of L2overL1 (nearest to L2). Together with Tarone (cited in Doughty & Long, 2005-03), we have the following table:

n=2	L1overL2	L2versusL1	L2overL1	?L2?L1
Interlanguages	+	+	+	+
Stauble	Basilang	Mesolang	Acrolang	
Tarone	Vernacular	Style n	Careful	
Gass & Selinker	From L1		From L2	new forms

Table 3 Comparison with Stauble, Tarone, and Gass & Selinker

As indicated in the Table, there are a total of four main styles of interlanguage, nearing L2, nearing L1, nearing both, or nearing neither, a case of both or either or neither. Tarone named the case of both as style *n,* as there are so many styles of interlanguages in there between the vernacular style at one end, and the careful style at the other. The case of ?L2?L1 (the case of Neither or ‘new forms’) does not necessarily mean that the origin is unknown, but that researchers have not found out what the origin is yet, i.e., the unknown unknowns (Kahneman, 2011).

At this moment, we can safely draw the conclusion that there are four major styles of interlanguage, or interlanguages, based on influence from both L2 and L1, from either more L2, or from more L1, or from neither. Therefore, based on known researches, interlanguage, represented by either *I* or *IL*, varies with L2, or L1, or both L2 and L1, or itself is the unknown unknowns (Kahneman, 2011). In the words of mathematics, or to use it as a tool of thinking, interlanguage is a function of both, or either, or neither.

The right or the wrong.

If there are only two languages, L2 and L1, then interlanguage is nearing both or either or neither. It can be neither for the time being (until newer research finds out otherwise), but, it is surely not both, and it is certainly not either, either. In other words, the interlanguage is not L2, nor is it L1. Interlanguage is an intermediate system, a natural route to the desired end (the L2 norm). It should not be discouraged (since it is naturally developing), and only a small part is influenced by L1 (Selinker, 1972).

The question is, is interlanguage right or wrong? The answer is, and should be, that it is certainly wrong for this moment, and it may be right in the future. If it is wrong for language learners and teachers, can we reduce it to a small amount or number?

Before seeking an answer to this question, let us move on to look at the numbers, how many errors, or the wrong, are there? The next question is, how many errors will be created?

The academic name, interlanguage, has generated hundreds of thousands of researches or hits on the Internet. It had over half a million hits on a Google search about two years ago, over 730,000 as of 15 August 2012, a growth of nearly 300,000 hits in the past two or three years. On a recent date, the 10th of December, 2013, Google had 630,000 hits of interlanguage. However, as this dissertation is going to expose, *IL* is fundamentally incorrect, it is neither L2 nor L1, but simply errors on the increase or decrease, which is better avoided as early and much and soon as possible, even though not completely.

The prefix inter- means, according to the *American Heritage Dictionary* website, 'between; among', 'in the midst of; within', 'mutual; mutually', and 'reciprocal; reciprocally'. Interlanguage is one created between at least two languages, mutually and reciprocally influenced by at least one language, or maybe even influenced by mutual internal influences. The sure conclusion, considering there are only two languages dealt with in this dissertation, L2 and L1, is that the *IL* is neither. The development of *IL* remains confined to the mental processes of the learner (M. Johnson, 2004, p. 130). The mental processes, with only two languages, can be listed in the following table, i.e., the two languages can move towards each other to incur more interference, or away from each other to incur no or less interference, or one after the other to incur even less interference.

Movements	L2	L1
2 left	←	←
2 right	→	→
2 opposite	→	←
2 separate	←	→

Table 4 Left or Right?

When the two languages move towards each other, they are affecting each other more, a mutual or reciprocal influence. When they move away from each other, they are preferably and ideally not affecting each other. When they are moving one after the other, there might be some overlaps, creating a plethora of mutual interferences upon each other, i.e., various styles (Tarone's interlanguage continuum, cited in Doughty & Long, 2005-03). The combined movements can be used to represent four kinds of interlanguages, and the total number of interlanguages, or main styles of *IL*, when two or more languages are being learned can be expressed in an equation (Appendix D, [D.1]):

The result is shown in the following table.

n=2	L1overL2	L2versusL1	L2overL1	?L2?L1
Interlanguages	+	+	+	+

Table 5 Four Interlanguages with only two languages.

Where there are three languages, there could be twelve kinds of interlanguages. The number grows by leaps and bounds, and all styles of interlanguage are wrong.

Considerations of the tool.

When two elements are connected in a relation, this is termed a dyadic relation (Eves, 1997-90, pp. 132-136). Related to this research is the dyadic relation between L2 and L1, which only has three possibilities if proficiency of each is expressed and compared, respectively, by *T* for proficiency of L2 and *M* for proficiency of L1, as follows: *T*>*M*, *T*<*M*, *T*=*M*. In a table format, it becomes:

n=2	T>M	T=M	T<M
Proficiency	Better L2	Bilingual	Better L1

Table 6 Three results only with only two languages.

The proficiency is defined as the four traditional language skills, expressed as *p*=*RSHW*.

The dyadic relation between L2 and L1 is also called a linear or simple ordering relation (Bullock & Stallybrass, 1977, p. 445; Ladyman, Ross, Spurrett, & Collier, 2007, p. 137; Spaulding, 1936, p. 262). Russell (In Mumford, 2003, p. 235) explains that an ordering relation is a distinction between *A-first-and-then-B* and *B-first-and-then-A*. Therefore, *AB* and *BA* are different relations, which means the two entities involved in the relation have an order. In this research of proficiency of language learning and teaching, the proficiency can be divided into three cases as well. L2 reaches a better proficiency, L1 reaches a better proficiency, or both reach a similar proficiency.

I will now turn to the dyadic ordering relations. This relation is established when an L1-speaker, especially a high school student or an adult student, starts to learn L2 by matching an L2-unit or L2-item with one or more L1-units, the unit or item being a linguistic unit of a word, a phrase, a clause, a sentence, or any similar denominations. This process is termed the Translation Method (*TM*) by this research to distinguish it from the Grammar-Translation Method (*GTM*) prevalent in literature. In *TM*, there are only two results, either the L1-speaker-cum-L2-

learner matches an L2-unit with one or more L1-units, or mismatches an L2-unit with one or more L1-units.

Another scenario is that when the L1-speaker-cum-L2-learner hears or reads an L2-unit, either the L1-speaker-cum-L2-learner recalls one or more L1-units, right or wrong, or the L1-speaker-cum-L2-learner recalls one or more L2-units, right or wrong. When more L2 has been learned, the L1-speaker-cum- L2-learner may be able to recall or match the L2-unit with another L2-unit that has already been learned, such as a synonym. Again, there are only two possibilities, either the L2-unit being learned finds its match, or not. All the possibilities are summarised in the following table. Out of the four conclusions, one and only one indicates that the L2-unit has been learned, the other three indicate review or revision of both languages, or duplicative learning in both languages.

	L2 Oracy/Literacy			
	L2		L1	
Matching	+	-	+	-
Output	+		+	
Scenario	+	-	+	-
Conclusion	Learned	Reviewed		

Table 7 When L2 is matched with L1 and/or L2, not all is learned.

In other words, if *TM* is used, learning of the L2 is limited.

Procedures and instruments.

Looking back on the three relations, $T>M$, $T<M$, $T=M$, one and only one assumption can be made, which is *T* varies with *M*, since during the secondary school period, most L2-learning students would use *TM*, for their L1 has already been well established. However, when L2 is being learned, L2 also starts to affect L1. Therefore, it is not simply variation, but interaction or intervariation between the two languages, if there are only two. In an effort to express the interaction mathematically, I choose to use the language of variation (Klaf, 1964). For the sake of simplification, *T* and *M* are used for respective proficiencies.

The language of variation.

A direct variation is expressed as $T=kM$ (Appendix D, [D.2]). The constant *k* in applied work is found numerically by experiments (Klaf, 1964). For ease of discussion in this research, it is assumed tentatively and initially that $k=1$, and the new relation becomes $T=M$ or $M=T$. this means both languages have reached a similar proficiency. This also covers the case when duplicative learning occurs, in which process the same or similar knowledge and/or skills have been duplicatively learned in both languages, either simultaneously, or at different times.

Now, I need to consider the other two relations, $M>T$, $M<T$. If $M=T$ or $T=M$ mean when L1 is enhanced, L2 is also enhanced, and vice versa. However, both $M>T$ and $M<T$ mean that when L1 is enhanced, L2 is not enhanced.

If L2 is not enhanced there are only two possibilities, either L2 remains unimproved, i.e., nothing in L2 is learned (nonlearning or unlearning), or L2 is reduced (mislearning or dislearning), i.e., corrupted or corroded with the influence from L1 or other factors (the unknown unknowns). Therefore, during the secondary school years, an L1-speaker improves her or his L1 when growing older and learns L2 at the same time. The proficiency of L2 either increases compared and together with L1, or decreases by the corruption or corrosion from L1 or other factors, when the *TM* is applied. We now need to borrow Klaf again (1964) for the inverse variation, $TxM=k$, that is, L2 times L1 equals k (Appendix D, [D.3]).

Again, for ease of discussion, we assume that $k=1$, and we are able to exhaust two extremes along a continuum covered by both $M>T$ and $M<T$.

If $T=kM$ represents one extreme of the dyadic relation between two languages, i.e., both improve, then $TxM=k$ represents the other extreme, i.e., one improves but the other does not improve.

The two extremes and everything in-between.

When an L1-speaker learns an L2, both the L1 and the L2 started to influence each other. As can be logically reasoned, L1 promotes L2, L1 corrupts L2, L2 strengthens L1, or L2 corrupts L1, inclusively. The two extremes in the four interactions mean L1 and L2 are moving in two different, or opposite directions. When L2 improves, L1 deteriorates, or when L2 is marked with errors, L1, on the other hand, improves or is reviewed more than once when L2 is translated into L1. In cases when the translated L2 turns out to be an idea or term non-existent in L1, L1 is definitely improved. Therefore, $TxM=k$ expresses the extremes when L1 increases, L2 decreases, or vice versa, thus, together with *T=kM*, exhausting all the possibilities of the interactions between L1 and L2.

Instruments.

The main instrument used in this research will be a TI-92 Plus (Texas Instruments, 2002-1999) graphing calculator, for its algebraic capabilities. For triangulation, Mathcad 8 Professional (Mathsoft Inc., 1998) will also be applied. Some of the graphs will be taken from online graphing calculators (FooPlot, 2007). On some occasions, manual calculation is also needed for verification.

Initial trends and possibilities.

Thus far, we have exhausted all the variations between L2 and L1 with T=*kM* and *TxM=k*. When L2 increases, L1 may increase or be corrupted or corroded. When L1 is used to learn L2, L2 may also increase or be corrupted or corroded by L1.

Now, let us move to mathematics.

If both T=*kM* and *TxM=k* are solved as linear equations, assuming *k=1* for ease of calculation, we will be seeing two extremes of a continuum.

Preliminary calculations.

One extreme, *TxT=1*, means that L2 will be corrupted or corroded or improved, despite whatever happens to L1, and as long as L1 is used in the learning of an L2, i.e., the *TM* is applied. The maximum proficiency that L2 reaches is an equivalent proficiency to that of the L1. The maximum corruption or corrosion that L2 reaches is total ignorance of L2, i.e., L2 is not learned at all (nonlearning), or only learned in such a way that any produced spoken or written form of L2 will be considered by a native L2-speaker as non-L2 (mislearning or dislearning). This result tells us that whenever TM is applied, either L2 is learned, or burned to some degree. Three results are learning L2, mislearning L2, and nonlearning L2, which is to be explored and expressed further.

The other extreme, *MxM=1*, means when L2 is translated into L1 and the translated term already exists in L1, i.e., L1 is not New Information (Quirk, et al., 1980-72) at all, L1 is actually reviewed, sometimes more than once, and nothing new is learned, a nonlearning, from L2. If every term or unit in L2 is turned intoL1, L1 is definitely consolidated and maximised. However, under the influence of L2, L1 may also be corrupted or corroded until most of the grammatical structures produced in L1, even by native L1-speakers who are learning L2, will look like or sound like structures in L2. In other words, whenever *TM* is applied, even the L1 is either earned, or unlearned, which establishes another case of learning and mislearning.

The emic version.

When an L1-speaker learns an L2, there are only a limited number of thinking processes going on in the brain of an individual learner. The learner mainly thinks in L1 and turns most of the L2 into L1. The learner may also think in L2 when his or her L2 has reached certain proficiency to allow such thinking, and turns his or her L1 into L2. There is also a third process when the learner code-switches between the two languages, i.e., bidirectionally, and produces a language that is neither L2 nor L1. This a set of thinking processes of which even the language learner may not be fully aware, nor can the language learner gain full control. Leaving the last scenario for further analysis in the Etic version, the current understanding of the learning of an L2 with two results may be termed the Emic version.

Conclusion.

The learning of a target language, with both the support and the influence from the mother tongue, can be a continuum moving from nonlearning to learning. Between the two extremes, there could be dislearning, mislearning, ambilearning and other combinations of learning. Using some of the available tools in mathematics, this section starts a tradition of mathematical expressions to exemplify the possible outcomes of second language learning under the influence of a mother tongue, shedding some light towards proving some flawed methods or methodological flaws of learning an additional language with less efficiency.

Limitations

This research is limited in its scope to the viewpoints and experiences related to one second language learner and teacher, his own formation and construction of his identity in national and transnational endeavours, via the learning and using of a second language translingually. This research is autoethnographical in nature and limited to the memories, observations, interpretations, and vignettes of half a dozen individuals with their shared understandings and interactions in both personal and mainly professional settings where the researcher has been involved.

Summary

This chapter sets up the framework for the current autoethnographic research on the formation and construction of an identity of a language learner and teacher. Considerations include orientation of the methodology, research questions, access to data sources, and the analysis and interpretation of the themes discovered. How to use mathematics as a tool for thinking to support this research is also explored. In the next chapter, data sources and analyses will be provided.

Chapter 4

Autoethnographic Exploration

As I have explained and understood earlier, autoethnography is the approach to put a solitary self, either fixed or flowing, into a bigger picture of people, race, nation, or culture, for a brief description, and write it down in a scientific manner to reveal the trait, or ‘smallness’ of a person.

‘A body in a coffin with the lid on, is the time rumours around will be gone.’ (Chinese proverb). That is very suitable for the fluidity of identity. The formation and construction of an identity is and should be a lifelong process. In this process, an autoethnographic research to understand and explore the identity would generate, between the two extremes of happiness and sadness, a lot of self-evaluation, self-revelation, and self-diagnosis of personal fears, doubts, and concerns. On many occasions, emotional pains will also be dug out from the deepness of the heart. In this chapter, personal and professional exploration of the good and the bad, as well as the ugly, will be on full display in vignettes, scenarios, memories, marginal notes, commentaries, and triangulational data. Such selection and collection are used to represent my desire to help and understand others as well as to deal with myself, in becoming a more efficient language learner and teacher.

In this autoethnographic exploration and expedition, my own data will be marked with capital letters, A, B, or C, and data influenced by the Other or others will be marked with numerals, 1, 2, or 3. On occasions when the information is from combined sources, mine and others’, the labels will be combined as well, such as, A1, B3, C4, etc.

Vignettes

All the vignettes under such titles provide the formation and construction of my identity. They are selected to illustrate how my identity has been formed bit by bit via agency (J. Jackson, 2011), theorising, reflexivity, characterisation (C. S. Ellis, 2004), and activities.

The word vignette means a small vine that grows until the end, but while growing, linking all that can be linked. A vignette in an autoethnographic exploration links the cultural identity to the larger sociocultural context, and communities of practice (CoP) (J. Jackson, 2011; Jiménez, Rose, Cole, & Flushman, 2011; the National Foreign Language Center, 2013-10).

Recalled Scenarios and Diaries

Diaries for a learner including a language learner are journals that are kept (either on his or her own initiative or following a request or assignment given by a teacher). Diaries are often a good source of information about attitudes and motivation and provide a more open-ended forum for such information without the constraints of specific questions (Gass & Selinker, 2008-1994, p. 71). Personally when I was young, I was against keeping a diary, but I did write something. One thing I wrote was some Romanised CPA to keep my understanding of the thoughts of my contemporaries regarding events and mainly people around me, which was lost though I can recall some anecdotes. The others were mainly notes taken while I was reading some extracurricular books or booklets, especially those on sciences, and I found some of those diaries. In this autoethnographic research on myself as the object of research, I had some difficulties initially in the selection of data, though diaries on the learning of science also contributed to the formation of my identity. Partly for lack of personal diaries and partly for the recommendation by H. Chang to guard against 'exclusive reliance on personal memory and recalling as a data source' (2008, p. 54), I choose to use some recalled scenarios as data, because recalling can be applied in supporting the interviewees in specific situation (Flick, 2009-1998, p. 151) in qualitative research. In this research, recalled scenarios refer to data that will find some material support, such as information published online, diaries or collective memories from my former classmates or schoolmates.

Memory Data

As mentioned earlier, I have been often credited with a superb memory by some of my high schoolmates and other acquaintances all the way until today, it may start to deteriorate any time now. The memory is, in language learning and teaching, built via the eye, or the ear, at least mainly so. Our perceptual systems do not passively match incoming data to stored memory data, we appreciate affordances, invariances and transformations in input-output feedback loop systems which may involve swathes of our brain, and many and various centres there, in our proactive search for meaning in our environment (Kerr, 2008).

In talking about seeing, or information to the eye, Richard Gregory conceives of seeing as ‘probably the most sophisticated of all the brain’s activities: calling upon its stores of memory data; requiring subtle classifications, comparisons and logical decisions for sensory data to become perception.’(cited in M. Bennett, et al., 2007, p. 17). Therefore, it is the brain that actually sees, makes classifications, comparisons, and decisions, at least happening a quarter of a million years ago, before language was even created. I have also chosen to use some memory data for this research. Different from recalled scenarios, memory data may not have some material support as they are taken mainly from thoughts in the brain.

Marginalia

Research in the teaching of writing, according to Sommer (1989), reveals that the use of red ink, marginal notes, and symbols for correction is not a sign of improvement in student writing (Andrea Penaflorida, 2008, pp. 344-353). However, the same or similar strategies are suggested in some programme guides, such as this resource guide (Alberta. Alberta Learning. Learning and Teaching Resources Branch, 2003, p. 315), in which students can use a fine marker pen and write marginal notes describing the successful elements of the design, drawing arrows to the elements in question. As one of the traditional approaches, marginal notes were also used for teachers to write comments on Latin texts (Reynolds, 1996, cited in Jin & Cortazzi, 2011, p. 572). Marginal notes have also been suggested as a useful tool in researching second language classrooms (McKay, 2006).

I kept some of my old books and textbooks, having shipped them from China to Canada to the USA, on which some marginalia or marginal notes are still intelligible to be used for this autoethnographic research.

Weblogs (blogging)

Researchers have already started to collect and analyse responses from students using weblogs as one of the new technologies (Larson, 2008; Love, 2002; Scharber, 2009; West, 2008, cited in Roser, Martinez, & Wood, 2011, p. 264). Weblogs are also suitable in motivating students in their writing (Meshkat & Goli, 2012, pp. 337-370). Scientists use weblogs (or blogs) to present their individual views and facilitate open discussion, since internet facilitates personal communication as well as formal, institutional communication (Trench, 2008, pp. 183-198). When more publications appear on the Web, with e-zines, magazines, and personal writing in weblogs, some authors expressed their concerns as the new medium also caused problems with existing copyright provisions when authors, photographers, and music publishers found their creations becoming freely available on the Web (Bunch & Hellemans, 2004, pp. 631-632). However, more recently one research derived metrics from large weblog corpora for four L1s (Chinese, Japanese, Spanish, French), and concluded that L1 forms created some L2 forms, supporting one theme in this dissertation that interlanguage has patterns of the L1 intruding into the L2 (Brooke & Hirst, 2012).

As mentioned earlier, one of my weblog sites, with only 63 weblogs, has over 79,252 visitors between 10 October 2011 and 10 December 2013, an average of 100 people per day. All my blogs have only one subject, in Chinese mainly though, on How to Learn the English as a Language?

In the four-volume series on autoethnography, editor Pat Sikes mentions that the primary agenda [of autoethnography appearing in blogs] is to do with projects such as personal identity formation (Sikes 2013, pp. xxi-lii). For that purpose, the following weblogs that I selected will be used to support this autoethnographic research on my identity formation and construction.

Cases for Triangulation

Most of the other data have been selected for this autoethnographic exploration from those concerning myself or those knowing me for a long time. For the purpose of triangulation, this set of cases has been selected from our research on the learning of English via the eyes of some immigrants, as well as how they understood and commented on my suggested strategies of language learning and teaching.

All of those immigrants came to Canada around the middle or end of the 1990's from China, PR. This group of immigrants lived through the Great Proletarian Cultural Revolution (GPCR, 1966-1976), a chaotic period in China when the Red Guards destroyed almost everything that was not considered 'red', or 'red enough.' Some of them were very young toddlers during the GPCR, others are my age or similar to my age. In the post-cultural revolution (post-CR) period, university entrance examination was restored in 1977 and the first wave (post-CR) of Chinese immigrants (students included) started as well. Those immigrants carried with them a love for knowledge inherited from a long tradition not completely destroyed by the GPCR, and a hatred partially caused by the consequences of the GPCR. Some of those Red Guards also came to Canada at the same time, now becoming grandparents.

Data Grouped by the Three Research Questions

All of the data selected according to the above categories are regrouped into themes based on the three research questions.

Question 1: English language learning as a linguistic and cultural system.

Vignette A: Kicked out of home, with (grand-)parents.

> *I have never written this part of the personal history about me before. It was and still is painful and traumatic, and all happened around the year 1968, when I was about ten years old. That was the third year of the Great Proletarian Cultural Revolution (GPCR) initiated by the great leader, Chairman Mao (Zedong or Tse-tung), in 1966.*
>
> *One day in winter, there was a truck, or several trucks, parked outside of our apartment, which at that time had two rooms, two balconies, a kitchen, and a washroom. Some workers, or people wearing working clothes like workers, knocked on the door and came in. They started to take our things outside, and one of them kicked open one of our half-sealed balcony door, full or half-full of sawdust against winter coldness. My grandmother was with us, me and my younger sister of about four years old, and she helped to wrap us in warm winter clothes and told us to stay outside in the winter, preventing us from seeing the scene.*
>
> *My mother was also with us outside, but my grandmother, on my mother's side, was inside. As I was told some years later, she was fighting with*

> *those workers for some of our stuff, yelling at them to be careful with it or them. My father, at that time, was 'factory-arrested', staying at his factory 24/7 under the surveillance of the Red Guards.*
>
> *The workers, according to Chairman Mao, is the 'big brother' or the 'first brother', second only to the peasants, the 'second brother', and they were so mean to us in that winter of 1968.*
>
> *We were moved to the second floor of a two family stand-alone building with both ceiling leaking from above and floor leaking to the downstairs, and stayed there until about five or six years later, when we were moved back to the same apartment mentioned above, quite a triumphant symbol then. My father was back with us before the triumphant move.*

The 'big brother' were really BIG. They could kick people around, throw things around, break things, as I learned later, even break people, not only heart, body included. I was only about nine years old then, and was only a national, when the idea of transnationalism meant nothing to me. However, what I saw, or was rather made to see, was the meanness of the workers, the 'big brother', or the 'first brother', to none other, but the whole nation. I started to ask 'why' at that time, to myself about a lot of things, events, and people, and in order to find out the answers to those 'whys' that could be accumulating for the social life of me, I needed some tools to help me find answers. I believe that I have been looking for those tools ever since.

The year 1968 was the third year of the GPCR, and to me, it marked the start of an understanding of the identity of myself, as well as the identities of the Other or others. From my personal reading, one book that related clearly to all those in the field of English language learning and teaching is *A Single Tear* (Wu 巫寧坤 & Li 李怡楷, 1993), the first writer was a translator of *The Great Gatsby* (Fitzgerald, 2003) into Chinese published in Taiwan. Wu was persecuted, with his family, during the Great Proletarian Cultural Revolution, one of the reasons of which was that he was teaching Fitzgerald to his students. Thirty years later, he was asked to translate Fitzgerald into Chinese, the same book he was persecuted for. There are a long line of other translators, though. As will be discovered, not a single tear, but many, in here or out there.

Scenario A1: In a young eye.

I could recall some scenarios in my young life during the Great Proletarian Cultural Revolution (GPCR, 1966-1976), and many of them were not positive at all. Recalling those scenarios has led me into thinking and asking questions about human nature, which is probably the reason that pushed me to find out what is always difficult to find out (N. Hill, 1979).

> *After my family moved to a new area, I had no friends to play with for a long time at first. Eventually, I found a few to play with. No one wanted to play with me then because our family of engineers was considered the 'enemies' of the workers, peasants, and soldiers (the WPS). People called such families chou lao jiu (臭老九)[1]. Kids of other parents were not allowed to play with me, or us with the same or similar labels, because our parents are engineers, doctors, professors, or other intellectuals. We are not bad or stinky, but they say we are because we were the children of chou lao jius. They must be the children of 'Good-smell #X' and are above others, the 'labelled' ones.*
>
> *I did not have much to do around other kids so I often wandered alone until one day I ended up at the window, or see-through door, of a sugar mill kind of place, smelling sugar all the time. It was a candy maker. I was able to stand outside, looking at how candies were made, manually, by the workers.*
>
> *They were able to make a cylindrical candy that when looking at the flat side, one could see animals, such as a duck, a rabbit, or others. I learned how those candies were made. Then a few times, another girl would came earlier and took my place. Some time I was pushed away as well. I learned the feeling of humiliation, all the time then.*
>
> *As we got to know each other, we exchanged information about us and our families, which was forbidden at that time by most, if not all, of the parents, since any 'wrong' words would incur damage to the people involved.*
>
> *The first emperor of China was known, perhaps by the whole world via movies, to have ordered some books from the whole nation burned, and about 460 'scholars' buried, alive. Books about war, medicine, agriculture and gods or 'heavens' were not burned.*
>
> *During the GPCR, the 'scholars' burned their own books, some written by themselves, published or their own manuscripts, some by other 'scholars'.*

---

[1] A term of abuse by ultra-Leftists for teachers and other educated people in the 1966-1976 Cultural Revolution. During the Cultural Revolution the "Nine Black Categories" were: Landlords, rich farmers, anti-revolutionaries, bad influences, right-wingers, traitors, spies, capitalist roaders and (ninth) intellectuals. Stinking Old Ninth. ("From Wikipedia, the Free Encyclopedia,"), retrieved from http://en.wikipedia.org/wiki/Stinking_Old_Ninth.

> *They also 'buried' themselves 'alive' by killing themselves, or kept silent for a very long time. The great force behind all the burning and burying during the GPCR was epitomised by the term Red Guards*[2] *exercising the 'red terror' all over China.*
>
> *It was good that I had someone to talk to, about languages, English, Russian, and Japanese. Those were some of the very few languages we were allowed to have heard of. Other languages were Albanian, the language of a long-time friend to China, and perhaps, Romanian, another language of a friend to China.*
>
> *It seems at that time, the language of the enemy, or a former friend, or current friends, was the most important.*

That was a time when many of us labelled 'gou zai zi' (whelps) had no friends, because we were labelled 'sons of dogs'. Our parents, and sometimes, our ancestors, if they were members of the intelligentsia, were labelled 'dogs', by the Red Guards, or the original 'gou zai zi'. Whoever 'patented' the term may not be brave enough to claim the ownership now.

I had to do something then, such as reading and browsing and fooling around. I had the vaguest idea to look for answers to questions I had in mind, that I could not understand then. English might be the one that came to help. Russian would not help since that 'big brother of USSR broke away from China. I was told by my parents many times to tell no one nothing about our family or what we do at home, 'guard your mouth as though it were a vase, and guard your thoughts as you would a city wall,' (Mieder, 1986) but I was only a kid. I would thank God and everything now that nothing happened then.

Marginal note A: Unit 10, Book 6, English 900®.

A course for students of English as a second language, *English 900*® contains material from beginning through intermediate levels of study (English Language Services, 1964). When I started learning the English course, I did not know how to use is, but simply followed what the Voice of America was teaching. I learned many years later that there were many other learners as well (Kang, 2007; Zhu, 1998). I listened to the broadcast in two cycles. In the second, of

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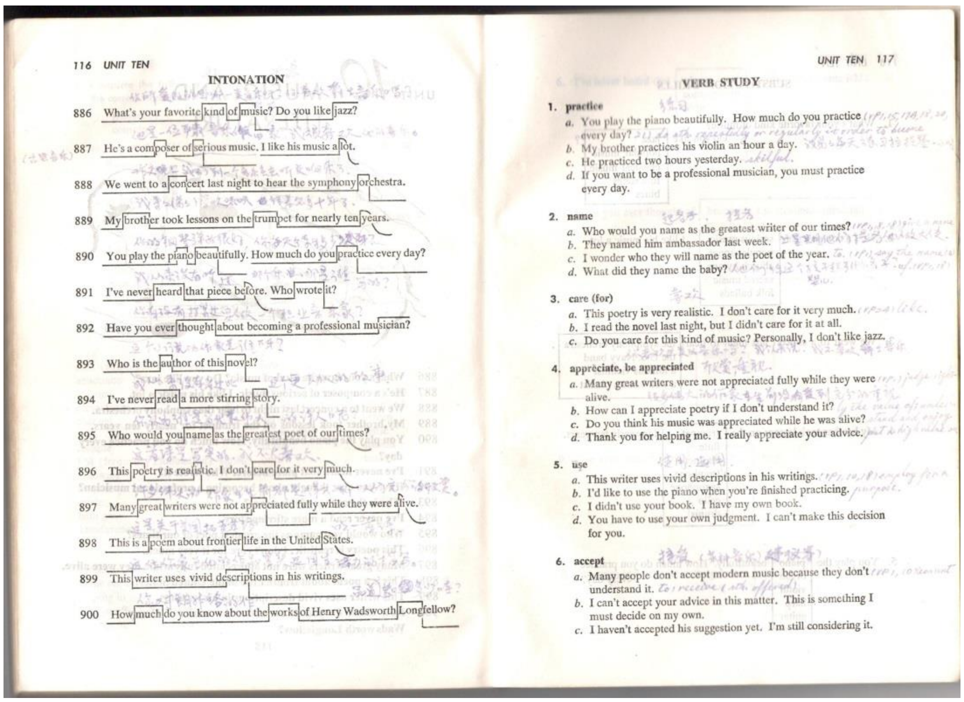
[2] Red Guards: ere a mass paramilitary social movement of young people in the People's Republic of China (PRC), who were mobilized by Mao Zedong in 1966 and 1967, during the Cultural Revolution. Red Guards (China). ("From Wikipedia, the Free Encyclopedia,"), retrieved from http://en.wikipedia.org/wiki/Red_Guards_(China).

course, repeated learning, I managed to write down the Chinese translations and/or explanations. Sometimes when I was so busy, my mother came to the rescue to take notes for me. The pencil I used at that time during the 1970s was very special. It changes colours after humidification. I will say a few more words on my pencil.

Most of the pencils at that time were usually sold, not by the dozens or boxes, but by the singleton, one at a time, purchased by k-12 students. The most



116 UNIT TEN

INTONATION

886 What's your favorite kind of music? Do you like jazz?
887 He's a composer of serious music. I like his music a lot.
888 We went to a concert last night to hear the symphony orchestra.
889 My brother took lessons on the trumpet for nearly ten years.
890 You play the piano beautifully. How much do you practice every day?
891 I've never heard that piece before. Who wrote it?
892 Have you ever thought about becoming a professional musician?
893 Who is the author of this novel?
894 I've never read a more stirring story.
895 Who would you name as the greatest poet of our times?
896 This poetry is realistic. I don't care for it very much.
897 Many great writers were not appreciated fully while they were alive.
898 This is a poem about frontier life in the United States.
899 This writer uses vivid descriptions in his writings.
900 How much do you know about the works of Henry Wadsworth Longfellow?

UNIT TEN 117

VERB STUDY

1. practice
   a. You play the piano beautifully. How much do you practice every day?
   b. My brother practices his violin an hour a day.
   c. He practiced two hours yesterday.
   d. If you want to be a professional musician, you must practice every day.
2. name
   a. Who would you name as the greatest writer of our times?
   b. They named him ambassador last week.
   c. I wonder who they will name as the poet of the year.
   d. What did they name the baby?
3. care (for)
   a. This poetry is very realistic. I don't care for it very much.
   b. I read the novel last night, but I didn't care for it at all.
   c. Do you care for this kind of music? Personally, I don't like jazz.
4. appreciate, be appreciated
   a. Many great writers were not appreciated fully while they were alive.
   b. How can I appreciate poetry if I don't understand it?
   c. Do you think his music was appreciated while he was alive?
   d. Thank you for helping me. I really appreciate your advice.
5. use
   a. This writer uses vivid descriptions in his writings.
   b. I'd like to use the piano when you're finished practicing.
   c. I didn't use your book. I have my own book.
   d. You have to use your own judgment. I can't make this decision for you.
6. accept
   a. Many people don't accept modern music because they don't understand it.
   b. I can't accept your advice in this matter. This is something I must decide on my own.
   c. I haven't accepted his suggestion yet. I'm still considering it.

Figure 5 Unit 10, Book 6, of English 900®

common ones were three pennies for each, and there were once some even thinner ones selling for two pennies each. The pennies here refer to Chinese cents, or *fen*. The more expensive pencils then, for designers and drafters and painters, ranging from 6H, to 2H, to H, to F, to HB, to B, and up or down to 6B, was selling at eleven pennies each. At that time, the average household income was perhaps about thirty Chinese dollars, good enough to buy 100 regular pencils. For the eleven-cent pencils, two of them are the cost enough to buy some ground pork to make dumplings as one meal for a family of five people. My pencil, the humidifier pencil that I used, was fifteen pennies each, very expensive at that time, which made the photocopy today still intelligible.

Towards the end of the learning, when I was able to get hold of the *Teacher's Manual*, I learned that a language learner will have to work a little harder, and in a somewhat different way, so that the obstacles that the learner's native-language habits put in the way of his [sic] success in learning a new language will not exert a hindrance. The author or authors recommended that in many cases, the teacher be the model speaker, and criticise the learner's performance, correct his [sic] mistakes, and praise his [sic] successes (Teacher's Manual, 1964, p. 1). The author also recommended that the teacher know both languages, claiming that the more thoroughly the teacher knows both the new language and the learner's native language, the more efficiently he [sic] can do his [sic] job.

As can be seen in the scanned page, on the left was my 'dictated' Chinese taken from the Voice of America. When I was doing that towards the end of the book, I knew for sure I did not need the translations. However, it became a habit, so I kept on taking the dictation. I would call that action of mine the inertia of human nature. On the right side of the scanned page, some Chinese could be recognised, not complete sentences but only words. More English compared with Chinese was also recognisable. I was using the second edition of A. S. Hornby's dictionary (Hornby, et al., 1970) and became interested in his Verb Patterns, which led me to get hold of his *Guide to Patterns and Usage in English* (Hornby, 1975-54) later. The VP24 in my marginal note referred to Hornby's Verb Patterns.

Vignette B: A colleague, one of a trade.

After the assignment to work at my alma mater, Harbin Normal University (HNU) or Harbin Teachers University (HTU), depending on who the translator is, for a couple years, I started to explore the possibility to use computers in the learning and teaching of English. A summary of our work on Computer-Assisted Language Learning (CALL) was published as a conference paper, and later in one of the national journals on media in foreign language instruction. I barely recall that my co-author was awarded 30 Chinese dollars for the publication, about one-third of her monthly income, with which she bought some candies for her colleagues.

Before that happened, around 1986 or 1987, our department was asking all of us teachers or instructors to submit applications for some funding on scholarly researches. I prepared a proposal to study the use of computers in language education and sent it to my mentor and professor.

He liked it very much, but suggested to have another instructor added, as the latter was the vice-supervisor of our division of the English language. Our department of foreign languages has three divisions, of English, Russian, and Japanese. Now we had three names on the proposal, my professor, him, and me.

Very soon my professor asked to add another her, a librarian who might help us to secure some resources. That was all right with me, resulting in that our proposal had four names, and order mattered, my professor, him, her, and me.

After some time, when I almost forgot about the proposal, my professor asked to talk to me. All right, something serious was going to happen. What was it? He told me that for such and such reasons, our dear vice-supervisor did not even submit our proposal but submitted his own on the study of English education to upperclassmen.

That surprised me a lot. He did not do anything, and there was no intention that he would do anything, but only had his name added to my proposal. Now he simply 'forgot' or for a world of reasons declined to submit a proposal with his name on it? I was perplexed.

Two of a trade can never agree (Mieder, 1986), which is a better English proverb compared with the Chinese one, since the latter would be more like that colleagues are foes always in a feud. I started to understand that, many years later. The human nature is a controversial topic to put any research on, as without adequate scientific evidence, generalisations and authentic truths are very difficult to reach. My later studies on horizontal and vertical cultures may offer some light on this vignette, for the time being a metaphor may work here. One of the greatest scientists Sir Isaac Newton's idea of standing on the shoulders of giants has been used by some authors (Friedman & Mandelbaum, 2011; Turco et al., 2008), however, to really stand on those shoulders of giants is really difficult for many people. The truth is, or the easiest thing to do, if somebody becomes the vice-supervisor, it is easier for him or her to stand on the head of others, much better than shoulders. By the same token, when a vice-supervisor becomes a supervisor, or even higher, a viceroy, the heads of others could be easily chopped off, at will.

Case 1: A medical doctor.

Mr. MJ

Graduating from a medical university, one of the key ones in Shanghai, he wanted to further his studies to get a Master's or a Ph.D. degree. Since all *of the Canadian universities would want a set TOEFL score, he had to pass the TOEFL to be enrolled.*

TOEFL was developed by Educational Testing Service (ETS) located in Princeton, NJ. It is given in Canada 12 times a year, once every month. There are several test centres in the locality.

Mr. MJ was introduced to us by a friend of ours. He heard that both of us worked as professors of English in China, so he came to us to seek an answer to how to pass the TOEFL in the shortest possible time. He was already in an ESL programme (at a local ESL centre). When he asked the teacher working there some of the problems from TOEFL preparation resources, the teacher could not, or would not, answer them directly. Sometimes he got an answer like, choice A is right, choice B is not wrong, choice C is OK, choice D is the answer. He told us that if he kept on studying like this he would never pass the TOEFL. He stayed in the programme for about one year, then he quit. He studied with us for about half a year. Then he found a job as a lab technician at a local hospital, and studied English at the same time. Following some of my ideas such as no translation and read English aloud, he passed the TOEFL test two years later. Meanwhile he would visit me for some questions on the TOEFL. He received his Master's degree in immunology, and passed several medical examinations to become a medical doctor. It took him about ten years to be there.

His idea regarding the approach that I suggested to the learning of English included the following:

'It is right that in Canada, English is needed and Chinese is next to almost useless. However, somebody needs to tell me how to learn my professional English. In my preparation for the medical examinations, for example, I have to fly to the USA to take some exams. It was in a room with examiners watching me somewhere else, and I have to solve real medical problems with a patient, maybe a fake. I had no time to think Chinese or translate.'

Talking about the ESL programme he was in, he told us that it did not help his TOEFL preparation. The native English teacher was not helping students enough, though the teacher was very nice. The class had a lot of activities, but no textbooks or a standard dictionary, and a lot of photocopies. Not much grammar. It did give him a lot of money more than enough to take the TOEFL test, though. Besides, the ESL programme did not have adequate information about the real world. One has to actually work and interact with English speaking people to learn about the culture, how Canadians think and behave, and how to interact with Canadians. The free ESL training programmes did not have much help in this regard.

Mr. MJ was not happy with his English language classes, and eventually withdrew and started to prepare his 'professional English' himself. For Mr. MJ, taking the language class is an investment, and if the learner invests in the learning of an additional language, some benefits or gains are expected or needed to enhance his or her future. The native English speaker, as required by the author or authors of *English 900*®, should know both languages in order to teach one well. Otherwise, the teacher does not even know where the problems come from. One model divides languages into four groups (Alberta. Alberta Education. Curriculum Standards Branch, 1997). Group I languages (Spanish, French, Italian, etc.) costs the average language learner the least amount of time to learn, while Group IV languages (Arabic, Japanese, Mandarin, Korean) require significantly more time to learn. That turns out to be that for survival proficiency, learners of Group IV languages require at least twice the amount of time (480 hours) to reach this level of proficiency compared with learners of Group I (240 hours) (p. xiv).

Case 2: ESL programmes, paid and good.

Ms. FG

Having been a business lady most of her time, she wanted to learn good English, good business written English. And she did not want to pay for it. Canada had such paid training programmes, though not in business. She thought by studying English in such programmes, she would be able to do business in both Canada and China in English.

She came to us seeking help for writing a business letter for her. She told us that Canada is a very good place to get paid training. You just need to work for half a year, then apply for your UI (Unemployment Insurance) (later on called EI, Employment Insurance). Then you read the newspaper to look for paid training. The training is nothing helpful, but you get paid. (She was so happy to talk about this, and she did not think she was wrong, or anybody was wrong.) Then you look for another job for another half a year or so. Then you start it all over again.

We told her that it was our money, the taxpayers' money. She said she did not care. If she did not go the ESL training programmes, someone else would go anyway. Why not? She said she also paid tax, but she got it all back. She wanted to learn how to write business letters, but Canada did not have such paid training yet. The programme she was taking was a low level programme. The teacher did not know much even about English. They were like her, just wanted to get the money.

She still could not write a business letter in English, though her business was very good. One best part of her business was how to get her tax all back. 'The programme was excellent because she got the money, though not much English. Canadians are generous.'

From this case we may draw the conclusion that the current English language programmes did not have teachers that are professionally trained, at least not adequately trained. The curriculum for the programmes does not meet well the needs of the students. The negative feedback from the students illustrated their frustration that the contribution of the Canadian government was not fully explored or appreciated.

Similar concerns were expressed by her classmates and other acquaintances of ours. One idea that I can expand on is that the identity of the teacher can also be deemed a problem, in its contribution to the identity formation of the students. The teacher may not be termed a 'knowledge-giver', but at least should be a 'service-provider', or to use a popular buzzword, a facilitator, to make students' life or learning easier. Identities are complex, as the Chinese proverb goes: a tiger drawn shows but the skin; a person known shows but the face. The skin of a tiger is not lethal, but the skill; the face of a person is not deceptive, but the faculty. The Other or others never know the complete true identity of a self, and vice versa. In a research on language learners, Norton summarises: 'insights from these students are best understood in the context of their complex identities in a time of social and political instability, both nationally and internationally.' (2013-2010) Identities are also multiple, a fact (Grossberg, 1996, p. 89), as Martin and Nakayama claim that it makes more sense to talk about our identities than our identity (2013-01). The plurality of the word identity means it is multidimensional, not singular. Identities also cross borders or linguistic boundaries into a third space (Chapman & Kinloch, 2011; Valdez & Callahan, 2011) via time, so they are cross time and place, or space and time. Qualified ESL teachers are rare, or not enough, especially those playing vital roles in the formation of identity of the students.

If I have a chance, I may encourage my future students to write autoethnographies, instead of a 'researcher' asking questions. What comes from the mind is the mind's truth.

Case 3: A student of computers after ESL.

Ms. FN

We came to know her husband first. When she came to Canada later she was enrolled in an ESL programme. How long did she study there? Six full years. She never worked in the real world. Then she studied computers at a local institute of technology for another four years, part-time, and graduated in 1999. She did not find any job in 2000 but followed her husband to the US. She told us her oral English was not very good. She may never find a job.

But the paid training was working really well. She received an excellent benefit package, covering family glasses and dental. Six years training in total could be two Master's degrees already, or maybe a Ph.D., for some people. She worked as a baby sitter for some time, driving out of town for about 30 minutes to go to work. She liked the programme very much. It is much better than working at a hotel or a restaurant. At least she learned how to speak a little. If the programme would allow her, she would like to stay in the program for as long as possible. The teacher did not correct any mistakes. She had to pick them out herself. Other classmates from European countries had more chances to speak English in class. She did not have the chance. The teacher did not even know how to choose a good dictionary. She had to come to us to ask for advice.

The local institute of technology was pretty easy for her. She just sat there and listened to the teacher, trying to understand as much as possible. Then she had to read the book carefully from cover to cover. If she understood the book, she could do the assignment. She did not need to speak a lot. She hoped the institute of technology could provide full-time paid training instead of putting applicants on part time. She had to pay a lot more tuition than a full time student did.

Without the ESL programme, she could not have the benefit package, nor could she study at the local institute of technology. She is thankful to paid ESL programmes.

An identity is formed via language and culture, if nothing else is considered. In language programmes designed for new immigrants, the needs of the new immigrants should be considered. In this case, the self-identity is a job-seeker, an Asian racial identity, a Chinese-Canadian ethnic identity, and a female gender identity. The programmes that might engage her is a CBI (content-based instruction) programme combining both language and content.

Case 4: A translator in China, an ESL quitter in Canada.

Ms. FS

She used to work as an English editor for a university journal (in engineering). She translated a little bit. Her oral English was not good, but her writing was much better. When she was in an ESL programme, the teacher would bring a lot of advertisements most of the time and tell them

> *how to read ads, where to find money-saving stuff, etc. She learned to be very economical. However, she would also like to learn how to write good English. She had great expectations of the teacher, who ruined them on one occasion.*
>
> *She wrote a composition and submitted it as an assignment. It was mostly translated from Chinese into English. She showed it to the teacher, who simply said she did not write it, but copied it from someone else. She was so furious that she quit the programme. She did not go for the money. She really wanted to learn English. At her age of about 50, there was no need for her to cheat in a paid training programme. The teacher had no experience in teaching ESL. No pedagogic knowledge (Shulman, 1987). Even content knowledge is dubious. They should have known that for some people, the four basic skills of speaking, listening, reading and writing are not on the same level. She was not there to learn to be economical, but some good English in all skills. The teacher should have some responsibilities and duties. They should not be paid to show their lack of professionalism or knowledge. She would never want to stay in such programmes even if she could be paid a million dollars a month. She decided to learn English in real world and went out to look for a job processing chicken. She said if she could be in charge of education for the immigrants, she would not waste taxpayers' money on such paid ESL programmes. People wanted to learn English, paid or not, they will meet the challenge. She and her husband started their own graphic design business. They did several brochures for a local university as well.*
>
> *The understanding of their new identity is not very encouraging and eventually they moved to the US, abandoning both Chinese and Canadian acculturations.*

As teachers of another language, we need to pay much attention to what can be said or shared among teachers and to students. Ms. FS was already struggling with her daily life, and she was concerned with her future. She needed some help with the negotiation of her identity in a new country, as well as her relations with the Other or others, including the teacher. Her teacher might be even considered a very good teacher, who at least read through all her writings. Ms. FS might not agree. As a language learner and a new immigrant, Ms. FS had hopes and desires for her future, which have a significant impact on her investment in language practices. The formation of an identity via a job or possible job as a translator is very challenging. For the written format only, a translator does two things, rendering meaning from the source language in the target language. If there are two languages, there are two directional translations, for Chinese to English, and from English to Chinese, excluding the spoken.

As I was sharing with her ideas about the learning of an additional language and becoming a Canadian, we all see that the formation and construction of an identity is like that every road leads to Rome. It cannot be limited to only a few conclusions, or some criticisms from the teacher. The identity is emerged, in this case, not so smoothly.

Question 2: Influence on performance and revelation of my experiences.

Memory data A1: 1977, university entrance examination.

On October 21st, 1977, the Chinese government announced that China would hold its first nationwide university entrance examination since 1966. It was and is known as the 'Gaokao' (short for 'the all-nation higher education (university or college) entrance examination'), the most competitive test for all Chinese high school graduates, not for that year though. In acknowledgment of more than a decade of missed opportunity, candidates ranging in age from 15 to 37 were allowed to take the exam in 1977. Almost A pent-up reservoir of talent and ambition was released as 5.7 million people took the two-day exam in November, 1977, in what may have been the most competitive scholastic test in modern Chinese history. There was no formal entrance examination for 10 years. Most of high school students from Grade 12 were not allowed to take the examination since too many people took the examination. The 4.7 per cent of test-takers who won admission to universities—273,000 people—became known as the class of '77, widely regarded in China as the best and brightest of their time (Lague, 2008). By comparison, 58 per cent of the nine million exam-takers in 2007 won admission to universities, as educational opportunities have greatly expanded.

Our alma mater, No. 3 Middle School (or the Third Middle School) in Harbin, was the best school before the GPCR, it was still a best school after it. Seven students (out of about 200) were selected by the school to take the examination, and I was one of the seven. Only three of the seven passed the test, and I was one of the three. The rest of my classmates and schoolmates were preparing for the examination next year in 1978.

When the academic year began in 1978, after the lost decade of the GPCR, an unusually mature freshman class entered universities across the country. I recall that some of my fellow students at Harbin Normal University (or Harbin Teachers University) were twice my then age, some of them were mothers or fathers already.

The three of us were greatly admired by those still preparing their exams, hoping to go to university soon. January 10, 1978, was the last day for me

> *to leave my classmates and schoolmates behind, in other words, I left my high school on that day, graduated. I was asked by our homeroom teacher to teach my last lesson in English. To make it memorable and historical, I imitated the title of a text selected in Chinese language arts and some English textbooks, the story by a French author, Alphonse Daudet, 'the Last Lesson'. I wrote the title on the then blackboard with a piece of chalk, to send the signal that I was prepared to leave and it was my own 'last lesson' to be given to my own high school class- and schoolmates.*
>
> *One of my classmates told me many years later that they did not understand what I was talking about even though I was reading some Chinese to them, translated from English by then a lecturer of English phonetics. The quotation was from Palmer & Blandford (1963).*

I was not pressured at that time, as most of the students are nowadays, to prepare for the university entrance examination, as I had been learning something all the time. I cannot say today that I was ready for a new identity then, a university student, but I can say that I was readier then than most of my schoolmates. My alma mater did something very bad, from today's viewpoint, that they decided to ask those who they thought could not pass the exam to graduate early and leave school. All those who left school were not graduated, without diplomas or certificates. One of my best friends was among the school-leavers, and it took him many years to regain his confidence in himself, and winning himself a B.A. degree in the Chinese Language.

Language learning and teaching, as any learning, takes time. It cannot be done overnight. Identity formation and construction also takes time, via the complexity and reflexivity of many things, ideas, and people, or through the culture cycle of the I's, interactions, institutions, and ideas (Markus & Conner, 2013). Many of my cohorts failed because of the English language as an additional language, or 5,000 years of Chinese history to be remembered. No wonder, those who did not fail usually have better memories.

Scenario B2: Practicum.

> *It was a joyful event when I finished all of the courses in my bachelor's programmes. I was designated to the middle school attached to my alma mater, which is one of the key schools in our province. Many people said that the graduates from that school were unique, smart, creative, and well-educated. I didn't believe it since graduated from another high school, equally if not more renowned. I only knew that all of the students in this school did more homework and were asked to read more than those in*

> *other schools. No fun, no play, just homework and reading. However, I was very happy to see how a feeding school to my alma mater was doing and how my teaching practicum would be like for weeks. I had to act like a real teacher at school during this time. I worked with my homeroom teacher, a teacher of political studies, who was assigned to be my mentor. Our schedule was tight: we worked more than eight hours a day for six days a week. After working we had to write reflections and personal narratives on teaching and observations.*
>
> *I did something not many of us pre-service teachers at that time would do. I asked my students what they would like to see related to the learning of English. Some of them said they would like to see a church, which was mentioned several times in their English textbooks. I agreed, and contacted a local Eastern Orthodox Church, a heritage from the time when the Russians were in Harbin. I told them my students read about churches in their English textbooks but never saw one or visited one, would my students be allowed to visit their Eastern Orthodox Church. They agreed. All right, and off we went on buses or bikes. The Father, as usual, talked about the age, the heights, the diameters, area in square metres, the windows, the colours of the windows, and so on, in Chinese; however, I only remembered one thing. The Father was a Party- or government-assigned Father. I did not talk to my students about it. The students or pupils were so happy that they could go on such a fieldtrip and personally see what church looked like.*

Perhaps because of our visit to the church, the teacher of political studies started to dislike me, I am not sure.

The church is an imported idea imported from out of China. I deemed it a very important cultural artefact in the learning and teaching of the English language, which is also imported. It seemed then that I touched upon what I learned as the student-centeredness in Canada about ten years later.

Scenario C3: Classroom observation.

> *Today was my first day as a pre-teacher to observe an English teacher. I sat in the class and observed an English teacher teaching. In the Chinese culture, a teacher is so important that an aphorism goes 'He who teaches me for one day is my teacher for life.' (Chen 陈欣望, 1984) In the relation between a master and a disciple, the same becomes 'He who is my master for one day is my father for life.' The Chinese equivalent to 'master' and to 'father' has one common character.*
>
> *The teacher spoke seriously without a smile. I remembered that we called our own English teacher an 'enemy face', or a 'class enemy face', a face without a smile. 'Good morning!' she said to the class. She didn't introduce me. Her teaching method has not changed much for many years.*

The students replied: ‘Good morning, Teacher.’

Today we learn Lesson Thirty-Five on page 207. 请打开书 207 页，我们今天学习第 35 课。The title is Face to Face with Danger, *based on the Adventures of Tom Sawyer, which was written by Mark Twain.这是根据马克•吐温的《汤姆•莎耶历险记》改编的故事。马克•吐温是美国的幽默大师、小说家。(Mark Twain was an American author and humourist.) She explained to us in Chinese, before returning to English.*

‘Firstly, I will read the first paragraph and please pay attention to the second sentence and tell me what the meaning is or try to translate it into Chinese.’ she told the class.

As always, the students had no problem following the rules. There were no whispers or noises, just the sound of books opening or closing. The students turned to page 207 and stuck their noses in the text as they listened to the teacher reading.

‘The dead silence of the ugly place almost drove them away. When they finally got up enough courage to go in, they found themselves in a dusty room with broken windows and rotten stairs.’

The teacher stopped, then asked one of the students to translate it into Chinese. ‘Liu Ling, translate the second sentence.’ Liu Ling stood up and read her translation:当他们鼓起勇气进去的时候，他们看他们到来到了一间房子里，房间的窗户都坏了，楼梯已经腐朽不堪了。Liu Ling finished the sentence and looked at the teacher.

‘Good,坐下(sit down), but you missed a word ‘finally 终于’。 ‘Finally’ is an adverb and modifies the verb ‘got up’ and also the phrase ‘found themselves 自己。’ Your translation is wrong.’ The teacher criticised. ‘The whole sentence in Chinese should be: 当他们(终于)鼓起勇气进去的时候，他们(发现自己)来到了一间房子里，房间的窗户都坏了，楼梯已经腐朽不堪了。’

‘Now, let’s continue to the next paragraph. Xie Ling, read the third paragraph. We are going to learn the new words we met today. Did you check your dictionary what the Chinese meaning of ‘Spaniard’ is?’ No one could answer her question since the Chinese-English dictionary did not have this word. The teacher didn’t say anything, just let the students know the Chinese, ‘西班牙人’.

In one of the stories by Hill (L. A. Hill, 1965a, 1965b, 1967, 1980a, 1980b, 1980c, 1980d, 1980e, 1981), there was a professor who was visited by his former student of twenty years earlier. The student discovered that the examination paper the professor was preparing for his current students was the same as twenty years ago. When asked, the professor answered that the questions are the same, but the answers are different.

In 2007 I was able to observe an English classroom on several visits in China. Except the fact that more English was used as a medium of instruction (MOI), or a metalanguage, the same method was used as depicted in this scenario, some quarter of a century apart. There was not much change in the teaching of English in China in the past 100 years. The students learn from their teachers, and the preservice teachers learn from their mentors, in a similar manner. In a class, most of the students were silent learners, listening to their teacher, obeying rules, seldom challenging the results of their tests. The word 'silence' also means that their brains were mostly 'silent' in English or any foreign languages they were learning.

As a sociocultural phenomenon, the learning of English in China at that time, 1980s, was not considered a language learning. The English language was not used for cultural negotiation, but only as a school subject. It is almost pretty much similar to what is being done now.

Scenario D4: Reflection of classroom observation

The English teacher used the Grammar-Translation method (GTM). It is kind of the only way of our language teaching. The GTM is used to develop a student's reading ability to a level where they can read contents in English. The students wanted simply to know the things of their interest in the contents of the English language. Class is taught in Chinese with limited English. Readings in English are translated directly and then discussed in Chinese. In this method, little or no attention is given to pronunciation. Communicative aspects of the language, such as listening and speaking, were not practised. Grammar is taught with extensive explanations in Chinese and is only applied later in the production of sentences through translation from English to Chinese. The only skill exercised is reading, and even then, it was only in the context of translation. It is believed that this method of teaching focuses on reading and writing and has developed techniques. As a result, speaking and listening are overlooked. The writing is not writing in the English language, but mostly translation from Chinese, either from words written down or from thoughts in the brain.

In the class, I didn't hear students speak any English except when they translated and read the text. The teacher spoke very limited English to the class. There was no relationship between teacher and students. The

> *students were not taught creativity or critical thinking. They were taught how to remember the answers.*
>
> *The class was well organised and the teaching plan was very clear. This method helped me to see how to plan a lesson as an English language teacher.*

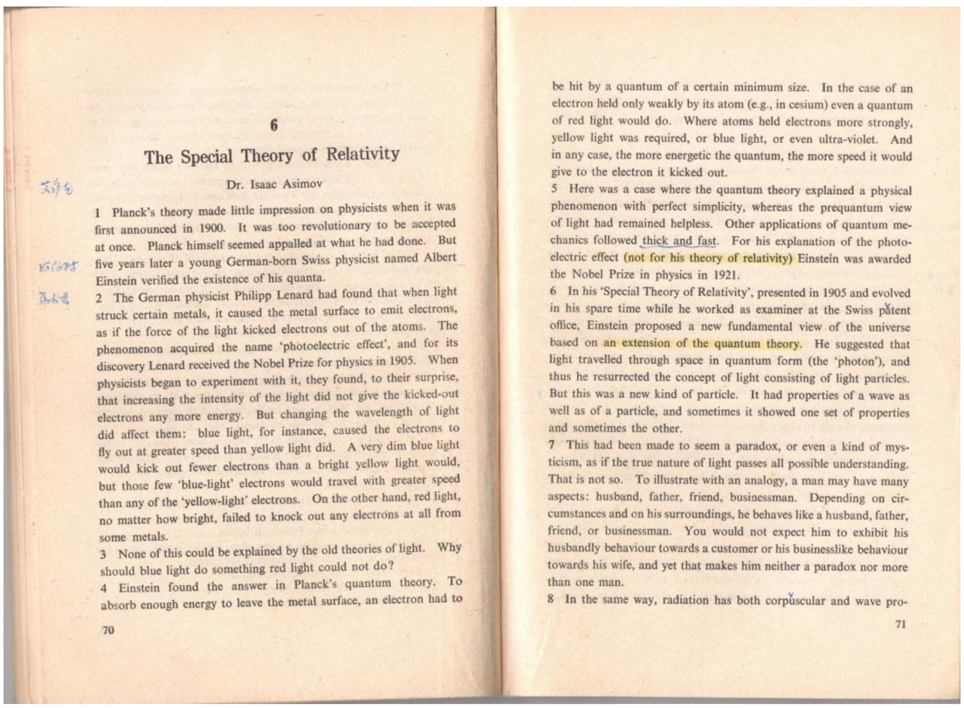
That was a time when the teacher was dominant in the classroom, a teacher-centred approach of teaching languages. The teacher was using her second language she herself learned in the same or similar teacher-dominant classrooms to teach her students, showing her then identity. Her English was hers as if she possessed it, and she was 'giving' English to her students, the 'receiver'. The students were like ducks, to be fed, hence a 'duck-feeding method' was another name for the teaching style, in imitation of the feeding of the Beijing ducks. The meaning of the English was depicted as 'fixed' instead of 'flowing', and the fixity, as I see it now, is one of the reasons that most of the Chinese language learners believe that the meaning of an English word is 'fixed' to the meaning of an 'equivalent' Chinese word.

For her as my English language teacher at high school, and my mentor who started me teaching English and thinking about teaching an additional language, I am proud to conclude that I have been ever since seeking opportunities to become a better ESL or EFL teacher so as to help my students to benefit from their learning as well as mine.

As an individual, I had the experience of being removed from my home, a place that is supposed to be warm and safe, during the GPCR. Then I was moved into a totally different community of practice (CoP) (Pasaniuc, Seidler, Bosioc, & Nistor, 2004), but deprived of many of the assumptions. Knowledge was not shared as not many people would talk to me. Language became almost useless, except self-talk (Murray & Christison, 2011, p. 184). Values and beliefs became, eventually, doubtful. In other words, politically I was deemed useless without a 'political life'. Socially, there was nothing for me to do or learn. Culturally, I was dimly feeling that English may help me to understand what was happening to me and around me.

Marginal note B: Lesson 6, Book 2, Advanced English.

In Memory data 3, it is mentioned that I was teaching a text from *Advanced English* (Zhang 张汉熙, 1980). I chose one page from that book to talk about. The yellow highlight on the right side of the scanned page was a recent add-on as I read the text again. What indicated how I prepared my lesson was marked on the left side margin, the Chinese transliteration of three proper names, Isaac, Albert, and Philipp. I chose this page since transliteration underpins some



6

The Special Theory of Relativity

Dr. Isaac Asimov

1 Planck's theory made little impression on physicists when it was first announced in 1900. It was too revolutionary to be accepted at once. Planck himself seemed appalled at what he had done. But five years later a young German-born Swiss physicist named Albert Einstein verified the existence of his quanta.

2 The German physicist Philipp Lenard had found that when light struck certain metals, it caused the metal surface to emit electrons, as if the force of the light kicked electrons out of the atoms. The phenomenon acquired the name 'photoelectric effect', and for its discovery Lenard received the Nobel Prize for physics in 1905. When physicists began to experiment with it, they found, to their surprise, that increasing the intensity of the light did not give the kicked-out electrons any more energy. But changing the wavelength of light did affect them: blue light, for instance, caused the electrons to fly out at greater speed than yellow light did. A very dim blue light would kick out fewer electrons than a bright yellow light would, but those few 'blue-light' electrons would travel with greater speed than any of the 'yellow-light' electrons. On the other hand, red light, no matter how bright, failed to knock out any electrons at all from some metals.

3 None of this could be explained by the old theories of light. Why should blue light do something red light could not do?

4 Einstein found the answer in Planck's quantum theory. To absorb enough energy to leave the metal surface, an electron had to

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be hit by a quantum of a certain minimum size. In the case of an electron held only weakly by its atom (e.g., in cesium) even a quantum of red light would do. Where atoms held electrons more strongly, yellow light was required, or blue light, or even ultra-violet. And in any case, the more energetic the quantum, the more speed it would give to the electron it kicked out.

5 Here was a case where the quantum theory explained a physical phenomenon with perfect simplicity, whereas the prequantum view of light had remained helpless. Other applications of quantum mechanics followed thick and fast. For his explanation of the photoelectric effect (not for his theory of relativity) Einstein was awarded the Nobel Prize in physics in 1921.

6 In his 'Special Theory of Relativity', presented in 1905 and evolved in his spare time while he worked as examiner at the Swiss patent office, Einstein proposed a new fundamental view of the universe based on an extension of the quantum theory. He suggested that light travelled through space in quantum form (the 'photon'), and thus he resurrected the concept of light consisting of light particles. But this was a new kind of particle. It had properties of a wave as well as of a particle, and sometimes it showed one set of properties and sometimes the other.

7 This had been made to seem a paradox, or even a kind of mysticism, as if the true nature of light passes all possible understanding. That is not so. To illustrate with an analogy, a man may have many aspects: husband, father, friend, businessman. Depending on circumstances and on his surroundings, he behaves like a husband, father, friend, or businessman. You would not expect him to exhibit his husbandly behaviour towards a customer or his businesslike behaviour towards his wife, and yet that makes him neither a paradox nor more than one man.

8 In the same way, radiation has both corpuscular and wave pro-

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Figure 6 Lesson 6, Book 2, in Advanced English

ideas that limit creativity and imagination.

In translation and interpretation, from or into the Chinese, a translator or an interpreter is required to follow one of the three rules. The first rule governs the pronunciation of the original language or source language, the Owner's Sound. The Japanese city Hiroshima has to be translated as the Japanese Kanji, then into the Chinese, and vice versa. So Hiroshima become 广岛 in Chinese, with two characters and two syllables. It has the Chinese sight and sound, but only the Japanese sight. If one does not know how to pronounce it in Japanese, which is Hiroshima, one has no clue, by looking at the Chinese, to figure out the sound in Japanese. The other rule is the Old Version rule. If there was somebody who first translated a proper name in Latin letters into the Chinese, the rest of and the later translators and interpreters must follow that sight and sound, until some authorities decide to change it. For example, Dr. Sun Yat-sen cannot be transliterated as Dr. Sun Zhongshan, a current Mandarin pronunciation of the same three Chinese characters. The Old Version has to be followed. The third rule is the Standard, a set of rules established by China's Xinhua News Agency. It is a table with consonants and vowels based on the International Phonetic Alphabet (IPA), to be combined into syllables, and transliterated into the Chinese (Zhong 钟述孔, 1997-80). I was made aware of those three rules, the Owner's Sound, the Old Version, and the Standard, in 1980.

My personal library has two handbooks on the transliteration of proper names from English (most varieties) to Chinese. The second revised edition (辛华, 1983) has about 20,000 entries, while the fourth edition (新华通讯社译名室, 2004-1984), published twenty-one years later, has about 60,000 entries. In the twenty-one years, it seems, 150 new proper names are created every month.

The transliteration from or into the Chinese is very problematic and time-consuming.

Memory data C3: Translation or understanding?

> *In a translation class, the whole class was asked to translate one of lessons from Advanced English edited by Hanxi Zhang (1980). The students were required to finish this last project before graduation. The text was titled* Loving and Hating New York*, by Thomas Griffith. One of the students wanted the final project to get a perfect grade. Grades were important for most of them. A draft was translated and I was asked if I could help with the editing and correction. I agreed.*
>
> *As an earlier graduate from the same alma mater, I was hired to be an English professor at the English Department. I was sometimes asked to teach the then scientific English, as not many of my colleagues would venture to do that. As I was reminded by one of my students years later, I was once asked to teach Lesson Six of Book Two of* Advanced English*. It was an excerpt by Dr. Isaac Asimov on the Special Theory of Relativity (Asimov, 1975-72). For most of the students in the department of foreign languages, in most of the then universities, even the Chinese used in science would be difficult for them to understand, even though Dr. Asimov was considered a populariser of science. To learn Einstein's theory in English is hard and it is so full of 'jargon' that it is just double Dutch to most of the language learners in China. I was able to teach such lessons*

because I read a few of the translated books by Gamow (1978-64, 1978-65). I also recall that I was able to find a reference book from our library on the theory of relativity.

I was told many years later that my lecture was amazing. I said something to the effect that one has to forget one's native language in order to learn another language well.

(That was not my idea, but the idea from Karl Marx, quoted in both Chinese and English in many of the then available textbooks.)

Karl Marx said (Marx, 1898):

Thus does the beginner, who has acquired a new language, keep on translating it back into his own mother tongue; only then has he grasped the spirit of the new language and is able freely to express himself therewith when he moves in it without recollections of the old, and has forgotten in its use his own hereditary tongue. (translated by Daniel De Leon)

Another version is (Marx, 1992; 北京外国语学院英语系 & 业余英语广播讲座教材编写组, 1979-75):

In the same way, the beginner who has learned a new language always retranslates it into his mother tongue: He can only be said to have appropriated the spirit of the new language and to be able to express himself in it freely when he can manipulate it without reference to the old, and when he forgets his original language while using the new one. (translated by David Fernbach)

I know for a fact that many, if not most, of the Chinese students who studied English for many years and are able to pass the TOFEL, GRE, CET6 (College English Test-Band 6) and TEM-8 (Test for English Majors-Band 8), still can't communicate in English, orally.

This memory data made me recall the bad and ugly when I was teaching English to another class.

We were in a building in which we have the departments of foreign languages, history, geography, and Chinese. As I was teaching English to my class, some or one of them required that I translate every sentence and paragraph into Chinese for them to understand. I suggested that whenever a short paragraph is read, it should be remembered as much as immediately. They of course challenged me. So I asked them to pick up any text from the book they were learning and I demonstrated immediately that after one reading, I could retell the gist of the paragraph, in the original word order, what it was about, of course, in English. They insist that I translate, to which I replied very impolitely that some of them were in the wrong department. They should go upstairs to the Department of Chinese, the language in which they all know so well and need not ask anybody to translate for them.

Looking back on it, my attitude was wrong and bad, though my theory was right. Translation from Chinese to English can only be done when the meaning of English is matched with the meaning of Chinese, not an English word matching a Chinese word. When most of my students learned English, they only learned the Chinese matches, not the English meaning of the English, how can they really understand English and translate? Using the idea of a target language, when learning a target language, the understanding should be in the target language so that the application is also in the target language.

Memory data D4: Teaching method, traditional.

It is true that most Chinese people spend their lives trying to learn English in order to teach it, but their English is still poor because they are taught wrong. They learnt how to teach English from their teachers and their teachers learnt how to teach English from their teachers. Not many really thought about how a language is to be learned or used, contrary to what we have always been taught by traditional wisdom. We learn anything to use it, or to learn in order to do. What is wrong about teaching or learning English or another language for the Chinese people? Whether one learns English in China or teaches it in China, the purpose of learning English is unclear. If asked why they learn English, many of the language learners, if they are young, will give the answer that they have to pass English tests in universities.

The method of learning and teaching English in China, the grammar translation method mainly, right or wrong, is really hard to change, especially when more teachers adopted the method from their own teachers without enough thinking about improvement. Most language teachers, even if they want to change, have to face large classes, which is difficult to teach or change. There are at least 50 students in each class learning English. The large class offers no chance for every student to practise oral English. The teachers have to use the spoon-feeding method, which dominates the whole class from the first minute of the class until the end, 45 to 50 minutes later. The students are confined to remain in their seats, listening passively for decades. I also understand that English and Chinese have many significant differences. At the same time, the students' English proficiency in listening, reading, writing, and translation is routinely assessed by the college or university final exams at the end of each semester. Their oral English cannot be improved much for lack of practice. That makes learning English a serious challenge for many native

Chinese speakers. Many people wanted to reform the assessment system, then and now, and the teaching method, but it is a long journey to reform.

Our job as language teachers is not only to teach the English language, but also to teach the students language skills: listening, speaking, reading, and writing, as well as how to learn. Translation comes after that, when the language has been learned. The use of English or another language comes first. The Chinese foreign language teachers teach their students to learn languages like robots, one language in, another language out.

I cannot claim that my English is superb, not can I claim that my method of learning English is the best for most students learning a second language. I can only say that in the formation and construction of my identity from China to Canada, and to the USA for a short time, I have been constantly searching for the possible explanations to the question of the efficiency of learning an additional language to survive, while my identity is being formed at the same time. When language learning and teaching starts with translation, or rather, matching, and such a method is well kept for a very long time during the learning and teaching, the learning and teaching becomes governed by statistics.

As explained in more detail in Appendix A, if one English word is matched with one Chinese word in the learning process, most or all learners can recall the match, as there is only one. However, if 1,000 English words are matched with 1,000 Chinese words, not counting the case when one English word may have more than one meaning or match in Chinese, then there is only 1 out of 1,000 chances to recall the match. The chance to mismatch is 999 times more than the chance to match. That is not a win-win situation, but win-lose situation, or even a lose-lose situation.

If such translation method is used in China, and everybody does it, there is no question at all regarding such relations as power relationship or identity formation among the teacher and the students. There is not much to improve on pedagogy, sociolinguistics, and many other fields as well, since the change cannot be used and accepted. Most of the English language learners in China learn English to pass tests, not as a language they plan to use in their future. Once the tests are passed, anything English will be totally or mostly forgotten.

Memory data B2: A question from my son.

> *In my second hometown, Edmonton, in Alberta, Canada, we found more and more immigrants. Economically it seemed good for the city. However, some of the international students brought with them their families, most of whom had some communication problems. They could not speak good enough English, and some of them wanted to improve. The culture shock makes them so unhappy. A Ph.D. student with a TOEFL score of 607 could not yet speak good enough English, even academically. There were many TOEFL classes that helped international students to get a high TOEFL score. However, oral English took much longer.*
>
> *If time permits, I would like to help more language learners to learn English more efficiently. When we know a bit more or have more skills, it is going to benefit others if we can share them and help more people. At our spare time we organised the Languages on Campus Association, which we called LoCA. It was a free programme for those international students or their families to learn 'academic' English to survive in their new identities. My son also attended the programme as a volunteer, contributing his help.*
>
> *One day, my son asked us a question and I could not answer immediately.*
>
> *'Mom and Dad, the process of making ground beef is to put the beef into the processor and at the other end the ground beef is out from the processor, is that right?' My son asked. 'However I talked to them in English, and why they answered my English questions in Chinese, only two seconds later. Why?'*
>
> *'I don't get it, say it again,' my wife asked my son to repeat his question.*
>
> *'Why I input English, and they output Chinese in 2 seconds? Like I put in the beef and the pork is out? It does not make any sense. How can they learn English if they translate to Chinese all the time? It is hard to teach them and I do not understand why.'*
>
> *It is really a good question. My wife could not explain it, but I understand that is how the Chinese people learn English, or they were taught to do so, for decades if not centuries.*

Various reports claim that there are roughly 300,000,000 English language learners in China, for example, Abley (2009-08). That is 0.3 billion learners. If I keep in mind that there are 0.2 to 0.3 billion K-16 students in China ("Wolfram Mathworld and WolframAlpha," 2013), it is reasonable to estimate that the total number of English language learners is around 0.35 billion. With so many people learning the English language, there should be some world-class theories and practices on how the English language has been learned and should be learned efficiently. That would be similar to the time when Harold E. Palmer was in Japan, which fundamentally contributed greatly to the practice and theory of language learning and teaching, including English, becoming now the field of second language acquisition (SLA).

Some of my parallel research, recorded in some of the cases in this chapter, also reveal that the new immigrants had problems finding their own identity in the process of enculturation. I see here again the new immigrants are motivated both instrumentally and integratively to become at least bilinguals, academically and socially in Canada while keeping their heritage language with China. The risk they took or chose to take usually takes them at least one year to prepare for the TOEFL so that some of them can register with universities or colleges. For some others, it may take even longer, five to fifteen years.

In China where new immigrants from China to Canada had their education in the bulk part of their life, an English lesson would look more like this. A native Chinese speaker with a major or even less in the English language, following the textbook, would list about 30 to 40 new vocabulary words. Then he or she would read aloud the text or dialogues, intermitted with explanations in Chinese on about half a dozen grammar points or patterns. The students would scrawl notes in the margins of their textbooks or in notebooks, mostly in Chinese. Marginal notes would be more likely than not some Chinese characters for the pronunciation of almost every new word in English. Students also read aloud after the teacher a lot.

Memorisation has always been stressed in the long history of China, for at least millennia. According to the Culture Cycle model by Markus & Conner (2013), an interdependent self realises the five facets, of being relational, similar, adjusting, rooted, and ranked. In the high-context culture of China from where new immigrants came to Canada, they were to remember thousands of characters, or emulate models from the past, which they also have to remember (rootedness) (Davis, 2005). Because our brains lack the means of manipulating memory addresses in the way computers are able to do, and because each neuron is connected to only a small fraction of the others, memorization is unnecessarily difficult (Valiant, 2013, p. 59). Perhaps someday there will be some new drug, though a drug that increases synapse creation might be ineffective for improving memorisation, unless the brain also succeeds at eliminating the larger number of unnecessary synapses, because new synapses survive only if they are used to store memories (Seung, 2012, p. 89). The memories of some or most of the new immigrants are so tired already, and added on top, some ineffective methods of learning another language were also applied.

In the Canadian struggle for new immigrants to succeed academically, they and I are all forming a 'situational identity' (Lawton, 1993), which exactly is the situation where we all need to reduce EintoC (English translated into Chinese), and work on EintoE, English input becomes English output, and nothing else. Such a linguistic identity is absolutely necessary in academics, the obvious reason being that the professors do not have a clue what the Chinese language is. Even most of the ESL professionals have no clue how difficult it can be for a language learner to learn an additional language that is remotely related to his or her mother tongue.

My son, fortunately, was born in Canada and went to French emersion programmes, speaking three languages, English, French, and Mandarin Chinese, a heritage language. He is now graduating from neuroscience and maybe he will find more answers than I can.

Vignette D: Managing STARTALK, a language program.

> *In the beginning of 2010, I was made aware of a program by the National Security Language Initiative (NSLI), named STARTALK. Its mission is to increase the number of Americans learning, speaking, and teaching critical languages. Students (K–16) and teachers of these languages are offered creative and engaging summer experiences that strive to exemplify best practices in language education and in language teacher development (the National Foreign Language Center, 2013-10).*
>
> *Proposals from schools, post-secondary institutions, school districts, state and regional educational agencies, language associations, and community-based organizations were sought in each fall of the year. However, I was not able to do it at the beginning at that time.*
>
> *The reason was that our local nepotism policy does not allow the placement of a relative in the same chain of command. My wife was doing it then. In other words, I could prepare the proposal, and even anything related to the proposal, as long as my wife is not my supervisor, or vice*

> *versa. What happened later got me involved, and our chancellor had to write a letter to approve my involvement.*
>
> *A gentleman was going to be part of the STARTALK management or preparatory team, but after the spring conference*[3]*, he started to miss meetings and was asked to quit. Then I was asked to join the team, hence the letter of approval from our chancellor.*
>
> *I jointed our local STARTALK management team in 2010, and we together secured for our local programme and our university, and inadvertently for many local businesses, a total of half a million dollars in the last three years from 2011 to 2013. We had altogether 65 students and 70 teachers trained in our programme. Ours is the only STARTALK programme in the state of Alabama.*

One remarkable requirement of the STARTALK programmes is that the target language has to be used while teaching either the students or the teachers, for as much as 90 to 95 per cent of the instructional time. This is in line with my ideas and ideals. The government of the USA knows about it, and promotes it. The Chinese government, and perhaps some other governments, do not know about the importance of using target language, to learn the target language, without doing anything or much with the mother tongue.

For the formation and construction of my own identity, I consider the management of the STARTALK a personal and professional success. If we win the award, the maximal outcome means $200,000 (the award has a ceiling) every year to spend within 15 days with both students and teacher-students. When the students finish the summer programmes, they have other options to keep learning and using the target language, such as the Language Flagship programme[4] for undergraduates. Some of the funding for the Flagship programme is about ten times compared with the STARTALK programmes. This is my and our next goal to submit applications. In the USA, it seems to me, the government really has set up some long-term programmes for the US nationals to learn additional languages, and the programmes are all set up for a purpose.

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[3] STARTALK requires two conferences per programme-year, one in spring and one in autumn, a fall conference.

[4] As a national effort to change the way Americans learn languages, this programme offers language programmes for undergraduates to learn one or more of about ten critical languages. Retrieved from http://www.thelanguageflagship.org/.

Question 3: Reaching efficiency of learning an additional language.

Weblog A: How to Learn English Well?—Where Is the Problem in China? [5]

> *Let us take a look at how most of the English language learners actually learn English in China.*
>
> *They start with the ABC's, or the alphabet, or the 26 letters, or the 52 letters including capitals. That seems very easy as most of them are also named Hanyu Pinyin, or Chinese Phonetic Alphabet (CPA). Most of the students, especially older ones, can learn them in a couple of days. Of course, the CPA was an import, not home-made.*
>
> *Then what do they do? They started to use dictionaries, but all or most of them, only use English-Chinese (EC) dictionaries. In such a manner, they turned every English word or expression into Chinese, which they all know very well. What do they remember now? English or Chinese? Chinese, of course, or mostly, Chinese.*
>
> *The new word or expression in English is already known once looked up in an EC dictionary. For most of the junior and senior school graduates in China, all the Chinese characters in an EC with 100,000 English words, or even with 200,000 English words, are already known. Here we are talking about Chinese characters, not words in the lexical sense that one word may have more than one Chinese character.*
>
> *That was exactly like the orocrafter in a metaphor, who does not mimic dogs which is what he or she is supposed to do, but all others. They read or saw English, but kept reviewing Chinese, which they all know, or know all. They are actually reviewing Chinese.*
>
> *For most such language learners, what they remembered is not English, but mostly Chinese. Most of them do not have photographic memories, so the little English they happened to remember, was not perfect, or was flawed. When they wanted to speak English, from the flawed English they have, they produce China English, or Chinglish, or even nonsensical English, or rather, they were speaking Chinese in an English format.*
>
> *This is what I would name EintoC, the English learned or supposed to be learned, becomes Chinese, and English is left behind. Of course, not all is left behind, some is left.*
>
> *There is only one way, the EintoE way, English learned is kept as English, at some age and stage, no Chinese is ever involved. That is to say, in order to mimic dogs, learn and mimic dogs whole-heartedly, without worrying about any other animals. Once an English word is learned, from that moment on, whenever the need arises, use that English word, until*

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[5] The title is bilingual in both English and Chinese. (Feng 冯睿, November 30, 2012). Retrieved from http://blog.sciencenet.cn/blog-639060-638009.html. It has over 4,000 visitors, 14 commentaries, and 22 endorsers. A gist in English is provided here.

extension and expansion of that word into phrases, paragraphs, chapters, books, and series of researches.

For instance, once the word 'phenomenology' is learned, one needs to know its meaning, in English, not in Chinese. Then one can, if need be, study phenomenology in English and English only, since not much in Chinese about phenomenology is available, if it is new. One then may be able to talk, in English of course, about phenomenology, about its development, people involved, events occurred, and can even give lectures on it, much better than many native English speakers, as not many native English speakers would research on phenomenology. Does one here needs to know anything in Chinese about phenomenology? No.

If necessary, let somebody else who studied phenomenology in English, and also in Chinese, and who also studied translation theory and practice, translate the English into Chinese, then one can read Chinese, the mother tongue, about phenomenology, happily and easily, instead of doing the reading oneself, wasting time and life at the same time translating the English into Chinese again. When one does that, one is never sure whether the understanding occurs in English, or Chinese, or both.

For most of the native Chinese speakers, with only one mother tongue, there are only two ways to learn English, EintoC, or EintoE, on the two extremes. Either they turn English into Chinese, forgetting most of the English, or they learn to turn new English into their learned English, retaining some English, or even most. If English language teachers teach English into Chinese, of course the English can hardly be learned.

If one wants to learn English, as English and master it, one'd better use EintoE, without reviewing Chinese characters. Whenever one hears or reads English, in English that brain thinks. Whenever one wants to speak or write English, that brains thinks English first, then one speaks or writes English. To learn to think and speak English is to let English go from mind to mouth. If the brain and mind think good, long, and correct English, the mouth and hand will produce good, long, and correct English, and nothing else.

I wrote my weblogs for the dissemination of my thinking white writing my Ph.D. dissertation on the efficiency of learning an additional language. I was not expecting many commentaries. However, some commentaries were added, asking questions or expressing their concerns.

One commentary asked several questions.

Teacher Feng: It seems we have gone astray many times in so many years learning English. After having read your blog, I have other questions to ask you, hoping for more guidance. Is it true that we have to reach some proficiency, with some vocabulary and grammar, when those are accumulated, then we will be able to reach what you have described here?

> *On many occasions I felt I did not know how to express myself, and my mind wanted to translated unconsciously, something I cannot do without.*
>
> *You suggested that we learn and review English only, aiming at 'think and speak English' or 'think and write English', as well as 'see a thing and think English' or 'hear an event and think English'. Those are not what I am good at, for I am not clear about what to do. My understanding of English was based on my Chinese, and my environment does not allow me to use English only. I cannot use English to understand English. Maybe I can use an all-English dictionary, but there are many entries that I have to turn to Chinese to understand them. How can I reach what you described. Please provide some guidance. Thanks ([8]Haoyu He 何浩宇 2012-12-1 18:48).*

Well, I dare not 'guide' anyone but can only share some of my thoughts and actions. Then I promised to reply in more details in the next blog.

What I usually do regarding blogs is to accumulate enough commentaries then answer or reply in a longer blog, which was exactly what I did to this commentary and over a dozen others. I started with a long quote:

> Lifelong experience has taught us that, in general, instances of large classes are recalled better and faster than instances of *less frequent classes*; that likely occurrences are easier to imagine than *unlikely ones*; and that the associative connections between events are strengthened when the events frequently co-occur. As a result, man has at his disposal a procedure (the availability heuristic) for estimating the numerosity of a class, the likelihood of an event, or the frequency of co-occurrences, by *the ease* with which the relevant mental operations of *retrieval, construction, or association* can be performed. However, as the preceding examples have demonstrated, this valuable estimation procedure results in *systematic errors* (Tversky & Kahneman, 1974, p. 1128, Italics added).

Using the above quote as a frame of reference, when there are only two languages, Chinese and English, or L1 and L2, and the L2 is the one to be learned, the 'large classes' should be L2. That means the language learner needs to make English 'larger' than Chinese, to receive and produce 'English' more than 'Chinese', or to make English 'more likely to occur'. The 'associative connections' should preferably all be English, not any Chinese, then 'the ease' can be reached. The 'ease' to 'retrieve, to construct, and to associate' in English only, or the 'ease' to 'perform'. If not, there will be 'errors', and those are not simple 'errors' as those 'errors' are systematised, becoming 'systematic errors', which are likely more difficult to remedy.

The most common commentary is that they have been so accustomed to translating from English into Chinese. They blame three elements, the language environment, the easy access to Google translator, and they can understand Chinese more.

The environment is the language and the learner or user. Fundamentally and essentially, the environment is the language and the brain of the learner. The learner needs to think with the brain in that target language, and nothing else, because everything else is built on the brain and the learner in that language. The learner initially learns ‘a dog’ in English, and matches it with the Chinese, or the picture of a dog. That is OK. Sometime later, the learner learns ‘an animal’, and should be learning ‘A dog is an animal. An animal can be a dog’, without any help from the mother tongue. Any further information or knowledge will be built upon the known conceptualisation, not that one can become a dog expert overnight. A dog expert in Chinese cannot become a dog expert in English overnight, either. Besides, when some become immigrants in Canada or in the USA, their environment is English, but they do not live in the English environment, and think in Chinese most or even all the time. The environment external to the brain does not help at all. ‘The beef becomes ground pork’, again.

Therefore, one should not resort to Google translators to understand the mother tongue, instead of the target language. If one does not understand English while reading but understand Chinese when translated, one understands, actually, Chinese, not English. Understanding Chinese and understanding English are two different things.

Vignette C: Two languages on a thought experiment, and a real story.

> *One language learner and teacher, with two languages that he or she has to work with, form a triangular relation. Taking the learner aside, the two languages may work side by side, or one on top of another, or in front of another, or behind another, or no obvious relations exist. In how many dimensions can the two languages be?*
>
> *How can a second language be learned more efficiently? When one language is for the eye, for the ear, makes sense, and is used in a specific context, how can this four dimensional space (scene-sense-sight-sound) be visualised and combined into a coherent theoretical framework?*

Maybe the improvement in one language can be correlated with the improvement in another language. How do the two languages, mother tongue L1 and target language L2, interact? Effectively, inefficiently, or does one destroy the other?

Those are the questions that have been forming ever since my earlier days when I was a senior secondary school student in a class oriented to developing future scientists. That was a time when I did not know any better, such that a lot of knowledge was waiting ahead of me, like psychology, education, neuroscience, pedagogy, and even second language acquisition.

In my fifties, I had an opportunity to have some of the above questions answered, in the second language that I have learned. However, as in the first language, nobody can say that the mother tongue is fully mastered, even by a native speaker.

Now through my dissertation in this Ph.D. programme, I have a chance to find and may even offer some possible answers, in a second language.

***Subvignette**: Tell me the story in English, please*[6]*.*

It was in the late 1980s. One day I was standing at the far back end of a bus, facing a bench seat, on which there were about four or five people, and a mother and son, a senior high school student, were among them. The boy was enthusiastically telling her mother a story in Chinese. I recognised the story and engaged him in a short conversation.

Me: *Your story is from New Concept English*[7]*, right?*

Him: *Yes.*

Me: *You learned the story in English only.*

Him: *Yes.*

Me: *You never read the story in Chinese, right?*

Him: *Right.*

Me: *Then, can you tell the story again to me in English, as well as you told your mother in Chinese?*

Him: *No, I cannot.*

Me: *Let us make sure, you really learned the story in English, right?*

Him: *Definitely.*

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[6] The Chinese version of the same story in an article won an award in China in 2006 (Feng 冯睿 & Xu 徐弘, 2006).

[7] *New Concept English* (L. G. Alexander, 1967a) is a set of textbooks ‘leading the adult and secondary school student who is an absolute beginner to fluent English through four integrated books.’ (L. G. Alexander, 1967a).

Me: *Then, where is your English now?*

Him: *I do not know.*

Me: *Can I say that you actually used English to learn and review your Chinese?*

Him: *…?*

The passage of time runs fast, but the understanding takes longer. As many as three hundred million people in China are now studying English (Abley, 2009-08, p. 93), at least in 2008. Some estimate that half the world's population will be able to speak it [English] by 2050 (MacGillivray, 2006, p. 259). It will also take a long time to change my identity, to add to it some more understanding of what language learning and teaching is. Many people, me included, use their life or lifetime to learn an additional language, or, as linguist Erard asks, in how many languages do we live (Erard, 2012, p. 24)? We should also ask ourselves, can we live in another language?

I found many language learners and users unaware whether they have learned another language or not, after a very long time of learning. In an interspective culture, in which its people constantly or most of the time compare themselves with one another, it has been discovered that its people tend to mirror their own lives in comparison with whatever they heard or saw. If your child learns to play the piano, my child has to learn it as well, and be better at it. If your child learns English, mine does that, too, and be better at that.

The face is a very important sociocultural feature of an identity for most of the Chinese people, and some of the other people. Whenever I kind-heartedly explained to them it is wrong to translate the unknown English into the known Chinese, to actually double-learn or review the known Chinese, they would not agree and would argue with me. Face-saving strategies (Flowerdew & Dudley-Evans, 2002; Hofstede, 1980; Yu & Watkins, 2008) seemed to be working in such situations. Many do not speak English well enough because they do not want to lose face while speaking 'poor' English. Why do I need another language if I already have one? The reason, from the earliest of times that I could recall, is to learn the unknowns in my mother tongue. When I am deprived of opportunities to know something important or unimportant until known, in my mother tongue, I need another language to know it.

The youngster in the story was constructing his own identity. Under that particular condition, he was speaking in his mother tongue to his mother, who looked very likely that she did not know English. In the relation of power, he had to speak Chinese to his mother so that her mother would understand him. Given that he may be put in another situation, he may be so marginalised but valued when he spoke English. For any language learner and user, in speaking or writing the second language, she or he is engaged in identity formation, construction, and negotiation.

Weblog B: #Four in TSWHRD—To Hear with Heart[8].

The fourth in the model of TSWHRD (Think, Speak, Write, Hear, Read, and Dream English) is to hear English, but to hear with heart.

It is said in the Chinese proverbs that 'a gentleman uses his [sic] tongue, a bastard, his [sic] fists,' (Chen 陈欣望, 1984) referring to the Chinese cultural identity that a gentleman fights with words, not deeds. The super-gentleman does not even use the tongue, but only uses the ear, to hear.

The English needs to be in the learner, somewhere named the mind, the heart, or the brain. We will use the heart here as the word heart is the word hear plus the letter t, for the ease to remember.

What does it mean when we say we heard English and understood it? To put it easily, that means the sound in English matches the sense in the heart, from sound to sense, all in English. The sense, importantly, is the sense in English, not in Chinese (I will talk about the sense in Chinese later). If the English sound matches the correct English sense, the sound is understood. If the English sound matches the wrong English sense, the sound is not understood. That is very simple.

Let me start with who to hear first.

We need to hear us, and I need to hear me, first. Why? Because I understand me when I speak English, simple English or not. If I can use 500 English words to speak English, I understand me when hearing me. If I can use 50,000 words, which I cannot, I can still understand me.

Therefore, as a language learner, I need to require myself that my heart, or brain, or mind, start using the English that is learned. It matters not whether it is one English word, or 100 English words. As soon as an

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[8] The Chinese title has 'to Hear with Heart" imbedded in it. (Feng 冯睿, February 24, 2012). Retrieved from http://blog.sciencenet.cn/blog-639060-541115.html. It has over 2,000 visitors, 19 commentaries, and 10 endorsers.

English word is learned, its Chinese is not to be used anymore, unless necessary.

Thus, English is learned efficiently, perhaps only once. Chinese is not reviewed, and English is not repeatedly matched with Chinese. Here are three rules that may help.

1. *When reading English, the sight needs to be turned into the sound, English sound, not Chinese one. The heart takes in the sight or shape, and the sound, since others cannot help at all. The heart also takes in the scene, that is, the context in which the word or sentence is used. The heart also takes in the sense, in English, not in Chinese. All the sight, sound, sense, by grammaring in a scene, is a complete unit, to be learned. In this learning, the Chinese is useless, it does not help, since there is nothing Chinese.*
2. *One cannot be a supergentleman with no speech, but a gentleman, that is, one has to speak English. That heart or mind or brain takes in the English sound, and matches the sound with the English sense. Then that heart or brain thinks the English sense and the mouth speaks the English sound, sense-making sound. At the same time, one is also hearing one's own sound or speech. The speaking becomes hearing. What is important in the whole process is that the heart or brain has to think in English, not in Chinese. Thinking in English will make a good English learner, even a master of the English language. However, thinking in Chinese does not necessarily make masters of the Chinese language, and does nothing to become even a good English learner.*
3. *One also needs the ability to judge whether the English heard is true and good English or not. If one does not know that, it is better not hear any English at all, including of course, nonsensical English. Do not repeatedly hear the same sentence 10 times or 20 times in one cycle, that is a waste of time. It is even worse if one does not understand what is heard, but read the English script or sight. Eventually, reading the English script does not help and one resorts to read the Chinese translation. For some that cannot even understand the Chinese translation, they resort to attend, by paying big bucks, lessons given by those teachers who can only talk in Chinese about English. That is the worst way to learn English.*

If one wants to hear English and understand English, it is true that by hearing Chinese, it does not help at all, for all the Chinese heard never turns into English.

There is a facility index or difficulty index that one needs to keep in mind while hearing or reading English. The number of new words per 100 consecutive words should not be more than two.

> *It of course takes time to understand more English when hearing it, and one can only understand one's own profession learned in English, not everything.*
>
> *In order to understand English when hearing it, one needs to hear more English, not more Chinese, and use English to understand the heard English, not using Chinese. Last but not least, English heard remains English in the heart or brain, to understand more English. English heard does not become Chinese in the heart or brain, because that is reviewing Chinese as the listening comprehension is done in Chinese, not English.*

Based on an earlier citation on the definition of culture, I summarised that, for any language learner and teacher, he or she needs to think, to say and do, to feel, and to act and make, or write and share an autoethnographic dissertation in a second language. To think, speak (say and do and feel), write (make and do and feel), hear and read (act), and dream (act and do) in English or an additional language, is exactly what a second language learner and teacher should be doing constantly. Many commentaries supported the idea that repeatedly listening to the same recording or watching the same movie, is already very inefficient. 'If translating into the Chinese is added, that method of learning English is destructive' ([11]Bingwei Tian 田兵伟 2012-2-25 19:46). One commenter asked a question.

> *It is a good writing. However, is it possible that one can speak English but cannot understand when spoken to? In other words, the ability to speak is better than the ability to hear? I believe I am such a case. ([19]Guoqiang Wang 王国强 2012-2-26 09:18)*

That is quite a good question and it is possible. In such cases the 'sense' that one has in the heart cannot match the 'sound' that one hears, but the same sound is what the one can also make. The 'sound' is likely 'recited' or 'repeatedly' learned and memorised, and can be spoken without thinking, or produced automatically. But the 'sense' that is supposed to match the 'sound' is likely not the English sense, but the Chinese sense. In other words, when the 'sound' is heard, the hearer cannot have the speed to turn the English 'sound' into the Chinese 'sense to understand. Thinking takes time. English sound plus English sense equals understanding English. English sense thought out plus English sound equals speaking English. Those two are the shortcuts. English sound plus Chinese sense equals understanding Chinese but does not necessarily equal understanding English, and the English sense is always partial. If the understanding has always been in Chinese but only partial understanding in English can be achieved, what happens when speaking English? This is what happens. Chinese sense plus English sense (mostly partial) plus English sound equals speaking Chinglish (sometimes English), but that takes a longer time. If the English (reception and production) is always or mostly partial, while the Chinese (reception and production) is always or mostly complete, what can the result be? Obviously.

***Weblog C: To Err, More or Less—on Learning Englishes in China*[9].**

Abstract

An English language learner in China may learn more English to become an expert in the English language, or less English for specific purposes only, but he or she ought not to learn wrong English, or to be taught wrong English, since wrong English is the most difficult to remedy. Many an English language student in China spends almost a lifetime correcting wrong English he or she has learned or has been taught, but only to have failed. If one learns or is taught so much wrong English one is definitely doomed. This article cites some of the popular and prevalent thinking behind wrong English learned and taught in China, analyses the roots within and provides some possible remedies.

Keywords: err, original, sinologise.

Introduction

Most of the English language learners in China were not born with English, so they have to learn English from a beginning, if they want to learn it well. In any language learning, there is always the problem of learning it the right way or the wrong way, and the good way or the bad way. Either one learns it in the right and good way, or in the wrong and bad way, or other combinations. It is also possible that one is taught in one of those ways, or any combinations. For most of the language learners, very few of them would willingly start with the wrong and bad way. The least they hope for is as less wrong or bad as possible. Is there any intention to teach in the wrong and bad way? That is hard to say.

There are only four ways: to wrongly learn a language, to learn a language wrong, to wrongly teach a language, or to teaching a language wrong.

[9] The title is bilingual in both English and Chinese, with an abstract in English. (Feng 冯睿, October 10, 2012). Retrieved from http://blog.sciencenet.cn/blog-639060-495376.html. It has over 2,000 visitors, 7 commentaries, and 13 endorsers.

Any English language learners can learn as few as thousands of word families, with the right grammar and the right pronunciation, or as many as half a million words, as those in OED or Webster's Third, all of them. It matters not whether they learn more, or less. However, the difficult lies in that they do not learn wrong, or wrongly learn, and they need to guard against being wrongly taught, or being taught wrong. If they are wrongly taught, they usually wrongly learn; if they are taught wrong, they usually learn wrong. Of course they can also wrongly learn even if they are taught right. If mistakes can be corrected instantly, that is wonderful.

If they think in right Chinese, they may produce right Chinese, but not necessarily right English. Right English thinking may produce right English, and there is no refutation again that, in normal conditions.

In order to learn the right English, any English read or heard should be right, and remembered. All the right Chinese read and heard and remembered does not help with producing right English. One cannot hope to think in the right Chinese only to produce the right English.

Therefore, the errors made in English are caused by thinking right Chinese but translating right Chinese into English. The only right way to learning English is to remember right English and to produce the right English remembered. Besides, what is called 'having learned English' is exactly the right production of right English, not wrong English.

Fluent Speech

Many language learners of English are aware, or should be aware, that a fluent speech refers to one's own speech, the speech one is able to produce and understand, the speech one is able to produce fluently. This is not nonsensical, because many language learners are not practising their own fluent speech, but that of others. Let us see some real examples.

In the 1970s there was a set of course books in China, with gramophones or phonographs, the plastic ones. It was the Linguaphone English Course. Let us look back on it and see if we as language learners can really imitate those people. A. C. Gimson, Reader in Phonetics at University College, University of London, was a phonetician. Daniel Jones, Professor Emeritus of Phonetics, was another phonetician and teacher of A. C. Gimson. Peter A. D. MacCarthy, Head of Department of Phonetics, University of Leeds, was a phonetician. Miss Audrey M. Bullard, Lecturer in Speech, University of London, was also a phonetician. Miss O. M. Tooley, another Lecturer in Phonetics, University of London, was also a phonetician. A few others were of the BBC, fluent speakers of English fluency, and announcers of the top announcers. How many people in the whole world can imitate those above?

An average Englishperson understands English in English all the time, chats in English when awake, and thinks, speaks, writes, hears, reads, and *dreams in English. His or her English proficiency is only that of an average Englishperson.*

It is impractical to believe that an average Chinese person is super intelligent, thinking bilingually and fluently at a velocity twice or thrice faster than an average non-Chinese person, that he or she can reach ultimate attainment in English with one or two years being 'crazy in English'. That is absolutely impossible.

Words or Sentences Recalled?

An English word does not match with a Chinese word or meaning. That mix-up does not guarantee the use of that English word. The Chinese word, of course, one can use that well as one is a Chinese person using Chinese all the time. The matched Chinese can be used, but to use the English, the English word has to be remembered, not the Chinese match. There are two different ways of thinking in the two languages. For the Chinese, the meaning lies in the character, combined to make words, sentences, and discourses. But in English it is different when seeking the meaning of a word. The meaning has to be inferred from the sentence, or sentences, and sometimes, even the whole paragraph, even a few paragraphs above or below. Nobody reads with eyes fixed on one word only. If one follows the order of the sentence, the meaning of a word is usually obvious there.

Let us cite an example sentence from a dictionary (Cambridge University Press, 2003):

Our headmistress was a real old battle-axe.

If there are two new words, headmistress and battle-axe, let us see what we can do. From this sentence, headmistress is a head, and mistress is a woman. The word battle-axe relates to battle and axe. If the battle-axe is a real old battle-axe, the meaning is usually negative. This headmistress of ours must be 'old' and 'a real battle-axe'. She may like battles, or use axes, figuratively.

Here I tried to use some Chinese as 'helper' to explain this sentence, without any translation. The aim of learning any English is to remember it and use it later when the occasion comes, not producing any Chinese. The best method or way is to understand English in English only and to be able to explain English in English. That means both spoken and written English is aiming at reaching the proficiency of that of an average native English speaker, or even above that level. Such proficiency is extremely useful for those wishing to study out of China, since outside China, Chinese is next to useless in universities, unless of course, the professors teach in Chinese.

If a complete English explanation is needed, here is an example:

Headmistress, well, a headmistress is the head of a school, since a mistress is a woman mister, a woman minister, a woman. A battle is like a fight, and an axe is a tool you chop or cut something with. 'Our *headmistress was a real old battle-axe' means she is a little bit old and unpleasant to talk with, to deal with. She may not agree with a lot of things you do or say. She is difficult to work with. (Flesh-Kincaid Grade Level 6, which seems easy, right?)*

If any recitation is needed, the recitation should not include any Chinese, but English sentences, paragraphs, discourse, and in English only. Chinese can be used as an aid to learning, a transition, but such a transitional tool needs to be eradicated as soon as possible. For those who need to discuss in English special fields with professors or classmates, Chinese is useless. They have to learn to use English to learn their fields in English, not in Chinese. One day they will have learned English to reach a level similar to their native English-speaking classmates, or have learned English well if their level passes beyond that of their native English-speaking classmates, in those special fields.

Listen to Oneself

Other than the wrongdoing of listening to English while thinking in Chinese, another grand mistake is to spend a lot of time listening repeatedly to something incomprehensible. A rebuttal can be: 'I listen repeatedly to English since I cannot understand it.' That is exactly the problem. Listening to something incomprehensible for a thousand times, the result is not understanding, either. The language learner has to learn to listen to something understandable, and this something understandable is what the listener himself or herself speaks.

An average language learner may not conclude that he or she understands other's speech but not his or her own. Therefore, it is easier to listen to oneself. One understands one's own speech, period. It does not matter whether one is a native speaker of a language, or learns another language. That one understands oneself should be axiomatic. As long as it is one's own speech, right or wrong, but not reading aloud or reciting other's speech. A corollary to the axiom is that the more one speaks, the more one understands the same or similar speech.

Therefore, to attain better listening comprehension, one has to speak better and more. The more one speaks, the more one understands the speech.

Write What You Will and Can

One of the aims for a learner to write English, at least, is or should be in studies. After attending an all-English class or lecture, the language learner writes the assignment. Further to that would be the writing of conference papers, theses or dissertations for master's or doctoral programmes, or papers for journals in one's own profession. Some other writers may be aiming at novels, poetry, essays, and others. At a workplace, the writing of reports, memos, daily logs, applications for jobs, or emails, maybe love letters, etc.

For the writing of an assignment, there is not much to copy from. Nowadays papers can be purchased on the Internet, but one day it will be detected and consequences occur.

Only when the union of the language and the learner has been reached can we say that the language has been learned. That means you are English and English is you, nothing more, nothing less. An Englishperson produces English based on thinking in the English meaning, and sometimes the production is a mistake. How much of it is possible for a native Chinese speaker to think in Chinese but to produce somewhat good and right English? Only by using the good and right English one is so familiar with can one produce some good and right English. For example, using 'my', 'father', and 'apostrophe s' can one produce 'my father's father' to represent 'grandfather', which is never learned before in English.

The next section is written in simple English. If the reader thinks it useful, please remember what it means, without any translation into the Chinese. If possible, turn it into your own English.

You are what you are, and you can be what you can be. You are not what others want you to be, and you cannot be what they want you to be. You can only become what you yourself want to become.

You learn to speak English for you, for yourself, not for me, nor for others, especially not for those who can only speak Chinese. You can only speak English to those who understand you. You can only speak the English you know. You may not speak the English I can. You need to learn how to speak English by speaking English. You cannot speak English well by speaking Chinese. The more you speak English, the more you learn to speak English. You may not speak Australian English, not British English, or American English. But, you speak your English.

You learn English words in English, not in Chinese. Chinese does not help, at all. You need to remember English, not Chinese, at all. An American student reads 13 pages in English every day. You need to read 26 pages of English every day, for 13 years, to beat the American students. You can only learn English by reading, working in, and thinking in, English. You cannot learn English by working in Chinese, nor can you learn English well by working in Chinese.

An American student learns 15 (fifteen) words every day, starting at age 2 (two), ending at age 17 (seventeen). How many words does this student know? 17-2=15. (Seventeen minus two is fifteen) 15x365x15=82125. (Fifteen times three hundred and sixty-five times fifteen, or fifteen squared times three hundred and sixty-five, is eighty-two thousand one hundred and twenty-five) An American student knows about 80,000 (eighty thousand) words at age 17 (seventeen)! They are American students. Can you beat them? You can!

> *You need to listen to yourself often. You cannot learn to listen to English by listening to many people speaking English with their own accents. Everybody speaks English with an accent. You need to understand your own accent. But, you have to make your accent better every day. Learn a British or an American accent. Learn to speak English like an Englishman or Englishwoman, or an American. You listen to yourself. You speak your good English and you listen to your good English. The more you can speak, the more you can understand yourself, and the more you can understand others when they speak English to you.*
>
> *You learn to write in English by writing, using your own words. You cannot write English with the words I know. You can only write with the words you know. If you only know 50 (fifty) words, use those 50 words to write. You cannot use more than 50 words because you only know 50 words. If you know 'my', 'father', and 's (apostrophe s), you can write about your grandfather or great-grandfather. You grandfather is your father's father, and your great-grandfather is your father's father's father. You can start your writing by "I am going to talk/write about my father's father. My father's father is my good friend." That is how you start to write about your grandfather. Isn't that English? Yes, it is. You understand it, I understand it, and English speakers understand it. But, you did not use the word 'grandfather', which you may not know. Can you see that writing in English is very easy and simple? Write in your own words, only the words you know.*
>
> *Remember this, please. The more you can speak English, the more you understand yourself when you listen to yourself, the more you will understand others speaking, and the more you will be able to read and write in English, if you know how to read and write.*

In writing this part of the weblog, I positioned myself as a victim of my own English language learning, or education. I was taught to think in Chinese, from birth, until the time while hearing or reading English, as most of my teachers did so, and most of my classmates did so. My parents, both being Russian speakers in civil engineering and metallurgy did not tell me (At that time during the GPCR, they dared not tell me, I bet.). My grandfather, translator of Hegel's *Wissenschaft der Logik* (Hegel 黑格尔, 1977) into Chinese, did not tell me. My grandmother, who stayed with my grandfather in France and Germany during the 1930s, did not tell me. My granduncle on my mother's side, who studied Japanese in Japan during the 1940s and came back to China to teach Japanese with an ability to speak even some of the Japanese dialects, such as that in Hokkaido, did not tell me. I am not complaining here but trying to think about the formation and construction of my identity, as well as of others. As of this writing, I may tentatively draw the conclusion that all of them had been living and working, aside from political reasons, in the Chinese linguistic context for so long and had not been thinking in another language for so long. I recall a letter from my grandfather about the learning of English, from which l learned the word ‘methinks’. I have never seen that word anywhere else.

When one’s identity is being changed one learns to remember each and every, almost, piece of information related to the change. For the pronunciation of English, I have read Jones (1972-50; Jones & Gimson, 1977-67), Gimson (1980-62; Jones & Gimson, 1977-67), MacCarthy (1950), and other books on the pronunciation or phonetics of English (Jespersen, 1958-12; O'Connor, 1980-67; Roach, 2001). I also know clearly that perfect mimics are very rare (Paulston & Bruder, 1976), when I wrote about my suggestions in the Weblog. However, it does not mean that an identity can be corroded or fractured, neither does an additional language. One of the readers commented and asked a question:

> *In such context when no English is known, how to start, with no Chinese at all? ([7]Ji Zhang 张骥 2011-12-29 23:55).*

A simple answer I provided is that the context is on the self, and the language or languages needed. At the very beginning, a mother tongue is needed; and later, the mother tongue is not used at all as long as the target language has been learned.

The language learners are introduced to an L2, with the help of their L1, used as an aid to learning. Once an L2-item is introduced, especially the concrete ideas such an animal, those L2-items will be required for the L2-learners to remember and use whenever such animal comes into sight, or even occurs in the brain while thinking.

Conclusion

Autoethnography helps me to conduct a personal analysis of my past transformed to become a language user and learner. From being a learner, I struggled to become a keen observer. As a researcher-participant in this research, I deem this writing of the dissertation developmental and experimental, recording my own formation as well as how others view me, in transformation.

It has been a long trip since I was forced to seek answers to ‘the mind behind the mask’ at the age of ten. I have partially, never say completely, found my tool to do the job, the English language. Now it becomes a habit to do so, seeking more answers. Such a path led me all the way from Harbin, Heilongjiang, China, to Edmonton, Alberta, Canada, into the University of Alberta.

In this autoethnographic exploration, I contrasted my personal experiences as an L2 learner and teacher with my own graduate studies, and with those of the Other and others in their pursuit of their identities in Canada. My own identity formation and construction has been re-examined, re-visited, and re-advised by such an exploration, moving beyond the familiar and the known. There is nothing more theoretical than a good practice. As a theme revealed in many of the literature, new immigrants can use autoethnography, or a similar approach, to help themselves look back and track their trajectories, from the past in the native country, to the present in the new community of practice (CoP), into the future of their professional and educational goals in the new country.

Summary

This chapter collected and selected some of the available data in the autoethnographic exploration of my identity formation and construction. What emerged from this reflexivity and complexity is the transnational and transcultural transition and transcendence the Other or others and I have been struggling to achieve. In the next chapter, wider and deeper autoethnographic findings will be explored.

Chapter 5

Findings

In autoethnography the individual and its society—the seat of the social and the cultural—mutually presuppose one another, in which what an individual does is always a concrete realisation of cultural-historical possibilities (Roth, 2005, p. 3). Citing Derrida, Roth further explains autoethnography as otoethnography, as oto, that which pertains to the ear, plays an important role because it is for the other that we write and speak; for the other, through the other, in terms of the other's language (p. 11). Following this example, I may venture to use another Greek root, opo, that which pertains to the eye, to create opoethnography, for what autoethnographers write, instead of speak, is easier for most of the second language learners to understand. They usually have more time to think while reading than when they hear stories read to them. Besides, if they want to become professionals, reading professionally helps more than hearing in a second language.

One important warning from Roth is that, … autoethnography bring[s] with them[it] the danger of illusion, grandiose myths, and delusion. More so, they can—it is very evident in totalitarian systems—support ideology and prejudice (p. 15). Keeping that in mind, I will explore some of the findings in this autoethnographic exploration, otoethnographic expedition, or opoethnographic excursion.

Overview and Research Questions

In the last chapter, I have summarised some of the differences between how my one identity has been formed or in the forming, and those of others in their own eyes. However, it is the similarities that revealed in this autoethnographic research regarding my overall strategies and processes of second language learning and teaching as well as theirs that point to a few common themes. Those themes include the transformation to an Asian-Canadian or Chinese-Canadian identity, the acquisition of an additional language for survival, improvement, or professionalization, and the importance of a social-cultural context, or a community of practice (CoP), in which language learners and users are posited.

Human beings relive their lives. In an autoethnographic research, the researcher-object/s relive their narratives as well. In this chapter, my purpose is to identify some issues that emerged from the autoethnographic exploration in the last chapter, and address deeper and wider implications of these issues to expose further their relations to the three research questions.

Summary of the Sources

The year 1976 marked the official ending of the Great Proletarian Cultural Revolution (GPCR) in China. After the GPCR, the Chinese government began its plan to rebuild many of the areas that were destroyed during the GPCR, mostly by the Red Guards, including education, policies, economy, social development, commercial activities, and cultural and scientific exchanges with other countries. One of the areas that needed immediate attention is the reformation of the teaching and learning of the foreign languages. Many of the important and supreme documentations published during the GPCR, including quotations from Mao Zedong and others on many of the issues, were recalled and destroyed. That made research on that particular period of the history somewhat difficult, and sometimes very difficult. With the availability of the Internet, and some people that were brave enough to have kept some of the documents, as well as memories, I may recollect the following.

The English language was almost banned after 1949, when the whole country was promoting Russian, the language of the socialist ‘big brother’. My parents were two Russian learners and users, using Russian to study their respective majors in civil engineering and metallurgy, belonging to the first generation of university students in New China. By 1954 Russian had become the only foreign language taught in Chinese schools (Boyle, 2000).

After I became one of the first generation of university students after the GPCR, English was starting to boom in China. The purpose of the promotion of English was to learn the ‘advanced science and technology’ from mainly western countries. Even with newer textbooks and curricula, the dominant method of teaching English was grammar-translation (Tang 唐力行, 1983), used successfully by all language teachers in China. It was believed that in that period, English learning and teaching was sweeping the whole China. In early 1980s, an English TV show *Follow Me* (Tomalin, 1979; 中央电视台电视教育部 & BBC English by Radio and Television, 1983) broadcasted by China Central Television (CCTV), had an estimated audience of 50 million learners (McCrum, 2005).

Together with the importation and promotion of a lingua franca, the way to provide important information to affect educational, linguistic, identity and economic systems also changed. To follow that change, especially the formation and construction of my identity, in view and light of available sources from artefacts and human opinions, I decided to follow the suggestion of my supervisor and the committee to choose autoethnography as my main method of research. The research was written with the eye and ear from the other, and my own eye and ear towards helping others to become acquainted with, and understand, the efficiency of language learning and teaching that influences language education and identify formation. The research draws background information from the following sources and resources, on top of the sources already utilised and analysed in Chapter 4.

The most currently available theoretical and practical summaries of autoethnography, especially the most or more recent publications (Holman Jones, Adams, & Ellis, 2013; Short, et al., 2013; Sikes, 2013), have been and will be used as a framework for reference and revision. My personal library of over 10,000 resources will be consulted, including 500 about SLA or SL (1956-2013), 200 about identity (1968-2013), 25 about autoethnography (1997-2013), 20 about neuroscience (1995-2012), 60 about cultural studies (1994-2013), 190 about language arts (1971-2013), 60 about the four language skills (1972-2013), from 150 to 750 about each individual language skill, and handbooks or companions, about education, linguistics, research, and teacher education, published by Blackwell, Cambridge, Routledge, and Oxford, from as early as 1927, to 2013, a little shy of 1,000 items. The resources that I borrow ideas for my tools of thinking, those about mathematics education, total a little over 300 in number. Other resources will be added as the research proceeds.

That language and identity work together cannot be ignored. In the process of language learning and teaching, new ideas forming both identity and ideology are crucial for the language learners and users. One of the themes in this research is that knowledge builds on knowledge (KonK). Past knowledge and experiences will merge in the newly gained or acquired sense of identity. Armed with the aforementioned resources and sources, the rest of this chapter endeavours to expand answers to the three research questions.

Question 1: English language learning as a linguistic and cultural system

The first research question is duplicated below for reference.

1. In what ways has a person with a Chinese cultural background formed his thoughts and ideas about his English language learning and teaching experiences via exposure to English as a linguistic system and as a linguistic culture? In this research, the phrase "thoughts and ideas" may be envisioned as conceptualization and comprehension of the formation of a closely-knit identity of an English language learner and teacher.

Memory data A1: 1977, university entrance examination.

It seemed very natural for me to pass the exam and go to university. There was nothing to boast about myself. I worked a little bit harder on a language than the then my classmates and schoolmates as I did not have much else to do, and gained some understanding of how to learn it, and will use it as a tool to find out some answers that my mother tongue may not be able to help me find. I also saw the vulnerability of my cohorts and my seniors and was vaguely trying to understand all that, as well as finding ways to offer my help to the Other or others that may need it. The English language might be the tool, and it is the tool now.

Looking back on it, a little extra work helped a lot. Without my extra work on learning or overlearning a little bit more than the Other or others, I might not have been selected among 200 students to be one of the seven to sit for the university entrance examination. I might not have succeeded as one of the three to have passed the examination to become one of the first generation of university students after the GPCR. The advice and lesson I have learned in this part of the formation and construction of my identity, that I may be able to pass on to my students, is ‘to be prepared’, and ‘be prepared early’.

Chinese cultural background.

A culture is an all-inclusive word covering expectations, attitudes, beliefs, values, perceptions, preferences, experiences, and behaviours. As a language learner and user, I will start with what is termed the Chinese culture of learning. This frame of reference for an understanding of the Chinese culture is composed of four R’s and four M’s (Silver, et al., 2002).

Four R’s	**Four M’s**
Reception	Meticulosity
Repetition	Memorisation
Review	Mental activities
Reproduction	Mastery

Table 8 Chinese culture of learning.

In this framework, Chinese students receive knowledge, repeat what is understood, review for better understanding or tests, and reproduce accurately whatever they have received, repeated, and reviewed, especially on a test. When Chinese students receive, they pay attention to details. They repeat in order to memorise. They emphasise mental activities in reviewing, looking down upon manual labour, if not despising it, and master for reproduction. All that has been culturally wired.

Out of the above framework and many other contrasts, my favourite is the dichotomy of horizontal-vertical cultures. Pinker mentioned that vertical metaphors for time are more common in Chinese, with earlier events being ‘up’ and later events being ‘down,’ presumably a legacy of their writing system (2007, p. 192). Such a vertical culture propels its whole nation to take an extra step in almost everything, comparing others, thus making it easier to have turns of dynasties, or vulnerable to bullies of its own kind. There is no need to follow that mind-set of comparison in order to catch up (Friedman & Mandelbaum, 2011). Comparison has been recognised as belonging to the Child in transactional analysis (T. A. Harris, 1999-69) and thus deemed ‘immature’ if adult business people keep doing it (Wilson, 1997).

Under the influence of such a vertical culture, I was educated by my parents and grandparents to study hard and find a good job to survive. My parents have been very nice to me, seldom bothered with my homework that I could take care of. My grandmother used to tell me something that I could never forget: 'You came to this world with two eyes, two ears and one mouth. The meaning for that is to read more, listen more and talk less.' I believe many parents or grandparents say similar things. Shakespeare once said: 'Men of few words are the best men.'

At school I had always been one of the tops, though I was able to see and hear all kinds of negative things around me, especially during the GPCR and after that. My teachers seldom said anything positive and learning was my job to do. If one of us got lower marks, get the parents to school to listen to the teacher. If one of us was bullied, solve it ourselves.

In the Chinese culture, book learning has always been emphasised, as in indicated in some proverbs. 'To open a book brings profit.' Or 'if your books are unread, your descendants will be ignorant.' (Mieder, 1986)

Vignette A: Kicked out of home, with (grand-)parents.

China, especially the mainland, was marked by movements, one after another. In the 1950s it was the Anti-Rightist Campaign. In the 1960s was the Great Proletarian Cultural Revolution (GPCR). A lot of the current literature did not use the full name of the Great Proletarian Cultural Revolution, which is really unfair to the 'proletariats', because they really believed they were, are, and will be 'great'. The idea of 'big brother' moved from being applied to the Russians or the USSR, to being applied to the 'workers'. The 'peasants' were ranked the 'second brother', before the 'soldiers', who were not brothers or the 'third brother', but 'comrades-in-arms'.

Some literature attributed the animalness to the GPCR (Bo 柏杨, 1992), even to the Chinese culture as a whole for internal bullying that had happened so much in the long history of China. However, 'you can't clap with one hand.' (Mieder, 1986) The nurture or culture does not work if the nationals do not have the genes. The nurture works via nature and vice versa (Ridley, 2003). The combination of both nature and nurture created such introracial hatred.

The best example of this part of the human nature can be exemplified by some of the current writing on the Internet, where writers behind the mask are free to refile anybody they would like to, creating a digital barbarism (Helprin, 2010-09).

More and more literature has been published on that specific period of the GPCR, both fictions and non-fictions, in both English and Chinese (J. Chang, 2003-1991; Cheng 郑念, 1987-86; Feng 冯骥才, 1991; Gao & Lee, 2002; Salisbury, 1992; Wang 王友琴, 2004), including theses and dissertations (Seppälä, 2011; Taylor, 2011). It is one wish of this language learner and teacher that one day the truth behind the curtain will be approached as nearly as possible.

Vignette B: A colleague, one of a trade.

The Chinese word for a friend '朋' originated from money, not one but two pieces. It seems the mind-set is 'no money or benefits, no friends'. Of course it is not always so. Both sides can have money, or both sides can benefit from such 'friendly' relations. The Chinese word for a colleague originated from 'the same event'. If there is nothing similar to do, there are no colleagues. It is not that most do not cooperate; some simply bicker among themselves to make cooperation impossible. My later study of vertical culture may offer an explanation.

There is some literature that locates the seeking of a clear sense of identity as a meaning-making process of becoming human (Leggo, 2007), however, some human nature hardly changes, and there are genes carrying and maintaining that nature.

English language learning.

For a language learner and teacher, there are only a few dichotomies to consider depending on how many languages are involved. English is the one language to learn. That is all right and I have a place to start. I need to consider the following questions. Do I work on more of L1 or more of L2? Which one is easier to learn, written or spoken? What should I be aiming at, more fluency or more accuracy? If I make mistakes, is it caused by L1, L2, both, or neither? How do I balance meaning and form, or sense and sight? If computers is what I am interested in, do I use L1 to learn computers, or L2, or both?

Those should be the questions asked by all language learners and teachers so that no or less time is wasted and they will be learning or teaching the language more efficiently, and their identity, and mine, can also be formed and constructed more efficiently.

The idea that one language alone is not enough does not necessarily mean that the more languages one lives with the better. However, it may mean that if one can live very well with one language, one does not usually need another. Learning an additional language has its benefits, and around seven hundred have been collected and published online by one source (Gallagher-Brett, 2004). However, it also takes a lot of time, and even a lifetime if more languages are to be maintained (Erard, 2012).

Identity is tied to culture, carried by language. In other words, language is the carrier of culture, or one of the carriers. Compared with culture, language is easier to acquire or learn.

Scenario A1: In a young eye.

I was doomed at that time, or was thinking that I was doomed. But why? I grew to understand that in my own language I might not be able to find out some answers. I may find out some answers in another language. When I grew even older, I came to understand that if by finding answers I mean to use external resources such as those languages that can be read or heard, there will always be something that language or speech cannot find or help. The language as a tool to know and whatever to be known by language form a dyadic relation: the language can know or cannot know, whatever to be known can be known or cannot be known by language, or I, as the language learner and user, may or may not have the language to know.

Weblog A: How to Learn English Well?—Where Is the Problem in China?

Before I came to Canada in 1988, I was touching upon what I later learned as conspiracy theory. I was seeking answers to such a question: If China has its foreign language learning and teaching switched from Russian to almost totally English, should it be working on more effective methods or policies to teach and learn better English? Most of the university students then at my time spent about five days out of six each week to study English, reading aloud or silently, and translating. If by that amount of time, most of my cohorts and fellow students could not yet learn English and pass tests, there might by such hidden agenda that they could never learn better English, or were not allowed to learn better English. I do not think I could ever find out an answer.

English linguistic culture.

In the learning of English or any language, culture is needed (Berlitz, 2005-1982). Like any other culture, English culture is also localised. There is the workplace culture, office culture, company culture, school culture, and others. When at Rome, do as the Romans do (Mieder, 1986). Knowledge of English-speaking cultures could help English language learners and teachers to use English more effectively and appropriately. However, culture cannot be learned while watching movie or reading books, as it is more lived than learned, and even wired (Pagel, 2012).

Linguist Erard contends that saying things is totally different from conversing (2012, p. 82). Therefore, a second language learner and user, if being unable to live in a culture for adequate time to acquire the new culture for the formation and construction of a new identity, would be better at ‘saying’ things, especially academically in lectures or presentations, instead of engaging in daily conversations talking about what was on TV the day before.

Weblog B: #Four in TSWHRD—To Hear with Heart.

The English linguistic culture is an oral culture, not as much as a literate culture (Abley, 2009-08; McCrum, 2005). One’s identity is better represented by speech, more than the written language, compared with some other cultures. The English culture speaks through the English speaker (Karpf, 2006), native or non-native. In the formation of an identity, hearing the sound of the language correctly is closely related to speaking the language with the correct sound.

In order to learn the language well and live happily ever after in a new culture, we need to become the language, the union of the learner and the language (ULL), or the union of the speaker and the speech (USS). 'We are the words we speak, write, think, hear, read, sing, play, dance and breathe. We speak, write, think, hear, read, sing, play, dance and breathe ourselves into being and becoming' (Leggo, cited in Irwin & Sinner, 2013), though I only sing very little and dance none.

Question 2: Influence on performance and revelation of my experiences

The second research question is duplicated below for reference.

2. How have the above thoughts and ideas influenced how he performs or reveals his learning and teaching experiences? Considering other English language learners and teachers, another way of asking this question is "In what ways does learning a language become and form a new identity to particular performances or behaviours of a self, specifically in L2 learning and teaching, and why?" In this research, "performances and behaviours" reference speech acts and non-verbal behaviours or backgrounds that index identity while "revelation" may be a specific type of performance where an individual makes his or her identity known to others.

My learning in the eyes of the Other.

Vignette C: Two languages on a thought experiment, and a real story.

Backed up by the Chinese culture and culture of learning, I generally follow the four R's and four M's, and vertical thinking. However, part of me keeps asking questions about whys, so I have some doubt of the four R's and M's as well.

When there are only two languages, the possibilities can be summarised as 'either or both or neither', or I may call it the Either, Both, or Neither Rule (EBN Rule). It does not matter which language learning method is applied, be it direct (Eckersley & Eckersley, 1971), structural (English Language Services, 1964), audiolingual (L. G. Alexander, 1967a), or some other ones such as Total Physical Response (TPR), Suggestopedia, the Silent way, Content-Based Instruction (CBI), or the currently popular Communicative Language Teaching (CLT), or Task-

Based Language Learning (TBLL), etc., the ways for languages to be learned are not limitless, but limited.

If there are only two languages, there are only three inputs for the learning or teaching, L1, L2, or a mixture, through the eye or the ear (so far, maybe into the brain directly in the future by the implant of a computer chip). There are also only three outcomes or outputs, L1, L2, or a mixture, from the mouth or the hand (until voice recognition technologies can turn the mouth into the hand, or the brain into the hand). A native Chinese speaker learning English with those two languages only, cannot produce German or French, period.

Vignette D: Managing STARTALK, a language program.

You bring the money, you spend it, not necessarily on you or for you, but for the programme, or local businesses, or a lot of people that can share the money by working in the programme. You may bring the money in, using your L1, or your L2, or both. In forming one's identity, the less effort one uses to do anything to form the identity or to bring more money, the better, usually. That is named the Law of Least Effort (LLE). English language learners are abbreviated to ELLs. If ELLs can apply LLE, so much the better. I am glad that I can help some language learners (ELLs) to understand LLE and apply it in their own formation of their identity.

The STARTALK is where I could apply some of my theories and understandings of how an additional language can be learned and taught more efficiently.

Scenario B2: Practicum.

For the purposes of identity formation and construction, it would be helpful if the practicum is conducted in a multicultural context. In such a context, intercultural development is more likely to happen. Using autoethnography, if I have to do a practicum again, or ask my students to do it, I would encourage more writing in the target language, not the mother tongue. Depending on the length of the practicum, progressive cultural development may be gained eventually.

Memory data B2: A question from my son.

L1 in, L1 out, that is the learning and teaching of L1. L2 in, L2 out, that is the learning and teaching of L2. If L2 in, L1 out, that becomes complicated. It may be a perfect translation or interpretation from L2 to L1, but both have to reach a comparable level of proficiency. It may be misunderstanding in L1 of L2. For the purpose of communication and indication of identity, I can only use L1 in the L1 culture, and L2 in the L2 culture. I cannot mix them up, or use L1 in the L2 culture, or vice versa. In other words, I cannot cross cultures. If I use L1 in the L2 culture or vice versa, the communication may fail or be fractured. To avoid failures of communication, it is better to do one thing in one culture in one language at one time.

My teaching in the eyes of others.

Scenario C3 and D4: Classroom observation and reflection.

As a common tool used to improve teaching practice worldwide, one of the collections of classroom observations is based on videos (Stigler & Hiebert, 1999). I never had the privilege of videotaping myself teaching, though it has been videotaped on a few occasions. My evaluation is usually not bad and some students would comment in my presence that they have learned a lot from me, or even I was the smartest teacher in the whole school. I cannot count on that though. The types of observation have also improved through the years, different from the 1980s, either in China or in Canada. One of the models of management by HP is something like ‘walking management’ when managers are walking among the manufacturing facilities (*Business: the Ultimate Resource*, 2011-02). A classroom observation may not be ‘walking observation’, but some other styles may apply, backseat for the whole classroom, on students only, on lessons, on interaction, on the teacher. In an autoethnographic observation, the style is on the self.

Memory data C3: Translation or understanding?

It is clear that in a country like Canada there would be no communication at all without a constant process of translation (Marinetti & Bassnett, 2006). In other plurilingual and pluricultural countries, translation as a complex mediation between cultures is also needed. One example given by Marinetti & Bassnett is

Québec, the case of which is doubly appealing since it includes two official languages with which the ethnic speaker has to deal with when expressing himself or herself. Residents there have to struggle between two different and opposite cultural systems with which they have to negotiate in order to define their linguistic and cultural identity (Marinetti & Bassnett, 2006).

As a conference interpreter myself, what I have been working on is the case when understanding does not equal translation. That is, many bilinguals cannot translate or interpret. The explanation given by Appel & Muysken is that bilinguals use their two languages in different domains of their life. They are connected to different cultural experiences. If a bilingual speaker always uses a language (L1) in informal and another language (L2) in formal settings, it will be difficult to translate a passage referring to experiences in informal settings from one language (L1) into the other language (L2). It might take some extra time to find 'the right words', for these words generally do not come up in the situations in which (L2) is spoken (2005-1987, p. 81).

Marginal notes A and B: English 900® and Advanced English.

When I was in China, in Canada, and I am in the USA, I have always been a constant reader. That means whenever I have some time I read. One reason is that there are still a lot of things or events or people that I cannot explain, of course, I can never be able to for some of them, or all of them. However, I have been trying. Other than thinking of my own answers or explanations, the other thing I always do is to find support of my thinking, or some related ideas, or some evidence. Now I do not write marginal notes, but rely more on computer with reference management software. Reading English is different from doing research in English. Reading English means, for me, from cover to cover; and doing research in English means to search a few key words or phrases, and sometimes sentences.

Now my marginal notes become reference notes recorded on my computer for easy retrieval my teaching and learning academically.

My thinking in my own eyes.

Having switched from the initial plan to study word problems in mathematics examinations, to study the dyadic relations between two and only two languages, to this current autoethnographic dissertation, I have been thinking about how I am going to put what has been done all together into a coherent dissertation. Some of my ideals and thought experiments are summarised here, depriving all the mathematics or converting those into words.

A language may preserve the heritage and identity. Mathematics is also a language. Therefore, it preserves the identity and the heritage as well.

From the emic to the etic.

When two and only two languages to be learned are engaged in a dyadic relation, there are only four outcomes when proficiency of each is concerned since a single language can only be in one of two states, improved or not. Therefore, when we have two languages, we have four cases or outcomes: both rise, one rises while the other stays or falls, or both stay or falls. Here 'rise' means a higher proficiency is reached, 'stays or fall' means the proficiency remains somewhat unchanged or falls back a little. It is the Either, Both, or Neither Rule (EBN Rule), applied here to refer to the result or outcome, in which 'Either' means at least one rises, 'Both' means both rises, and 'Neither' means both stay or fall. The four outcomes can be expressed mathematically by two sets of equations or relations. One relation is the direct proportion, that is, L2 rises as L1 rises, the Both; or L2 stays/falls as L1 stays/falls, the Neither. The other relation is the inverse proportion, that is, L2 rises as L1 stays or falls, the Either; or L2 stays/falls as L1 rises, the Either.

Both relations, or equations of proportions are expressed in Appendix D, [D.2] and [D.3]. If we choose to use the mathematical language of covariance, the second or additional language, L2, on top of or in addition to the mother tongue, L1, either improves with L1 or not. We here have two languages, and two relations or operations.

For understanding the problems of description and comparison, between two or more languages, the concepts of 'Emic' and 'Etic' are indispensable. In other words, it is necessary to pause personal judgment most based on personal experiences as observing the learning of a different language with an ‘Emic’ approach and switch to derived ‘Etic’ as describing the learning later. As indicated in Harris (1976, pp. 330-335), ‘Emic’ operations are the ones suitable for discovering patterns with respect to what goes on inside of people’s heads, while ‘Etic’ operations are suitable for discovering patterns in the behaviour stream. In other words, whether a construct is Emic or Etic depends on whether it describes events, entities, or relationships whose physical locus is in the heads of the social actors or in the stream of behaviour. However, behaviour eventually comes from the head, so it is reasonable to start with the head. Both Emics and Etics are needed (Jardine, 2004). I will start with the head or the brain, mine especially, for the Emic.

When a monolingual L1-speaker learns an L2 as an additional language, there are only a limited number of thinking processes or routes going on between the two languages in his or her brain. The L1-speaker may mainly think in L1 and turn most of the L2 into the L1. The L1-speaker may also think in L2 when his or her L2 has reached certain proficiency, and turn his or her L1 into the L2. There is also a third process, what Wardhaugh terms ‘a third code’ (2010-1986), more complicated than the above two more direct and monodirectional ones. The L1-speaker-cum-L2-learner may also code-switch between the two languages, i.e., bidirectionally, and produce a language that is neither L2 nor L1, e.g., an L1 sentence with an L2 structure, or vice versa, or a mixture of both languages. This is a thinking process of which even the language learner may not be fully aware, nor can the language learner gain full control.

Starting with direct proportion and inverse proportion, we can see that the total number of relations is exhaustive. That means the only exception is the ‘third code’ or ‘new form’ that is neither L1 nor L2. The words ‘third’ and ‘new’ here both refer to a form of language that is neither L2 nor L1.

In the Emic variation between two and only two languages, when L2 rises, L1 either rises or not, i.e., stays or fall. The improvement for L2 needs to be maintained if L2 is to be learned, instead of being burned. The fall or stay of L2 needs to be eliminated if L2 is to be earned, instead of being turned into the L1, resulting in either forgetting the L2 (nonlearning) or corrupting the L1 (mislearning). The L1 also goes through the same or similar process, when L2 has reached a better proficiency.

The thinking of the language learner can hardly be controlled by the learner herself or himself. The Either, Both, or Neither Rule (EBN Rule) applies here as well. An L1-speaker, while learning an L2, may think in L1 mainly, or L2 mainly, or in a mixture of both L2 and L1 inconsistently, or think nothing at all. This will lead me to the Etic version.

The etic version.

The Etic version, the meaning of which is similar to that used by Harris (1976, p. 341), refers to all interactional alterations, or all possible alterations that this section can include based on the dyadic relation between the two languages, L2 and L1, with each one at either end of the continuum.

By combining the two proportions, direct and inverse, I can derive 24, or 48, or more variations. Those variations can be viewed in a metaphorical manner as the firing of one neuron to the next, as one neuron and the next neuron that is linked is in a dyadic ordering relation. That means the firing only goes from neuron A to neuron B, but not vice versa. This has been discovered in neuroscience. For the purpose of simplicity, I will remove all the mathematical calculations and summarise here the results of the variations.

More variations, but same results.

As all the Etic variations are based on the Emic version and the dyadic ordering relation based on neuroscience that one neuron links to another but not vice versa, the Etic version gives more results but of the same kind, the Either, Both, or Neither Rule (EBN Rule). The L2-learner can only think in L2, or L1, or both, or not thinking at all.

In such a dyadic relation, both can excel if the language learner is willing and wants to, but it takes more time and efforts, obviously. On some, or many occasions, it is not worth it for the L2-learner to excel in both L2 and L1, since there is the more serious problem, or waste-of-life problem, of double-learning or duplicative learning in both languages for the same or similar knowledge and/or skills. The L2-learner may also choose to learn nothing, i.e., neither the L2 nor the L1 will rise, which is an impossibility since the language learner has to survive in the real world by using and improving at least one language. That leaves most of the language learners and users with only one option out of two, which can be expressed as ‘one up, one down’, or ‘L2 or L1’, or the Either. As this dissertation will argue, on some occasions, L2 is used and improved, while on other occasions, L1 is used and improved. In between the two extremes, there are occasions when both are overlapped, though any overlapping may indicate a waste of time and life because of double-learning.

Such a result can be used to explain many of the current known issues in second language acquisition (SLA), such as interlanguage, fossilisation or stabilisation, or errors made by language learners. It may also direct future learning and teaching, if not research, of second language acquisition or instruction in addition to one and only one mother tongue.

Question 3: Reaching efficiency of learning an additional language

The third research question is duplicated below for reference.

3. In what ways can the efficiency of learning an additional language be reached or at least improved based on the dyadic relation between a first language and a second language? In this research, the phrase “dyadic relation” refers to a relation that connects two and only two identities or elements, while such a relation can be expressed linguistically, mathematically, logically, and conceptually.

Language learning, second (L2 or M) or first (L1 or T).

Learning is often defined as a change in behaviour due to experience (Chance, 1999-79, p. 19), or in an expanded version, as a process by which change in behaviour, knowledge, skills, etc., comes about through practice, instruction or experience and the result of such a process (J. C. Richards, et al., 2002-1992).

For research question three, this section explains the relation between two languages, L2 and L1, using selected mathematical and logical tools for thinking. If L2 is viewed and used similarly as L1, L2 should at least be learned to a similar proficiency level as that of L1 and be treated and nourished as much as L1, so that a comparison can be discussed. ACTFL suggests that second language education, including language learning, contains five C's, i.e., communication, cultures, connections, comparisons and communities (American Council on the Teaching of Foreign Languages, 1996). For all the five C's to be functioning, a language needs to be learned through the traditional four language skills of speaking, listening, reading, and writing, in which commonly-seen order 'writing' has been, as always, considered as the 'fourth' language skill (Seaton, 1982). As L2 and L1 are two different languages, usually learned at different ages and stages, and the order matters, one order (*LSRW*) of the skills to be learned could be more pertinent to the development of linguistic literacy in L1. The young listens first for months if not for years, then speaks for many years before learning to read and write, usually reading before writing. Hence *LSRW* is for the order of learning the mother tongue. Some literature replaced listening with understanding (Esser, 2006; Gunderson, 2008; Minguez, Baidak, Harvey, Longo, & Holdsworth, 2000), but as understanding is used inconsistently to refer to either listening or both listening and reading (Council of Europe & Council for Cultural Co-operation. Modern Languages Division, 2001), the interpretative mode, therefore, listening is the one used in this research, especially for novice second language learners. However, in order to emphasise the result of listening, or even the higher proficiency of listening and understanding unconsciously, both listened to and understood, or even better, heard and also understood, another term, hearing *H*, may also be used

Figure 7 5 Cs, 4 skills, and 3 modes (2000) to refer to listening *L* interchangeably, despite some scholarly difference between listening and hearing (Beck & Flexer, 2011).

For the development of L2, the order of the four skills should and might be reasonably different from that of learning or rather, acquiring L1, for three groups of L2-learners divided by age or school years, the elementary schoolers, the secondary schoolers, and adult learners. For younger learners, before the Critical Period (CP) around puberty (Bista, 2008; Ioup, 2005; J. C. Richards, Platt, & Weber, 1985; Rothman, 2008; Schouten, 2009; Singleton, 2005; Tran, 2009), those primary or elementary school pupils learning child Target (cT) languages, the order can be similar to that of L1, *LSRW*. For adult learners after Grade 12, in tertiary educational institutions or not, the order of *RLWS* or *RLSW* seems more pertinent. This group of adult students may only need to gain information from an L2 by reading and listening, or listening and reading, though listening to an L2 is usually more difficult than reading in an L2, especially for those starting to learn L2 after Grade 12. The reason is that reading provides more time for thinking, or more effort to refer back to the text and consult dictionaries. Some adult second language learners may remain listeners-speakers only, without becoming readers-writers. Therefore, for most or more adult second language learners, reading comes before listening for older L2-learners. The order of writing-then-speaking or speaking-then-writing or both happening somewhat simultaneously depends on the needs of the adult students.

cT<CP	**cT<CP<aT**	**CP<aT**
Primary/Elementary	Secondary	Tertiary
LSRW	*RSLW*	*RLWS or RLSW*

Table 9 Preferred order of learning the four language skills

For those after the Critical Period but before Grade 12, i.e., between child Target (cT) language learners and adult Target (aT) language learners, the order of learning an L2 can be again somewhat different. Secondary schoolers would have to speak and hear the L2 as they also need to survive outside of classrooms, relying much less on their parents or guardians. They may, or most of them may, have to follow the order of reading-speaking-listening-writing, with an extra emphasis on the speaking-listening segment between reading and writing after they are able to read. They need the two skills of speaking and listening or hearing, the oracy or orality skills, to survive their schooling, as well as their daily lives outside of school, i.e., both academically and socially.

Before they start their speaking-hearing skills, they may have to start to learn to read first, i.e., their textbooks, since many of them may not have learned any second language in a written form before, and listening to the new sound may not help them much as well. After they have gained some reading-speaking-listening skills, especially reading, they may have to develop the writing skill to finish their assignments in or outside of classrooms.

The following section will follow the order of reading-speaking-listening-writing, an order of L2-learning the pertinence of which in secondary education seems to render more evident towards the end of this dissertation.

Reading.

Practically and preferably the four skills cannot be separated, but can only draw more emphasis on one or more skills during specific learning processes. For most of the L2-learners, starting at secondary school level (Grade 7), they need to gain knowledge in L2 by reading materials or textbooks in L2. Though an integration of the traditional four skills of language learning is called for (D. Li, 1997) and the division of the four skills is artificial (Krashen, 1981, p. 100), reading is the starting point at this age and stage. The reason is that most of the ESL students at secondary school need to read L2 to finish schooling and to catch up with local students, as well as learn L2 as perhaps a new and an additional language. Besides, reading is perhaps the easiest of the four skills to start with (it provides more time to think and re-read) compared with listening (it requires instant response or understanding), especially with a language written in only dozens of letters.

It has been confirmed that reading skills are related to more years of education (DuBay, 2004), which means that when one has better reading skills, she or he tends to remain longer in education. We may reasonably conclude that one tends to read more when the subject is more appealing, when one is engaged in a specialty, or when one is spending more time reading since their reading skills are better developed. For the purpose of reading textbooks in a new language to finish secondary education, an L2-learner in secondary schools starts with reading for listening is more difficult.

One research study conducted by Lipka & Siegel (2007), an examination of the reading skill predictors of grade three native-English speakers (NESs) and ESL students (ELLs), found that while five key factors (letter identification, lexical access, phonological awareness, syntactic awareness, and sentence memory) were significant for NESs, only two (letter identification and sentence memory) were significant for the ELLs (in Howard Research & Management Consulting Inc., 2009). This result indicates the difference between NESs and ELLs but did not provide more information on the reason behind their research.

It is intuitively correct for me to notice that if the five key factors are ordered from the smaller units, i.e., letters, to the larger units, i.e., sentences, what is significant for L2-learners is the smallest and the largest units. Does it mean that ELLs are not able to recognise the factors of lexical access, phonological awareness, or syntactic awareness, the intermediate units between the smallest and the largest, or they have to grow older to recognise the significance of those three factors? However, this research evidently indicated the difference between L2-learning and L1-learning, in reading.

In other words, ELLs have to learn the skills to turn letters to lexicons, then to pronunciation, then to grammaticality, leading to sentences. Missing the three intermittent key factors is likely one of the reasons that ELLs cannot or do not learn the L2 adequately.

Speaking.

My intention to talk about speaking after reading is to show that many L2-learners, especially in secondary education, actually have to learn to speak L2 after, or immediately after, they have begun reading in L2, unlike younger or earlier learners of L2, who start to speak while hearing the L2 without being able to read. For some teaching methods that stress both reading and speaking, there is obvious difference in timing, since learners have to have something to speak about, and this ‘something’ is usually from reading or listening. In other words, without input, there will be no output.

Speaking skills are the ‘face’ of a language learner, either in L2 or L1. In schools, the ability to form and maintain relationships and to collaborate and extend learning through interaction with others is closely tied to listening and speaking skills (Alberta. Alberta Learning. Learning and Teaching Resources Branch, 2003). For one thing, pupils’ lack of competence in speaking skills had a ‘negative impact on their confidence and enthusiasm’ (Evans & Fisher, 2009). For another, American culture emphasises speaking skills (David M. Kennedy Center for International Studies, 2006-07). Take China for an example. In a study on the regional differences in teaching English in China, Hu concluded that in many cases emphasis was placed on the development of reading and writing skills at the expense of listening and speaking skills (2003). There has been relatively little research on speaking skills and on the development of speaking at different language levels, as reported by Huang (2006). It is possible that speaking skills are the most difficult to acquire, since speaking is an active skill, requiring students to combine the words into sentences without preparation, and leaving no time to revise. In other words, speaking is instant, different from writing.

For most native L1-speakers, speaking skills are acquired earlier, after which, native L1-speakers learn to convey information and express their own ideas in written form, such as showing an ability to write short, simple texts on given themes appropriate to the addressee and expressing an opinion or a judgement (Minguez, et al., 2000). For most of the native L1-speakers and L2-learners, a few core standards are developed by Common Core State Standards Initiative (CCSSI) (2009) to describe the particular speaking skills that students will need in order to use media effectively in college and careers, one of which is multimedia comprehension:

> When speaking, students can draw on media to illustrate their points, make data and evidence vivid, and engage their audiences. (p. 9)

In other words, even technologies used in college and careers cannot but have to be learned or relearned if students are to go to college or start their careers, both L1-speakers and L2-learners alike.

Speaking skills and strategies of the secondary school students usually mean the demonstration of a range of the following: establishing a context, plot, and point of view (which I may call scene, or setting); posing relevant questions sufficiently limited in scope to be competently and thoroughly answered (I would use the two skills to represent them, both speaking and writing, presentational or output); developing an interpretation exhibiting careful reading, understanding, and insight (I would put these skills within reading and listening, interpretative or input); engaging the listener and fostering acceptance of the proposition or proposal (I would say it is mostly speaking); and theorising on the causes and effects of a problem and establishing connections between the defined problem and at least one solution (California Department of Education, 2007) (I would here refer to mainly writing).

They are expected to demonstrate a range of speaking skills and strategies that includes, for example, describing complex major and minor characters and a definite setting; using a range of appropriate strategies, including dialogue, suspense, and naming of specific narrative actions; using their own words, except for material quoted from the source, in an oral summary; and including evidence generated through the formal research process for a research presentation (California Department of Education, 2007).

How do students develop their speaking skills to reach the above goals? Students develop speaking skills through a variety of informal and formal experiences: discussing issues in small groups, performing monologues, debating, audiotaping news items, hosting ceremonies and so on (Alberta. Alberta Learning. Learning and Teaching Resources Branch, 2003).

During the process of developing their speaking skills, students should be able to match their voice modulation, tone, and pacing to the purpose of the presentation. There are also three elementary rules suggested: speak audibly, speak clearly, and maintain eye contact with your audience (California Department of Education, 2007).

No matter where L2-learners are, for survival or communicative or professional purposes, the mastery of listening and speaking skills can be given priority while writing skills come second (the Curriculum Development Council, 2008). That means even if L2-learners started with written languages, i.e., starting to read first, they have to catch up with their speaking skills, and listening skills, for their survival at least.

Listening or hearing.

I have not found much literature that has mentioned the dyadic relation between speaking and listening, especially regarding secondary schoolers. Such a relation between speaking and listening can be, but not limited to, whether speaking promotes or demotes listening, or vice versa. At least we know that reading and listening skills reinforce each other (Yalçınkaya, Muluk, & Şahin, 2009), both being in the interpretative mode. It is not mentioned that one skill physically and experientially generates the other. However, if one speaks more L2, one definitely understands L2 more when listening to it in an accent not distant from one's own. If one speaks Canadian English, British English, American English, Australian English, or New Zealandish English, one definitely understands those accents when listening to them. What is more, the more L2 one speaks, the more one definitely understands oneself, or one's own L2. Therefore, if one wants to enhance one's listening skills, one needs to enhance one's own speaking skills first and foremost. My favourite metaphor is, if one is able to lecture orally on the complete set of *Great Books of the Western World* (Adler, Fadiman, Goetz, & Encyclopaedia Britannica inc., 1990), a total of 61 volumes on 37,844 pages, without referring to one's notebook, one is definitely able to understand anybody talking based on the content of the set, pending similar accents.

Do not expect listeners, especially native speakers, to tolerate one's 'special' accents, because, they do not (Leonard, 2014).

Not only will more practice of oral skills contribute to the gain of fluency (Serrano, 2007), research indicates that speaking and listening skills are crucial to the development of a child's strategies for learning mathematics, a process in which language is a vital element (Williams, 2008). That is probably why the development of pupils' speaking and listening skills, and the strengthening of oral and mental work, are deemed core principles of the mathematics strand of the Key Stage 3 Strategy (Department for Education and Skills, 2004). I can reasonably assume that oral skills are also crucial to the development of a student's strategies for learning other school subjects, since most of them (except perhaps, the playing of a musical instrument) would depend on language as a vital element.

It is also known that for the enhancement of listening skills, the concentration of instruction hours seem to have a beneficial effect, as well as intensity of exposure (Serrano, 2007). And the instruction and exposure are and should be all in the L2, i.e., the metalanguage and the language should be one and the same.

In certain cultures, there is no direct relationship between spoken and written characters or scripts (unlike Western languages) (Minnesota Department of Education, 2007), which poses problems for students from those cultures when they switch from reading-heavy to listening-heavy cultures. For example, American culture emphasises speaking skills, while Chinese culture emphasises listening skills (David M. Kennedy Center for International Studies, 2006-07). However, listening to English or any language as a second language is quite a different matter.

Despite the fact that listening and speaking skills have been emphasised by several of the ESL programmes and services locally (Language Assessment Referral and Counselling Centre LARCC, 2009-2010), some students do not get many opportunities to practise using the language, particularly listening and speaking skills (D. Li, 1997) in their own cultures. Their listening and speaking skills in English have been neglected, and thus they have not had much time to communicate orally in English, which has led to their deficiency and lack of confidence in oral English (D. Li, 1997). For those students, an avoidance of the continual correction of mistakes, which can have a demotivating effect (Minguez, et al., 2000), is necessary.

Writing.

Even though writing is admittedly the most difficult of all four skills especially in the L2, it should be introduced from the very beginning of instruction (Minguez, et al., 2000) for L2-learners together with other skills. Written language is based on spoken language. Consequently, a foundation in spoken language must be established before reading and writing are introduced (Minnesota Department of Education, 2007), mainly for L1-speakers. ESL or L2-learners, when they are in Grades Seven to Twelve, may need to start from reading unless they have learned some L2 already, and they need to turn their reading into speaking and writing all along the way.

The skills learned in L1 may be transferred to L2, but research data suggested that about six months of formal education in the L2 were necessary before L1 writing skills were available in the L2, a result that suggests the operation of a linguistic threshold (Wolfersberger, 2007). Another earlier research conducted by Dong (1998) has reached a similar conclusion.

Research by Wolfersberger (2007) also indicated controversially that writing can draw upon skills gained in reading, but improved writing skills provide no benefit for reading. At the same time, the other version of this theory goes in the opposite direction with reading drawing upon the knowledge and processes learned through writing. The controversies aside, from my experience, though the above research is the only support I found (Also Hedrick & Cunningham, 1995), I contend that writing generates reading.

Conversely, the absence of reading and, in particular, writing skills in the native language L1 has an independent (negative) influence on second language acquisition. Writing skills in the native language have a clear influence on L2 acquisition, which explains part of the effect of education and so constitutes evidence of the fact that education is actually an indicator of cognitive and cultural capital in general. This effect is (considerably) stronger for the acquisition of writing skills in the L2 (Esser, 2006).

Different cultures present different attitudes towards writing. For example, Latin, as a heavy influence on current grammars of many languages and the Grammar-Translation Method of learning languages, places a stronger emphasis on reading, while oral skills receive less emphasis. Non-Roman alphabet languages, such as Chinese, Japanese, and Russian, may require more time to develop reading and writing skills (Kean, Grady, & Sandrock, 2001-1997). Today Chinese schoolchildren normally take three years longer than Western children to learn to read and write, with most of that extra time devoted to mastering the symbols (Sacks, 2003, p. 5). Even native speakers may not be able to read and write. A 1992 nation-wide survey conducted by the US Department of Education found that 21 per cent of the adult population (in the US) did not have basic reading and writing skills, and eight million people were unable to perform even the simplest literacy tasks (Rosenthal, 2006). However, for both L1-users and L2-learners in the academic community, entering first year students often lack the writing skills to succeed (O'Riordan & Wach, 1998).

Summary of the four skills.

The traditional four skills are integrated and cannot be separated, though for the sake of language learning, some skills are emphasised earlier or more than others. For most of the secondary school ESL students and many adult language learners, the order of acquisition of the four skills should better be *RSLW* since they usually have already acquired the ability to read in their L1, which helps them to read L2. Starting with reading, they need to work more on both speaking and listening so that they will be able to survive in their school work and daily or social lives, i.e., understanding teachers and classmates when they speak, and asking questions interactively. The last skill, writing, which develops slowly, needs to be based on both reading and speaking and listening, so that they will be able to use the knowledge gained in reading and listening to finish their assignments in writing. The reason is that between speaking and listening, speaking generates listening, and between reading and writing, writing generates reading.

Duplicative learning.

Duplicative learning is a waste of time and energy in many cases. In language learning and teaching, if the same subject is learned at least twice in two or more languages, that is duplicative learning. We all know that practice makes perfect, but duplicative practice makes imperfect. Before detailed exploration of duplicative learning, I will first start with how the brain works.

The brain.

The brain and the language are related, but how and how much, especially how much is the brain working on the learning of an additional language? Recent research on the brain is even establishing its relation with our culture (Pagel, 2012; Seung, 2012). We know now that a drug that increases synapse creation might be ineffective for improving memorization, unless the brain also succeeds at eliminating the larger number of unnecessary synapses (Seung, 2012, p. 89). If synapses are not all and not always necessary, new synapses survive only if they are used to store memories (Seung, 2012, p. 89). Therefore, perfection is achieved not when there is nothing left to add, but when there is nothing left to take away (Seung, 2012, p. 108). Applying such understanding in the learning of an additional language in the brain, new information from the new language is definitely added to the brain, but something has to be taken away, until there is nothing left to take away for the additional language, thus resulting in the learning of a new language. Even in reading a different language in its written form, the brain is the organ of human thought, and within it the cortex is where our thinking happens (K. S. Goodman, 2012, p. 13). This is telling us that the brain thinks in a particular context, and that context has to be in a particular language, otherwise:

> [S]ubjects...could read and understand English print but lacked sufficient control of oral English to discuss what they read in English, although they could discuss what they read in their first language (K. S. Goodman, 2012, p. 8).

This is what I would call the case of L2intoL1, the target language is read, but mostly and unfortunately for the learning of it, into a format of one's mother tongue.

When the output of L2 itself is concerned, some cases are even worse. What is termed 'translated writing' refers to the written language in the production of which the L2-learners think in their L1 first then produce, more often than not, incomprehensible sentences in the L2. Through the filter of their native language L1, it only perpetuates poor English or a target language grammar and syntax (Sousa, 2011, p. 93), resulting in a 'third language' or 'nonsensical language'. That may mean when one or several synapses in L1 connect to eventually one or more synapses in L2, it is going to create trouble in the brain. The result coming out of the mouth is neither L2 nor L1, or erroneous L2 in the form or structure of L1, or vice versa. The Either, Both, or Neither Rule (EBN Rule) functions here again.

Avoid duplication.

If an L2-learner has already learned or studied in L1 a specific subject, let us say, physics, there is no need, usually for him or her to re-learn physics again in L2. That is duplicative learning. Here are some of the cases when duplicative learning happens.

If a male G8 student moved from China to Canada, and wanted to register in G9. Let us suppose after some assessment, the Canadian school authorities allowed the G8 student to study in G9, good for him. However, he did not learn much English back in China, so he has to catch up what was behind. One way to do that is for him to re-learn G8 or even earlier courses in English, an L2, though he has learned all of those in Chinese, L1, already. That is duplicative learning.

Another case would be that a female L2-learner, let us say, a university student in the second year, a sophomore, just started to learn L2, and resorts to translate all L2 into L1. As common sense tell us, she could not start with L2 on nuclear physics beyond her sophomore level, so she has to start with some very elementary English books. At the very beginning, everything in the L2 has to be translated into L1, and the translated L1 is something she has learned in elementary school in L1. That is also duplicative learning.

Should duplicative learning be avoided as much as possible?

Domains of learning.

Duplicative learning can be avoided, for one thing, when L2 and L1 are used in different domains.

Language learning: a stochastic process.

A stochastic process is a dynamical system with random fluctuations at each iteration or one that is influenced by random noise. The process is usually represented by a random variable that, at each stage in time, depends on its previous values and on further random choices (Darling, 2004). The process is neither deterministic, i.e., the next event can be calculated with certainty, nor random, i.e., the next event is totally free. Each event has a probability that depends on the state of the system and perhaps also on its previous history. If for event we substitute symbol, then a natural written language like English or Chinese is a stochastic process (Gleick, 2011, p. 225). According to the *American Heritage Dictionary* (AHD) (Houghton Mifflin Company, 1992), one of the origins of 'stochastic' is from the Greek *stokhazesthai*, which means *to guess at*. In learning a language, especially a new language when one already has learned a mother tongue, one may have to 'guess at' the meaning of the new language and its units based on what one has already learned, i.e., his or her mother tongue. The knowledge of the new language is built on that of the old language, knowledge built on knowledge (KonK).

Language is linear or one-dimensional (Chao 赵元任, 1968, p. 3). In the learning of a target language, one usually has to learn one L2-item or L2-unit after another, be it spoken as a sound or syllable or written as a symbol or shape. The 'nativeness' of the application of a language usually reveals that the native speaker of that specific language is well aware of the rules of that language, i.e., the statistics or probabilities of that language, which non-native speakers do not usually have a clue of, thus making all kinds of errors, especially 'non-native-speaker errors'. Most of the L1-speakers, when learning an L2, tend to translate the L2 into the L1 when reading or hearing the L2, a method named the Translation Method (TM). Using some of the tools to describe such a stochastic process, this section explores probability of how probable an L2 can be learned, or new information can be gained, if the translated L1 is used and sometimes, the translated L1 is also new information.

A Markov process.

A Markov process is a stochastic process which assumes that in a series of random events the probability of an occurrence of each event depends only on the immediately preceding outcome (Lapedes, 1978). In the learning of a linear language, whether an L2-item or L2-unit is learned, is determined by the result of the learning of the previous L2-item or unit, which is the intrinsic property of the

Markov process. The state vector for an L2-item to be learned gives the probabilities of the possible outcomes of a single act of learning.

The L2 to be learned, once translated into L1, ends up mostly in two subsets of L1, one is already known, the other is unknown. The unknown L1 is divided into those translated from L2, and those newly created in L1. However, what should be learned is L2, not L1. The only part that can be considered as being learned, is a subset of L2, not L1.

In a Markov process, the result of any trial, or an act of learning, is expressed as a state vector, and the result of the next trial, i.e., the learning of the next L2-unit, is obtained by multiplying the state vector by the transition matrix. The state vector with the property that it is unaltered when multiplied by the transition matrix is called the steady state vector for the Markov process, which gives us the ultimate result of a given Markov process. Each multiplication of the state vector times the transition matrix is called a transition (Bouldin, 1985, pp. 654-661). The state vector is also called the initial probability or initial state vector of the Markov process (Perera, Sonnadara, & Jayewardene, 2002), which is a row matrix that contains the probabilities at the outset of the experiment (R. Alexander et al., 2002-00) or of the learning, in Appendix D, [D.4].

The initial probability matrix or initial state vector or state vector has only two numbers. Representing the probability of L2 as unknown by 0 or 0.0 on the left side, and L1 as known by 1 or 1.0 on the right side of the matrix. The learning of an L2 as defined by Chance (1999-79, p. 32), is a change in behaviour due to experience. At the initial stage, all of the L2 is translated or translatable into L1, and the L1 is totally known. The change of behaviour is measured mainly by the speed of recalling the L1-match when the L2 is read or heard, or the speed of using L2 automatically and naturally when the situation requires it. Such method falls into the dichotomy of match or mismatch. The transition matrix, a square matrix that shows how the probability of one or the next L2-unit being learned is dependent on the previous L1-unit being learned, is represented by Appendix D, [D.5].

This transition matrix applies in the matching method or translation method. One feature of such a transition matrix is that the sum of the entries of each row is equal to 1.0 and none of the real entries are negative (Lapedes, 1978). Such transition matrices are also named stochastic matrices. Once we have found out how to express initial probability matrix and transition matrix, we can move on to find out the steady state vector, Appendix D, [D.6].

In this case, as all or most of the L2 are translated into L1, there is no steady state. What is left mostly is L1, and not much L2 is learned.

Thinking in L1

The state vector is unaltered, but the transition matrix is changing all the time with each new L2-unit learned. The learner is thinking in L1 most of the time, if not all the time, translating almost any L2-unit into L1, thus reducing the probability of learning and using L2 for a very long time. The result indicates that the probability of learning L2 is being constantly reduced. The steady state vector shows that the L2 is hardly learned while the L1 is being constantly consolidated. This method is equivalent to reviewing the L1 with the help of L2. The target language L2 can be learned, but with great efforts and more difficulty, if the learner is willing, as well as with a longer time spent on the learning, whether the learner is willing or not. The result of such language learning is reported by Ken Goodman (2012), indicating that the reading as input is achieved in English, but the speaking as output is only achieved in the first language, leaving the understanding unknown whether in the first or in the second language Appendix D, [D.6]:

> [S]ubjects...could read and understand English print but lacked sufficient control of oral English to discuss what they read in English, although they could discuss what they read in their first language (2012, p. 8).

Thinking in L2

Let us speculate that the thinking is somewhat reversed, and the L2-learner is thinking more in the L2 as long as an L2-unit is learned. After that moment, whenever a similar concept or situation arises, the L2-learner does not use or think L1 at all, unless the occasion requires that the L1 be used out of necessity, the L2 will be used and consolidated while the use of L1 and the thinking in L1 has been avoided or eliminated. The transition matrix, in this case, is different, as expressed in Appendix D, [D.7]:

When the learning starts, the L2-learner does not know the L2 but knows all the L1. He or she has to translate the L2 into the L1 as well. Therefore, the initial state vector is the same as Appendix D, [D.5]. However, as more L2-units are learned and accumulated in the learning, the L2-learner controls himself or herself to use those L2-units only or as much as possible, even though the L1-equivalents can be occasionally matched and/or recalled. Thus the second row of the transition matrix Appendix D, [D.7] is different from that of Appendix D, [D.5], with the probability of using and recalling the L2-unit greatly increased, while that of using and thinking the L1 reduced. Such a transition matrix is also referred to as doubly stochastic matrix since both the rows and the columns sum to 1.0 (Lee, Moore, & Taylor, 1993-81, p. 480). As I have found out in the following, now the steady state vector is going to be steady, as calculated to be 0.5677, Appendix D, [D.8].

The steady state is reached when an L2-learner had learned 7,673 L2-units, or words, which also represents the intermediate to upper intermediate level of proficiency (J. C. Richards, et al., 1985; J. C. Richards, et al., 2002-1992) in a second language, with a passive vocabulary being between 5,000 and 10,000.

Conclusion.

When there are only two languages, L2 and L1, and an L1-speaker is learning L2, there should, ideally, be only two ways of thinking, and of course, everything in between. The L1-speaker already uses L1 as a native speaker and mostly thinks in L1. The same L1-speaker may also think in L2 after an L2-unit has been learned. If the learner thinks in L1 and translates L2 into L1 most of the time, chances are that the learning of L2 will take a much longer time, or more efforts are needed. If the learner thinks in L2 even if the L2 is translated into L1 but the learner always uses the limited L2 to think whenever possible, chances are that the learning of L2 will take less time, or less effort. The Markov processes are based on the concept that the language learning is a stochastic process and the probability of whether the learning may happen can be calculated using Markov process matrices.

Summary

In this chapter, another circulation of this autoethnographic research is re-visited and new thoughts and findings are added to the three research questions. In the next chapter, a summative cycle will finish this dissertation.

Chapter 6

Discussion

As far as my personal understanding goes, the identity formation and construction begins with the creation or birth of a life, or even before that with the formation of genes from ancestry. On many occasions, the identity forms itself, a joint job done by both nature and nurture (Ridley, 2003). The literature review of autoethnography has provided me with more details of the construction and formation of the identity of other teachers and professionals. However, mine, and each one's, was not the same. For example, I did not find anybody that started to teach his or her own classmates or schoolmates in their junior or senior high school days, in exactly similar manner as a teacher, in a second language. Therefore, my own autoethnographic research has to start with a newer framework based on earlier ones (knowledge builds on knowledge, KonK).

'Know thyself' seems to be the starting point of an autoethnography as auto- begins the research method. The JOHARI Model (Afolabi, 1993) divided the self into four quadrants, the open, that both the self and the other know; the blind, that only the other knows; the hidden, that only the self knows; and the unknown, that neither knows. The Either, Both, or Neither Rule (EBN Rule) again.

In language learning and teaching, as well as in any learning and teaching, the identity of the learner and teacher, sometimes one and the same, facilitates the learning and the teaching, which works back on the formation and construction of the identity as well. I have been improving and perfecting my toolbox, or tools in the box, since the 1970s on myself first, and sometimes have gained a sense of satisfaction whenever the principles that I have been advocating helped some of my students or tutees. Although I know, either in the open or the hidden quadrants, that the learning and teaching of any language is mainly the job of the brain, of the self. The brain should also have an identity, though the study of that entity perhaps remains the job of neuroscience.

This autoethnographic research of my identity formation and construction has made me realise some of my own strengths and weaknesses as an English language learner and teacher. One of the strengths is to think both mathematically and bilingually. I know that other English language learners and teachers have perhaps achieved similar goals, and I can only hope that more others are willing to take the same steps that I have taken in an effort to improve English or any language learning and teaching, as well as writing autoethnographies in a second language.

The new journey of mine with an abrupt start and sleepless nights treading words has really opened my eyes to my identity as well as to the identity of others. Autoethnographer Ellis has done some revisions, or rather, re-visions, of her earlier visions. In her light, this last chapter of this dissertation will re-visit some of the discovered themes, and re-search the undiscovered, looking for insights and outsights, in the analysis (graphy) of the self (auto) and of the culture (ethno) (Ellis, Adams, & Bochner. 2013, pp. 247-264, Vol. II).

Introduction

As I have explained and understood earlier, autoethnography is the approach to put a solitary self, either fixed or flowing, into a bigger picture of people, race, nation, or culture, for a brief description, and write it down in a scientific manner to reveal the trait, or 'smallness' of a person.

I will start with a review of the findings, with the aim to look for whether anything has been overlooked. Then I will speculate on the contributions of this and such research to education, especially to language learning and teaching in the formation and construction of an identity. Looking back on what has been reached so far, I will review and reflect on some of the limitations of this research. Then I will speculate again on the implications this research can exert on future researches. The last section will review some of its significance in the formation and construction of an identity in the showing and telling of language learning and teaching.

Review and Overview of Findings

The findings of this autoethnographic research provide both outsights onto and insights into the depth and width in which I lived and was influenced as a cultural Chinese before 1988, and how I might have tried to influence other Chinese, English language learners and would-be teachers mainly. These findings further give a glimpse into my personal research of English language learning and teaching in China and in North America, and demonstrate how some new immigrants, Chinese or otherwise, can use my research as a guide to reclaim their identities in North America. Through my research, I was encouraged to challenge my beliefs about language learning and teaching, and some superficial notions of the racial Chinese identity, or ethnic Asian American identity.

Starting with the Chinese culture, for thousands of years, its cyclical rise and fall is the usual tick-tock of Chinese history (Ostler, 2005, p. 136), through which there was no interest in learning other languages out of sheer intellectual or linguistic curiosity (citing Mair, in Erard, 2012, p. 149). Those in one of the longest histories on earth were busy running ‘peasant uprisings’ most of the time, and did not have other time for language learning and teaching. The legacy of the writing system (Pinker, 2007, p. 192) of the Chinese language is closely linked with what I called a vertical culture. When I first searched ‘vertical culture’ on Google around 2000 there were only less than a dozen hits. Today, 17 December 2013, there are 69 hits when I juxtapose ‘vertical culture’ and ‘horizontal culture’. When I searched Adobe PDF files using the same juxtaposition, there are only 12 hits (Boyer, 1995; Kweon, Kim, & Yi, 2008; Sainio, 2007; Sim & Senna, 2012).

In such a vertical culture, when the peasants ‘uprose’ and became the emperor (used here as a symbol, not the ruler), they were usually, 99% of the times, at the lowest end of education and acculturation. They might be ‘street-smart’, but not ‘maths smart’, nor ‘language smart’, nor any or most of the current ‘academic stuff’ smart, even then. Then, as the ruler of the state and nation, they only did two things. One is the consolidation of their own power, by cultivating their own offspring and those who expressed ‘loyalty’ to them. The other thing was that they would ‘kill’ either physically or mentally those who helped them to gain power.

The vertical culture created such thinking that is very straightforward, those who helped the peasants to gain power, at other time and place, may help another group of peasants to gain power. Therefore, those helpers would, should, and could, all be killed or eliminated as much and many and completely as possible. From the short-lived dynasties of a few years, to the long-lived ones of about three hundred years, the emperor and the like behaved in the same manner, to aggravating degrees century by century, lasting two millennia at least. The better angels of our nature, or the emperor's nature, in the aforementioned vertical culture, unlike Pinker has summarised, has seldom been seen or recorded, even though the history was written by those in power, for perhaps three hundred years in each dynasty.

In the long history of thousands of years, the students in the vertical culture, receive, repeat, review, and reproduce (the Four R's) whatever they learned, not 'out of sheer intellectual or linguistic curiosity' or any other curiosity, but to please the emperor, mostly. Their meticulousness, memorisation, mental activities, and mastery (the Four M's) were used not to show and tell and share and help, but to 'hide the capacities and bide the time' (Chen 陈欣望, 1984) until the emperor could see and recognise them, for most of them. During such 'hiding and biding' preparatory time, not only would they stand on the heads of others, giants or otherwise, if there were any other heads that appeared more intelligent than theirs, they would find some of the powerful, or themselves, to 'behead' those heads.

Did they ever argue and debate on academic issues and other issues? Of course they did. They tried to imitate and copy Confucius in the learning and teaching of many subjects. However, many of the debates concerning major new intellectual issues, or any issues, were reduced to the level of power play, personal attack, and mean-spirited denunciation (Barmé, 1999, p. 267). That happened millions of time, perhaps billions of times, during the GPCR, as those Red Guards cited some of the quotations from Mao Zedong, to fight another group of Red Guards, citing another set of quotations from Mao, ending up beating or killing one another, physically.

Only after I started to use English to read and think was I able to figure out stories in vignettes A and B.

Eight translations for two languages.

In any culture, vertical or horizontal, or more of one or the other, education is provided. However, how can the emperor know who is loyal and who is not in the educational establishment of the vertical culture?

Very easy, just give them a lot of tests.

The rule of thumb is to make the complicated more complicated. In language learning and teaching, before the learners know any better, let them translate. The emperor (as a symbol, not a single ruler) would say, if language learners cannot translate L2 into L1, they are not serving this state and nation, nor are they serving the people, because the people do not understand L2. The emperor does not say: if they do not translate L2 into L1, they are not serving me.

Hence, translation and interpretation in language learning and teaching.

When translation, or rather, matching, has always been applied in the learning and teaching of an additional language, how many translations and interpretations are there? Let us do some very simple mathematical calculation.

If there are two and only two languages, and translation is defined as from input to output, and L2 to L1 is different from L1 to L2. Now for two languages, spoken and written included, we have altogether eight (8) different translations and interpretations. When there are 3 languages, there can be 24 translations and interpretations. Can those language learners catch up with their translations and interpretations? No, they are tired.

Therefore, translations or interpretations per se, especially good ones, are difficult to do, or to even practise, or even to imagine. On top of that, the process of translation is exactly the reverse of the process of learning a language, making translation even more difficult, aside from making a lot of errors in both the translations and the use of the language or languages. It is advisable that translation be only used at the initial stage of learning a new language, and be weaned off soon and completely. When at least two languages are learned to certain proficiency, e.g., mastery, translation or interpretation can be refreshed or picked up or resumed as an application. Anyhow, translation is only attained via double-learning, or polylearning if there are more than two languages.

If the language learners as so tired out by working on eight things, instead of, let us say, four, they can only form and construct tired identity.

One research has shown, in Leonard's (2014) study, that multilingual writers can switch and translate between and among languages, but it takes double the time.

Contribution to Educational Research

In the field of autoethnographic research, autoethnographers aim to touch the reader, evoke emotions, and provide alternative perspectives in viewing life (Bochner & Ellis, 2002; C. S. Ellis & Bochner, 2000-1994). However, life has to be viewed in many facets, not only words and sentences, but almost all things and events and people and interactions that contributed, known or unknown, to the formation and construction of identity. As I browsed the four-volume *Autoethnography* (Sikes, 2013), confessing that I did not read all the 80-some selections, I found artistic forms such as photos, black ones, of people, things, and actions. However, I did not find the application of another important language, mathematics, in the four volumes.

Of course we cannot perhaps swear in mathematics if it is a language (Wagner, 2009), but generalisation and abstraction are features of mathematical thinking, and they have their place in thoughtful human problem solving. There is value in asking what is always true regardless of context (Wagner, 2009). In reality, there are some people who do not solve problems, but find problems most of the time. However, to find problems also needs, if there are some out there who would join the folks, those problem-finders also need generalisation and abstraction.

I recall, though pending verification, that there was once a Nobel laureate in chemistry who had done all the chemical work but was waiting for the right mathematical tools to summarise all the chemical work. Once the tool was available, the Nobel was available as well.

I am not a mathematician, but at least I should be able to use some of the mathematics as a tool for thinking. When a conclusion or a claim is made, some people would like to know why such conclusions or claims are made, and those who concluded and claimed them have an obligation to provide some answers. As I was forming and constructing my identity as a language learner and teacher with deeper and wider understanding of how an additional language can be learned more efficiently, I tested my ideas and thoughts experiment with a sixth grader, my daughter, to see if she could understand the gist of the Either, Both, or Neither Rule. She did.

Therefore, the contribution that my current autoethnographic research makes to educational research is that the toolbox for future educational researchers may be added with another tool, a tool for thinking. Such a tool can be used in understanding how learning and teaching of an addition language, or learning and teaching of other subjects, can be perceived and achieved with better efficiency, while at the same time, the identity can also be formed and constructed with flexibility, fluidity, fixity, and efficiency.

For that to be reached, we also need union.

The union of the learner and the language (ULL).

Let me start with a scenario with one language learner, L, who has been growing up in the mother tongue, L1, until 18 years old and has graduated from a secondary school, having used L1 all those 18 years. Then, L goes to a 4-year university where only L2 is used to learn and study. At the L2 university, L has to use some L1 as an aid to learning to catch up with L2, or contents in L2. After 4 years studying in L2 when L is 22 years old, L graduated from the L2 university. We will compare the languages, L2 and L1, and the corresponding professional level or proficiency at different ages and stages. Now let us look at the following table:

Age		*L2-level*	*L1-level*	*L2 after*	*L1 after*
Student L	*@18*	*0*	*18*	*0*	*18*
	@22	*?22*	*18-*	*22*	*18-*
Questionable	*@22*	*?18*	*?22*	*?18*	*?22*

Table 10 L1 Student after four years at university in L2.

Now that L is 22 years old, his or her knowledge in L1 and corresponding professional knowledge in L1, such as all the school subjects up to high school, should be somewhat deteriorated since in the four years at the L2 university, L could but does not have the time to upgrade L1. He or she had to use all or most of the time and energy to catch up with L2. L's knowledge in L2 and corresponding professional knowledge in L2, should be, at least ideally and theoretically, similar to that of his or her L2 university fellow students, and all the knowledge, declarative and procedural, in L2 only, especially in his or her profession. Can L's language and professional level in L1 be up to his or her L2 level? That is highly possible but if such possibility becomes reality, that proves again double-learning in both L2 and L1 as extra cost has done that.

If this student is able to catch up in his or her profession at L2 university in L2, his or her social L2 is likely below age 22 [?22], and his or her academic L2 is at age 22, ideally. However, his or her social L1 and academic L1 should remain somewhat still at age 18.

Therefore, there are two, at least, unions of the learner and the language. Before age 18, the union was between the L1-user and the L1 at proficiency level 18 (age average) in L1, while after age 18 during the study abroad in an additional language L2, the union is between the L2-learner and the L2 at proficiency level 18+ in L2, ideally up to a level at age 22. Unless absolutely necessary, it is preferable not to double-learn in both L2 and L1, taking at least double the time.

Comparison of the Meaning with Published or Existing Studies

In language learning and teaching, or in identity formation and construction, Homo sapiens do all of the above for a simple reason, to survive. After they survive or have survived, they can and may decide to write autoethnographies for academic purposes, in their L1 or in their L2 or even Lx, depending on how well they manage to use each or all. In search for the world's most extraordinary language learners, linguist Erard (2012) uses the word 'hyperpolyglots' to refer to those who can use six languages or more in their daily lives to live, or to live happily. He cited political economist Joseph M. Colomer and mentioned the 'utility of knowing a language'. In Colomer's own article that Erard cited, the conclusion is that it appears that learning one foreign language is more efficient than translating in communities with up to five languages, while learning two foreign languages is more efficient than translating in communities with ten languages or more (Colomer, 1996). If by knowing and using two languages, one can survive up to five languages, some may ask: why do we need to know six languages?

With over 1.5 billion people using English in this world to some extent or in some areas, English is a lingua franca and a globish (McCrum, 2005). If about three-quarters of the world's population live in countries where an alphabet or alphabet-based script is the national writing system (Sacks, 2003, p. xiii), it is much easier for those to learn English, forming and constructing their identity or otherwise. Linguist Crystal contends that it is obvious that anyone who lacks the ability to express English formally, with control and precision, is at a serious disadvantage in modern society. But the opposite also applies: anyone who lacks the ability to handle the informal range of English usage is seriously disadvantaged, too (2004, p. 9). So English covers both the social and the academic, both the personal and the professional.

For the identity, many people with little education or intelligence seem to have selves of obvious integrity, authenticity, and honesty (Peterson & Seligman, 2004, p. 265). If that is the case, being educated, or well-educated, does not necessarily mean that those in there are good people, including prolific writers and readers.

During the GPCR, there were many cases of Red Guards beating and killing people, as more and more of those are being revealed on the Internet. Those Red Guards never publicly confessed anything, and their children and grandchildren are now 'filling the earth and be plentiful', carrying with them some genes that may carry with them the same or similar genes. As the library is the books' way of keeping books, those people are the genes' way of carrying on, and this goes on and on. It is also an identity, of the Red Guards and their offspring.

Of course, the greatest benefit of learning to read and write in two languages is the obvious benefit of biliteracy (Escamilla & Hopewell, 2011). However, learning an additional language or forming a new identity obviously takes time and energy.

Nobel laureate Kahneman noticed that we can be blind to the obvious, and we are also blind to our blindness (2011, p. 24). What is less obvious is the paradox of learning (Schöne, 1987), when an additional language, a really new competence, or a new identity, is being learned or formed, the learner or student cannot at first understand what needs to be learned or formed.

To learn the unknown with the unknown, until the unknown becomes the known, is the time when real learning happens. Before that happens, there is not much learning. When there is not much learning, that is, we are prone to blame decision makers for good decisions that worked out badly and to give them too little credit for successful moves that appear obvious only after the fact (Kahneman, 2011, p. 203).

In reference of the above, this autoethnographic research added some newer thoughts and tools to the current status quo, if no obvious improvement is foreseeable.

Reflections and Limitations

In language learning, it is mainly the visual and the auditory learning styles that prevail, proven by research on the brain, with only two routes to meaning in the brain, i.e., from sound or from vision or sight (Dehaene, 2009), to an area Dehaene named ‘letterbox’ which understands whatsoever is heard or seen, or learned.

Formula for L2 learning.

There is no magic formula for learning a second language, or for that matter, learning anything. What is suggested here is a conceptual formula for learning that can be used to explain acquisition of a second language. This formula is based on the fact that there is a dyadic relation between two and only two languages, L1 and L2, or two factors, i.e., what is known, and what is unknown and to be learned, i.e., knowledge built on knowledge (KonK). It is assumed that for a very long period of learning the user is unable to learn the whole of L2, but only a part or subset of L2 that is learnable for the specific learner or user during a specific span of time. The learnable part indicates that it will remain a subset of L2 for quite some time, until the learner or user is able to create something new and correct out of the target language. Besides the learnable subset of L2, there remains another subset of L2 that the learner cannot or has not learned yet. Therefore, we can derive the basic formula for learning an L2 as such T=t+(T-t), Appendix D, [D.9].

The target language to be learned, being learned by the learner or user, becomes a subset of the same language that the user has learned plus another subset of the same language that the user has not learned yet.

The learner learning what is to be learned results in what the learner can learn and has learned plus what the learner has not learned or cannot learn.

When a second or target language is being learned, for most of the beginning or novice learners, with the exception of very young children, a subset of the mother tongue is used as a helper or mostly a translated helper, linking the target language, L2, to the learner or user, T+m=t+(T-t)-m, Appendix D, [D.10].

What is to be learned L2 or T, with the help of a subset of the L1 or m, results in what the learner has learned, t, and what the learner has not learned yet, (T-t), at the same time reducing the interference or 'duplicative knowledge' from part or subset of the mother tongue, -m.

The discrepancy between the two m's on either side of the equation can be explained by the following reasoning. The m is theoretically and ideally neither to be learned nor to be reviewed or relearned (doubly learned), since it is, most of the time, what the learner and user already knows so well. Therefore, m as a helper is to be removed from the result of the learning of L2 or T, which is the sole purpose the learning, expressed on the right side of the equation as -m (negative m). The outcome of the learning should and should only be either what is learned, t, or what is not learned yet, (T-t), while the review of the m, even if as a helper, is a waste of both time and efforts, and even life, on the part of the learner or user, for the purpose of learning L2 well. The reason for the above statement is that when there are only two languages being learned, there will be only four results, and to excel in both would be possible but very time-consuming and effort consuming, and sometimes even very life consuming.

Break-even point.

If T+m=t+(T-t)-m, then T=t+(T-t)-2m.

If t=2m, then T=T-t, and t=0.

This would be called the break-even point in the process of learning an additional language, where effect of t on the review of m is eliminated or cancelled out. At the break-even point, the learner has learned some t, but m is applied in translation, or explanation, etc., as a helper twice, or doubly reviewed, in order to learn about half the total amount of 2m. If the learner knows this result and works hard to truly learn t, double the time or effort is needed to compensate for 2m, reaching the break-even point as soon as possible.

Efficiency.

As defined by Chiswick, Lee, and Miller (2004), efficiency refers to the extent to which a given amount of exposure to English produces language proficiency. Another term related to efficiency is optimisation, defined by Vaknin (2007) as the securing of maximum results with minimum invested resources and minimum damage to other resources, not directly used in the process. I have chosen to use a simple definition (Gray & Isaacs, 1975) represented by the Greek letter η, eta, Appendix D, [D.11].

In our formulae for learning in SLA, the output, the input, and the losses are shown in the following table.

	Output	*Input*	*Losses*
L2 or T		+	
t	+		
T-t			+
m	+	+	+

Table 11 Output, Input, or Losses?

Using the equation for efficiently, the result shows that in SLA learning efficiency is better achieved using L2 only, though m can and sometimes has to be used as a helper at the initial stage of learning L2. The effect of m is better reduced to the minimum as early as possible.

Proficiency.

In language learning, proficiency usually refers to language proficiency: the degree of skill with which a person can use a language, such as how well a person can read, write, speak, or understand language (J. C. Richards, et al., 2002-1992). Consequently, we have conversational or oral proficiency and academic proficiency (Valdez & Callahan, 2011). Cummins and Swain (1986) argued there are two basic kinds of English a learner has to learn; ‘basic interpersonal communicative skill’ (BICS) and ‘cognitive academic language proficiency’ (CALP), the language of instruction and academic texts. BICS appears to take about 2 to 3 years to develop and CALP about 5 to 7 (cited in Cummins, 1999; Gunderson, et al., 2011).

In the learning of a language, or for that matter, any knowledge and skills, parsimony or Occam’s razor (A. A. Hill, 1980, p. 251) is one of the principles in learning, unless one is determined to double learn or overlearn. The principle of parsimony can be stated as: the utilisation of a minimal set of (mostly known) assumptions, constraints, boundary conditions and initial conditions in order to achieve maximum explanatory or modelling power (Vaknin, 2007). Based on this principle, the pathways to the brain, in a second language, the target language to be learned and to have learned well, can better be built and efficiently built by the target language, mostly the target language alone, with as less help from the mother tongue as possible.

Conclusion.

When a target language is being learned, there are two results only, either a subset of the target language is and has been learned, while the rest of the target language is not and has not been learned. For most of the language learners, it is their purpose or aim to have learned the target language, not to delearn it, or mislearn it, or dislearn it, nor double-learn it, but without much of it being learned. Besides, for most of the novice language learners, the mother tongue has to be used as a helper to learn a target language. The use of the mother tongue more likely than not reduces the efficiency in learning a target language, or duplicatively adding an extra layer between the target language to be learned and the language learner. If there are only two languages, it is better to improve one, or the other, in different domains or on different occasions, instead of excelling in both, reaching a higher proficiency in both, which is difficult for most language learners. It is better to seek both proficiency and efficiency by stressing one language in one domain.

Limitations.

This autoethnographic research centres mainly on one and the same researcher and participant. Therefore, it is not universally applicable. Readers of such researches might be warned that reader discretion is advised. Besides, the formation and construction of identity, as well as the learning and teaching of an additional language, are all multifaceted transnational, transcultural, transcendental, transracial and trans-ethnical, and translingual dimensions.

The researcher also has to keep a very open mind, revealing many seldom talked about ideas and topics willingly. Academically, the professional vocabulary is limited as more emphasis in autoethnography has been laid on the ethnographic and social, communicative, and literary. Socially, this method requires that the researcher has better ability to handle vocabulary in social or everyday life and activities, rendering it a challenge for second language learners.

This research only sets out to discover some of the facts and concepts related to the efficiency of language learning, teaching, and using. Readers are at their disposal to choose Either, Both, or Neither (EBN Rule) to develop their own identities without restrictions in Canada or the USA thanks to freedom of speech. The choices are open therefore are not detailed in this research.

Foreign language learning, according to some literature (Loewen & Reinders, 2011), is different from second language learning in the amount of exposure but not qualitatively different from each other. Although the understanding of this research can be applied in foreign language learning, the detailed difference of the 'amount of exposure' is unknown, therefore, not dealt with.

Implications for Future Research

The language is a very important, if not the most important, tool for the formation and construction of an identity, especially for new immigrants or any language learners in a second language. The dyadic ordering relation of the two languages, L2 and L1, reveals merely three relations, the Either, Both, or Neither

Rule (EBN Rule), which can be mathematically expressed by either a direct variation and/or an inverse variation, Appendix D, [D.2] and [D.3]. The two variations have included or covered or exhausted all the possibilities between the two languages in a continuum. When one rises, the other either rises or falls, although not causally but relationally. Future research might add the detailed calculation of the coefficient k in the two variations so that the expressions will become more mathematically accurate rather than conceptual.

Since an L1-speaker, while learning an L2, may think in L1 mainly, or L2 mainly, or in a mixture of both L2 and L1, the thinking process and direction is worth further exploration, which is one of the objectives of this research for only a start. The issues planned at this stage of the research will tentatively include the following:

The Etic version of language learning only explores possibilities of the extremes along the continuum from learning to nonlearning of an additional language. Detailed Etic version between the two extremes, as well as the ‘Neither’ will be the focus of future research. Thinking in multidimensions and pathways to the brain should also be further developed. The brain may think in multidimensions, but when there are two and only two languages, the brain can but only think in one, or the other, or both, or neither, making errors or what not. It seems thinking in only one language is the better solution, unless one does not think at all.

The Last Word Hypothesis is the result of the Translation Method (TM), or the matching method. In TM, language learners tend to match the target language L2 with the known mother tongue L1. Such a method eventually leads to the last and final set of words or phrases, out of the limitation of their memories and the almost complete insensitivity to variations of risk among small probabilities (Kahneman, 2011), they will reach their Last Word, or the plateau of learning, or fossilisation, or stabilisation.

Language learning is a Markov Process. In knowledge built on knowledge (KonK), the new item learned is affected by the previously learned item or items and the whole language as a system, viewed in a Markov process, which can be calculated based on the Last Word Hypothesis to prove that thinking in one language instead of two is more feasible. There could be other hypotheses or models that need to be further explored.

The life of an individual is short, so efficiency in working on or learning an additional language, or forming a new identity, is important. The efficiency in language learning and teaching can be increased by reducing the duplication of learning the same or similar knowledge or skills in two or more languages.

The formation or construction of an identity needs information, which is measured by entropy. The entropy of L2 is and has been measured only in L2, not in L1. At the current moment, what is revealed to me is that the information content in L2 is not commensurate with that in L1, according to Kolmogorov (1983). If that is the truth, then the formation and construction of identity in L2 by L1, or understanding L2 in L1 or by translation from L2, would be very dubious, if possible at all.

By the Either, Both, or Neither Rule (EBN Rule) and support from literature, when TM is used, L2 or L1 will be affected, but to what degree and how much? If such influence or negative transfer is to be reduced early, what is the cost? This research may raise a lot more new questions for future research. By only considering the learning of an additional language, one measure of the Either, Both, or Neither Rule (EBN Rule) can be the size of the control of economy by those language speakers. For example, according to one estimate, the 51 million overseas Chinese control an economy worth $700 billion—roughly the same size as the 1.2 billion mainlanders (Ostler, 2005, p. 161). That is only one of the measures, though.

Using mathematics as a tool for thinking, and for future researchers, a tool for calculation, the maximum proficiency of L2 reachable compared with L1, or the maximum corruption or corrosion on either L2 or L1 may be calculated using some formulae.

By the same token, if interlanguage is governed by the Either, Both, or Neither Rule (EBN Rule), can it be calculated? If it is systematic, can it be foreseen to be avoided or reduced? How to achieve or approach native-speaker or ultimate L2 competence, if the language learners want or are willing to? Even if ultimate attainment is difficult or impossible for some language learners, it is reasonable to search for or research on some possible principles and methods to help language learners see some light in their pursuit of language learning by providing some evidence that quick improvement, or reduction of errors, is possible.

Conclusion

Human nature hasn't changed that much during the past 2,000 years, contends linguist Crystal (2004). If identity can be formed and developed (Erikson, 1968), and is changeable, it is not the same as human nature. In the review of literature, this research only touched upon some identities. However, the thinking of generalisation and abstraction tells us that there are so many identities that one research cannot study them all. Closely related to this autoethnographic research are linguistic identity and cultural identity, bound with two Either, Both, or Neither (EBN Rule) languages, L2 and L1.

A table may be helpful.

	L2 identity	*L1 identity*
Cultural identity		
Linguistic identity		

Table 12 Two languages and two identities.

The same Either, Both, or Neither Rule (EBN Rule) applies.

What is obvious in this table is that one can only form one identity in one specific language in one specific culture. One of the language learners of the Chinese language has a book published (McDonald, 2011), entitled *Learning Chinese, Turning Chinese: Challenges to Becoming Sinophone in a Globalised World*. That book clearly indicates that if one wants to acquire an L2 identity, it can only be done via L2 as a language and in L2 as a culture.

It is not the time for a Globish identity yet, which may take some years, decades, or centuries. Even if there is a Globish identity, it is also formed in the Globish language, and in the Globish culture.

Identity formation is achieved by many means, consciously or unconsciously. A similar idea that is often used in juxtaposition with formation is construction. Construction can only be reached step by step, and can be studied and categorised.

As a conclusion to the formation and construction of my own identity, this section will summarise what this autoethnographic research has re-discovered via the support of the study of the dyadic oracy ordering relations between two languages, L2 and L1.

Identity formation and construction via a language is done or carried out mainly by the language learner, me, the agent of learning, though instruction and group may often help on some occasions. Language learners need to be made aware in one way or another that they need to take into their own hands what they want or need to learn, because a language, at least, grows with them into their future. They also need to understand the relation between them and the language they need to learn so that they may not waste their precious time and even life double-learning, for example, since spending time and energy on more than one language for similar or even identical knowledge or skills is a serious decision they may have to make.

The language learner usually has one language already to start with at hand, the mother tongue or the first language L1. On top of that, the target language or the second language L2 is added, when required by the curriculum or syllabus or the need arises. The two languages, related remotely or closely, form a dyadic relation which works interactively to either promotes the learning of one or both of the languages, or demotes or delays or corrodes the languages. Both languages or one or none of the two can excel simultaneously, but the easiest and entropic choice is to have at least one excel. This is another serious decision to make, to avoid double-learning, at least.

When there are only two languages, learners should ideally make only two types or styles or kinds of errors. Both errors should be identical or similar to the errors made by native speakers of those two languages respectively, L1-errors made by average native speakers of L1, and L2-errors made by average native speakers of L2. If more than two types of errors, or styles of errors, are made, something is definitely and fundamentally wrong. Based on this research and analysis, those styles of errors can be eliminated, avoided or reduced to the best or better extent by separating the two languages, applying the principle of D&C, divide and conquer, as early as possible, or as the students and teachers can manage. As young language learners may not be able to D&C themselves, or even know that they should do so, they have to be told and encouraged by their language instructors, or parents, or teachers, to do so.

Most of the literature about knowledge would mention two knowledges, the declarative and the procedural. However, working between the two is the most important linguistic knowledge, culture aside. The declarative knowledge in L1 cannot be transferred to L2, nor vice versa, and has to be relearned or double-learned in L2, even between closely related L1 and L2, for some equivalency. Some of the procedural knowledge gained in L1 can be applied in an L2 scene, but only when the L2 language, i.e., linguistic knowledge in L2, is not needed. If there is a need to describe or explain the procedural knowledge to somebody else in L2, such as a supervisor or in an examination or an assessment, then the L2 has to be relearned or double-learned in L2 as well. Therefore, both the declarative and procedural knowledges may have to be relearned or double-learned in L2, though not necessarily totally if the two languages are more related or borrowed words from each other. As can be seen obviously, the declarative knowledge is more double-learned, while the procedural knowledge may be relearned, in the L2 scene.

When there are two and only two languages, L1 and L2, being used and learned by a single language learner, the input can be and only be one of the two languages, L1 and L2, but the output can be one of the three languages, L1, or L2, and a third language, which is rightly called a non-sensical language, or senseless at that moment, being neither L1 nor L2. Sometimes, the third language is called an interlanguage, and an interlanguage, though very systematic and has been studied and researched widely, is wrong, or developmentally wrong, and it is neither L1 nor L2. Therefore, any language learner learning only two languages should be aiming at producing two languages only, not three, or even more.

An interlanguage is neither L1 nor L2, therefore, it should be eliminated, avoided or reduced as early and soon and much as possible. The best and easy way to avoid it is the separation of L1 and L2 being learned as soon as possible so that L1 has the least effect on L2, or vice versa. The separation of the two languages means a divide and conquer (D&C), i.e., using each in different domains or for different purposes.

Five main factors contribute to the learning of any language, i.e., the four language skills and grammar or grammaring, which links all the four skills into a unified system. The order of the four skills or factors in the learning of L1 and L2 is naturally and practically different. In L1 learning, the order can be and usually is listening, speaking, reading, and writing, with the last skill usually even difficult for many native speakers, especially writing professionally. In L2 learning, especially for those above grade four who have already learned L1 or some L1, the order is reading, writing, listening and speaking, and some other variations, with the last skill usually very difficult for many non-native speakers even in social communications. In alphabetic languages where the sight-sound correspondence is easily established, the learning order of the four skills forms a degenerative relation, while the reverse of which forms a generative relation.

The more one speaks, the more one understands when listening, the more one writes, and the more one understands when reading. The four skills can also be divided into three pairs, oracy-literacy, active-passive, and input-output. Each of the pairs had two directions, making a total of twelve orientations. They all work simultaneously via grammar, or grammaring.

The order of learning the four skills can be modified for personal learning styles. As most of the learners since grade four are preferably and usually starting with reading, there are six routes, code-named six DOORs (dyadic oracy ordering relations) for second language learning. If we add the DOORs of the L1, there are twelve in total. We can represent the four skills in the Cartesian plane, with speaking in quadrant one, listening or hearing in two, reading in three, and writing in four. Now we have another three pairs, the horizontal, the vertical, and the diagonal. The horizontal pair is easy to learn, one after the other, while the vertical ones are less easy, and the diagonal ones are the least. Of the six DOORs, *RSHW* is the easiest or preferred for most second language learners learning alphabetic languages since two of the four skills have generative relations. *RWHS* is the most difficult, again, for most learners, since all three relations amongst the four skills are degenerative.

If two L1-units are matched with two L2-units, four errors could be made between the two, since the association can be broken. If ten L1-units are matched with ten L2-units as a means of learning L2, only ten correct matches could be recalled, but ninety erroneous matches, or ninety mismatches, could be wrongly recalled. Therefore, two steps or stages of learning a target language are advisable. The first step is to use the L1-L2 match, which is unavoidable at the very beginning. Then, as soon as possible, a switch to step two is needed, to use the L2-L2 match, using a simpler L2 to match or explain the more complicated L2, or the old L2 to learn the new L2. The chances of getting the L2 correct when the L2-L2 match is used is 2/3, and though the chances of getting the L2 wrong is 1/3, even the wrong match is still L2, instead of L1, which is not L2 at all, or even worse, the wrong L1! Harvard professor of mathematics Valiant (2013, p. 6) contends:

> Learning should enable organisms to categorize new information with at most a small error rate.

In language learning especially, too many errors will definitely affect the learning of other subjects and professions.

No input, no output (NiNo), but it does not mean that more input yields more output. Neither does it mean that correct input yields correct output. However, L1-input yields L1-output, while L2-input should yield L2-output, at least supposedly. If L2-input yields L1-output, if not that something is wrong, at least the L2 is dubiously learned, or the learning is doubtful. Then what is true is that between L2 and L1, more L1-input should yield more L1-output but not L2-output, and more L2-input should yield more L2-output but not L1-output , for the learning of the two languages. Therefore, in order to learn L2 well, linguistically and culturally for identity formation and construction, more L2-input and more L2-output should be sought after, instead of 'digging' in L1 more or even most of the time. This principle can be code-named TiTo, target language in, target language out, or target in, target out.

Generally speaking, language learners learn an additional language for some new information, usually not to review or refresh their mother tongue, not even with the aid of a target language. The new information, of course, can be obtained in L2 or in L1, or in both. If the L2 is new, then it does not mean it is also new once translated into the L1, since after the translation, the translated L1 can be either new or old. Without bothering about how new or how old the translated L1 is, for language learners, it is better simply to learn the L2 as new, since it is new as L2 being learned. Based on this principle, the L2 can be learned and more new information in L2 can be gained at the same time, without referring to L1 at all.

The new information is gained at the same time with the reduction of entropy, or noises. Of course, double-learning in both L2 and L1 is usually a waste of time and life, partially at least, in any sense of the word *waste*. Once a language learner is somewhat sure of his or her future job or orientation or identity, the entropy will be greatly reduced if only one language, L2 or L1, should be enhanced and improved. That is the language to be used for his or her future security of the self or survival, one language not at the expense of the other. The simple thinking is that if one language is good enough for the formation and construction of identity, do not waste too much time or energy on two or even more.

Epilogue

In many parts of this dissertation, I have used generic terms such as "a language learner", "the language learner", and "language learners". It is important to note, however, that these terms are not, in fact, generic and that they are used in my research as a way that reflects my own experience. A language learner and user may have many identities, or a multi-facet identity. Combined with language, one or more, an identity is formed depending on the needs of the language learner and user. Others' experiences may be very different from my own, and others may not view language learning from the perspective of efficiency that is so prominent in my own story. For example, some learners face difficult challenges such as the possibility of language attrition or the potential loss of a culture and identity that they value (Verspoor, Bot, & Lowie, 2011). I have not personally encountered such language learners and users, but theirs is an equally relevant outcome in language acquisition. My goal has been to try to find some ways to form my identity—ways that are less time-consuming and based on the value of efficiency. Such methods may help some language learners and users, but may not be applicable to all of them. I leave it to readers to decide what aspects of my own story and experience might be useful in helping them understand the process of language learning and teaching.

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Appendix A:
The Last Word Hypothesis[10]

'Traditional methods of learning a foreign language die hard', as repeatedly stated several times by Louis George Alexander in his 'To the Teacher' in several editions and subsequent printings of *New Concept English* (1967a, p. vii, Book 2), likely because human nature hasn't changed that much (Ostler, 2005, p. 538) during the past 2,000 years (Crystal, 2004, p. 14). However, in a constant development of the new, or timely rejuvenation of the old, one of the traditional language learning methods, translation, or grammar-translation, or translation method, TM, lingers on in second or foreign language learning, ever since it was first used and summarised. Despite the fact that the translation method neglects spoken language, and further, communication skills, it seems, with the newer incorporation of corpus linguistics, translation method may see a comeback (Shei, 2002). In the case of China, where today about 5-10% of the world's population is learning English, students have already formed the habit of thinking in Chinese, and tend to think of a Chinese equivalent to an English concept or word they are learning (Tang 唐力行, 1983, p. 78). Some of the linguists in China even openly expressed their preference to the grammar-translation method (D. Li, 1997, p. 74).Twenty years later, translation is still focused upon in English language learning in China (Sun 孙若红 et al., 2003, p. 432), as a standard means to teach and learn English (Luo, 2007, p. 188; Silver, et al., 2002, p. 20). Taiwan has a similar situation, since translation as a requirement starts as early as Grades 7-9 (Her, 2007, p. 118). In Japan, it has been mostly translating English into Japanese (Silver, et al., 2002, p. 82). However, I did not find much in literature that has drawn or even mentioned the conclusion that the learner's native language and word-by-word translation lead to translingual errors (Li 李雪顺, 2007), though it is reasonable to think so. Many students of English will even come to class firmly believing that they will not learn English unless the teacher gives them rules and

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[10] A modified version of this chapter has been submitted for publication as a conference paper at the 8th Annual Hawaii International Conference on Education, 7-10 January 2010, Honolulu, HI, co-presenter, Dr Iris Xu.

requires them to translate from one language to the other (Peace Corps, 1989), in a much wider international perspective.

I also felt, during the 70s when I started learning with and teaching English to my classmates and schoolmates under the mentorship of my homeroom teacher, that translating everything English into Chinese had not given me the correct ‘feel’ of learning English, or mastering English. This chapter is my summary of the Last Word Hypothesis that I have proposed to mathematically prove the failure of grammar-translation method in the long run in second or foreign language learning.

Background of the Last Word Hypothesis

All human languages are related, but some are more related than others are. Then, there comes the question of how to measure the relatedness of languages. Two concrete examples, one from an alphabetic language, and one from a logographic or ideographic language, will suffice, compared with English, a lingua franca which might be used by half of the world’s population in the year 2050 (MacGillivray, 2006, p. 259).

The alphabetic language I choose is German, where the name of the author of *Das Kapital*, Karl Marx, is transliterated into English in an identical form, without any change of form or shape or sight. Viewed from the 4-dimensional space of scene-sense-sight-sound, there are a lot of similarities between German and English. The proper noun of Karl Marx in both German and English is used in similar scenes or settings: both have the same meaning or sense, both look identical in shape or sight, and both even pronounce alike or are similar in sound. It seems the two languages are closely related or more related. However, in a logographic or ideographic language I choose, Chinese, Karl Marx is transliterated as 卡尔•马克思, which is remotely related to Karl Marx in sight and sound (unclear and unknown, unless learned separately or duplicatively), obviously. Despite the extra symbol between the first and the last names, even in the Romanised form, the Chinese Phonetic Alphabetic (CPA) or *Hanyu Pinyin*, *Ka’er Makesi* or *Kǎ’ěr Mǎkēsī* with tone markers above the vowels, Chinese and English have nothing in common, except a few letters actually borrowed from

Latin and look-alike pronunciation, when one works hard to think in that direction. Besides, 卡尔•马克思 (*Kǎ'ěr Mǎkēsī*) is only a transliteration with five Chinese characters and a mid-dot, all the six symbols are not Chinese, either, but German written in Chinese characters based on Chinese pronunciation in imitation of the original German pronunciation. What is more, when a language learner knows Karl Marx in German, he or she also knows Karl Marx in English, and identically in many of the other alphabetic languages used by over half, or three-fourths (Sacks, 2003), of the world's population. However, if one knows 卡尔•马克思 (*Kǎ'ěr Mǎkēsī*), he or she either knew or learned Karl Marx earlier, or has to learn Karl Marx aside from 卡尔•马克思 (*Kǎ'ěr Mǎkēsī*), or side by side with it. If he or she wants to match 卡尔•马克思 (*Kǎ'ěr Mǎkēsī*) and Karl Marx as one and the same person, he or she has to learn to, or be told to, match the two, or more likely than not, she or he will mismatch, or totally ignorant of the two items in two languages referring to the same person.

From the example above, we may draw the conclusion that German is more related to English than Chinese superficially, and historically as well. The similarity between languages, or linguistic distance, is usually viewed in pronunciation, syntax, and semantics (Nerbonne & Hinrichs, 2006), which is similar to the 4-dimensional space of scene-sense-sight-sound proposed in this chapter. A more detailed summary of a numerical language score is provided by Chiswick and Miller (2004), in which a score of 3.00 means the most related and a score of 1.00 means the least. In their summary, German has a language score of 2.25 and Mandarin (Chinese) has a score of 1.50, both compared with English. That means a native English speaker will find German easier to learn than Chinese. To me, a low language score may also mean that a language learner reaches his or her 'last word', or fossilisation, or stabilisation, or plateau, much faster when learning a less related language than a more related language, when the grammar-translation method is used. To use one of Alexander's concepts, every student of a foreign language has what might be called a 'language ceiling', a point beyond which he [sic] cannot improve very much (1967a, p. vii, Book 2).

The grammar-translation method (GTM), as one of the traditional ways, has been labelled a ‘die-hard’ method (L. G. Alexander, 1967a, p. vii, Book 2), because ‘the very real danger for the language learner …… this [i.e., list of vocabulary] will lead him [sic] into frequent error’ (Wilkins, 1974-72, p. 120). Referring to teaching vocabulary, Wilkins contends that ‘as a technique of teaching meaning, translation is in the long run unsound’ (1974-72, p. 130). Even though ‘one might plump for the efficacy of a quick translation, but the implication is that one has not taught the meaning of the item, and one should be aware of that implication’ (1974-72, p. 221).

This chapter endeavours to prove mathematically the unsoundness and the rate of failure of the grammar-translation method, and the ‘language ceiling’ or frequent error that the grammar-translation method will quickly lead the language learners into.

Cases Visited: One-to-One or One-to-Many Matches

Opening any bilingual desktop dictionary, one will find one headword or entry matching more than one translation. If we start with a small, pocket size bilingual dictionary, we may find at least one headword matching one translation. Using the translation method, a language learner learns one headword in the foreign language, L2, or target language, then matches it with one word in his or her native tongue, L1, or mother tongue, and memorises either the foreign word, or the native equivalent, or preferably both, and also the match for later recall. When the translation method is applied, there are only four mutually exclusive cases: L2 is recalled, L1 is recalled (which the learner already knows so well), or both are recalled and matched perfectly, or, L2 is recalled or forgotten but mismatched L1, hence the worst scenario.

L2	*t* or *T-t*	L1	Case
heard or read	recalled	recalled and matched	1
	forgotten	?recalled and matched	2
	recalled	mismatched	3
	forgotten	?mismatched	4

Table 13 Recalled, matched, forgotten, or mismatched?

In all or most of the cases, the L1 is already known for most of the novice learners for most of the time, and it is likely only cases 1 and 3 can be considered as the learning of L2 but they do not happen easily. Case 4 also refers to the time when a new word or phrase or sentence is encountered, in addition to the time when the L2 has not been learned, and the matched L1 is not existent. For case 3, what is left is L1 only, and the L2 is forgotten.

Let us take case 1 when an L2-word is heard or read, the learner recalls, instantly, the L1-equivalent, which is typically what translation method teaches language learners to do.

If we use *C* (correct Matches) to represent the number of Correct L1-equivalents that a learner can recall perfectly, $\overline{C}$ (Mismatches or incorrect Matches) to represent the number of possible Incorrect L1-equivalents a learner can recall and mismatch the L2-word, and *n* to represent the total number of L2-words to be learned or to have been learned, we come up with the following two equations:

$$C = {}_nC_r(n,1) = n \qquad [A.1]$$

$$\overline{C} = {}_nP_r(n,2) = n \times (n-1) \qquad [A.2]$$

If only one L2-word is learned, $n = 1$, and there is only one L1-word to match the L2-word learned, $C = 1$, that means there is only one Correct match, or one chance of recalling the correct L1-equivalent. The mismatch, $\overline{C}$, is zero, $\overline{C} = {}_nP_r(1,2) = 1 \times (1-1) = 0$, unless the language learner matches the L2-word wrongly with all the other L1-words but the one that should be matched. That means if she or he is able to recall the corresponding L2-equivalent perfectly, the learner never makes a mistake when only one L2-word is learned. Besides, there is only one L2-word learned, which can hardly be mismatched. Of course, the L2-word can be forgotten completely.

However, if $n = 2$, $C = 2$, but $\overline{C} = {}_nP_r(2,2) = 2$. That means if two L2-words are learned, there are two chances of recalling the correct L1-equivalents and match them with the L2-words. There are also two chances of recalling the wrong L1-equivalents for the match, if the translation method is applied. The following table shows the correct English words learned, the correct Chinese matches, as examples, and the mismatches, marked with an asterisk (*).

	Correct	C	$\overline{C}$
Word 1	*Horse*	*Horse=马*	*Horse=*鸡*
Word 2	*Cock*	*Cock=鸡*	*Cock=*马*

Table 14 2 matches and 2 mismatches for two words learned

When the third L2-word is learned, then, $n = 3$, $C = 3$, but $\overline{C} = {}_nP_r(3,2) = 6$, which means the chances of recalling mismatches become three times those of recalling matches, as seen in the following table.

	Correct	C	$\overline{C}$
Word 1	*Horse*	*Horse=马*	*Horse=*鸡*
			*Horse=*猫*
Word 2	*Cock*	*Cock=鸡*	*Cock=*马*
			*Cock=*猫*
Word 3	*Cat*	*Cat=猫*	*Cat=*马*
			*Cat=*鸡*

Table 15 3 matches but 6 mismatches for three words learned

The chances of recalling the wrong equivalents or matches increase rapidly as can be seen in the following table:

n	1	2	3	4	5	...	10	25	50	10^2	10^3	10^4
C	1	2	3	4	5	...	10	25	50	10^2	10^3	10^4
$\overline{C}$	0	2	6	12	20	...	42	600	2,450	99×10^2	999×10^3	9999×10^4

Table 16 More possible mismatches for more words learned

Even though 'a probability of mismatch' does not necessarily mean that the language learner will 'always mismatch', at least this mathematical calculation indicates that there might be something wrong with the translation method, since the chances of recalling matches increase linearly while the chances of recalling mismatches increase quadratically. Let us check a few more cases.

How about the case when one L2-word matches two L1-words? In this situation, $n = 1$,

$$C = 2\times {}_nC_r(1,1) = 2n = 2$$

since there are two matches for the one L2-word learned. However,

$$\overline{C} = 2\times {}_nP_r(1,2) = 2n\times(n-1) = 0$$

the mismatch is also zero, which means the learner may always recall the L1-equivalents, one or both. If $n = 2$,

$$C = 2\times {}_nC_r(2,1) = 2n = 4$$

that is, two L2-words match two L1-words each. The possible mismatches,

$$\overline{C} = 2 \times {}_nP_r(2,2) = 2n \times (n-1) = 4$$

The result is identical to one-to-one match above, i.e., four chances of recalling matches, and four chances of recalling mismatches, or, ½ the chance of match, and ½ the chance of mismatch. The following table shows how rapidly the chances of recalling wrong L1-equivalents increase.

n	*1*	*2*	*3*	*4*		*10*	*25*	*50*	10^2	···	10^4
C	*2*	*4*	*6*	*8*	...	*20*	*50*	*100*	2×10^2	···	2×10^4
$\overline{C}$	*0*	*4*	*12*	*24*	...	*180*	*1,200*	*4,900*	$2\times99\times10^2$	···	$2\times9999\times10^4$

Table 17 When 1 L2-word matches 2 L1-words, doubled.

For the purpose of triangulation of the above two scenarios, we will look at the case when one L2-word is matched with three L1-words. As can be seen in the following table, both the chances of recalling matches and mismatches are tripled compared with one-to-one match in the translation method, which turns out to mean more probabilities of making errors.

n	*1*	*2*	*3*	*4*	*5*		*10*	*25*	*50*	10^2	···	10^4
C	*3*	*6*	*9*	*12*	*15*	...	*30*	*75*	*150*	3×10^2	···	3×10^4
$\overline{C}$	*0*	*6*	*18*	*36*	*60*	...	*270*	*1,800*	*7,350*	$3\times99\times10^2$	···	$3\times9999\times10^4$

Table 18 When 1 L2-word matches 3 L1-words, tripled.

If we use *E* to represent the average number of L1-Equivalents to each L2-word to be learned, as often seen in bilingual desktop dictionaries, we end up in the following two equations:

$$C = E \times {}_nC_r(n,1) = E \times n \qquad \text{[A.3]}$$

$$\overline{C} = E \times {}_nP_r(n,2) = E \times n \times (n-1) \qquad \text{[A.4]}$$

The two equations above means that *E* is a coefficient to both the equation for the chance of matches [A.1] and that for mismatches [A.2]. Thus, we derive the following Match Rate Formula (MRF):

$$R_m = \frac{C}{C+\overline{C}} = \frac{E \times n}{E \times n + E \times n \times (n-1)} = \frac{1}{n} \qquad \text{[A.5]}$$

As indicated by Lyons (1968, p. 458), there is no synonymy between words of different languages. Therefore, the Match Rate only indicates that the learner can recall one or more L1-matches for the L2-word to be learned, and it does not mean either the matches are correct or the L2-words are actually learned. For the discussion of this chapter, we will assume that the matches mean 'correct matches'. The MRF also indicates that it is irrelevant to use *E* since the rate of matches or mismatches is not affected whether one L2-word matches one, two, three, or even more L1-words. However, matching one L2-word with more than one L1-word obviously increases the burden to memorisation.

In view of statistics, both *C* (Matches) and $\overline{C}$ (Mismatches) are independent events, and $R_m = \frac{1}{n}$ is the empirical probability or a posterior probability (Gray & Isaacs, 1975), where an event has occurred *C* (Matches) times and failed $\overline{C}$ (Mismatches) times.

If R_m is the probability of match (or success), we may use $\overline{R_m}$ to indicate the probability of mismatch (or failure), or Mismatch Rate. Therefore, we have one more formula to consider in this chapter:

$$\overline{R_m} = 1 - R_m = 1 - \frac{1}{n} = \frac{n-1}{n} = (n-1)R_m \qquad \text{[A.6]}$$

This is telling us that in the translation method of learning a foreign or second language, the Mismatch Rate, $\overline{R_m}$, is always $(n-1)$-fold of the Match Rate, R_m, $\overline{R_m} = (n-1)R_m$. That is, if the translation method is applied, with the increase of the number of new foreign words, or phrases, or sentences, or anything that is to be translated into the L1, when the nth L2-word, or term, is learned, the possibility of mismatch is always $(n-1)$ times of the possibility of match. This conclusion sounds very discouraging, and it, in fact, is discouraging. It is exactly working against one's memory, and memory always wins (or rather, loses for the possessor of the memory).

Discussion

In the application of Match Rate Formula (MRF), we need to recheck each and every known case mentioned above to validate the formula in the translation method.

Suppose one L2-word is to be learned which has only one L1-equivalent, $R_m = \frac{1}{n} = \frac{1}{1} = 1$. Using Chinese as an example, when a learner learns that ‘dog=狗’, and when he or she hears ‘dog’ or reads ‘dog’, he or she never fails to recall the Chinese equivalent ‘狗’ under normal circumstances, unless she or he forgets the single English word learned, dog. Since only one L2-word is learned and there is no chance to make a mistake in speaking, writing, hearing and reading the single word by mismatching this L2-word with another L1-word. In cases when one L2-word is matched with two, three, or even more L1-words, such as ‘dog=狗=犬’, it is unlikely that the learner will make any mistakes either, unless those native words are not synonyms or near-synonyms but antonyms or near-antonyms to one another.

When two L2-words are to be learned, $R_m = \frac{1}{n} = \frac{1}{2} = 0.5$, which indicates that unless the two L2-words are synonyms or near-synonyms and correspondingly, the two L1-equivalents are also synonyms or near-synonyms, chances of making a mismatch are one out of two.

The MRF, R_m, also indicates that the Average number of L1-equivalents to L2-words is irrelevant, i.e., it does not matter whether one L2-word corresponds to one, two, three, or more L1-equivalents. The Match Rate remains unchanged and only relates to the total number of L2-words to be learned.

Now let us look at a few of the examples when the same translation method is applied, i.e., a list of vocabulary provides an L2-word with one or more L1-equivalents, hoping that the learner will be able to recall the L1-equivalents when hearing or reading the L2-word, or phrase, or sentence.

$$R_{10} = \frac{1}{10},$$

$$R_{100} = \frac{1}{100},$$

$$R_{1000} = \frac{1}{1000},$$

$$R_{10000} = \frac{1}{10000},$$

where R_i means the Match Rate of recalling the L1-equivalent or equivalents to the ith L2-word learned.

When the 10th L2-word is learned, the probability of recalling an L1-equivalent or equivalents to the 10th L2-word is only 0.1; when the 1,000th L2-word is learned, the probability of recalling an L1-equivalent or equivalents to the 1000th L2-word is greatly reduced to 0.001. That means the more a learner learns new words in the translation method, the less likely the learner will be able to recall their L1-equivalents. In a similar manner, if not less, he or she is equally likely to speak and write the newly learned L2-words correctly, nor hear and understand or read and understand the newly learned words correctly due to the low probability of match, i.e., low R_m, either the L1 match, or even a sense in the L2. This also means that the more new words are to be learned, the more it would be for the learners to feel the difficulty of learning an L2, using the translation method. The fact is, it is becoming more difficult in the translation method, which is doomed to failure in the long run. This is exactly happening to most of the language learners, when they start with enthusiasm, and fail with dismay.

Theory of Failure in the Translation Method

We can list the first few of the Match Rates here to indicate how rapidly it decreases, individually as a sequence, starting with $n = 1$:

$$1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}, \frac{1}{11}, \frac{1}{12}, \frac{1}{13}, ... \qquad [A.7]$$

We then end up with an interesting property of this sequence, which is that it is called a harmonic sequence. Harmony means joint or fitting together (Onions, et al., 1966) and a harmonic sequence is one in which the reciprocals of the terms form an arithmetic sequence (Gray & Isaacs, 1975). When forming a harmonic series, it diverges (having no finite sum) (Darling, 2004), which means its total sum is infinity, ∞, which proves mathematically why the translation method fails the learning of a foreign or second language, as the language learner cannot reach infinity, most likely.

Let us take a moment and go back to the harmonic sequence:

$$1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}, \frac{1}{11}, \frac{1}{12}, \frac{1}{13}, ...,$$

which becomes the corresponding series:

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \frac{1}{10} + \frac{1}{11}, \ldots, + \frac{1}{\infty} = ?$$

At first sight, it seems the series is converging to a limit to, say 2, however, that is not the case. The series actually diverges to infinity. For example, when $n = 3$, $\sum_{n=1}^{3}(\frac{1}{n}) = 1.83$. When $n = 4$, $\sum_{n=1}^{4}(\frac{1}{n}) = 2.08$, which exceeds 2. A few more examples follow, rounded to two decimals.

$$\sum_{n=1}^{10}(\frac{1}{n}) = 2.93,$$

$$\sum_{n=1}^{100}(\frac{1}{n}) = 5.19,$$

$$\sum_{n=1}^{1000}(\frac{1}{n}) = 7.49,$$

$$\sum_{n=1}^{10000}(\frac{1}{n}) = 9.78,$$

$$\sum_{n=1}^{100000}(\frac{1}{n}) = 12.09, \ldots$$

We will stop right at this number since very few foreign or second language learners will have learned over 100,000 words.

That also means:

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \frac{1}{10} + \frac{1}{11}, \ldots, + \frac{1}{\infty} = \infty$$

What does all this mean in the theory of failure in translation method in L2-learning, especially when a vocabulary list is provided in which an L2-word is matched with one or more of the L2-equivalents?

This means that the translation method works only when a learner, if he or she learns once and retains instantly whatever is learned, lives and learns long enough, that is, an extreme longevity of ∞ (infinity) number of years, or days, or

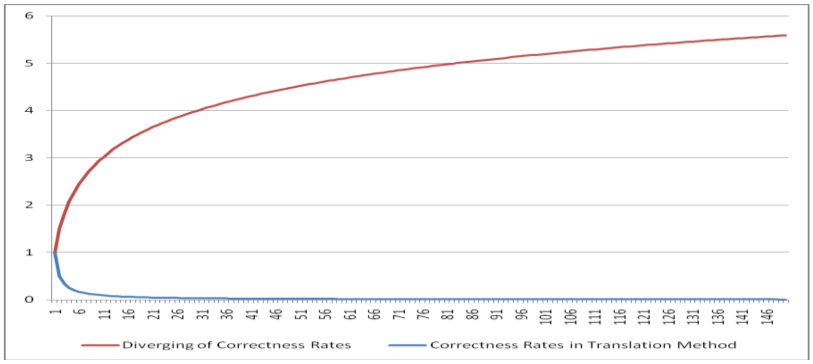

Figure 8 A sectional, showing that R_m drops quickly.

seconds, continuously, will he or she be able to learn enough of the words of a foreign language to function well and know all their meanings in the L1! In other words, because of the extreme slow increase of the cumulative sum of the Match Rate, the translation method is a very slow method of learning an L2. This contention accounts perfectly for the fact that in China where the logographic or ideographic Chinese language has a language score of 1.50 (Chiswick & Miller, 2004) compared with English, most of the English language learners could hardly use English up to par even after having been learning English for fifteen or twenty years. Translation method, or rather, the matching method, is an extremely slow method, if not the slowest, to learn a foreign or second language, though it reaches the language ceiling the fastest.

The Match Rate R_m decreases very rapidly as more L2-words are learned (Figures 8 and 9), as shown by the blue line at the bottom of the figures.

The single advantage of the translation method, as seen in both Figures 8 and 9, is that for the first dozen of L2-words learned, the learner felt it extremely easy, since he or she could easily turn those L2-words into his or her L1. This ‘false start’, the Feel-Good Start Method, soon makes itself falsehood felt when more L2-words are learned, especially in the case of Chinese language, or an L1 that has a great linguistic distance to L2, since the Chinese language has no cognates with any of the alphabetic languages used by at least half of the world’s population.

However, for each and every L2-word or unit, the possibility of making mistakes in speaking, writing, hearing and understanding, reading and understanding the L2, increases, as learners accustomed to the TM tend to think in the L1 when in interpretative or presentational modes, instead of in the L2, thus making the translation method or matching method in learning a foreign language doom to failure in the long run!

Figure 9 The slow rate of learning new L2-words in translation method (red).

The last word hypothesis.

When we again look at the harmonic sequence formed by the first dozen of R_m:

$$1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}, \frac{1}{11}, \frac{1}{12}, \frac{1}{13}, \ldots,$$

we can derive the following equation:

$$\lim_{n\to\infty} R_m = \lim_{n\to\infty} \frac{1}{n} = 0 \qquad \text{[A.8]}$$

and the Mismatch Rate:

$$0, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}, \frac{9}{10}, \frac{10}{11}, \frac{11}{12}, \frac{12}{13}, \ldots,$$

therefore,

$$\lim_{n\to\infty} \overline{R_m} = \lim_{n\to\infty} (1 - R_m) = 1 \qquad \text{[A.9]}$$

The graph (Figures 8 and 9) and the two equations above, [A.8] and [A.9], show clearly that as more and more L2-words are learned in the translation method, the Match Rate R_m approaches a zero when the last L2-word is learned.

That means that the last L2-word can never be used to recall an L1-equivalent! The Match Rate of the last word learned is zero, $R_m = \frac{1}{\infty}$. By the same token, if the Match Rate of the last word is 0, then the last but one word learned also has a Match Rate of zero, $R_{m-1} = \frac{1}{\infty - 1} = 0$, which means, for each different individual, the last set of words learned can never be matched with L1-equivalents, though the 'last word' for different learners means differently. For student A, the last word might be the 2,000th, while for student B, the last word might be the 20,000th, since the latter has a better memory. For want of a better term, this conclusion can be called the Last Word Hypothesis, as restated in the format of a definition in the box:

> **Last Word Hypothesis**
> The Last Word Hypothesis states that, in the grammar-translation method of second language acquisition where the Match Rate R_m of matching one L2-word with one or more L1-words approaches zero, there exists a subset of L2-words or language items in L2 to be learned whose R_m is equivalent to zero beyond which the language learner cannot recall the correct match in the L1. In practice, the 'Last Word' is different for each and every different language learner, thus indicating a plethora of proficiencies that different language learners may have reached.

This hypothesis accounts for, if not wholly, the concept of fossilisation (Doughty & Long, 2005-03; Gass & Selinker, 2008-1994; Han & Selinker, 2005) in which incorrect language features in L2 are fixed or stabilised and very difficult to change, despite the fact that change is possible. It also accounts for, partially, interlanguage (Collinge, 1990; Long & Porter, 1985) whose errors are caused by borrowing patterns from the mother tongue, or vice versa. On top of that, the Last Word Hypothesis also proves there exists a 'language ceiling' (L. G. Alexander, 1967a; Bouziane, 1993; de Jong, 1990; Hulstijn & Matter, 1991), which is reached more quickly when the grammar-translation method or the matching method is used in the learning of a second or foreign language.

Conclusion

The Last Word Hypothesis has proven, as well as accounted for the fact that in the learning of a foreign or second language, translation method or matching method only introduces the first and initial set of foreign words and their matches with the mother tongue equivalents, about a dozen or so, successfully and quickly, giving the learner a true but in the long run false feeling of ‘having learned some words or sentences or expressions in another language’. After the honey moon period, the Match Rate drops rapidly until the last foreign word (or word family or language units), whose native tongue equivalent or equivalents can hardly be recalled, thus reaching fossilisation point quickly. At the same time, errors are made because of the mix-up of the mother tongue and the target language. Therefore, translation method, a Feel-Good Method, should only be used to introduce the first few L2-words and sentences, and then stopped as completely as possible, so that language learners can learn to think in the target language (Dong 董宇仁, 2007; Linguaphone Institute, 1970; Lin 林语堂, 1982-30; Willis & Willis, 2007) eventually, instead of recalling more incorrect native tongue equivalents to the waste of their precious learning time, and their more precious life.

Appendix B:
Information and Entropy in SLA

One of the reasons, amongst perhaps seven hundreds (Gallagher-Brett, 2004; von Randow, 2006) of them, of learning a second or foreign language, as a target language, L2, is to gain information. In the learning of the L2, for many beginning or novice learners, L1, or a subset, *m*, of L1, has to be used as a helper or a metalanguage or a medium of instruction (MOI), especially for those who have already learned to use L1 to read. As both L2 and L1 are used in the learning of L2, there are in total four sources of information, or rather, of both information and non-information (noises), when two languages only are concerned, as shown below.

	L2	*L1*
Information	+	+
Non-information	+	+

Table 19 Information or non-information

From the above Table we can infer clearly that, when there are only two languages, information can be gained from L2 or from L1 or from both. At the same time, non-information, or noise in contrast with information or wanted information, which Claude Shannon was endeavouring to find the best methods to separate from information, is also unavoidably gained from L2 or L1 or both, even if the learner does not want it or them. For a definition of information, this chapter turns to the OED (Simpson, et al., 1993) for an answer:

> As a mathematically defined quantity divorced from any concept of news or meaning (see quots. 1925, 1928, 1948[1], 1948[2]); spec. one which represents the degree of choice exercised in the selection or formation of one particular symbol, message, etc., out of a number of possible ones, and which is defined logarithmically in terms of the statistical probabilities of occurrence of the symbol or the elements of the message.

This chapter explores information and entropy in second or additional language acquisition.

Old information or new, in L1 or in L2

Before using the above definition for a deeper discussion at a later section on entropy, it is advisable for the moment to turn to a simpler definition for information, which is, that information is uncertainty, surprise, difficulty, and entropy (Gleick, 2011, p. 219). Leaving entropy for later, we can see that information is not ignorance, or ignorance is not information. Information is not knowledge either. In a continuum from ignorance to knowledge, or from the unknown to the known, information lies somewhere between the two extremes, perhaps more towards the end of ignorance. It is something the seeker feels not so sure, but is aware of a little. Once known, or more known, the seeker feels surprised. Once learned, the learner feels like a difficulty overcome. Information, here applied in the learning of L2, follows the rule that no matter how beautifully organised and tailored a lecture or a piece of writing, it puts nothing, i.e., information, into the heads of students. Only the students themselves can put information into their own heads (Farnham-Diggory, 1992, p. 570). In other words, the learner has to turn what is very little known into something more known. Then, what information can L2-learners put into their own heads?

Whenever L1 is used as an aid in the learning of an L2, and L2 is translated (including explanation) into L1 and if the translated L1-term or concept or notion already exists in L1, i.e., the known, L1 is not learned or encountered as New Information (Quirk, et al., 1980-72) at all. L1 is actually relearned or reviewed, sometimes more than once, and nothing new in L1 per se is learned. If every term or unit in L2 is turned into the known L1, L1 is definitely consolidated and maximised. We can safely say in such cases that, L1 is being relearned with the help of L2, while L2 is at the same time what should have been learned, but more often than not, less learned and retained, if L1 interferes.

To use one equation to represent such relations among L1, we have:

$$m = m_k + m_u \qquad \text{[B.1]}$$

The mother tongue, or a subset of the mother tongue, used in the learning of L2, once translated from L2, can be either known, represented by m_k, or unknown, represented by m_u, in the L1 only. m_k, being known in the L1 already, is definitely not information at all, while m_u can be further divided into:

$$m_u = m_{u_m} + m_{u_t} \qquad \text{[B.2]}$$

m_u, being unknown in the L1 but based on translation from L2, may be composed of known word-stock in the L1, i.e., a new word or expression made with known roots and infixes in the L1 only. In other words, this part of the m_u is related more to L1 and is already partially known, though it is translated from L2. Thus, it is expressed as m_{u_m}, a subset of L1 that is partially known in L1 but related to L1 translated from L2. Another part of the m_u is totally new in L1, unknown and non-existent in L1 before. It may be a loanword or a transliteration of L2. The sound, sight, and sense of the m_u is all new, except scene or setting, which means that the m_u, though translated from L2, has to be used in the familiar setting of the L1. This part of the m_u is related more to L2, expressed as m_{u_t}, a subset of L1 that is unknown in L1 but related to L2 since it has been translated from L2. Now we need a new table for translated information and non-information or noise when two and only two languages are involved.

	L2	*L1*
Information	m_{u_t}	m_{u_m}
Non-information	t_u	m_k

Table 20 Translated information or noise

From the above Table, we can see that in the learning of L2, once L2 is translated into L1, the translated information, if the L2 is not remembered and retained and reproducible, is no longer in L2, but in L1. There is no guarantee that the learner of L2 really understood L2 or partially understood L2 and partially understood L1. The completely unknown t_u is not information at all, especially when translated into m_k and becomes completely known in L1. It is also possible that the learner did not understand L2 at all, but only understood L1. The three possible understandings are shown in the Table below.

	L2	*L1*
Understanding L2	+	
Understanding L1		+
Understanding both	+	+

Table 21 Three understandings after translation

t_u in Table 20 is completely unknown to the learner, therefore, it is considered as noise, either in the form of sound or sight, to the learner. Also categorised as noise is m_k, the translation from L2 that is already well-known in L1. It is highly possible that L2, or part thereof, is neither remembered nor learned, but m_k is surely reviewed, and more often than not, repeatedly reviewed. However, it does not mean that there is no information in L2 but only in L1. Using another equation, let us look at what information is contained in L2 or L1 or both.

$$T = t + (T - t) - 2m \qquad \text{[B.3]}$$

The language L2 to be learned, *T*, becomes a subset of *T* which has been learned, and a subset of *T* which has not been learned yet, *T-t*, and removal of double the effort or time or amount of the subset of the mother tongue, *2m*, used in aiding the learning and is already well known in L1.

	L2	*L1*
Information	T	$m_{u_t} + m_{u_m} = m_u$
Non-information	$T - t$	m_k

Table 22 the Learned, the unlearned, and the almost useless

L2 is the language to be learned or is supposed to be learned, but only *t* is or has been learned, which can be information, since before *t* has been learned, it is unknown, uncertain, and difficult. While L2 is being learned, with the help of L1 or *m*, the unknown becomes known, the uncertain becomes certain, the difficult becomes easy, and *t* has been learned, it is no longer a surprise. However, *t* is information related to L2, the language supposed to be learned, not to L1. m_u, though being information, is somewhat or partially known, certain, and easy. It does not give that much of a surprise, i.e., the information or informatent in *t* and the translated m_u are not the identical. m_k is not information, and *T-t* is not learned yet, rendering it almost useless though some time, or a lot of time, has been spent on learning it.

In a nutshell.

As can be seen from the above thought experiment, the ideal source of information should be L2, since L2 is the language to be learned, and information should be drawn from it as well when a certain proficiency is reached at the same time. During the learning of L2, especially at the initial stage, L1 is unavoidably applied as an aid to learning and L1 does provide some or much information. In the next section I will expand on how information is expressed mathematically.

The information in L2

In the learning of an L2, information should be obtained and obtainable, ideally, from L2 and L2 only, at least, mostly, since L2 is the language to be learned and anything else that is not L2 can be and might be counted as noise, rather than information. Referring back to the definition of information in OED, information is a quantity … defined logarithmically in terms of the statistical probabilities of occurrence of the symbol or the elements of the *message* (italics added). That message, in the learning of L2, should be L2 only, and 'the statistical probabilities of occurrence' should also refer to L2 only. However, in the real world, L2 is being learned via L1 or *m*, and the latter cannot be avoided completely for a very long time when L2 is being learned. This section will explore the calculation of information based on the Last Word Hypothesis depicted in Appendix A.

Considering that information can be mathematically expressed to represent the degree of choice, in terms of probabilities of occurrence, I have found from several sources (Gleick, 2011; Ramsden, 2009; Stein, 2008; Tattersall, 2008), for triangulation, a simple formula for the calculation of information.

$$I = -\log_2 p = \frac{-\ln p}{\ln 2} \qquad \text{[B.4]}$$

In formula [B.4], I is the value of information, p is the probability associated with a given event, or a signal, or a symbol, or a word. Formula [B.4] represents the level of uncertainty. When a signal is received, there is a reduction of uncertainty, which is information (Chen, 2005). Formula [B.4] is also termed Hartley's formula (Ramsden, 2009), which can also be expressed equivalently as:

$$I = \log_2 n = \frac{\ln n}{\ln 2} \qquad [B.5]$$

Where $p = \frac{1}{n}$.

As number 2 is used as the base of the logarithm, the unit of information is bit (Tattersall, 2008, p. 81).

In the learning of L2, the probability associated with a given event, *p*, can be taken as the Match Rate, R_m, since the L2-learners are working hard against his or her own memory to recall the *m*-equivalent or equivalents of L2 being learned, resulting in *t* which is matched with an *m*, and the L2-learner believes that the *t* has been learned if a match can be recalled in L1. According to Table 22, the information at this stage of the learning of L2 is:

$$I = t + m_u \qquad [B.6]$$

Now let us turn to a graphic representation (FooPlot, 2007) of the information, *I*, as expressed by [B.5] without the very negligible m_u, as the latter only occurs when a very high proficiency of the target language has been reached.

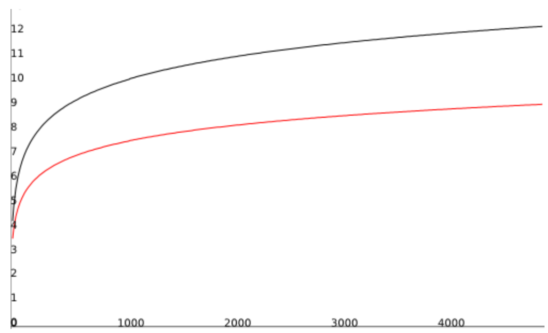

Figure 10 Information (black on top) [B.5]

As shown in the above Figure, the information, *I*, which contains the learned *t* (which was unknown before learning L2), and the unknown m_u (mostly translated or borrowed from *t*, negligible before some duration of learning), increases with more words or units in L2 learned, even if translation into the L1 is applied. As defined earlier, information is uncertainty, surprise, difficulty, and entropy (Gleick, 2011, p. 219). Messages that say something we all know already are worthless (Tattersall, 2008, p. 81), i.e., non-information or noise. For example, If only one message is possible, there is no uncertainty and thus no information

(Gleick, 2011, p. 219), such as the L1 that is already natively and naturally known. In the learning of the L2, once translated into the L1 and the latter is something that the learners all know already, the messages in L1 are also worthless. We can also see from Figure 10 that information is increasing very slowly, as it is true that information that is more valuable is in general more expensive to obtain (Chen, 2005, p. 4).

From Appendix A we know that the list of the Match Rates, R_m, starting at $n = 1$, ends up with a sequence called a harmonic sequence, the one in which the reciprocals of the terms form an arithmetic sequence (Gray & Isaacs, 1975), like this:

$$1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}, \frac{1}{11}, \frac{1}{12}, \frac{1}{13}, \ldots,$$

which becomes a harmonic series:

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \frac{1}{10} + \frac{1}{11}, \ldots, + \frac{1}{\infty}$$

The nth partial sum of the diverging harmonic series is called the nth harmonic number, represented by H_n.

$$H_n = \sum_{n=1}^{n} \left(\frac{1}{n}\right) \qquad \text{[B.7]}$$

The graphic representation of H_n is shown in Figure 10 in red, in comparison with information, *I*, in black. If the black line represents true information or total information, the red line can be understood as true understanding of the true information, which, for a long time in the learning of a new target or second language, is always less than the true information.

More exploration of H_n will be given in later sections on how many best language learners will come out the best if the translation method, or the matching method, is carried out strictly to the end.

In this section I have explained that information is uncertainty, surprise, and difficulty. If the target language L2 is learned properly as *t* is or has been learned, the information is increasing. Now I will turn to the calculation of entropy in second language learning in the next section, another representation of information.

Entropy in learning L2

Entropy, as defined by *Oxford English Dictionary* (Simpson, et al., 1993) means a measure of the average information rate of a message or language in communication theory, which represents the average information rate per symbol. More entropy means less information. Language is used to transmit information, which is the reduction of entropy (Chen, 2003), or the reduction of disorder. In the learning of L2, the translation method, or the matching method, is applied at the initial stage of the learning. However, as indicated by Lyons (1968, p. 458):

> It is a sound methodological principle that sense is not held invariant in translation (so that there is no synonymy between words of different languages) but a greater or less degree of equivalence in the 'application' of words.

My understanding is that there are at least two applications of words, one in L2 and one in L1. The application of words in L2 is the one an L2-learner needs to know and learns to use. The mixed application of translating one into the other is the one an L2-learner needs to avoid as much and early as possible, especially in the process of learning the second language. The good news is that even if the translation method is applied, there is still the chance that the new *t* is learned and some new *I* is gained. In this process, entropy is reduced while new information is gained, from mother tongue mostly translated from the second language, or the second language per se. Now let us explore how entropy is calculated when the Match Rate, R_m, is applied in the learning of L2.

From Appendix A, we have:

$$\overline{R_m} = 1 - R_m = 1 - \frac{1}{n} = \frac{n-1}{n} = (n-1)R_m \qquad \text{[B.8]}$$

That is, in the learning of L2, there are only two possibilities when the translation or matching method is applied. The entropy in the case of two possibilities with probabilities p and $q = 1 - p$ (Luenberger, 2006; Shannon & Weaver, 1949-48) respectively, is calculated with the following formula:

$$H = -(p\log_2 p + q\log_2 q) \qquad \text{[B.9]}$$

Applied in our case, we have:

$$\begin{aligned} H_{R_m} &= -(R_m \log R_m + \overline{R_m} \log \overline{R_m}) \\ &= \frac{-R_m \ln R_m - \overline{R_m} \ln \overline{R_m}}{\ln 2} \end{aligned} \qquad [B.10]$$

The graphic representation of [B.10] (FooPlot, 2007) is given below:

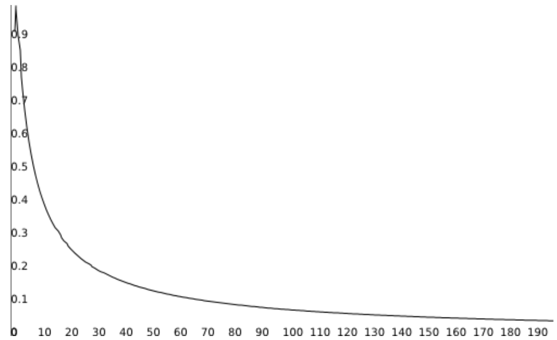

Figure 11 Entropy in Translation Method

Despite the fact that information [B.6] in language learning is a mixture of both target language L2 and a minute subset of the mother tongue L1, information is increasing slowly and entropy is decreasing, at first quickly and then slowly. That could mean that more information is gained at the beginning, or the L2-learner feels that it is very easy and afresh to learn L2 at the beginning, an easy start when the translation or matching method is used.

Conclusion.

In the beginning, an L2-learner usually has to use some L1 as a helper or aid in learning an L2, more often than not, in a translation or matching method, matching one or more L1-expressions or units with an L2-expression or unit being learned. In such cases, i.e., a mixture of both L2 and L1, the L2-learner is still able to gain some information and reduce entropy at the same time, as long as the L2 being learned has some new information that surprises the language learner. The problem is, despite the fact that some L2 is learned, *t*, it is unknown or hardly distinguishable whether the information is gained in L1, which is more likely being reviewed repeatedly, or from L2, which is supposed to be learned without too much revision from the known L1, or from a mixture of both. In the main text of the dissertation it has been examined and concluded that that interlanguage and errors or mistakes in language learning are similar if not identical, when two or more languages are unintentionally or even intentionally mixed up. A brief summary is provided here.

Errors or Mistakes, and Interlanguage

In the learning of a second or foreign language, as a target language, L2, there are bound to be some errors or mistakes. Errors may result from incomplete knowledge of the L2, not from *t* (that which has been learned already and should produce no or negligible errors) but from $T - t$ (that which is being learned but has not been fully learned yet), while mistakes are caused by lack of attention, fatigue, carelessness, etc. (J. C. Richards, et al., 2002-1992). It seems that mistakes are a natural part of learning and cannot be avoided completely. Therefore, this section will concentrate on errors. This thinking is also in line with Corder (1967; M. Johnson, 2004). However, we need to keep in mind that errors or mistakes may become standard use one day with the passing of time, and they are errors only for the time being. We also need to keep in mind that whatever names they are called, they are wrong, they are not right, at least at the moment of learning, in any sense of the words.

Starting with both L2 and L1, we have our first table of errors.

<table>
<tr><td></td><td colspan="2">L2</td><td colspan="2">L1</td></tr>
<tr><td>Errors (the wrong)</td><td colspan="2">+</td><td colspan="2">+</td></tr>
<tr><td>Standard (the right)</td><td colspan="2">+</td><td colspan="2">+</td></tr>
<tr><td>L2-learner errors</td><td>+</td><td colspan="2">+</td><td>+</td></tr>
</table>

Table 23 Errors for a language learner

Do L1-users make errors or mistakes in L1, the mother tongue? Of course they do. A language learner and user either uses a language correctly (rightly at one end of the continuum) or incorrectly (wrongly at the other end of the continuum), and everything else in between the two extremes. For errors, an L1-user can make L1-related errors, and an L2-learner also makes L2-related errors. Ideally and theoretically, a language user and learner should make only one kind or type or style of errors in one language, the ones specific to that specific language. For example, an English language speaker should not make errors in German unless he or she is learning and using German incompetently. That is, an English language user should make and only make errors in English, or English errors, or no errors at all in other cases. In other words, she or he either makes English errors in English, or makes no English errors in English, be she or he a native speaker of English or a language learner of English. By the same token, if a language learner of English has a mother tongue which is not English, he or she also makes another kind or type or style of errors, i.e., errors in his or her L1. Based on the fact that a bilingual language learner only knows two languages, L2 and L1, he or she at most only makes two kinds or types or styles of errors, errors in L2 and/or errors in L1, as shown in Table 23. Those two styles of errors can be termed ‘native-speaker errors’, which an average native speaker of that specific language usually makes.

Other than the two ‘native-speaker errors’ made by a language learner with only two languages, there is a third kind or type or style of errors, also shown in Table 23, which will be the topic of the next section.

Errors between

Errors or mistakes are wrong, and they should be better avoided as early and soon as possible, even though they are part of the learning process and cannot be completely avoided. When two languages form a dyadic relation, for the language learner, it is not simply only two kinds or types or styles of errors that the learner makes, but the number of kinds of errors increases rapidly with the number of languages involved, as shown in the next table.

	L2	*L1*	*L1onL2*	*L2onL1*	*L2cumL1*	*?L2?L1*
6 Errors (the wrong)	+	+	+	+	+	+
Noise from	*only*	*only*	*moreL1*	*moreL2*	*both*	*unsure*
Errors in	*L2*	*L1*	*moreL2*	*moreL1*	*both*	*both*

Table 24 Six styles of errors when there are only two languages

The two languages, L2 and L1, engage in a dyadic relation, i.e., affecting each other, when a single language learner and user tries to use one or the other. However, it has been proved that when two languages work together, or on each other, or side by side with each other, there are four influences or effects, which I would call an ‘A or B or both or neither’ situation, governed by the ‘Either, Both or Neither’ Rule. As shown in Table 24, a bilingual (with both L2 and L1) language learner and user makes errors: 1) mostly in L2 because of incomplete knowledge in L2; 2) mostly in L1 because of incomplete knowledge in L1; 3) more in L2 and some in L1 because of more incomplete knowledge in L2 than in L1; 4) more errors in L1 and some in L2 because of more incomplete knowledge in L1 than in L2; 5) errors in both L2 and L1 because of almost equally incomplete knowledge in both L2 and L1; and 6) errors in both L2 and L1 because of unknown incomplete knowledge in both L2 and L1, since the origin and cause of the errors (the so-called ‘new forms’ (Gass & Selinker, 2008-1994)) have not been found out by researchers yet. How can we calculate the total number of all the styles or kinds or types of errors (six) when there are only two languages, or more?

$$E_n = C(n,1) + 2P(n,2) = n(2n-1) \quad \text{[B.11]}$$

When there is only one language to learn and use, i.e., the mother tongue, L1, only one kind or type or style of errors is made, $E_1 = 1$, the errors made in that specific L1, the native-speaker errors, unaffected by any other languages, since there are no other languages involved. When two languages are engaged in a dyadic relation, L2 and L1, it is possible that six kinds of errors, $E_2 = 6$, are made. It does not mean that all the six kinds of errors will occur, or occur equally, but only that they may occur. Just for the sake of curiosity and calculation, when three languages are being used and learned, there might be fifteen, $E_3 = 15$, different kinds or types or styles of errors being made. Nicholas Ostler uses 28 languages (Ostler, 2005). If he is not careful in managing all those 28 languages, he has the possibility of making a total of $E_{28} = 1540$ different kinds of errors (Table 25) in all of his 28 languages, including 28 native-speaker errors. Charles Frambach Berlitz, grandson of the creator of the Berlitz Schools of languages, uses 25 languages (Berlitz, 2005-1982), and a possible number of styles of errors of $E_{25} = 1225$ (Table 25) is also very scary for him. Among the 1,225 errors, 25 of them a native-speakers errors. For most of the native speakers of a mother tongue, native-speaker errors may not even affect the understanding of the language, however, they are errors. The more problematic errors and the non-native-speakers errors, which when heard or read by native speakers, may cause resentment. The fact is that non-native-speaker errors greatly outnumber native-speaker errors, when the language learner endeavours to learn more additional languages, using improper methods.

	L2	*L1*	*L2&L1*	E_n
1T1M, n=1	*1*	*1*	*4*	*6*
2T1M, n=3	*2*	*1*	*12*	*15*
3T1M, n=4	*3*	*1*	*24*	*28*
...	...	...	...	
24T1M, n=25	*24*	*1*	*1200*	*1225*
27T1M, n=28	*27*	*1*	*1512*	*1540*
...	...	...	...	

Table 25 Kinds of possible errors with more L2.

Of course all those errors are not equally likely, nor are they all occurring on a specific language learner. However, the above situation is much better than when the translation method or the matching method is used, to which I now turn.

Translation and matching

One of the reasons in learning a target language is to seek information, which can be defined probabilistically. However, such definition cannot be applied to the translation of a novel into another language relative to the original (Kolmogorov, in Gleick, 2011, p. 336; Kolmogorov, 1983). In other words, the information in a translated version cannot be measured relative to the information in the original, i.e., the two are not commensurate. I may reasonably conclude that the translated information or information content or the value of information is different from the original information, either more or less. That topic is beyond the scope of this section or dissertation, though the idea is very importantly borrowed here as an additional indication that translation and the original are two different versions with different information and entropy, casting some doubt on translatability of information, i.e., the translatability of languages. However, most language learners, in the learning of an additional language, have to resort to translation, an approximation rather than identification, especially at the very beginning of the learning. In language learning, the translation is, initially, mostly matching or association of an L2-item with one or more L1-items. Such associations, or rather, association errors, pose new problems, those that are even more serious than the errors mentioned in the above section on interlanguage. Let us explore in more details.

Suppose one L2-item is associated with or translated into one L1-item, that is, 1T=1M. Here we also need to borrow Cajal's principle of neural organisation, dynamic polarization (In Kandel, 2006, p. 64):

> Within a neuron, signals travel in only one direction. This principle allows one to determine how information flows in neural circuits.

Not only within a neuron, between neurons there is also the restriction of direction, i.e., from the axon terminal of one neuron to the dendrite of another. Therefore, information flow in the brain is reasonably viewed as directional, or the association of two language items should also be directional. When 1T=1M, the association could be from L2 to L1, or vice versa. Adding that both L2 and L1 can be recalled wrongly, we have four possible causes for errors, from L2, from L1, from both, or from nowhere, regarding not the totality of two languages, but only single items or words, since the one single direction may yield wrong association or associations:

$$E_i = \sum_{i=1}^{x} P(x,i) \qquad \text{[B.12]}$$

$$if\ \ x = 2,\ E_i = 4$$

If one L2-item is translated into two L1-items, 1T=2M, i.e., making three items in total, the possible causes that may lead to errors, from L2, from L1, from MtoT or TtoM, including from M1toM2 or M2toM1, as well as the possible association of all three items, can be expressed mathematically as:

$$x = 3,\ E_i = 15$$

It matters not whether we have 1T=2M or 1M=2T, the resulting number of errors is the same. Now we need another table to show the new thinking about causes of errors when one L2-item is associated wrongly with one or more L1-items. This also covers the case when one L1-item is associated wrongly with one or more L2-items. This of course, only refers to possible errors or mismatches, or cases when the language learner only recalls the wrong match or matches.

$E_i = \sum_{i=1}^{x} P(x,i)$	*L2*	*L1*	*L2&L1*
1T=1M, x=2	*1*	*1*	*2*
1T=2M, x=3	*1*	*2*	*12*
1T=3M, x=4	*1*	*3*	*60*
…	…	…	…
1T=5M, x=6	*1*	*5*	*1950*
1T=6M, x=7	*1*	*6*	*13692*
…	…	…	…

Table 26 Causes of possible errors with more L1-equivalents

Conclusion of En and Ei

This section indicates that in a language learning situation where the L2-learner mixes up L2 with L1, or follows the usual practice of matching an L2-item with one or more L1-items in the Translation Method (TM), the result would yield more errors than correct expressions in L2, as well as in L1. As has been proved by many cases, even those from the United Nations (Berlitz, 2005-1982), such association or matching can be disastrous. For the sake of comparison, here is another table with both E_n and E_i.

N=x	E_n	E_i
1	*1*	*1*
2	*6*	*4*
3	*15*	*15*
4	*28*	*64*
5	*45*	*325*
6	*66*	*1956*
7	*91*	*13699*
…	…	…

Table 27 Translation or matching creates errors.

As is indicated in the Table above, the translation or matching method in the learning of an additional language, E_i is much worse than possible influence between languages, as a cause for errors. Based on this table, the translation method of learning an additional language is better weaned off when the language learner sets up his or her mind to start a third language, including his or her mother tongue, when $E_n = E_i = 15$, n=i=3, beyond which, more errors will be caused by the translation method by leaps and bounds.

The number 15, representing three languages including the mother tongue, coincidentally reflected a conclusion drawn by Colomer (1996) that in a given community with ten languages, three languages are optimal for a person to be able to speak (Erard, 2012) and hear to communicate. In the real world, there is no community where ten languages are used simultaneously equally importantly in either daily lives or at a workplace. Therefore, it seems knowing three languages can be an ideal goal for an average language learner and user, thus greatly reducing the total number of possible errors during the learning process.

The Language of joint variation

A joint variation may be any combination of one or more of each of the direct and inverse types, according to Klaf (1964). If *I* varies directly as L2 and inversely as L1, or $T \propto \frac{T}{M}$ ($\propto$ means 'varies as'), then we may write:

$$I = k\frac{T}{M}$$

(symbol $\propto$ is replaced by [=] and a constant *k*)

This is an expression of joint variation. *k* in applied work is found numerically by an experiment or experiments, and is or may be inserted to get a particular equation for later use (Klaf, 1964). For ease of discussion in this dissertation, it is assumed tentatively and initially that *k=1*. Because the interlanguage is affected by both L2 and/or L1, two equations of joint variation are needed in this discussion:

$$I = \frac{T}{M} \qquad [B.13]$$

$$I = \frac{M}{T} \qquad [B.14]$$

As indicated in previous sections, one of Cajal's four principles is dynamic polarization, which states that within a neuron signals travel in only one direction (cited in Kandel, 2006). Therefore, we need both [B.13] and [B.14] to cover two possible joint variations on interlanguage, *I*, from both L2 and/or L1.

Solving the two equations by addition, we get:

$$I = \frac{M^2 + T^2}{2MT},\ MT \neq 0 \qquad [B.15]$$

From [D.2] and [D.3] in Appendix D, several variations can be derived in their combination for the Etic version. When some of the variations are applied in [B.15], we derive some of the typical and simple expressions for interlanguage as it is related to either L2 or L1. We need to keep in mind that the following are not exhaustive but only a sampling of some possible interlanguages directly or inversely related to both languages. The unknown unknowns, of course, cannot be covered yet for lack of research.

$$\text{When } M = \frac{1}{T},\ I = \frac{T^4+1}{2T^2},\ T \neq 0 \qquad [B.16]$$

$$\text{When } T = \frac{1}{M},\ I = \frac{M^4+1}{2M^2},\ M \neq 0 \qquad [B.17]$$

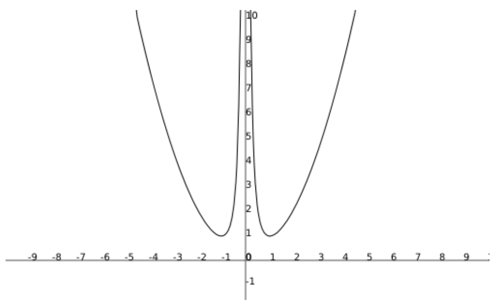

Figure 12 Interlanguage 1

If x-axis represents L2, interlanguage *I*, as in the above Figure (FooPlot, 2007), deviates from L2, but moves more towards L1, or *I* diverges from L2 and converges towards L1. This is a case of L1 over L2 (Tables 3 and 5). Inversely, if x-axis represents L1, interlanguage *I*, as in Figure 12 (FooPlot, 2007), deviates from L1, but moves more towards L2, or *I* diverges from L1 and converges towards L2. This is a case of L2 over L1 (Tables 3 and 5), which is a preferred situation when more second language is being learned.

$$\text{When } \frac{M}{T} = 1 \text{ and } M = \frac{1}{T},\ I = \frac{M+T}{2M} = \frac{T^2+1}{2} \qquad [B.18]$$

$$\text{When } \frac{M}{T} = 1 \text{ and } T = \frac{1}{M},\ I = \frac{M+T}{2T} = \frac{M^2+1}{2} \qquad [B.19]$$

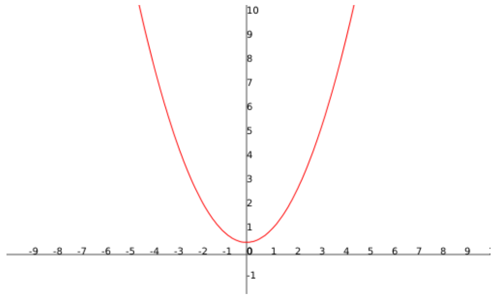

Figure 13 Interlanguage 2

Figure 13 (FooPlot, 2007) is very much similar to Figure 12 (FooPlot, 2007) and bears a similar explanation as that of Figure 12 (FooPlot, 2007).

When $\frac{T}{M}=1$ and $M=\frac{1}{T}$,

$$I=\frac{M+T}{2M}=\frac{T^2+1}{2T^2},\ T\neq 0 \qquad [B.20]$$

When $\frac{T}{M}=1$ and $T=\frac{1}{M}$,

$$I=\frac{M+T}{2M}=\frac{M^2+1}{2M^2},\ M\neq 0 \qquad [B.21]$$

The four formulae of [B.16], [B.17], [B.18], and [B.19], represent, at least, that *I* is improving, with 50% of a chance, towards L2, while these two new formulae [B.20, B.21] show that *I* is being fossilised or stabilised.

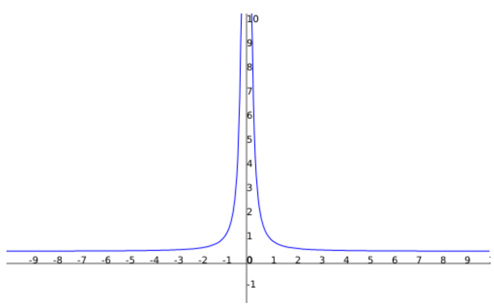

Figure 14 Interlanguage 3

This is first of all a case of L2 over L1, if x-axis represents L2, where L2 is very well learned. Here *I* approaches L2, but never reaches L2, indicating that the ultimate attainment can never be reached [B.20]. In the case of L1 over L2, if x-axis represents L1, Figure 14 (FooPlot, 2007) means the *IL* or *I* remains inferior to L1, approaching L1 but never reaching L1 [B.21], or away from L2. The fossilisation or stabilisation of [B.20] and [B.21] can be expressed by

$$\lim I = 0.5 \qquad [B.22]$$

That means for some language learners, or in the learning of some additional languages, this specific style of *IL* stabilises at a proficiency roughly at about half of the proficiency of an average native language speaker of the target language.

Sources of all or most of the errors

This appendix summarises most of the errors, to be presented again in the following table:

2 languages	L2		L1
Within	L2 only		L1 only
Among T&I	T1↔T2, etc.	1T↔1M, 1T↔2M, etc.	M1↔M2, etc.
Between	L2→L1	L2↔L1	L2←L1

Table 28 Sources of errors, known.

The ‘within’ errors are ‘native-speaker errors’ that are bound to occur, and all language learners and users might ideally be making. The ‘between’ errors are caused by interactions between any two languages and should have been avoided by separating the two languages during the learning process as early and much as possible. The ‘among T&I’ errors are the most difficult to eliminate as these are lated to translation and intrepretation. For example, one L2-unit may have more than one L1-matches. Among the several L1-matches to some L2-units are definitely synonyms, and those are in fact only L1-synonyms. L1-learners, when producing L2, may be very likely to mix up L2-units that are only related to L1-synonyms, but those are not L2-synonyms at all. As each individual learner tends to make his or her own ‘among T&I’ errors, those errors are very difficult to be generalised into a pattern to be avoided in the teaching-learning process to help other language learners.

Conclusion.

When there are only two languages, L2 and L1, and an L1-speaker is learning L2, there should, ideally, be only two results. The L1-speaker already uses L1 as a native speaker and only makes L1-errors like any other or an average L1-speaker. The same L1-speaker should also make L2-errors like any other speakers of L2 who are average native L2-speakers. Anything in-between the two results, anything that is considered wrong no matter how systematic it is, such as: errors related to the total number of languages involved, E_n, errors related to the application of translation or matching method, E_i, or an interlanguage, *I*, that is neither L2 nor L1, should and could be avoided as early and as soon and as much as possible in the process of language learning and teaching.

Before making some suggestions as to how the aforementioned errors can be avoided in the process of learning-teaching a second language, we now turn to a description of the fundamental difference between L1 learning and L2 learning, i.e., the order of acquiring the four languages.

Order of the four skills, RWHS

H	S
R	W

The four language skills, traditionally, are Reading, Writing, Hearing and Speaking, hereafter represented by their four corresponding initial letters, *R*, *W*, *H* and *S*. In second language acquisition, these four skills are logically related, but quite differently from first language acquisition. Starting with the skill to begin with for most second language learners after CP, *R*, since most of the second or foreign language learners would start with *R*, unless they were born in a multilingual context, the reading of a second or foreign language is the most repeated and needed. Most of the learners read to gain new information, read to learn new words, read to learn how to write, and even how to speak or hear the new language. For reasons to be explained later, *R* is put in the third quadrant of a Cartesian space. Compared with and related to *R* the easiest is writing *W*, since most learners starting with *R* will have learned the written script. While reading is usually reading what others write, writing is to write down what one oneself is able to write, easier than reading other people's writing, since obviously one cannot write down what one has not learned what and how to write. *W* is put in the fourth quadrant of a Cartesian space below the x-axis together with *R* to indicate that both *R* and *W* are part of the written language, to be represented as literacy, instead of the spoken, or oracy, or orality. The other two skills, the oracy or orality skills, are represented above the x-axis correspondingly, that is, input or receptive skills on the left side of the y-axis, and output or productive skills on the right side of the y-axis.

The relationship between *R* and *W* can be expressed by the following two formulae:

$$R \geq W \qquad [B.23]$$

which means that a reader in a second language understands more when reading than when producing anything written, since writing can and only can be based on what has been read and has been learned, in other words, *R* is a superset of *W*, which is a subset, and

$$R = wW \text{ , } 1 \leq w \qquad [B.24]$$

which means *W* times a Writing factor greater than or equal to one equals *R*, though the Writing factor, *w*, very seldom reaches one in the second language learning process. That usually means that the writing vocabulary is always smaller than the reading vocabulary (Hunt & Beglar, 2005).

By the same token, other skills have similar relations, such as:

$$W \geq H \qquad [B.25]$$

This means that if one L2-learner hears and fully understands L2, one is usually able to write what is heard, since the L2-learner starts to read first. Of course there are occasions on which one can write L2 but one may not be able to understand one's own writing in L2 said or read aloud by others with unfamiliar accents or intonation or speed, since what one writes is usually much longer and much more complicated than what is usually heard, i.e., spoken speech is usually easier with shorter sentences than written language, assuming both pieces are on the same or similar level of proficiency. However, for most novice and intermediate language learners, $W \geq H$ holds true.

$$H \geq S \qquad [B.26]$$

This means if one is able to speak and talk about one's own ideas, one usually understands hearing the same ideas or identical sentences when one is spoken to in a similar accent and at a similar speed. However, even if one hears and understands what one is spoken to, one may not be able to speak and talk about what one hears oneself, i.e., one's hearing vocabulary is larger than one's speaking vocabulary (Hunt & Beglar, 2005).

In order to find out how *R*, *W*, *H* and *S* are related based on the above reasoning, with their corresponding factors, I am going to use the following equations to start with, combining [B.23], [B.25], and [B.26] by adding a few coefficients, in order to eliminate some factors.

$$\because R \geq W \geq H \geq S, \therefore R = wW = aH = bS \qquad \text{[B.27]}$$

$$\because W \geq H \geq S, \therefore W = hH = cS \qquad \text{[B.28]}$$

$$\because H \geq S, \therefore H = sS \qquad \text{[B.29]}$$

$$\because aH = bS \text{ and } H = sS, \therefore b = as \qquad [b \text{ replaced}]$$

$$\because wW = aH \text{ and } W = hH, \therefore a = hw \qquad [a \text{ replaced}]$$

$$\because b = as \text{ and } a = hw, \therefore b = hsw \qquad [a \text{ and } b \text{ replaced}]$$

$$\because wW = bS \text{ and } W = cS, \therefore b = cw \qquad [b \text{ replaced}]$$

$$\because hH = cS \text{ and } H = sS, \therefore c = hs \qquad [c \text{ replaced}]$$

$$\because b = cw \text{ and } c = hs, \therefore b = hsw \qquad [b \text{ and } c \text{ replaced}]$$

We now see that *a*, *b*, and *c* are all eliminated, and we obtained the following:

$$R = wW = hwH = hswS \qquad [\text{L2or}R]$$

[L2] only represents the age and stage when an L2-learner is learning a second language, excluding the period when the learner starts to create new L2 after some time. [L2] can be further transformed into the following variations:

$$R = wW, \ 1 \leq w \qquad \text{[B.30]}$$

$$w = \frac{R}{W} \qquad [w\text{=Writing factor}]$$

$$W = hH, \ 1 \leq h \qquad \text{[B.31]}$$

$$h = \frac{W}{H} \qquad [h\text{=Hearing factor}]$$

$$H = sS, \ 1 \leq s \qquad \text{[B.32]}$$

$$s = \frac{H}{S} \qquad [s\text{=Speaking factor}]$$

Once [L2] is established, any one of the skills can be expressed in the other three skills:

$$R = wW = hwH = hswS \tag{RorL2}$$

$$W = \frac{R}{w} = hH = hsS \tag{W}$$

$$H = \frac{R}{hw} = \frac{W}{h} = sS \tag{H}$$

$$S = \frac{R}{hsw} = \frac{W}{hs} = \frac{H}{s} \tag{S}$$

All four language skills are directly proportionate to one another, and three, with the exception of *R*, are inversely proportionate to one, two, or all three, of their own corresponding factors or multiplications containing their own corresponding factors.

Multiplications of factors or multifactors can be expressed as follows:

$$hs = \frac{W}{S} \tag{hs}$$

$$hw = \frac{R}{H} \tag{hw}$$

$$hsw = \frac{R}{S} \tag{hsw}$$

A little explanation is needed here. *W* and *S* are related by both Hearing and Speaking factors [*hs*]. In other words, in order to turn *S* skills into *W* skills, one has to enlarge *S* by a multiplication of both Hearing and Speaking factors [*hs*], i.e., an increase of the oral factor or oracy, for the obvious reason that the proficiency of *S* is usually inferior to that of *W* since second language learners starting with reading have, for some time, better writing ability than speaking ability and a larger writing vocabulary than a speaking vocabulary. Inversely, one has to reduce or shrink *W* skills by multiplication of both Hearing and Speaking factors [*hs*] to be able to speak understandably, i.e., a reduction of the oral factor down to oracy. In other words, one cannot simply speak 'bookish English' learned from reading and expects listeners to understand him or her as if he or she is speaking an oral speech, nor can one write 'oral speech' and take it for granted that whatsoever written down is also adequate standard written language. To put it simply, whatever one can speak, one can usually write; however, whatever one can write, one may not be able to speak it fluently, or to make oneself understood using written language as an oral speech.

By the same token, *R* and *H* are related by both Hearing and Writing factors [*hw*], and *R* and *S* are related by all three factors of Hearing, Speaking and Writing [*hsw*]. In other words, as one started to learn a second language by reading, one's reading vocabulary is the largest for some time. At the same time, one needs to change what one reads into sound by reducing Writing factor, or a multiple of both Hearing and Writing factor, so as to cultivate the ability to hear spoken speech, i.e., a transition from passive sight to passive sound. From Reading to Speaking it takes more time or efforts as one has to reduce what one can read by a multiple of Hearing, Speaking, and Writing factors, i.e., a transition from passive sight to active sound. It is obvious that a transition from passivity to passivity is much easier than a transition from passivity to activity.

Generative or degenerative?

H	S
R	W

Other than the above mentioned relations, another dyadic relation amongst the four skills for alphabetic languages can be named generative or degenerative, as shown in the following table.

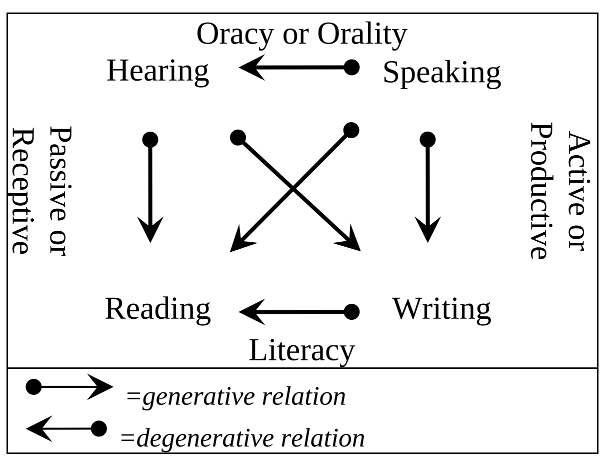

Table 29 Second Alphabetic Language Learning Model (SalLM).

Starting with *R*, if an L2-learner can read the L2, there is no guaranteed possibility that he or she is able to write, hear, or speak the L2, hence the relation between *R* and the other three skills are degenerative, i.e., *R* does not generate the other three skills automatically and easily. However, if the L2-learner writes the L2, she or he definitely understands the L2 (when reading) he or she writes down, or even if written down by somebody else, unless the writing itself is not recognisable or is only scribbles but not meaningful sentences, which the L2-learner is also able to write. The corollary is that the more one writes the L2, the more one understands the L2 when reading it, either his or her own writing or writing by others. Therefore, *W* and *R* has a generative relation, i.e., *W* generates *R*. Understanding the generative relation amongst the four skills has the importance in that the most generative of the four, *S*, means that as long as one can speak the L2, on the condition that the L2 is an alphabetic language with only fewer than 100 symbols to write the language, i.e., a language the writing of which is very easy to learn, say, within a couple of days, then one is definitely able to understand it when heard, to write about at least those one can speak about, and read those one can speak about. The corollary is also true that the more one speaks an alphabetic language, after having learned how to write, the more one can hear and understand, write, and read and understand, the language. This is the advantage of learning alphabetic languages.

The same dyadic relations can also be expressed in the following table, in which (d)egenerative and (g)enerative relations are represented by the initial letters d and g respectively.

$P(4,2)=12$	*R*	*W*	*H*	*S*
Horizontal	*RdW*	*WgR*	*HdS*	*SgH*
Vertical	*RdH*	*WdS*	*HgR*	*SgW*
Diagonal	*RdS*	*WdH*	*HgW*	*SgR*
	3d	*2d1g*	*1d2g*	*3g*

Table 30 Three orientations, creating 12 relations.

Out of the four skills, there are only twelve dyadic relations in total, as given in the permutation below.

$$P(4,2)=12 \qquad \text{[B.33]}$$

Appendix C:
DOORs to SLA

DOORs (Dyadic Oracy Ordering Relations) in SLA

Based on Tables 29 and 30, the following Table 31 can be developed to incorporate a list of all the twelve dyadic relations involving the four language skills. The red G in the middle of the squares represents grammar or grammaring, which is the adhesive tool that links all the four skills in an organised team. The relations are further divided with the addition of oracy or orality, literacy, active or productive or presentational, passive or receptive or interpretative, and combination of them all (interpersonal). Each of the four or five symbols (with G for grammaring) in a square shows one of the three orientations, horizontal, vertical, or diagonal.

	R	*W*	*H*	*S*	
R	***R***	*G a* *R l W*	*H o* *P G* *R*	*o S* *G a* *R*	*R*
W	*P G* *R l W*	***W***	*H o* *p G* *W*	*o S* *G a* *W*	*W*
H	*H* *P G* *R l*	*H* *G a* *l W*	***H***	*H o S* *G a*	*H*
S	*S* *p G* *R l*	*S* *G* a *l W*	*H o S* *p G*	***S***	*S*

Table 31 All 12 Dyadic Oracy Ordering Relations (DOORs)

From DOOR 1 to 6: twelve relations.

All the six DOORs, or twelve relations, are significant in that they all shed some light on how an alphabetic language can be learned as a second or foreign language.

DOOR lpa (literacy passive-active).

1. WlpR or WgR (literacy active to passive or writing generates reading): whatever an L2-learner is able to write she or he is definitely able to read and understand, but not necessarily vice versa, since the relation is generative from active literacy to

passive literacy. This is a productive route after having learned, i.e., via *R*, some L2, an output relation. This DOOR can be used for the consolidation of the learning of an L2. The principle applicable here is: the more output possible, the more input understandable (MoMi). However, this principle is only possible combined with TiTo below.

2. RlaW or RdW (literacy passive to active or reading degenerates writing): after reading the L2 as input, a L2-learner can be asked to write about what she or he has read and understood as a practice, since reading, though as input, is degeneratively related to writing, to be overcome by *R* more for learning *W*. The more an L2-learner reads, the more he or she can turn what is read into what can be written, on the principle of no input, no output (NiNo). This is a degenerative relation from passive literacy to active literacy, an input and learning relation supported by the evidence of an output.

DOOR opa (oracy passive-active).

3. SopH or SgH (oracy active to passive or speaking generates hearing): whatever an L2-learner is able to talk about he or she is definitely able to hear and understand, but not necessarily vice versa, since the relation is generative from active oracy to passive oracy. This is a productive route after having learned, i.e., via *H* or *W*, some L2, an output relation. This DOOR can be used for the consolidation of the learning of an L2. The principle applicable here is: the more output possible, the more input understandable (MoMi).
4. HoaS or HdS (oracy passive to active or hearing degenerates speaking): after hearing the L2 as input, an L2-learner can be asked to talk about what he or she has heard and understood as a practice, since hearing, though as input, is degeneratively related to speaking, to be overcome by *H* more for learning *S*. The more an L2-learner hears, the more he or she can turn what is heard into

what can be spoken, on the principle of no input, no output (NiNo). This is a degenerative relation from passive oracy to active oracy, an input and learning relation supported by output. However, this principle is only possible combined with TiTo below.

DOOR plo (passive literacy-oracy).

5. HplR or HgR (oracy to literacy passive or hearing generates reading): whatever an L2-learner hears and understands he or she may be able to read and understand, unlimited by time to think and reflect while reading, a generative relation from passive oracy to passive literacy, very useful for sound-sight correspondence.
6. RpoH or RdH (literacy to oracy passive or reading degenerates hearing): whatever an L2-learner reads and understands he or she may not be able to hear and understand, limited by time to think and reflect while hearing, a degenerative relation from passive literacy to passive oracy. However, the learner needs to turn what is read, i.e., symbols, into sound so that the sight-sound correspondence can be established for learning oracy. This DOOR can be used for sounded reading, instead of silent reading, to cultivate *H*, i.e., a symbol to syllable practice.

DOOR alo (active literacy-oracy).

7. SalW or SgW (oracy to literacy active or speaking generates writing): whatever an L2-learner speaks about he or she may definitely be able to write about, unlimited by time to think and reflect while writing, a generative relation from active oracy to active literacy, very useful for sound-sight correspondence. The more one is able to speak, after having learned how to write, the more one is able to write down what one can speak about.
8. WaoS or WdS (literacy to oracy active or writing degenerates speaking): whatever an L2-learner writes she or he may not be able to speak about, limited by time to think and reflect while speaking, a degenerative relation from active literacy to active oracy, but a

useful practice for sight-sound correspondence, a symbol to syllable practice.

DOOR laop (literacy active-oracy passive).

9. HlaW or HgW (oracy passive to literacy active or hearing generates writing): whatever an L2-learner hears and fully understands as input he or she may be asked to write down, since it is easier to write down what one hears and fully understands orally, a generative relation from passive oracy to active literacy, a useful practice for sound-sight correspondence. This is the basis on which dictation is applied, though for younger learners mainly.
10. WopH or WdH (literacy active to oracy passive or writing degenerates hearing): whatever an L2-learner is able to write down she or he may not be able to hear and understand since the written language is usually more difficult and complicated than the spoken language, a degenerative relation from active literacy to passive oracy. However, if the learner is required to think of the pronunciation while writing it is also a useful practice for sight-sound correspondence, a symbol to syllable practice.

DOOR lpoa (literacy passive-oracy active).

11. SlpR or SgR (oracy active to literacy passive or speaking generates reading): whatever an L2-learner is able to speak about she or he may be able to read and understand, a generative relation from active oracy to passive literacy. What is read is usually more difficult than what one can speak about, however, the more one can speak about, the more one can read and understand.
12. RoaS or RdS (literacy passive to oracy active reading degenerates speaking): whatever an L2-learner reads and understands he or she may not be asked to talk about, since the written language is usually more difficult than the spoken language, a degenerative relation from passive literacy to active oracy. However, this route

> can be used in the practice of sight-sound correspondence, or turning the sight into sound into sense.

The importance of a second or target language (represented by *T* or L2) sometimes even surpasses that of the first language or mother tongue (represented by *M* or L1), with the help of another important language (Dewdney, 2004; Hood, 2012; Knill et al., 2002-00; Knill et al., 2001-1999; Knill et al., 2001-1998), mathematics, as an important tool for thinking and for sciences. Perhaps the chief difference in English language arts and mathematics is that writing in English language arts is more directed to the reader's mind, while writing in mathematics makes little effort to appeal to the emotions. Some scholars are working on combining the two languages, one symbolic and one artistic (Morgan, 1998). The symbolic language is the mathematics language, while the artistic language is the English language, or any language other than mathematics.

In secondary education, languages, both L1 and L2, and mathematics are three of the disciplines that have been constantly developing for any area where immigration is vital. In the province of Alberta, the English language and mathematics are two of the subjects that are examined in the provincial achievement tests in grades 3, 6, and 9, as well as in diploma examinations at grade 12 (English Language Arts). As a matter of fact, English and Mathematics are the only two provincial achievement tests given at grade 3. Second language is also highly developed in Alberta. In 2003, Alberta Education published a report with 35 recommendations to enhance second language learning in the province (Alberta. Alberta Education, 2003). Most recently, new strategies are summarised and promoted as well (Alberta. Alberta Education, 2009; Alberta. Alberta Education. Early Learning Branch, 2009).

In view of the above, language arts (mostly L1) and second language learning (L2) can be a combined or common-interest study involving both areas with the support of mathematical perspectives. One problem that also occurred to me is that many of my secondary school students, especially senior high, are not in favour of the idea of writing down what their thought path is when they solve a mathematics problem. Many of them would tell me that they know how to do it and they can do it well, but they could not write down how they did it. As soon as they start to write down how they solve a mathematics problem, they forget what the next step is. On top of all that, many of the students usually do not like to write as well mathematically, except when they have to finish a writing assignment in Language Arts. To me, that may also mean that mathematics, as a language, is revealing to us a problem that can be solved in consideration of the dyadic relation between L1 and L2. In other words, the dislike for students to write about mathematics may be revealed in the study of the mother tongue and the second language.

One needs to be very determined to be a writer, of course. Writers need to overcome the problem of being blocked in their own culture, and need to get a perspective that questions their own culture. One writer, Sir Bertrand Russell, wrote an average of 3,000 words every single day, according to *Encyclopaedia Britannia*. As a matter of fact, many people do not often write, especially professionally in their own field of studies, once they finish their education. However, as a student, especially students in secondary and tertiary education, one needs to learn to write by writing often to finish assignments, either in L1 or L2.

Having seen and faced with a challenge that has to be overcome by my students, most of whom are native speakers of the English language, and many of the immigrants I have been working with, I engaged in my current Ph.D. programme, hoping that by analysing how languages are related and learned, supported with mathematical tools for thinking, my research will help both ESL learners and native English speakers alike.

Entropy, an idea that looms large in this research, as defined by *Oxford English Dictionary* (Simpson, et al., 1993), means a measure of the average information rate of a message or language in communication theory, which represents the average information rate per symbol. More entropy means less information. Language is used to transmit information, which is the reduction of entropy (Chen, 2003), or the reduction of disorder. Where there are two and only two languages, the disorder can be caused by one or the other of the languages.

Not only in language learning and teaching, the idea of entropy is also very applicable in living one's life, as in living, entropy has to be reduced in order to live well.

This research will benefit both second language and language arts teachers in that they will be able to assist their students in recognising and emphasising strategies in treating words, phrases, clauses, sentences, and structures or paragraphs in both L1 and L2, so that their marks can be increased upon better understanding of learning strategies, thus reducing entropy. It will definitely help students in their learning of a second language in the areas of language arts learning and any other learning which can be put into a dyadic relation.

In the long run, this research will or may also start as one of the steps, a very tiny one step, towards an integration and harmony of eastern and western cultures, such as the understanding of different thought patterns (Kaplan, 1966), the relationship of thought patterns to geography (Nisbett, 2003), interrelatedness of languages and cultures and language education (Brooks, 1975; Kramsch, 1998; Sapir, 1949; Soto, 1997), connectedness between human nature, culture, and language (A. H. Goodman, Heath, & Lindee, 2003; Ridley, 1999), for the development of a better world (Pinker, 2012-11).

Appendix D:
Relations and Equations

Interlanguages

$$IL = 4C(n,2) = 2n(n-1) \quad [D.1]$$

Direct proportion

$$\frac{T}{M} = k \text{ or } T = kM \quad [D.2]$$

Inverse proportion

$$T = \frac{k}{M} \text{ or } T \times M = k \quad [D.3]$$

Initial state vector

$$P_0 = (0 \quad 1) \quad [D.4]$$

Transition matrix, L1

$$S_M^x = \begin{pmatrix} x^{-1} & (x-1)x^{-1} \\ x^{-1} & (x-1)x^{-1} \end{pmatrix}^x \quad [D.5]$$

Steady state vector, L1

$$P_M = P_0 \times S_M^x = \begin{pmatrix} 0 & 1 \end{pmatrix} \begin{pmatrix} x^{-1} & (x-1)x^{-1} \\ x^{-1} & (x-1)x^{-1} \end{pmatrix}^x \quad [D.6]$$

Transition matrix, L2

$$S_T^x = \begin{pmatrix} x^{-1} & (x-1)x^{-1} \\ (x-1)x^{-1} & x^{-1} \end{pmatrix}^x \quad [D.7]$$

Steady state vector, L2

$$P_T = P_0 \times S_T^x = \begin{pmatrix} 0 & 1 \end{pmatrix} \begin{pmatrix} x^{-1} & (x-1)x^{-1} \\ (x-1)x^{-1} & x^{-1} \end{pmatrix}^x \quad [D.8]$$

Learning equation

$$T = t + (T - t) \quad [D.9]$$

L1 added in learning

$$T + m = t + (T - t) - m \quad [D.10]$$

Efficiency

$$\eta = \frac{output}{input} = 1 - \frac{losses}{input} \qquad \text{[D.11]}$$