AGE-RELATED EFFECTS IN ADULT SECOND LANGUAGE ACQUISITION:
A STUDY OF MANDARIN-SPEAKING LEARNERS OF ENGLISH

by

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A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy
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The Ontario Institute for Studies in Education
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DEDICATION

To my parents,

Fengzhen Han and Zhiqing Wang,

who have lived my dream as theirs and provided constant support from afar.
ABSTRACT

Age-related Effects in Adult Second Language Acquisition:
A Study of Mandarin-speaking Learners of English

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OISE, University of Toronto, Ph.D., 1998

One of the assumptions of the critical period hypothesis (Lenneberg, 1967) as interpreted by Bialystok and Hakuta (1994) is that there should be no continuing age effect in second language (L2) acquisition after maturity at puberty: that is, there should be no systematic age-related differences in L2 proficiency outcomes among adult learners. In this thesis, I examine this assumption by comparing the oral L2 proficiency of two different age-of-arrival (AOA) groups: one group of 15 learners whose AOA in Canada was between 25 and 35, and another group of 15 learners whose AOA was between 40 and 55. All were female Mandarin-speaking immigrants learning English as a second language. The two AOA groups were similar in terms of length of residence in Canada and years of first language (L1) education, but the later AOA group had had the advantage of receiving more English instruction than the earlier AOA group since their arrival in the L2 environment. These adult learners were tested for accuracy of production of six basic morphosyntactic features of English via two speech tasks: an elicited imitation test and a guided oral interview. Excerpts taken from all of the guided oral interviews were also rated for fluency in English. Results demonstrated consistent advantages for the earlier arrivals over the later arrivals on the two summary measures of morphosyntactic accuracy and on the measure of oral fluency, although this effect of AOA did not appear on every morphosyntactic feature tested. The overall results indicate that among these adult learners, differential L2 proficiency outcomes continue, as in prepubertal learning, to be related to learners’ AOA in the L2 environment, thus posing an empirical challenge to the assumption implied by the critical period hypothesis.
A further comparison of the two AOA groups on the measures of learner variables that may underlie the effect of AOA on L2 proficiency outcomes highlights the importance of fluid intelligence, variety of L2 contact, and amount of L2 daily use. On these learner variables, which correlated positively with learners’ L2 proficiency outcomes, the earlier AOA group had an advantage over the later one. Finally, the learners’ account of their experiences and perceptions of learning English as a second language reveals the complexity of adult L2 acquisition, which involves factors pertaining not only to the learners themselves, but also to the social context in which the L2 is learned.
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My thanks to all the members of my defence committee: To David Singleton for serving as the external examiner and for his critical comments which I will take into account in my continuing research; to Jim Cummins and Peter Lindsay for their generous support. I am very pleased to record that my Ph.D oral examination was a most memorable experience. I shall always be grateful for the constructive comments from all the members.

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1. INTRODUCTION

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<tr>
<td>A-LINC</td>
<td>Assessment Tool for Language Instruction for Newcomers to Canada</td>
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<td>ANOVA</td>
<td>analysis of variance</td>
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<td>AOA</td>
<td>age of arrival</td>
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<td>CPH</td>
<td>critical period hypothesis</td>
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<td>EIT</td>
<td>elicited imitation test</td>
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<td>EL</td>
<td>earlier AOA learners</td>
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<td>ESL</td>
<td>English as a second language</td>
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<tr>
<td>L1</td>
<td>first language</td>
</tr>
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<td>L2</td>
<td>second language</td>
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<tr>
<td>LINC</td>
<td>Language Instruction for Newcomers to Canada</td>
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<td>LL</td>
<td>later AOA learners</td>
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<tr>
<td>LOR</td>
<td>length of residence</td>
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<td>LTM</td>
<td>long-term memory</td>
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<td>OF</td>
<td>oral fluency</td>
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<tr>
<td>OI</td>
<td>oral interview</td>
</tr>
<tr>
<td>SD</td>
<td>standard deviation</td>
</tr>
<tr>
<td>SOC</td>
<td>supplied in obligatory context</td>
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<tr>
<td>STM</td>
<td>short-term memory</td>
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<tr>
<td>TESL</td>
<td>teaching English as a second language</td>
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<td>TLU</td>
<td>targetlike use</td>
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Existing theories concerning the role of age in second language (L2) acquisition have centred on identifying the close of a critical period for L2 acquisition. This has generated a large number of comparative studies concentrating on the younger end of the age continuum with a focus on the ultimate L2 attainment of learners whose acquisition commenced before, during, and after puberty. This line of research claims that there is a gradual linear decline in learner performance in L2 as a function of age of onset (Oyama, 1976) and that this decline continues up until puberty. After this onset age, it is argued, there is a lack of linearity and great variability in L2 attainment (e.g., Johnson & Newport, 1989; Long, 1990; Patkowsk, 1980). Findings from this line of research have been interpreted as “evidence for a critical or sensitive period, a maturationally determined point of heightened receptivity to environmental stimuli” (Bialystok, 1997, p.116). As a result of this focus on physiological maturation as an explanation for diminished success in L2 acquisition among adult learners, “there is a particular dearth of data on first and second language learning through adulthood” (Singleton, 1989, p.267), and the possibility of age-of-onset differences in adulthood is an issue that has been largely neglected to date. However, the tacit assumption of the critical period hypothesis (Lenneberg, 1967) as interpreted by Bialystok and Hakuta (1994) that there should be no continuing age effect after maturity at puberty is now challenged by empirical findings from several studies focusing on different starting ages for L2 acquisition in adulthood. Findings from these studies suggest that

1 Although I assume Krashen’s (1978) distinction between acquisition and learning, in this thesis both terms are used on the ground that they are used interchangeably by some second language researchers.
there is a continuing decline in L2 outcomes with increasing age of onset, particularly in oral-aural aspects (e.g., von Elek & Oskarsson, 1973; Klein & Dittmar, 1979; Scott, 1994; Seright, 1985; Thorndike, 1928). Clearly a closer examination of the two divergent positions on the relevance of starting age for L2 acquisition in adulthood is warranted.

The present study seeks to determine which of these two positions on adult L2 acquisition can be supported by investigating the acquisition of English as a second language (ESL) by two different age-of-arrival (AOA) groups of adult Mandarin-speaking immigrant learners. Two specific research issues are of particular theoretical and educational interest in the context of adult L2 acquisition. The first issue concerns whether, among adult learners, differential L2 proficiency outcomes continue to be related to learners' AOA in the L2 environment. The second research issue concerns factors that may underlie the possible effect of AOA on the L2 proficiency outcomes among adult learners. In addressing these two research issues, an overall hypothesis was formulated against the background of existing empirical evidence of age-related differences in L2 acquisition among adult learners:

Adult learners with AOA in the L2 environment between 25 and 35 are likely to achieve a higher level of oral proficiency in L2 than adult learners with AOA between 40 and 55.

The present study does not attempt to make a broad comparison of all aspects of oral English proficiency of the adult learners involved, but instead focuses on morphosyntactic accuracy and oral fluency. With respect to morphosyntactic accuracy, the study concentrates on the accurate production of six basic morphosyntactic features of English: noun plurals, the simple past tense, the third person singular, the progressive marker, determiners, and auxiliaries. The learners' morphosyntactic accuracy is measured by two speech tasks: an elicited imitation test and a guided oral interview. Excerpts taken from all the guided oral interviews are then
rated for oral fluency with a focus on delivery, rhythm, stress and prosody. If L2 proficiency outcomes of these two AOA groups are to differ significantly on the measures of morphosyntactic accuracy and oral fluency, such differences cannot be explained simply by maturation since both groups of learners were cognitively and socially mature on arrival in the L2 environment.

In exploring explanations for possible effects of AOA on the L2 proficiency outcomes among these adult learners, I take two approaches. First, I compare the two AOA groups on four sets of learner variables that have been considered to bear on adult L2 acquisition: language contact, intelligence, memory, and motivation. Should differences on these learner variables exist, they may help argue for a continuous decline in L2 proficiency outcomes with increasing AOA in the L2 environment. Second, in recognition that L2 acquisition is a personal experience and that there are likely to be many previously unrecognized or inadequately described factors affecting adult L2 acquisition, I conduct a descriptive analysis of the learners' own assessments of the personal and experiential factors that may underlie their L2 proficiency outcomes.

The issues to be examined in the present study are of both theoretical and educational importance. From a theoretical perspective, evidence concerning age-related effects in L2 acquisition during adulthood, if verified, would provide a new challenge to the relevance of the critical period hypothesis for L2 acquisition with its implication that there should be no continuing effect of onset age on L2 performance after puberty. Given an increasing number of adult immigrant learners of different age ranges learning ESL in the Canadian context, a better understanding of the age issue in adult L2 acquisition is of obvious educational relevance. Learning an L2 is a task of great difficulty for many adult learners. Findings from this study regarding the characteristics and learning experiences of these adult immigrant learners, and particularly the constraints they experience in their acquisition of ESL will be of relevance to
The thesis is organized in the following manner. In Chapter 2, I first discuss the critical period hypothesis (Lenneberg, 1967) and its subsequent versions; I then look at the proposed turning point at puberty for L2 acquisition in light of the L2 empirical findings. Based on the analysis of the critical period studies available, I argue that the alleged terminus to a critical period for (second) language acquisition is not as convincing as is claimed, and that the assumption that there is no continuing age effect in L2 acquisition after puberty needs to be addressed more thoroughly. A review of age-related studies in L2 acquisition in adulthood is then provided, which is followed by a discussion of their implications for the present study. The chapter concludes with a discussion of four learner variables which seem to be important in adult L2 acquisition and which may have a bearing on L2 proficiency outcomes in the present study. Chapter 3 describes the research design. This includes defining the research questions, specifying the research focus, describing the participants in the study, and detailing research instruments and scoring procedures. This chapter ends with a brief presentation of how the data are prepared and analysed quantitatively and qualitatively. Chapter 4 presents the results of analyses of the two AOA groups' performance on the test of oral English proficiency and on the measures of the learner variables under study. Relationships between these learner variables and L2 proficiency outcomes are also examined. This chapter concludes with a descriptive comparison of the two AOA groups' experiences and perceptions of learning ESL, which provides additional information and perspective on the quantitative findings to the present research questions. Chapter 5 is devoted to a discussion of the empirical findings in relation to each of the two research questions of the present study. Finally, Chapter 6 considers the theoretical and educational implications of the findings for further research, curriculum development, and classroom teaching.
Chapter 2

AGE AND SECOND LANGUAGE ACQUISITION

It has been observed that there is great individual variation in L2 acquisition both among children (Wong Fillmore, 1979) and adults (Skehan, 1989). This variation may have a number of cognitive, affective and environmental causes (for a review, see Krashen, 1982; Long, 1990; Singleton, 1989). However, the advantage that children have in acquiring the language or languages of their communities, while most adults who try do not appear to succeed in developing native-like mastery of an L2 (Bley-Vroman, 1989), calls for explanation. An influential hypothesis, which is still widely believed to have considerable explanatory value, is the critical period hypothesis (CPH) (Lenneberg, 1967), in the context of which much of the research on age-related effects in L2 acquisition has been conducted.

2.1. The Critical Period Hypothesis

In behavioural science, the critical period concept is defined as a time period during which sensitivity to certain kinds of environmental stimuli is greater than at other times (Colombo, 1982). The general phenomenon of critical periods for learning has been well documented in many non-human species (see Bornstein, 1987; Hurford, 1991). Penfield and Roberts (1959) were among the first to apply the critical period concept to human language development. They postulated an optimal age for language learning between age 4 and 8 because of greater neural plasticity in the brain in these years, and that after age 9 language
learning of all kinds would become increasingly hampered by stiffness and rigidity in the brain. Their hypothesis was later refined by Lenneberg (1967), who argued persuasively based on his clinical observations that language development runs a definite course on a definite schedule with an onset between the second and third years of life. As for the end of the critical period, Lenneberg placed it rather firmly at the age of 13 or puberty in order for language to fully develop (Lenneberg, 1967, p.127). He postulated that the close of the critical period coincides with the end of the development of cerebral dominance, after which the ability to learn a language naturally atrophies. As to the prospect of language acquisition after puberty, Lenneberg (1967) stated:

... the incidence of “language learning blocks” rapidly increases after puberty. Also automatic acquisition from mere exposure to a given language seems to disappear after this age and foreign languages have to be taught and learned through a conscious and labored effort. Foreign accents cannot be overcome easily after puberty. (p.176)

This implies that the process involved in any language acquisition which takes place after the age of puberty will be qualitatively different from that involved in child language acquisition, and will generally be less successful and less natural than that occurring during the critical period (Long, 1990, p.256).

However, Lenneberg’s hypothesis with its strictly defined upper and lower bounds has been seriously challenged by evidence indicating that cerebral lateralization for language is present much earlier in childhood than puberty, and may already be present at birth (e.g., Kinsbourne, 1975; Kinsbourne & Hiscock, 1977; Krashen, 1973). Moreover, Whitaker, Bub, and Leventer’s (1981) argument that there are no known neurological correlates for a sudden decline in language ability at puberty casts further doubt on puberty as a maturational turning
point for language acquisition. However, the removal of the neurological basis for the CPH has apparently not troubled the basic hypothesis of a childhood advantage in language acquisition. Instead, it has opened the door to a continuous debate about the onset, the relevant cause or causes of the hypothesized decline in language ability, and whether puberty or thereabouts is indeed a turning point for language acquisition (see Harley & Wang, 1997, for a review).

Note that Lenneberg's critical period hypothesis was concerned with first language (L1) acquisition. It has nonetheless often been tested in the L2 domain based on the logic that "if there is a sensitive period for second language acquisition, then there must be a similar constraint on first language acquisition" (Bialystok, 1997, p.118). In the field of L2 acquisition, the term 'sensitive' period is preferred by some researchers to the term 'critical' period, as a more flexible construct.

In a refinement of the CPH, and in view of both L1 and L2 acquisition, Johnson and Newport (1989) made a distinction between an 'exercise' version and a 'maturational state' version of the CPH. According to the exercise version:

Early in life, humans have a superior capacity for acquiring languages. If the capacity is not exercised during this time, it will disappear or decline with maturation. If the capacity is exercised, however, further language learning abilities will remain intact throughout life. (Johnson & Newport, 1989, p.64)

To elaborate, the exercise version of the CPH predicts that children will have an advantage over adults in acquiring L1. As long as one has successfully acquired his/her L1, and hence has activated his/her capacity for acquiring languages, one will continue to have the capacity to learn

---

2Although the term 'critical period' is associated with a strictly defined critical period concept and the term 'sensitive period' is indicative of a more flexible one, both terms are nonetheless used interchangeably by some researchers, and hence here in this thesis.
additional languages. In this sense, the exercise version of the CPH predicts the same for children and adults with respect to their L2 acquisition, or perhaps even that adults may have an advantage over children in this regard due to their cognitive superiority.

Johnson and Newport (1989), however, took a stand in favour of the contrasting maturational state version of the CPH, claiming that:

"Early in life, humans have a superior capacity for acquiring languages. This capacity disappears or declines with maturation." (p.64)

Johnson and Newport (1989) elaborated the maturational state version as follows:

"... there is something special about the maturational state of the child’s brain which makes children particularly adept at acquiring any language, first as well as second. This hypothesis predicts that language learning abilities decline with maturation, regardless of early linguistic experience: acquiring a first language early in life will not guarantee the ability to acquire a second language later in life." (p.64)

This implies that, regardless of L1 or L2 acquisition, native-like outcomes will be unattainable after the mid-teens. However, an important difference between Lenneberg’s original hypothesis and the maturational state version of the CPH is that Johnson and Newport believe that the declining process up through puberty is likely to be gradual rather than a one-time loss. By predicting that the CPH extends to L2 acquisition, the maturational state version of the CPH is subject to being tested in L2.

Lenneberg (1967), however, did not specify which aspect(s) of the language system a child would be most sensitive to during the critical period for language acquisition (Colombo, 1982). Concerning the acquisition of different aspects of language competence (e.g., phonology, syntax, and lexical development), other hypotheses were subsequently proposed, including the hypothesis that there are multiple sensitive periods, each governing the acquisition of different
aspects of language competence (Seliger, 1978). In light of the available empirical data in the acquisition of L1 and L2, and yet still without solid support from the neurophysiological accounts of brain maturation, Long (1990) proposed what he called a radical version of the maturational state hypothesis, which he specified as follows:

There are sensitive periods governing the ultimate level of first or second language attainment possible in different linguistic domains, not just phonology, with accumulative decline in learning capacity, not a catastrophic one-time loss, and beginning as early as age 6 in many individuals, not at puberty, as is often claimed. (p.255)

Likewise, Long argued that there is more than one sensitive period governing ultimate attainment in different linguistic domains, and that each runs on its own schedule. Long claimed that the supposed closure for complete, native-like acquisition of phonology in many individuals is as early as age 6 (e.g., Oyama, 1976; Tahta, Wood, & Loewenthal, 1981; Thompson, 1991), and around age 15 for morphology and syntax (e.g., Johnson & Newport, 1989; Patkowski, 1980). It is important to point out that the key issue for Long’s maturational state hypothesis is whether complete native-like L2 attainment is possible after a given age. The easiest way to falsify this notion, according to Long (1990), would be “to produce learners who have demonstrably attained native-like proficiency despite having begun exposure well after the closure of the hypothesized sensitive periods” (p.274). While a number of studies can be considered as attempts to meet Long’s challenge (e.g., Birdsong, 1992; Ioup, Boustagui, El Tigi, & Moselle, 1994; Nova, Fein, & Obler, 1988; Obler, 1989; Schneiderman & Desmarais, 1988), it is doubtful whether any L2 learner can ever meet Long’s criterion of complete native-like proficiency. As Cook (1992) observed, no matter how proficient bilinguals are, the mental representation of neither their L1 nor their L2 is exactly the same as that of either language for
the respective monolingual groups, simply because "each language is influenced by the presence of the other" (p.115). Arguing with Cook (1992) from the perspective of multicompentence, Harley and Wang (1997) suggested a need to reconsider the notion of complete native-like attainment as a criterion for successful L2 learning. If knowing more than one language has a mutual effect at any age, then Long's (1990) criterion for complete native-like proficiency is unrealistic, as is his approach to the testing of the maturationally determined critical period for L2 acquisition.

Despite differences between Lenneberg's original hypothesis and subsequent variations of the hypothesis, what they have in common is their strong emphasis on the role of physiological maturation in (second) language acquisition. As Bialystok and Hakuta (1994) argued, if one assumes that a critical period comes to a close at puberty, Lenneberg's critical period hypothesis, in its strongest form, implies three predictions:

1) There should be perfect learning until puberty;
2) there should be a sharp drop [in language learning ability] at puberty;
3) and there should be no age effect after puberty.

(Bialystok & Hakuta, 1994, pp.71-72)

While a great deal of research has been devoted to the investigation of the first two predictions, the third prediction, however, has been a tacit assumption that has rarely been addressed. If age of acquisition indeed ceases to have systematic effects on L2 acquisition after maturity at puberty, as the CPH implies, then testing this tacit assumption is crucial if the debate as to whether puberty or thereabouts is indeed a turning point for L2 acquisition is ever to be settled. In the following section, I will review a few key studies in light of the third prediction of the CPH to see whether there is a 'turning off' point at around puberty for L2 acquisition, after which onset age is unrelated to proficiency outcomes (Bialystok, 1997, p.133).
2.2. Does Puberty Mark the Turning Point for a Critical Period for L2 Acquisition?

The proposed turning point at around puberty for a critical period for language acquisition has generated a large number of comparative studies investigating the L2 outcomes of learners whose L2 acquisition commenced before, during and after puberty. Note that most available critical period studies of L2 acquisition have been devoted to the test of the first two of the above predictions of the CPH. Findings from these studies appear confusing and even contradictory; however, a somewhat clearer pattern emerges if a distinction is made between ultimate attainment in L2 and rate of L2 acquisition at the early stages (see Krashen, Scarcella, & Long, 1982, for a review) and if due account is taken of the differential effects of age on the acquisition of phonology, morphosyntax, and semantics (see Long, 1990, for a review).

With reference to ultimate attainment in L2, the general consensus in the literature is that there is a linear relationship between an increasing age of onset for L2 acquisition and declining ultimate attainment in L2 proficiency, though there is no agreement on what may underlie the child advantage in this regard (see Long, 1990). With reference to rate of L2 acquisition, the available data point to the conclusion that more mature learners are initially faster than younger ones in acquiring morphosyntactic and lexical aspects of an L2, but that this initial rate advantage is often short-lived. As Cummins (1981) pointed out, the distinction between rate of L2 acquisition and level of ultimate attainment is useful in showing the two dimensions in this area of research. What remains a central issue in the continuing debate, however, is the relevance of a turning point at puberty for a critical period for L2 acquisition.

Many studies investigating the critical period for L2 acquisition have concentrated on one level of language—namely, phonology (e.g., Oyama, 1976; Patkowski, 1980; Tahta, Wood, &
Loewenthal, 1981; Thompson, 1991; see also Long, 1990, for a review), which many researchers consider in terms of "accent" (Cook, 1986, p.27). Although differences in subject populations and methods exist, findings from these studies appear consistent, indicating that the younger the AOA in an L2 environment, the more likely the person will be accent-free, though the closure for achieving a completely accent-free speech identified in these studies has varied. In contrast to Patkowski's (1980) study, which showed a discontinuity at age 15 in the accent ratings of pre- and post-puberty groups, Oyama (1976) reported that her youngest arrivals' (ages 6 to 10) performance was comparable to that of the native speaker control group, whereas those arriving after about age 12 felt short of the native standard, though substantial accents were observed much earlier. Tahta, Wood and Loewenthal's (1981) findings indicated that there were excellent chances of attaining a native-like accent if L2 acquisition began by age 6, and minimal chances if L2 acquisition began during or after puberty. Data from Thompson's (1991) study indicated that the onset-age effect could begin earlier than age 6. Those who arrived in the United States between ages 4 and 10 were judged to have a slight foreign accent, which led Thompson to raise the possibility that the acquisition of fully native-like speech in L2 may not be possible if L1 is maintained at a high level of proficiency, no matter how young the age at which the individual starts to acquire L2.

What is noteworthy about the findings of these studies is that the decline in attaining accent-free speech appears to begin much earlier than the alleged pubertal turning point. Equally important are the findings indicating a gradual linear decline with increasing age of onset in attaining accent-free speech. These findings are important for they provide an empirical challenge to the second prediction of the CPH that there will be a sharp drop in language learning potential at puberty. In Oyama's (1976) view, the superior advantage of early as opposed to late
L2 speech learning supports the existence of a broadly defined ‘sensitive’ period, which she refers to as a period of greater responsiveness to certain environmental stimuli “bounded on both sides by states of lesser responsiveness” (Oyama, 1979, p.88). This suggests a ‘weaker’ version of the CPH, implying that there is no ‘hard and fast’ boundary at puberty beyond which L2 acquisition becomes impossible. In fact, other studies of the acquisition of L2 speech have demonstrated that adult learners do have the capacity to perceive and produce native-like sounds, thus challenging any claim of a complete loss of phonological capacity in adults (e.g., Best, McRoberts, & Sithole, 1988; Bongaerts, van Summeren, Planken, & Schils, 1997; Flege, 1992; Flynn & Manuel, 1991; Neufeld, 1977, 1988). Moreover, Seliger, Krashen and Ladefoged (1975) reported that a small proportion of adult learners (6 to 8%) do acquire accent-free speech in another language in adulthood. Accordingly, Flynn and Manuel (1991) argued that “puberty is not a pan-species end of a window of opportunity for acquiring accent-free speech” (p.119). However, with regard to the issue of normal range of performance, Flynn and Manuel (1991) concluded:

... all other factors being equal, the younger you are when you begin learning an L2, the less likely you will be to end up having an accent, or the less marked that accent will be - but to be fairly sure of being totally accent-free, you have to start quite early - before the age of five. (p.119)

With their focus on identifying the age of onset at which a decline in attaining accent-free speech begins, prior studies of L2 speech concentrating on the younger end of the age continuum have been informative with respect to the first two predictions of the CPH as interpreted by Bialystok and Hakuta (1994). However, none of these studies is explicit with respect to the third prediction of the CPH; in fact, there is no firm indication that the decline of L2 performance
does not continue with increasing age in adulthood. As Flynn and Manuel (1991) observed, although Oyama's (1976) study shows that "accent increases gradually as a function of age of onset of L2 acquisition, up to and past puberty", it is conceivable that comparing learners scattered across a wide range of onset ages may underestimate the possible steady increase in marked accent due to a ceiling effect in ratings of heavy accent. In particular, Flynn and Manuel (1991) speculated:

Note that as accents increase (as a group), there may be ceiling effects. Suppose you rate accent on a five point scale (0=no accent; 5=heavy accent). It may be that many individuals, who learn an L2 after age 30;0 get a 5. Individuals who start learning after age 30;0 may be worse, but the rating scale tops out at 5. (p.119)

Therefore, the possibility that an increasing age of onset continues to be negatively associated with relative success in acquiring L2 speech in adulthood has been left unaddressed in the domain of phonology.

Acquisition of L2 phonology has tended to dominate the discussion of the CPH until recently. However, the pattern of declining attainment with increasing age of onset is not unique to phonology. In fact, studies of L2 morphosyntax have reported similar findings, though they claim that the turning point of a critical period for morphosyntax is at age 15 (see Long, 1990, for a review). Patkowski's (1980) study and particularly Johnson and Newport's (1989) study are the most frequently cited research in support of the claim that, around puberty, there is a turning point for the acquisition of L2 morphosyntax; therefore, a detailed look at their studies is relevant here.

In a pioneering study of the acquisition of L2 morphosyntax at different onset ages, Patkowski (1980) investigated the eventual oral syntactic proficiency of child and adult learners of ESL by comparing the spontaneous speech of 67 adult immigrants with that of 15 native
speakers of English on measures of global syntactic accuracy. Wishing to test the ultimate attainment of these non-native speakers, Patkowski included learners with an average length of residence of 19.5 years (range from 6 to 61 years). To address the issue that AOA is the only predictor of syntactic proficiency, Patkowski also investigated three independent variables that could have confounded effects on L2 attainment: years in the United States, informal exposure, and formal instruction. Patkowski's results on syntactic ratings revealed a bimodal distribution among the non-native speakers, indicating that they represented two populations, identified by Patkowski as those who had arrived in the United States before age 15 and those who had arrived after that age. The pre-puberty group (onset ages between age 5 to 15) showed significantly higher levels of proficiency than the post-puberty group (onset ages between age 15+ to 50). A striking difference observed between these two groups was that the former was characterized by learners clustering at a high level of proficiency, whereas the post-puberty group was best represented by a normal distribution, indicating a wider range of outcomes. Using two-way analyses of variance, Patkowski reported that AOA was the only predictor of oral syntactic proficiency whereas no main effects for the other independent variables were registered.

Patkowski's findings revealed a strong inverse relationship between age of onset for L2 and syntactic ratings ($r=-.74, p<.001$), with the pre-puberty group enjoying a great advantage over the post-puberty group. However, as Johnson and Newport (1989) argued, although the correlation between AOA and syntactic scores indicated a linear trend, the exact shape of the relationship between age and L2 syntactic ratings cannot be determined from the results reported by Patkowski. Recall that Patkowski was comparing two adjacent groups divided by age 15. From his published graph of the syntactic ratings for his postpubertal group, we can gather that there was one postpubertal learner who obtained a maximum syntactic rating on a scale of 0 to
5. With the median level being 3, there were four postpubertal learners reaching level 4+ and nine at level 4. Given this information, Patkowski's claim of a sensitive period for morphosyntax ending at around age 15 is less convincing in the absence of information on the L2 onset age of a few relatively successful postpubertal learners.

In a similar vein to Patkowski, Johnson and Newport (1989) studied the eventual attainment in morphosyntax by 46 Chinese and Korean learners of ESL, with AOA in the United States between ages 3 and 39. Johnson and Newport divided their learners into early arrivals—those arriving before age 15 (subdivided into three age groups: 3 to 7, 8 to 10, and 11 to 15), and late arrivals—those arriving after age 17 (17 to 39). These learners were tested on their judgment of the grammaticality of spoken English sentences of 12 rule types: the simple past tense, plural of nouns, the third person singular, the present continuous, determiners, pronominalization, particle movement, subcategorization, auxiliaries, Yes/No questions, wh-questions, and word order. To address the issue of whether AOA is the only predictor of L2 attainment, Johnson and Newport also investigated a number of independent variables that might have confounded effects on L2 attainment: length of residence in the L2 environment, age of exposure to formal instruction, and experiential and attitudinal variables. Their results show:

(1) Before age 15, and most particularly before age 10, there are very few individual differences in ultimate ability to learn language within any particular age group; success in learning is almost entirely predicted by the age at which it begins.

(2) For adults, later age of acquisition determines that one will not become native or near-native in a language; however, there are large individual variations in ultimate ability in the language, within the lowered range of performance.

(Johnson & Newport, 1989, pp.80-81)
In line with Patkowski’s findings, Johnson and Newport showed that there was a decline over age in the ability to acquire the morphosyntactic aspects of L2 ($r=-.77, p<.01$). Unlike Patkowski, Johnson and Newport also conducted correlation analyses between AOA and test performance in the early and late AOA groups separately. They found that the early learners’ performance was negatively correlated with AOA at a higher level ($r=-.87, p<.01$) than for the entire sample ($r=-.77, p<.01$), whereas no significant correlation was found with AOA for the later learner group ($r=-.16, p>.05$), a finding that they claimed indicated a maturational turning point for L2 morphosyntactic acquisition at puberty. In addition, Johnson and Newport reported an age effect on virtually every rule type they tested. They interpreted their data in terms of their maturational state version of the CPH:

Thus it appears as if language learning ability slowly declines as the human matures and plateaus at a low level after puberty. The precise level of this plateau differs between individuals. (Johnson & Newport, 1989, p.90)

For these authors, puberty marks the completion of neurological maturation, and L2 learning afterwards will be less successful, with a lack of linear decline and much variability in learners’ performance.

Johnson and Newport’s study is the only one to my knowledge that attempts to flesh out the three predictions implied by the CPH stated earlier. Their findings would support ‘the younger is better’ position, with puberty as a maturational turning point for L2 acquisition, leaving no room for any age effect thereafter. However, concerns about the reliability of grammaticality judgment tasks as a measure of linguistic competence seriously undermine their conclusions (Kellerman, 1995; Flynn & Manuel, 1991). According to Kellerman (1995), “this
method of obtaining data is problematic, since it assumes an unspoken contract between subject and researcher to focus exclusively on the research object (i.e., the error)” (p.220). But one simply cannot know what part of an ungrammatical sentence is being judged as incorrect. As Kellerman (1995) put it:

It is quite conceivable that a subject may fail to recognize the ungrammaticality of the researcher’s target structure, while some other irrelevant (and perfectly grammatical) aspect of the sentence could be unjustly considered wrong. (p.221).

Thus crediting learners with appropriate knowledge based on this kind of nontransparent judgment of grammaticality raises concerns as to the validity of the results.

Another problem noted by Harley and Wang (1997) is that, typical of all critical period studies, Johnson and Newport’s 11-15 age group was established as an onset age for L2 acquisition rather than as a terminus age. It is reasonable to argue that “in order to reach a level of ultimate attainment that was higher than the older arrivals, the second language development of learners in this group would have had to continue in some cases well beyond puberty” (Harley & Wang, 1997, p.34). This argument is substantiated by Bialystok and Hakuta (1994) who cast a critical eye over Johnson and Newport’s (1989) evidence for their claim. Recall that Johnson and Newport’s data analyses were based on separating their learners into pre- and post-puberty AOA groups. Obviously, such a division was prompted by the notion of a turning point at puberty, which was taken in their study as a given rather than a hypothesis to be tested. By reanalysing Johnson and Newport’s data, dividing learners into two new groups before and after the arrival age of 20, Bialystok and Hakuta found the same magnitude of correlation for those arriving prior to age 20 as that reported by Johnson and Newport for their prepubertal learners ($r=-.87$). Moreover, Bialystok and Hakuta found a statistically significant correlation between
age and performance for the late arrival group as well ($r = .49$), now defined as older than age 20 on arrival.

Bialystok and Hakuta's findings suggest that there is "a general pattern of lower ultimate attainment associated with rising onset age; however, this pattern does not appear to come to an end at around puberty but may well persist into the 20s at least, with a continuing, somewhat less precipitous pattern of declining oral outcomes across mature adult starting ages" (Harley & Wang, 1997, p.37). This alternative interpretation of Johnson and Newport's data can be taken as an indication that the fit between the data and the CPH theory with a 'hard and fast' boundary at puberty is not particularly good, and that Johnson and Newport's explicit claim that there is no continuing age effect on L2 acquisition after puberty is no longer sustainable.

In sum, in light of the empirical evidence, the maturationally determined turning point of a critical period for L2 acquisition does not appear to be as convincing as has been claimed. In fact, "whether and when an approximate maturational turning point occurs remains to be established" (Harley & Wang, 1997, p.37). Cases in which there is a continuing decline in L2 performance among mature adult learners will provide further counterevidence to claims about puberty as the turning point for a critical period for L2 acquisition. In the next section, I will review the age-related research on L2 acquisition in adulthood.

2.3. Are There Age-Related Effects on L2 Acquisition in Adulthood?

Few researchers, as Seright (1985) has observed, have attempted to determine whether within groups of adult L2 learners, differential L2 performance might be related to learners' age, and what the possible age-related causes might be that would account for such differences.
These important research issues have been neglected mainly due to the CPH, which implies that “there should be no age effect after puberty” (Bialystok & Hakuta, 1994, p.72). However, a few studies which have attempted to investigate these questions have generally concluded that younger adult learners are capable of higher performance in L2 than older adults.

Bialystok and Hakuta’s observation with reference to Johnson and Newport’s (1989) study that there is a continuous decline in L2 performance across adult onset ages is supported by findings from Birdsong (1992), in which testing procedures were consistent with those of Johnson and Newport. With a focus on the acquisition of L2 grammar by adult learners, Birdsong tested 20 near-native adult speakers of French who had arrived in France between ages 19 and 48 (average arrival age=28.5) using a more demanding grammaticality judgment task involving “syntactic phenomena more complex and less frequently-occurring than those tested in Johnson and Newport [1989]” (Birdsong, 1992, p.720). In line with Johnson and Newport’s findings, differences between the native and non-native speakers in Birdsong’s study were due neither to the age at which L2 study began nor to years of residence or number of years of study. Rather it was AOA in France that was found to be positively correlated with overall deviance scores from French native-speaker norms ($r=.51, p<.02$), a finding which is ostensibly different from that reported by Johnson and Newport, where no relationship between AOA and L2 attainment was seen for adult arrivals.

Birdsong’s finding then casts further doubt on Johnson and Newport’s claim that there is no age effect on L2 acquisition after puberty. One interpretation for such a discrepancy between the findings of the two studies, according to Birdsong (1992), is that it could be attributed to Johnson and Newport’s use of the most basic aspects of L2 sentence structure to test the ultimate attainment. According to Bialystok and Hakuta (1994, p.62), if there is a critical period
in learning an L2, it may be confined only to certain linguistic features that involve complex morphology and syntax; therefore, testing only the most basic morphosyntactic features may favour those who would display less competence in "'subtle areas' of the target-language grammar" (Birdsong, 1992, p.720).

In any case, if there is a continuous decline in language learning ability with increasing age, it looks as if it is probably a gradual decline, which may be manifested more clearly when looking at the average performance of different adult age-of-onset groups that are more substantial in size. An interesting observation is that whereas investigating the average performance of different prepubertal groups is a common practice in research on L2 acquisition, most researchers have presumptuously regarded adult L2 learners as a global group. It is unfortunate that Johnson and Newport (1989) did not subdivide their adult group as they did their prepubertal group. But if they had done so, they would have realized their problem with the adult group in terms of the distribution of learners' AOA. A closer look at the AOA distribution of their adult learners displayed in their published graph reveals an obvious landslide towards the younger end of adulthood with 12 subjects between ages 17 to 24, 8 between 25 to 35 and only 2 between 36 to 39. With such an uneven scattering of adults across age groups, the chances of underestimating an age effect on L2 acquisition among adult learners seem notably high.

An association between age and declining L2 outcomes, particularly in the oral-aural aspects of L2 proficiency, is reported in the following studies of average performance of different adult age-of-onset groups. Klein and Dittmar (1979), for example, made a careful attempt to assess varying success in the acquisition of oral L2 syntax by 48 Spanish- and Italian-speaking foreign workers learning German in Germany. These learners were divided into three groups according to their age at the time of immigration: 18 to 21, 22 to 30, and older than 30, with
length of residence varying from 10 months to 10 years. Nine extralinguistic and environmental factors—age, contact with Germans in leisure time, contact with Germans at the workplace, formal professional qualifications, attendance at school, duration of stay, sex, origin, and abode—were also studied in an attempt to determine the influence of these various factors on the complex process of foreign language acquisition. In analysing their learners’ spontaneous speech, the authors found that there was a strong inverse relationship between AOA in Germany and oral syntactic rating \( r = -0.57 \): the higher the AOA, the lower the syntactic rating. The ten speakers with the highest syntactic ratings were 20 years old on average when they arrived in Germany, while the seven speakers who had arrived at age 40 or over showed particularly low ratings. The variable that showed the highest correlation with the syntactic ratings, however, was contact with native speakers \( r = 0.64 \), followed by AOA in Germany. With reference to their data, Klein and Dittmar concluded that age may co-vary with exposure to L2, since the younger adults they studied had more contact with native speakers. However, it may be noted that the correlation between AOA and their two contact variables was no more than \( r = 0.32 \), which is not strong. Thus it is possible that other individual factors which were not investigated in their study, such as intelligence, memory, attitudes and motivation would help to explain their results, and would therefore be worth including in further investigations.

In a recent study, Scott (1994) found that older adult American missionaries (ages 54 to 71) to Spanish-speaking countries had achieved in general much lower L2 proficiency in listening comprehension and vocabulary recognition than younger missionaries (ages 21 to 25) had after a 17-month period of service. Like Klein and Dittmar, Scott associated the higher achievement of the younger missionaries with greater contact with native speakers. However, reduced hearing acuity at higher frequencies (as demonstrated on a measure of speech perception in noise
(SPIN)) in the older age group as well as less foreign language training received by this older group prior to their foreign residence (an average of 9 months received by the older group as compared to 16 months by the younger group) may also have contributed to the lower performance of the older adults (Scott, 1994, p.276).

That amount of L2 exposure is not the only factor involved in the pattern of decline in L2 outcomes across adult age groups is suggested by language classroom studies in which L2 exposure has been controlled. One of the early studies, Thorndike (1928), investigated the learning of Esperanto by 48 college students of different age groups: 20 to 25, 26 to 34, and 35 to 57. The three groups, who demonstrated equivalent ability on a standardized intelligence test, were given 10 hours of instruction in Esperanto with an additional 10 hours of individual study. Progress was then measured by the difference between the pre- and post-test scores on a series of four tests in Esperanto—vocabulary, printed directions, oral directions, and paragraph reading. Thorndike reported that the youngest group outperformed the middle group, who in turn surpassed the oldest group. However, the superiority of the younger group was found to be almost entirely due to their greater gain on the oral test, whereas little or no difference was found on the other three tests. Based on his findings, Thorndike claimed that, given the same level of intelligence, the difference between age 22 and age 40 in the ability to learn a logical systematic language is small and is confined largely to oral production (Thorndike, 1928, p.46).

Similar findings were reported by von Elek and Oskarsson (1973), who investigated the possible interactive effects on L2 outcomes of teaching method—implicit versus explicit teaching of certain grammatical features—on the one hand, and various individual variables such as age, initial proficiency, and aptitude on the other. Their experimental sample comprised 125 Swedish learners of English as a foreign language with ages ranging from 18 to 60, who were then divided
into three age groups: 18 to 25, 26 to 35, and 36 to 60. Learners were given ten pre-recorded 40-minute lessons in one method before taking various post-tests of general proficiency in English. With respect to age differences, it was reported that in general there was a negative correlation between age and achievement on the various tests. It is worth noting that the age difference was not manifested in the acquisition of the grammatical features, but was “particularly noticeable on the tests which involve auditory discrimination and oral production” (von Elek & Oskarsson, 1973, p.178).

What might have biased von Elek and Oskarsson’s grammatical findings in favour of the older learners and hence narrowed the potential differences between groups, was a reported positive correlation between age and verbal aptitude test scores \( (r = .26) \), a finding which can be taken as an indication that the upper and middle age groups may have represented a slightly better qualified population with better prospects of success in language studies than the lower age group.

Seright (1985) made a more deliberate attempt to determine whether, within groups of adults, differential achievement in L2 might be related to learners’ age by examining the relationship between age and global aural comprehension of L2 among 71 French-speaking adults in Canada learning English in an intensive program. Seright divided the learners into a younger group (aged 17 to 24 with a mean age of 19.9) and an older group (aged 25 to 41 with a mean age of 29.6). Pre- and post-tests in listening comprehension were given before and after 300 hours of intensive training in English. The primary objective of this study was to compare gains made in listening comprehension by the younger and older learners who were matched on all variables but age: pre-test score, nonverbal intelligence, years of education and years of ESL. To make this comparison, two samples of 18 matched pairs were created from the pool of 71
learners using two slightly different criteria. In both of these samples, as well as in the global sample, the mean gain made by the younger learners significantly exceeded that made by the older learners. Seright's stepwise regression analysis showed that age, along with pre-test score, was an important predictor of a learner's post-test score, strongly suggesting that, given the same time span and similar learning conditions, adult achievement in L2 listening comprehension decreases with increasing onset age.

Seright's (1985) claim that age continues to be an important predictor of achievement in adult L2 learning is supported by d'Anglejan and Renaud (1985), who explored the relative importance of a variety of learner variables with respect to individual differences in overall achievement in French as an L2. Their sample consisted of 391 adult immigrants to Quebec with ages ranging from 17 to 63 years. Learners were tested in listening, reading, speaking and writing after completing a 900-hour course of classroom instruction. The results of a multiple regression analysis using nine learner variables as predictors—nonverbal intelligence, years of schooling, age, use of French, cognitive style, classroom anxiety, competence in English, contact with Francophones, and literacy—indicated that nonverbal intelligence accounted for the greatest proportion of variance (about 19%) in overall achievement in French, followed by years of schooling (about 5%), age (3%), and use of French (2%), while the contribution of the rest variables was negligible.

In sum, these various findings of a continued pattern of declining L2 outcomes across mature adult age groups are important, for they provide counterevidence to Johnson and Newport's (1989) claim of a turning point for L2 acquisition at puberty, and thus challenge the third prediction implied by the CPH that there should be no continuing age effect after puberty.
2.4. Implications for the Present Study

One of the conclusions one can draw from a review of the age-related literature on adult L2 acquisition is that there is still a scarcity of research in this area. Moreover, since the scope, design, methods, and aims of existing studies are rather diverse, comparisons of available studies are difficult to make, and no far-reaching conclusions can currently be drawn. Nevertheless, the accumulated results appear to be consistent with a hypothesized continuing decline of L2 proficiency outcomes related to onset age in adulthood, particularly in the acquisition of oral/aural aspects of L2. The differential proficiency outcomes in L2 found across the mature adult groups point to the conclusion that “adulthood can no longer be regarded as one global age group” (Harley & Wang, 1997, p.45). At the same time, there are some methodological issues arising from these studies that need to be reconsidered and that have implications for the design of the present study.

First, if as Bialystok & Hakuta’s (1994) reanalysis of Johnson and Newport’s data suggests, “the steepest decline occurs in a linear fashion before age twenty, at which point the decline becomes less steep” (p.72), then including learners younger than age 20 as adults and comparing them with older adults, as was done in most of the studies reviewed above (see Table 2.1), is likely to overestimate the magnitude of the onset age effect on adult L2 acquisition. On the other hand, if there is a slow decline in adult L2 acquisition with increasing age, then a research design that compares adjacent age groups or an uneven scattering of adults across age groups is likely to underestimate the magnitude of the onset age effect. Evidently, a problem emerges as to how to group adults appropriately to best address this issue of adult age differences. In the absence of specific criteria, grouping of adults into different age groups
appears to have been completely arbitrary in the studies reviewed above (see Table 2.2). Taking this issue into consideration, the present study compares mature adults of different age ranges defined on the basis of cognitive and physiological characteristics (see Section 3.3 for the criteria used for grouping of adults). It is hoped that investigating L2 acquisition by different age-groups of mature adults will be more revealing of age-related differences in L2 outcomes, if such differences exist.

### Table 2.1: AOA range of the adult learners

<table>
<thead>
<tr>
<th>Studies</th>
<th>Age Range</th>
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<tbody>
<tr>
<td>d’Anglejan &amp; Renaud (1985)</td>
<td>17 - 63</td>
</tr>
<tr>
<td>Birdsong (1992)</td>
<td>19 - 48</td>
</tr>
<tr>
<td>von Elek &amp; Oskarsson (1973)</td>
<td>18 - 60</td>
</tr>
<tr>
<td>Johnson &amp; Newport (1989)</td>
<td>17 - 39</td>
</tr>
<tr>
<td>Klein &amp; Dittmar (1979)</td>
<td>18 - 40+</td>
</tr>
<tr>
<td>Patkowski (1980)</td>
<td>15 - 50</td>
</tr>
<tr>
<td>Seright (1985)</td>
<td>17 - 41</td>
</tr>
<tr>
<td>Scott (1994)</td>
<td>21 - 71</td>
</tr>
<tr>
<td>Thorndike (1928)</td>
<td>20 - 57</td>
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</table>

### Table 2.2: AOA groupings of the adult learners

<table>
<thead>
<tr>
<th>Studies</th>
<th>AOA Groupings</th>
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<tbody>
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<td>1</td>
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<tr>
<td>d’Anglejan &amp; Renaud (1985)</td>
<td>17 - 63</td>
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<tr>
<td>Birdsong (1992)</td>
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<td>21 - 25</td>
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<tr>
<td>Thorndike (1928)</td>
<td>20 - 25</td>
</tr>
</tbody>
</table>
A second methodological issue concerns the method of data collection in investigating L2 morphosyntax. Johnson and Newport (1989) and Birdsong (1992) used grammaticality judgment tasks, in which sentences were presented to learners who were then asked to judge whether or not the sentences were grammatical. One obvious advantage of such tasks is that they allow researchers to construct sentences in such a way that specific linguistic structures under investigation will be included. However, the problem with this method of data collection, as discussed earlier, is that “grammaticality judgment task results in themselves are notoriously difficult to interpret. While experimenters often interpret such judgments as grammaticality judgments, it is difficult to know when it is the case for the subjects that the grammar and not some other factors (semantic or pragmatic, for example) provides the basis for a judgment” (Flynn & Manuel, 1991, p.133). It is this nontransparent nature of grammaticality judgment tasks that raises concerns as to the validity of the results.

In contrast, Klein and Dittmar (1979), in their investigation of oral syntax, used participant observation to elicit spontaneous speech, a method which guarantees the authenticity of production, but often at the cost of little control of numerous variables operative in complex situations. The chance of getting a representative data sample is also limited, since learners will often not reveal to researchers their entire linguistic repertoire; rather they will use only those linguistic features in which they have most confidence and avoid the troublesome features of the L2, which may be exactly what the researcher is most interested in. Obviously, Klein and Dittmar’s participant observation technique is at the far end of the closed/open-ended data elicitation continuum with the least control of learner performance in L2. For the purpose of eliciting speech data that can be examined with respect to grammatical accuracy without the researcher exerting too much or too little control over learners’ L2 performance, an elicited
imitation task and a guided oral interview may be most useful. In the past twenty years, there has been increasing interest in using elicited imitation as a baseline measure for L1 and L2 learners' competence (Bley-Vroman & Chaudron, 1994). An obvious advantage of an elicited imitation task is that it can create definite obligatory contexts for the linguistic items under study. On the other hand, a guided oral interview can provide naturalistic communication to elicit spontaneous L2 data, allowing learners the freedom to reveal their linguistic repertoire in structured contexts. With differences in these two techniques, the use of both in parallel may mitigate task effects.

Although available findings from studies of L2 acquisition in adulthood point to the conclusion that there is a linear decline in adult learners' L2 performance associated with increasing age, it is obvious that few of these studies were designed to investigate what possible age-related factors might be that would account for the decline. Important learner variables such as intelligence, memory, and motivation were either not touched upon or not brought into contact with the empirical findings. While little is known about what may underlie the age-related differences in L2 outcomes among adult learners, the learner variables discussed in the following section may offer us some plausible clues. Therefore, a comparison of two mature adult groups on measures of relevant learner variables and correlating them with L2 proficiency outcomes should be able to shed some explanatory light on the apparent decline in adult learners' L2 performance with increasing age.

Fourth, a careful look at the age-related studies in adult L2 acquisition shows that most studies are confined to the investigation of adults learning an L2 typologically similar to their L1. Given that one's L1 is likely to have some effect on the learning of an L2 (Kellerman & Sharwood-Smith, 1986), it may be more revealing to concentrate on L1 and L2 where the grammars are sufficiently different that a significant L2 acquisition problem would arise.
However, to capture interference from L1, it may not be sufficient to look at typologically similar languages as if they were the same, as was done in Johnson and Newport's (1989) study. In principle, their design feature of using two typologically similar languages, Chinese and Korean, would allow them to determine whether results could be generalized beyond speakers of a single native language. However, they did not specify whether they had a comparable number of speakers of each language in each of their age groups. Presumably, with only a few learners representing one of the two languages, one cannot assume validity of results for the individual language group, much less generalize across groups. To better understand the effect of L1 on the learning of an L2, the present study will investigate adult learners of a homogeneous L1 background—Mandarin Chinese, a language which is typologically different from English. The current focus on learners' accurate production of morphosyntactic features in L2 that are similar to those in L1 as well as those that have no equivalents in L1 will allow me to look at the possible effect of the nature of L1 on the development of L2.

Finally, the studies of L2 acquisition in adulthood reviewed above used very different measures to assess L2 proficiency. Of all the studies that showed a linear decline in L2 proficiency with increasing age, some studies used integrative tests tapping overall L2 proficiency such as listening, speaking, reading, and vocabulary (e.g., d'Anglejan & Renaud, 1985; von Elek & Oskarsson, 1973; Thorndike, 1928). Other studies assessed general proficiency in a specific domain, particularly in listening comprehension (e.g., Scott, 1994; Seright, 1985). Only Klein and Dittmar (1979) and Birdsong (1992) investigated the development of specific morphosyntactic features. So far, none of the available research studies concerned with age differences has specifically assessed oral fluency of adult L2 learners. An attempt to examine the acquisition of specific morphosyntactic features together with oral fluency is, therefore, the focus of the present study.
2.5. **Learner Variables and L2 Acquisition in Adulthood**

To explain the role of age in L2 acquisition in adulthood, it is necessary to show not only that there are age-related differences in adult L2 acquisition, but also how these arise. Existing theoretical explanations offered for the age factor in L2 acquisition aim to account for the differences between children and adult learners. An intriguing characteristic of these explanations is that they are so diverse, and yet “they tend to converge on puberty as the end point of the alleged period of receptivity to new languages, even when the explanatory mechanism invoked does not, in itself, imply that particular cutoff point” (Oyama, 1976, p.263). In his insightful review, Long (1990) identified four kinds of popular explanations for the decline in language learning abilities: affective, input, cognitive, and neurological. Long concluded that there are various difficulties with each of the four explanations in light of the empirical data available. While each of these perspectives has something to offer, it is obvious that no single perspective “can adequately account for the full range of findings” (Harley & Wang, 1997, p.44). Long seems to place his faith in neurological factors with cognitive consequences, even though the specific aspects of brain functioning remain difficult to specify.

If neurological maturity is posited as the explanation for diminished success in L2 acquisition, this explanation fails to account for the age-related differences among mature adult learners. However, little research has been done so far in this regard. To seek potential evidence that may underlie the age-related differences in L2 outcomes among adult learners, I have gleaned some plausible clues from the following research areas: language contact, intelligence, memory, and motivation.
2.5.1. Language Contact

Spolsky (1989), in his preference model of L2 learning, argued that extensive exposure to and practice in the target language is a graded condition for L2 learning: the greater the learner's exposure and practice, the faster that learner will learn the L2. In line with Krashen (1981), Spolsky identified two qualitatively different settings for L2 learning: the formal or 'educational' setting of the classroom and the informal or 'natural' language environment of the target language community. As Ellis (1994) pointed out, "Each setting can be seen as a context in which constellations of social factors typically figure to influence learning outcomes" (p. 197). While the general assumption, however, is that the learning that takes place in these two settings is different in nature, it is by no means certain that the learning that takes place in a natural setting leads to high levels of oral proficiency (see Ellis, 1994). However, empirical support is available to suggest that learners with access to a natural language environment are likely to achieve greater functional proficiency than those who are limited to educational settings (e.g., d'Anglejan, 1978; Fathman, 1978; Schinke-Llano, 1990). Spada (1984), in a review of a number of studies on the effects of informal contact on L2 proficiency, observed that the effects of L2 contact are likely to be sustained when learners are engaged in real communicative use of the target language, suggesting that it is quality, not mere quantity, of informal contact that contributes to L2 proficiency.

In many age-related studies, informal contact, which many researchers consider in terms of 'exposure', has been commonly measured by length of residence in an L2-speaking environment. While it is possible to control for the length of time that learners have lived in an L2 environment, the possibility exists that adult learners' variation in L2 acquisition may derive
from differences in the quality and quantity of L2 experience. That length of residence has been found to be unrelated to L2 success in several studies (e.g., Johnson & Newport, 1989; Oyama, 1976; Patkowski, 1980) may be because length of residence in the L2 environment cannot be taken as equivalent to L2 exposure. Obviously, there is a great difference between the communicative activities and challenge of an L2-speaking workplace versus going shopping in a mall where L2 is spoken. There is also a difference between speaking the L2 on a daily basis and speaking the L2 at an occasional party. Given that there is great variation in terms of quality and quantity of L2 exposure independent of length of residence, it is reasonable to assume that learners directly involved in a variety of L2 communicative activities in their daily life have more exposure to L2, which can be expected to facilitate their L2 acquisition.

Informal contact and use as situational variables in adult L2 acquisition have been studied by several researchers (e.g., d'Anglejan & Renaud, 1985; Klein & Dittmar, 1979; Scott, 1994). D'Anglejan and Renaud's (1985) study of new immigrants to Quebec showed that most learners had very limited social contact with native speakers, especially the older learners since they immigrated to join their families and had a greater tendency than younger immigrants to reside in an area populated by other immigrants. In their multivariate analysis of a number of learner variables and learners' L2 outcomes, d'Anglejan & Renaud (1985) found that the use of French was an important predictor of L2 outcomes whereas the contribution of contact with Francophones was negligible since both groups had very limited social contact, so the potential impact of this variable could not really be determined. However, one can speculate that L2 contact and communication with native speakers may be far more important factors than revealed by this Quebec study.
Two studies which found strong support for informal L2 contact and L2 use as important predictors of adult learners' L2 outcomes were Klein and Dittmar (1979) and Scott (1994). As discussed earlier, both Klein and Dittmar's and Scott's studies indicated that age co-varied with environmental factors affecting older adults' exposure to the target language. In Klein and Dittmar's study, the younger foreign workers in Germany had more contact with native speakers than the older workers had. Klein and Dittmar speculated that younger adults may be more willing and able to build up social contacts. In Scott's study, the younger missionaries were reported to have significantly more opportunities to work with native speakers than the older missionaries. The difference between the younger and older missionaries with respect to the number of hours they estimated speaking the target language was also striking. If amount of L2 contact and L2 use are important causes of variance in L2 outcomes among adult learners, as Klein and Dittmar and Scott have proposed, then these factors are also likely to help explain possible variance in the L2 proficiency outcomes of the two AOA groups in the present study.

2.5.2. Intelligence

Cognitive factors are indispensable components of any comprehensive characterization of language learning. A cognitive explanation such as Cummins' (1981) cognitive/academic proficiency (CALP) seems most reasonable in accounting for the initial rate advantage of adult learners over children since the former have "a more mature cognitive system [which] allows for better abstraction, classification and generalization of learning" (Glass & Denny, 1987, p.105). Conversely, the rate of L2 acquisition of young children may be slower than that of adult learners because they are still in the process of cognitive 'maturation', and therefore at a cognitive
disadvantage. If adult learners enjoy a cognitive advantage in learning an L2, it appears paradoxical to postulate a decline in language learning capacity in adulthood when other cognitive capacities remain stable, if not on the rise. To understand this paradoxical notion of declining language learning capacity, one may have to turn to a developmental cognitive theory of learning. A cognitive developmental perspective on maturation and learning accepts the notion of a potential decline in performance across adulthood. According to Cattell (1963, 1972), cognition is not monolithic, but rather multidimensional and multidirectional (see also Baltes, 1987, p.614). Cattell argued that cognitive performance is determined by two primary factors: the general ability to perceive and develop new patterns of response, which Cattell referred to as ‘fluid intelligence’, and accumulated knowledge in the form of cultural information and experiences resulting from environmental conditions and education, which Cattell referred to as ‘crystallized intelligence’. According to Carroll (1993), the term fluid intelligence is used because it is conceived “as being able to flow into many kinds of mental activities” (p.61), and the term crystallized intelligence is used because it is thought of “as a kind of end product of experiences up to any given point in the life of an individual” (p.61).

Considerable evidence seems to support the distinction between crystallized and fluid intelligence (e.g., Horn, 1982; Horn & Cattell, 1967, 1982; Salthouse, 1989). Horn and Cattell (1967, 1982) postulated that there is an interplay between the two types of intelligence, which are highly correlated during the period of development with an increase in both types of intelligence at least through adolescence; however, fluid intelligence declines steadily from the late teens across the adult years, with a dramatic decline occurring between the ages of 30 and 60, whereas crystallized intelligence generally remains stable. As Baltes (1987) put it, the development of cognitive maturity is a process of gain and a process of loss, with crystallized
intelligence exhibiting continuation of an incremental function, and fluid intelligence showing a tendency toward a steady decline (p.614).

Recognizing cognition as multidimensional allows us to posit that younger adult L2 learners may have an advantage over older learners as far as cognitive flexibility is concerned. However, within the general trend of decreasing cognitive flexibility among adults, there is great variability from individual to individual. Denney (1982) makes an important distinction between what she called ‘exercised’ and ‘unexercised’ abilities. According to Denney, abilities that are exercised throughout one’s life time may age differently from those that are not exercised. Optimally exercised abilities are expected to peak later in life and do not decline as early or as dramatically as those that are not exercised. Presumably those whose fluid abilities are exercised, and hence retain their flexibility, are more adept at acquiring new patterns of response than those with less flexibility (Salthouse, 1989, p.26).

No data now available address this issue of crystallized and fluid intelligence in adult L2 acquisition, but L2 performance among adult learners is known to be related to nonverbal intelligence (d’Anglejan & Renaud, 1985). On traditional measures of intelligence, most researchers report differences between the performance of young and middled-aged people for tests of nonverbal tasks. As reported by Singleton (1989), Agruso (1978) summarized the results of experiments that Wechsler (1958) conducted using tests of adult intelligence as follows:

Wechsler found that results from the tests of verbal ability did not indicate significant differences among age groups; however, those tests which demanded reasoning ability yielded significant age differences. He called the verbal portion (vocabulary, information, object assembly, picture completion) ‘hold tests’ and the performance portion (digit span, similarities, digit symbol, block design) ‘don’t hold tests’ to indicate that the former do not drop at the rate of the latter ...

(Agruso, 1978, p.95 cited from Singleton, 1989, p.64)
As Salthouse (1989) pointed out, the verbal portion of Wechsler's measure of adult intelligence clearly assessed previously accumulated knowledge, whereas the nonverbal portion can be taken as an evaluation of processing efficiency (p.18). What is relevant in the context of L2 acquisition is that fluid intelligence is categorized as nonverbal intelligence (Carroll, 1993; Salthouse, 1989) and nonverbal intelligence is predictive of L2 outcomes (d'Anglejan & Renaud, 1985). With reference to the nature of fluid intelligence, it is therefore reasonable to hypothesize that younger adult learners are likely to outperform the older learners in L2 due to their possible advantage in terms of cognitive flexibility.

2.5.3. Memory

According to Carroll (1993), "Individuals differ in a general memory ability that affects, to a considerable extent, performances on a wide variety of tasks and behaviours involving memory" (p.302). Memory as a factor of interest in this study was driven by the observation that adult L2 learners, especially older learners, appear to complain more often about their ability to memorize than any other cognitive ability. Is it a myth or a fact that adult learners experience difficulties in learning an L2 due to declining memory with increasing age? According to Singleton (1989), there is not enough evidence to support this popularly held view.

Considerable research has been conducted to investigate memory and learning. According to Atkinson and Shiffrin (1968), memory consists of two discrete subtypes: short-term memory (STM) and long-term memory (LTM). These two types of memory are defined based on the length of time lapse between input and output. STM is thought to have a very small capacity. It can process only a limited amount of information for a period of time up to a few
seconds (Cook, 1991, p.49) or less than a minute (Gregory, 1987, p.29). LTM, on the other hand, has an extremely large capacity with a period of retention from weeks to years (Gregory, 1987, p.31). As Towell and Hawkins (1994) put it:

Learning is essentially the transfer of patterns of activation from the short-term memory store to the long-term memory store in such a way that new associations are formed between information structures or nodes not previously associated. (p.163)

However, for transfer of information from short-term memory store to long-term memory store to occur, "a deeper processing of the information must take place" (Gregory, 1987, p.30) in order to achieve long-term retention.

In his analysis of the essential aspects of learning and memory function, Welford (1956) stated that STM storage is perhaps most likely to be vulnerable to age changes, and yet it is on the efficiency of this STM storage that LTM and learning depend (Inglis, Ankus, & Sykes, 1975). However, evidence for STM in relation to age is contradictory. Some studies of short-term storage capacity (as measured by memory span) have indicated that there was a gradual but systematic decline in STM across adult years (e.g., Botwinick & Storandt, 1974; Horn, 1970; Randt, Brown, & Osborne, 1980; Wechsler, 1981), while other studies have found no age differences in STM (Siegel, 1994), or at least not until late adulthood (Fozard, Nuttal, & Waugh, 1972).

In contrast, available data with regard to LTM seem to be consistent, suggesting that LTM appears to hold up with age (Craik & Simon, 1980; Horn, 1970). These results seem to suggest that any difficulties that older adults experience in remembering are likely to be involved in STM storage rather than in retrieval from LTM. A possible reason for older adults' failure to process incoming information as deeply as younger adults is that it is attributable, at least in
part, to a change in attentional systems that may occur with increasing age (Geschwind, 1980).

As Scott (1994) suggested:

Changes [with increasing adult age] in attentional systems and in depth of processing might make it difficult [for older adults] to integrate new information about the L2 with existing interlanguage structures. (p.264)

Memory ability is considered a component of language aptitude with a positive bearing on language learning (Carroll, 1981, 1993). According to Skehan (1989), “there is no reason to think that informal settings are less dependent on the memory component of aptitude than are formal ones. In each case, high-level functioning in the target language will require the assimilation of a considerable quantity of material” (p.41). However, only a few researchers have addressed the issue of memory in relation to adult L2 acquisition (Scott, 1994; Skehan, 1980, 1986), and their results are not consistent. Scott (1994), in her study of younger (aged between 21 to 25) and older missionaries (aged between 54 to 71) learning Spanish, found that, somewhat surprisingly, the relatively successful younger adults were not significantly different from the older adults in terms of STM capacity as measured by digit span, indicating that older adults “are capable of retaining chunks of L2 speech of comparable length” (Scott, 1994, p.278). Scott speculated that “the differences [between the younger and older adults] in their perceptual abilities may influence their success in apprehending and reproducing these chunks” (Scott, 1994, p.278).

In contrast, Skehan’s (1986) research among adult L2 learners indicated that memory span (as measured by digit span) and associative memory (as measured by words in sentences) were associated with L2 achievement. In fact, his cluster analysis of L2 learner types illustrated
two types of high achievers: the first type (average age=27.3) suggested a younger, intelligent student who was able to use a good memory to assimilate a lot of L2 material, and the second type (average age=46.1) suggested an older learner, who did not have such effective memory abilities, but seemed able to compensate for these abilities by a combination of intelligence and analytic language aptitude. Skehan’s findings indicated that declining memory capacity seemed to be associated with increasing age, but Skehan did not rule out older adults’ chance of being successful if declining memory capacities were compensated for. In another study, Skehan (1980) reported that memory for text as measured by a task involving immediate recall of the rules of a game presented orally was significantly correlated with L2 outcomes among adult learners. Skehan’s research on adult L2 learning points to a relationship between age, L2 outcomes and some aspects of memory, which deserves further investigation.

2.5.4. Motivation

Pulvermüller and Schumann’s (1994) recent brain model for language acquisition is an attempt to explain the large variance in success in late learners. These authors postulated that two conditions must be met to acquire full knowledge of a particular language:

The first condition is that the learner is motivated to learn the language. The second condition is that the learner is equipped with the ability to acquire grammatical knowledge. (p.687-688)

According to their model, late or adult learners are assumed to have a specific grammar deficit; therefore, the best an adult learner can be is no more than a [-g; +m], which means a highly motivated learner with a grammar deficit. This leaves the large variance in L2 outcomes
among adult learners to be explained by their motivation. In their words: "the large variance in language abilities found in late learners reflects their degree of motivation, which can vary dramatically among adults" (p.689). However, as Harley and Wang (1997) have pointed out, although Pulvermüller and Schumann's specific proposals as to the neurological correlates of language learning certainly "add an important new dimension to the critical period debate .... The concept of motivation and how degrees of motivation might be measured remain vague in this hypothesis" (p.42).

Considerable research has been conducted to investigate attitudinal/motivational characteristics that correlate with language learning success (e.g., Gardner, 1985; Gardner & Lambert, 1972; Gardner, Day, & MacIntyre, 1992; Gardner & MacIntyre, 1995). The basic premise of this line of research is that "attitudes play a role in language learning though their influence on motivation" (Gardner & MacIntyre, 1995, p.207). According to Baker (1988), attitudes are learned rather than inherited. Therefore, attitudes towards the target language and its speakers are dynamic and are likely to reflect the social and contextual situations in which learners find themselves. The nature of attitudes determines that one's motivation is also contextually and socially oriented. Gardner and Lambert (1972) drew a distinction between 'integrative' and 'instrumental' motivation, the former reflecting an interest in learning another language because of "a sincere and personal interest in the people and culture represented by the other group", and the latter emphasizing "the practical value and advantages of learning a new language" (p.132). Although Gardner and Lambert found that integrative motivation correlated more highly with L2 learning than instrumental motivation, Gardner and MacIntyre (1995)
recently argued that both integrative and instrumental motivations are important in that they have an "energizing effect" (p.207) and in that they determine (a) whether or not the learner will avail him- or herself of informal language contexts, and (b) how active the learner will be to obtain the necessary input or intake for language acquisition (Krashen, 1981, p.159). In this view, both motivational orientations are considered as facilitating language learning through active involvement, which is assumed to ensue if learners are positively motivated.

Not only has motivation been considered an important learner variable in L2 learning (e.g., Gardner, 1985; Gardner & Lambert, 1972; Gardner & MacIntyre, 1995), but Schumann (1975) and Krashen (1982) have suggested that "age may well play a role in this integrative-instrumental polarity" (Singleton, 1989, p.202). They postulate that age effects in L2 acquisition may be a secondary by-product of changes in people's cultural identification and motivation. Their claim has been widely used to explain child-adult differences in ultimate L2 attainment. Yet remarkably few age-related studies have actually investigated attitudinal and motivational factors in the context of child-adult L2 acquisition. Of those that did, the results were not consistent. Oyama's (1976) study showed no effect of motivation once the effect for AOA was partialled out. On the other hand, Johnson and Newport (1989) had a brief look at L2 learners' cultural identification and motivation in relation to age. Their results indicated that both identification with American culture and motivation were positively correlated with test scores, and were negatively correlated with AOA ($r=-.55, p<.01$ and $r=-.48, p<.01$ respectively), though only identification with Americans had significant predictive value in their regression model.

Although there is not much research in the context of L2 acquisition by adult immigrants to indicate that older adult learners would be less motivated than younger ones, there are some data that provide a basis for this prediction. For example, d'Anglejan and Renaud (1985)
speculated that the inverse relationship between age and French achievement found in their study was presumably due to "little motivation to learn the second language among older immigrants who live within the confines of tightly knit and protective family units or ethnolinguistic groups" (p.13). Oyama (1976) mentioned another case of women immigrants having little motivation to learn L2 due to cultural pressures (p.264). These observations make it relevant to study family and social support as potential motivational factors in L2 acquisition by adult immigrants (see also Cumming & Gill, 1992).

While Gardner and his associates' concept of attitudes/motivation has a role to play in L2 learning, the relationship between attitudes/motivation and L2 learning "is almost certainly bi-directional and dynamic, and is likely to vary according to setting" (Ellis, 1994, p.210). Learners with positive attitudes are likely to be highly motivated, and hence likely to be successful, which in turn reinforces their motivation for further learning. In fact, a number of researchers have argued that motivation is the result of achievement rather than the cause (e.g., Burstall, 1975; Crookes & Schmidt, 1991; Hermann, 1980; Strong, 1984). If that is the case, the relative advantage of younger adult learners over older learners in their L2 outcomes might reasonably be expected to lead to differences in their motivational levels, which in turn has an impact on their L2 acquisition.

Although the distinction between integrative and instrumental motivation has been criticized as lacking in universal relevance (Skehan, 1991), it could be a predictive aspect of motivation in the context of L2 acquisition by adult immigrants. As Krashen (1981) has argued, the effect of integrative motivation may be weaker when there is not enough exposure, a situation which seems to characterize adult immigrant learners as reported by d’Anglejan and
Renaud (1985). While it is reasonable to assume that permanent immigrants as opposed to non-immigrants are more likely to be integratively motivated, learning English to obtain a decent job or to learn a new skill is obviously a practical concern and top priority for new immigrants (see also Zhang, 1995). Given this salient situation, it is reasonable to argue that adult immigrant learners will be instrumentally motivated as well, though there is no reason to assume that younger adults will be more so than older adults.

As Skehan (1991) has pointed out, there is a wide range of influences on motivation from both inside and outside of the individual. In the specific context of L2 acquisition by adult women immigrants in the present study, attitudinal and motivational factors such as attitudes towards learning ESL, desire to learn ESL, integrative orientation, instrumental orientation, as well as family/social support may all have a bearing on their active involvement in learning ESL.

2.5.5. Summary

In sum, little is currently known about what may underlie the age-related differences in the L2 outcomes among adult learners. The relevant learner variables discussed above offer some plausible clues, and hence are worth investigating further in the present context of adult L2 acquisition. In the next chapter, I will describe the research design of the present study with a careful consideration of these learner variables.
Chapter 3

RESEARCH DESIGN

In this chapter, the design and implementation of this research study is described. Section 3.1 presents the research questions and the overall hypothesis formulated for the present study. Section 3.2 specifies the research focus. A detailed description of the participants in the study is then provided in Section 3.3. Section 3.4 presents the research instruments and scoring procedures. The last section describes how the data were prepared and analysed both quantitatively and qualitatively.

3.1. Research Questions

The preceding review of the literature on the relationship between onset age and L2 outcomes among adult learners indicates that two specific research questions are of particular theoretical and educational interest in the context of adult L2 acquisition: (a) whether, among adult learners, differential proficiency outcomes in L2 continue to be related to learners' AOA in the L2 environment, and (b) what factors may underlie the possible effect of AOA on learners' L2 proficiency outcomes. Against the background of empirical evidence of age-related differences in L2 acquisition among adult learners, the following overall hypothesis was formulated for the present study:

**Hypothesis:** Adult learners with AOA in the L2 environment between 25 and 35 are likely to achieve a higher level of oral proficiency in L2 than adult learners with AOA between 40 and 55.
To address the first research question, I compared the two adult AOA groups on measures of oral English proficiency. If an age-related difference in the test performance were to be found, physiological maturation would not be a tenable explanation since these are all mature adult learners. It is obvious that other explanations are required. In seeking possible explanations for an age-related difference in L2 proficiency outcomes among adult learners in the context of an exploratory study, two approaches were taken.

First, I compared the two AOA groups on measures of language contact, intelligence, memory, and attitudes/motivation to learn ESL. These learner variables, as discussed in the previous chapter, have been considered as factors that may have a bearing on adult L2 acquisition. It is, therefore, of special interest in the present study to know (a) whether the earlier and later AOA learners differ on measures of these relevant learner variables, and (b) whether learner variables on which the two AOA groups differ correlate with learners’ L2 proficiency outcomes. Where differences exist between the two AOA groups on these learner variables, and scores on these variables also correlate with the criterion scores, they may provide some potential reasons for any differences in their L2 proficiency outcomes.

Second, in recognition that research on onset age and adult L2 acquisition involves many unrecognized or inadequately described variables, I gathered descriptive information through individual interviews on how the learners experienced and perceived their learning of ESL. In conducting the interviews, I asked the following three sets of questions in Mandarin:

1. Describe your learning experience. Is it difficult for you to learn English? What is it that makes it most difficult for you? In terms of speaking, listening, reading and writing, in which aspect do you think you have made most progress? Do you think you have favourable learning conditions to learn English? What obstacles have you experienced in learning English?
2. How long do you think it will take for you to be able to speak English fairly fluently? What do you consider as the best method to improve your oral English? Do you think oral English is better learned through use or by rote?

3. How would you rate your memory? Are you able to remember what you have learned in class and use it in social contexts? Why or why not? Do you think age is a factor in learning a second language? If yes, in what way?

By asking these questions, I hoped to gain some insights from the learners as to whether age makes any difference in their experiences and perceptions of learning ESL.

3.2. Research Focus

The present study does not attempt to make a broad comparison of all aspects of oral English proficiency of the two AOA groups, but focuses instead on morphosyntactic accuracy and oral fluency. With respect to morphosyntactic accuracy, the present study concentrates on the accurate production of six English morphosyntactic features (see Table 3.1).

<table>
<thead>
<tr>
<th>Table 3.1: Six morphosyntactic features tested in the present study</th>
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<tbody>
<tr>
<td>1. Noun plurals (both regular and irregular)</td>
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<td>2. The simple past tense (both regular and irregular)</td>
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<td>3. The third person singular of the present tense</td>
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<td>4. Progressive -ing</td>
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<tr>
<td>5. Determiners (a, an, the)</td>
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<tr>
<td>6. Auxiliaries (be, do, have, and will)</td>
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</table>

Of the six morphosyntactic features, the first four involve bound morphology, and the remaining two deal with free morphemes. These six morphosyntactic features were selected because they have been investigated in the context of L2 acquisition by learners from
typologically different language backgrounds (e.g., Johnson, 1992; Johnson & Newport, 1989; Slavoff & Johnson, 1995). However, it is worth noting that none of these researchers analysed the acquisition of these grammatical features in speech. In addition, these six morphosyntactic features were selected for the following reasons.

First, they represent a wide variety of the most basic English grammar, and obligatory contexts for their use are relatively easy to elicit from learners of low proficiency in English. Second, they represent the range of difficulty found in Johnson and Newport’s (1989) study of Chinese and Korean speakers of English, with some morphosyntactic features being the most difficult for their adult learners (determiners and plurals), some being relatively easy (the simple past tense, auxiliaries, and the third person singular), and one causing almost no trouble at all (progressive -ing). Third, Johnson and Newport reported an age effect on the acquisition of every rule type tested in their study using an auditory grammaticality judgment task. By choosing to assess some of the same morphosyntactic features as were tested in their study, I am more likely to pick up age effects where they exist. Fourth, in considering the possible effect of L1 on L2 development, the six morphosyntactic features were chosen to represent both points of contrast in English and Chinese (e.g., the third person singular and some auxiliaries) and points of partial correspondence (e.g., noun plurals, the simple past tense, progressive -ing, determiners, and some auxiliaries) in the two languages.

As mentioned in Section 2.4, remarkably few studies have specifically assessed L2 oral fluency of adult learners in relation to age differences. It is, therefore, desirable to look at the development of oral fluency in the context of this study.
3.3. Participants

The sample for this study consisted of 30 female Mandarin-speaking adult immigrants to Canada, 25 of them originally from mainland China, three from Taiwan, and two from Macao. To measure possible onset age effects on the acquisition of ESL, AOA in Canada was used as the primary criterion for selecting participants. An important methodological implication derived from the literature on adult L2 acquisition is that, if there is a slow decline in adult L2 acquisition with increasing age, the magnitude of an age-related effect is likely to be underestimated in a research design that compares only adjacent age groups or an uneven scattering of adults across age groups (Birdsong, 1992; von Elek & Oskasson, 1973; Johnson & Newport, 1989; Klein & Dittmar, 1979; Seright, 1985; Thorndike, 1928). In designing the present study, I therefore decided to compare adult learners of two different, but relatively narrow, age ranges defined on the basis of cognitive and physiological characteristics. According to Camp, West, and Poon (1989, cited in Salthouse, 1991), researchers working in the area of cognition and aging have been fairly consistent in referring to adults between 18 and 30 years of age as young, to those between 39 and 58 as middle-aged, and to those from 62 to 90 as old. Similar groupings of adults are defined on a physiological basis by Siegler (1989), who claimed that:

... adulthood starts roughly at 25, the age at which most physiological processes are fully developed and are still functioning at close to peak efficiency. Adulthood, then, continues through middle age (roughly around 45) into later life (at 65) and into old age (around 85 and older). (p.119)

Kidd (1973) also observed that some physiological characteristics, such as auditory acuity and reaction time to stimuli, decline with age. However, decline in these areas appears to become marked only after age 40 (Brundage & MacKeracher, 1980, p.23).
In line with the above discussion, the present study investigated adult learners with AOA in Canada between 25 and 35, defined as young adults, and between 40 and 55, defined as middle-aged adults. The 30 participants were divided equally between the two groups: 15 young adult learners with AOA in Canada between 25 and 35, who are referred to as “the earlier AOA group”, and 15 middle-aged adult learners with AOA between 40 and 55 referred to as “the later AOA group” (see Table 3.2).

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>AOA Range</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier</td>
<td>15</td>
<td>25 - 35</td>
<td>31.87</td>
<td>3.56</td>
</tr>
<tr>
<td>Later</td>
<td>15</td>
<td>40 - 55</td>
<td>45.60</td>
<td>4.98</td>
</tr>
</tbody>
</table>

My choice of homogeneous L1 controls for possible effects of L1 on the development of L2 proficiency (Kellerman & Sharwood-Smith, 1986). Although the original research plan was to have a comparable number of male and female adult learners in each group, only one male adult learner was located who would have been eligible for the earlier AOA group versus six for the later AOA group. To eliminate the potential effect of gender on the acquisition of L2 (Cook, 1986; Nyikos, 1990; Oyama, 1976; Slavoff & Johnson, 1995), I decided to include only female learners in this study.

The 30 voluntary participants were recruited through LINC (Language Instruction for Newcomers to Canada) program offices across Metropolitan Toronto. This basic language training program funded by the federal government is offered to new immigrants in local communities throughout English Canada. The stated goal of LINC is the development of learners’ communicative competence in English in order for them to be able to participate in
Canadian society (LINC Curriculum Guideline, 1994, p. 7). As measured by LINC assessors using A-LINC (Assessment Tool for Language Instruction for Newcomers to Canada), all the participants were initially assessed as LINC level 1 for their English proficiency at entry to the program. LINC Level 1 represents limited proficiency in English, which is specified in A-LINC with respect to aural/oral skills as follows:

May speak a little, but usually not at all. May recognize some letters but have trouble pronouncing them.

Understanding is very limited and may range from no apparent comprehension, to comprehending short phrases or key words.

(LINC Curriculum Guideline, 1994, p. 215)

However, the timing of these learners’ entrance into the LINC program varied, with some entering soon after their arrival in Canada and some after a certain length of residence in Canada. Although they all started at LINC level 1, at the time of my data collection, some of these learners had moved to LINC levels 2 or 3.

To ensure that these learners had had time to acquire some oral proficiency in English, all those included in this study had resided in Canada for a minimum of 6 months at the time of my data collection, with a maximum length of residence (LOR) of 69 months. The mean LOR was 30.9 months for the earlier AOA group and 36.1 months for the later AOA group (see Table 3.3). The result of a two-tailed Mann-Whitney U test indicated that the two groups were not significantly different from each other in LOR ($z=-.561, p=.58$).

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>Range</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier</td>
<td>15</td>
<td>30.9</td>
<td>6-60</td>
<td>14.7</td>
</tr>
<tr>
<td>Later</td>
<td>15</td>
<td>36.1</td>
<td>6-69</td>
<td>19.9</td>
</tr>
</tbody>
</table>
Most learners in the study turned out to be relatively well-educated individuals with an average of 13.8 years of L1 formal education for the earlier AOA group and 13.5 years for the later AOA group (see Table 3.4). The difference between the two groups in terms of years of L1 education was not significant ($z=1.138$, $p=.26$). With respect to their levels of L1 formal education, eleven earlier arrivals reported having finished post-secondary education, one reported having completed high school/vocational school, and three reported having completed middle school. In comparison, nine later arrivals reported having finished post-secondary education, five reported having completed high/vocational school, and one reported having completed middle school (see Table 3.5).

**Table 3.4: Years of L1 education**

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>$M$</th>
<th>Range</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier</td>
<td>15</td>
<td>13.8</td>
<td>7 - 16</td>
<td>3.29</td>
</tr>
<tr>
<td>Later</td>
<td>15</td>
<td>13.5</td>
<td>8 - 17</td>
<td>2.33</td>
</tr>
</tbody>
</table>

**Table 3.5: Levels of L1 education**

<table>
<thead>
<tr>
<th></th>
<th>Earlier group (n=15)</th>
<th>Later group (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle school</td>
<td>3 20.0</td>
<td>1 6.7</td>
</tr>
<tr>
<td>High/Vocational</td>
<td>1 6.7</td>
<td>5 33.3</td>
</tr>
<tr>
<td>Post-secondary</td>
<td>11 73.3</td>
<td>9 60.0</td>
</tr>
</tbody>
</table>

With reference to classroom instruction, the result of a two-tailed Mann-Whitney U test indicated that the later arrivals had received significantly more ESL instruction than the earlier arrivals at the time of my data collection ($z=-2.096$, $p<.05$). The mean number of instruction
hours received by the earlier AOA group was 614.1 hours compared with 965.1 hours by the later AOA group (see Table 3.6).

Table 3.6: Instruction hours received by the two AOA groups

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>Range</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier</td>
<td>15</td>
<td>614.1</td>
<td>200-1800</td>
<td>414.2</td>
</tr>
<tr>
<td>Later</td>
<td>15</td>
<td>965.1</td>
<td>240-2720</td>
<td>588.0</td>
</tr>
</tbody>
</table>

3.4. Instruments and Scoring Procedures

I collected data in an individual interview format with the following instruments: an Oral English Proficiency Test, a Background and L2 Contact/Use Questionnaire, an Intelligence Measure, a Memory Measure, and an Attitudes/Motivation Questionnaire. Except for the Oral English Proficiency Test, all the instruments were administered in Mandarin. These instruments were first piloted with a group of four Mandarin-speaking learners (aged between 25 and 55) attending the LINC program. The pilot study resulted in some modifications and exclusions of some items to ensure that the measures were culturally appropriate for Mandarin speakers and would discriminate well among adult learners.

I conducted the 30 individual interviews. I am a native Mandarin speaker. The interviews took place at the learners' choice either in their classroom after class or at their home. At each interview, I tried to create a friendly and open atmosphere. Each interview lasted between 50 and 70 minutes. The instruments used in the study are described below in order of their administration.
3.4.1. *Oral English Proficiency Test*

The oral English proficiency test consisted of two speech tasks: an elicited imitation test and a guided oral interview. They were used to elicit learners' performance of morphosyntactic accuracy and oral fluency. An elicited imitation task was selected as a baseline measure of learners' L2 competence, following the argument that elicited imitation is a process of reconstruction of meaning using learners' own grammar (Bley-Vroman & Chaudron, 1994, p.246). An obvious advantage of an elicited imitation task is that it can isolate morphosyntactic features of special interest and create definite obligatory contexts for the linguistic items under study. A guided oral interview format was chosen to provide naturalistic communication to elicit spontaneous oral L2 data, allowing learners the freedom to reveal their linguistic repertoire in structured contexts. The use of two tasks to measure morphosyntactic accuracy was at the same time intended to mitigate task effects.

The two speech tasks, administered individually, were tape-recorded and transcribed for rating separately. While punctuation was provided in the written transcripts, mispronunciations were not indicated. I first rated the transcripts of the elicited imitations and oral interviews; a random second rating (30% of the total sample) was then done by a second rater (a native speaker of English with a TESL certificate).

*The Elicited Imitation Test (EIT).* Since STM may have a confounding effect upon elicited imitation performance, the effect of stimulus length on imitation was taken into consideration when developing the EIT for the present study. To promote grammatical processing, it is essential that sentences to be imitated contain a quantity of information that can
surpass a learner's upper STM limits. According to Naiman (1974), an adult learner's STM would be taxed if a sentence contained more than 15 syllables. Following Naiman, I constructed 10 sentences for the elicited imitation test in varying lengths from at least 16 syllables per sentence to a maximum of 30 syllables ($M=20$), and from at least 12 words per sentence to a maximum of 21 words ($M=15.1$). The 10 sentences were designed to provide 44 obligatory contexts for the use of the six features of English morphosyntax under study: noun plurals (9 instances), the simple past tense (4 instances), the third person singular of the present tense (11 instances), progressive -ing (4 instances), determiners (10 instances), and auxiliaries (6 instances) (see Appendix B for a list of the sentences and a sample learner protocol). In the EIT, the learners were asked to imitate the 10 sentences one by one. I first read aloud each sentence slowly twice, instructing the learners then to repeat each sentence as completely as possible.

Scoring procedures for EIT. The scoring for the EIT focused on the accurate production of the six English morphosyntactic features under study. To describe the performance of each learner, a 'supplied in obligatory context' (SOC) analysis was used to capture what a learner could do in obligatory contexts (Stauble, 1984). The target items produced in response to the stimuli were first tallied for each learner, and an SOC score for each of the six features was calculated, as well as a global SOC score, by dividing the total correct uses of the target items by the total number of obligatory contexts which required them. The elicited items were scored according to the following criteria:

1 point for each correct use of a target item
0 point for an error in the use of a target item
0 point for an omission in an obligatory context
0 point for no response to a stimulus
For example, in response to the stimulus sentence “Li Chen was a high school teacher before he came to Canada”, a learner produced: “Li Chen is a high school teacher before she came to Canada” (EL:04). One point was awarded for the correct use of the simple past tense realized by ‘came’ and 0 point was given for the use of ‘is’ where the simple past tense was required. In cases where there were repetitions involving different versions of a target item, one point was given for the correct use of the target item. For example, in response to the stimulus for the use of the third person singular, a learner who produced “... but she don’t like ... doesn’t like him...” (EL:04), was awarded one point for the correct use of the third person singular realized by ‘doesn’t’. In conducting the EIT, I occasionally gave prompts in Mandarin when learners had trouble recalling what they heard. After consulting my supervisor, I decided that sentences elicited upon prompt in Mandarin should be excluded from rating. Occasional missing data for the use of a particular item as a result of a procedural error on the part of the interviewer were rated as N/A, and were handled by eliminating that item from the averaging of scores obtained by the same learner in response to other relevant stimuli.

The Guided Oral Interview (OI). The task of constructing OI questions that elicit the use of particular linguistic features proved to be a demanding one. To ensure as much as possible that the OI questions would generate contexts for the use of each morphosyntactic feature under study, I constructed both closed and open questions. While the closed questions were expressly constructed to provide contexts for learners to produce specific target items, the open questions were designed to help involve learners actively in the conversation so that they

\(^3\)EL:1-15 refer to earlier AOA learners and LL:16-30 refer to the later AOA learners.
would produce more spontaneous speech to display a representative sample of their natural use of the six English morphosyntactic features under study. For example, to provide a context for the use of noun plurals, a closed question would be “How long have you been in Canada?”, where an answer involving ‘months’ or ‘years’ would be expected. An open question would be “Can you tell me something about your family?”, where an answer involving ‘brothers’ or ‘sisters’ would be expected. To provide contexts for the use of progressive -ing, learners were asked to describe a picture of a few students preparing for a party (taken from Harley, 1989). There were altogether nine closed questions and six open ones, all of which were at the same time formulated to cover familiar topics, such as family, previous occupation, living accommodation in Toronto, neighbours, classmates, and future plans (see Appendix C for a list of the questions in the guided oral interview and a sample learner protocol). In the course of conducting each individual oral interview, in most cases I used the questions as drafted; however, questions were not always phrased precisely as drafted in order to achieve a natural flow to each individual conversation. Since speech rate, pauses, and English proficiency varied considerably among these learners, the length of the oral interview also varied, with an average length being 13.2 minutes, ranging from 7.1 to 20.1 minutes.

*Scoring Procedures for OI.* The scoring focus for OI was also on the accurate production of the six morphosyntactic features under study. Since the SOC analysis does not show when a certain linguistic feature is used incorrectly in other than obligatory contexts (Hakuta, 1976; Stauble, 1984), a ‘targetlike use’ (TLU) analysis was used in an attempt to “capture this fact by adding the total number of inappropriate uses outside of obligatory contexts
to the denominator of the SOC fraction” (Stauble, 1984, p.329). Accordingly, TLU scores for each of the six morphosyntactic features as well as a total TLU score for the guided oral interview as a whole were calculated by considering all uses of the six morphosyntactic features in all the contexts supplied for these elements. A TLU score was thus a percentage score of accuracy. All the utterances in the transcripts were rated according to the following criteria:

1 point for each correct use of a target item
0 point for an error or an overgeneralization
0 point for an omission in an obligatory context

Hesitation phenomena involving exact repetitions of an immediately preceding target item were eliminated from scoring. For example, “... he likes to travel ... likes to travel ...” (EL:08) was awarded one point for the correct use of the third person singular realized by the word ‘likes’. In cases where near-repetitions of a particular item were not the same, the correct use of the particular item was considered for scoring. For example, “She is cook, cooking sandwich” (EL:07). The correct use of the progressive -ing realized by ‘cooking’ was awarded one point. Failure to use a particular linguistic feature throughout the entire interview was treated as 0 for the use of that feature.

Scoring Procedures for Oral Fluency (OF). To select excerpts from the guided oral interviews for OF rating, it was necessary to distinguish question-answering passages with rapid turn-taking from passages where learners spoke for some time without notable interruptions. An excerpt of the second kind on the topic of living accommodation was then selected from each individual oral interview. Since speech rate, pauses, and English proficiency varied considerably across learners, the length of excerpts ranged from .50 seconds to 4.30 minutes, with a mean
length of 2.10 minutes. All the excerpts were rated for OF by two raters (both were native speakers of English with TESL certificates), who were blind to the learners' age, using a 4-point (0 to 3) rating scale adapted from Hart, Lapkin & Swain's (1988) global rating for oral fluency. While the foci of rating remained on delivery, rhythm, stress, and prosody, the excerpts were rated separately on a 4-point scale for each of these four aspects instead of globally as in Hart et al.'s study (see Appendix D). This modification was prompted during a rating-training session by the initial difficulty that the raters experienced in globally rating individual learners whose oral performance varied across these four aspects. Each participant's final OF score was the average of the two raters' total scores for the four aspects, with a maximum possible score being 12.

3.4.2. Background and L2 Contact/Use Questionnaire

General information about the participants and their L2 contact and use outside the classroom setting was collected using a Background and L2 Contact/Use Questionnaire administered orally in Mandarin (see translated version in Appendix E). The first section of the questionnaire was designed to obtain general information about the participants, such as their LOR in Canada, years of L1 education, their knowledge of English when they came to Canada, and hours of English instruction they had received at the time of my data collection. The second section was an L2 Contact/Use Questionnaire adapted from Spada's (1984) Language Contact Questionnaire and Language Use Questionnaire (Development of Bilingual Proficiency: Second Year Report, June 1983). Spolsky (1989) argued that the language learner can have exposure to and practice in the target language in two qualitatively different settings: the formal language environment of the classroom and the informal or natural language environment of the target language community. The focus of the present L2 Contact/Use Questionnaire was on the latter.
There were altogether 21 items, with the first 15 items eliciting information on the variety of contacts the learners had with English in their everyday lives, and the remaining six items eliciting information on their amount of use of English on a daily basis.

**Scoring Procedures for L2 Contact/Use.** In assigning scores for the 15 items measuring contact with English, I used a weighting procedure designed to be sensitive to variations in both quality and quantity of L2 contact. The basic assumption is that contact involving regular use of English as the functioning language indicates a higher degree of immersion in English and hence a better quality of contact than bilingual contact in which both Chinese and English are used. Therefore, daily situations in which English was used as the functioning language were more heavily weighted than those where both Chinese and English were used. For example, in a given context such as, what language(s) is spoken regularly at your home? If a learner reported using English only, this response was assigned a maximum value of 2, whereas a value of 1 was assigned to a response of using both English and Chinese, and 0 value was assigned to a response of using Chinese exclusively. Assuming that a variety of contact situations means a wider exposure to English, responses indicating that a specific situation did not apply were rated as 0. The total score for contact with English could thus range from 0 to 30.

Of the six items measuring the amount of English the learners used in a typical day, three items were concerned with the amount of time learners spent speaking English, and the remaining three items were concerned with the amount of time they were exposed to English (e.g., listening to the radio, watching TV, and reading). A learner's total score for amount of daily use of English was the sum of time they reported using and being exposed to English productively and receptively.
3.4.3. Intelligence Measure

The Intelligence Measure used in the present study was administered in Mandarin. It was an individual test of intelligence, adapted and translated from Wechsler’s (1941) *The Measure of Adult Intelligence*. It consisted of four components: General Information, General Comprehension, Quantitative Reasoning and Similarities, with the first two components combined to assess previously accumulated knowledge in the form of cultural information and experience, and the latter two combined to measure learners’ reasoning and information processing efficiency with time constraints. Following Carroll’s (1993, p.626) general outline of the three-stratum structure of major cognitive abilities, the first two components can be taken as an approximate measure of crystallized intelligence and the latter two as an approximate measure of fluid intelligence. Learners’ responses were tape-recorded and later transcribed for scoring. The Cronbach alpha for the entire measure was .71.

*Measure of Crystallized Intelligence.* This measure consisted of two components: General Information and General Comprehension. There were a total of ten questions tapping learners’ range of factual knowledge and their common sense. Each question was read once as stated. It was legitimate to say “explain more fully” but not to give leading questions. Following Wechsler’s (1941) scoring criteria, learners’ responses were scored either 0, 1 or 2 depending upon the degree of generalization and the quality. The maximum score was 20, and the Cronbach alpha for this measure was .46.
Measure of Fluid Intelligence. This measure consisted of two components: Quantitative Reasoning and Similarities. Quantitative Reasoning was designed to assess learners’ quantitative reasoning ability as a sign of mental alertness in solving arithmetic problems (Wechsler, 1941, p. 84). There were altogether five arithmetical problems, three easy ones and two difficult ones. With a view to assessing processing efficiency, reaction time to the test items was incorporated along with accuracy, and scoring was conducted with respect to both. The time limits were 30 seconds on questions 1, 2, and 3; 60 seconds on question 4, and 120 seconds on question 5. One point was given for each problem answered correctly within the time limit, and an additional point was given for time on problem 4 if a correct answer was given within 30 seconds and two additional points for problem 5 were awarded if a correct response was given within 60 seconds. The maximum score for quantitative reasoning was 8.

Similarities was designed to indirectly evaluate the logical character of thinking processes with a focus on discrimination between essential and superficial likeness. According to Wechsler (1941), qualitative differences in judging when a likeness is essential rather than trivial are often suggestive both of “the evenness and level of intellectual functioning” (p. 89). There were altogether six pairs of words, presented orally one by one, and learners were asked to point out their similarities within 15 seconds. Following Wechsler’s (1941) scoring criteria, responses were scored either 0, 1, or 2 depending upon the degree and quality of generalizations. The maximum score for similarities was 12. The Cronbach alpha for the measure of fluid intelligence was .65.
3.4.4. Memory Measure

The Memory Measure, administered individually in Mandarin, was adapted and translated from the Wechsler Memory Scale—Form I (Wechsler & Stone, 1975), which Russell (1975) categorized as a measure assessing mainly short-term or immediate memory. While the original measure consisted of seven subtests, the present study included three: Memory Span, Logical Memory, and Associate Learning, which have been investigated in relation to adult L2 acquisition (e.g., Scott, 1994; Skehan, 1980, 1986). The three subtests were presented orally and tape-recorded. The Cronbach alpha for this entire measure was .81.

Memory Span. Memory Span was designed to measure STM capacity, which requires good attention to temporally ordered stimuli and freedom from distractibility. It consisted of six series of unrelated, frequently used single-syllable Mandarin words (e.g., tree, home) and six series of digits of progressively increasing length. Following Miller (1956), who placed the recall ability of any unit at seven plus or minus two, the number of units used in the test was limited to seven for word series, nine for digit series forward and six for digit series backward. The learners were asked to repeat a series of words or a series of digits forward in the order of presentation immediately after the end of the series. For digits backward, the learners were asked to repeat the series heard in reverse order. I read each series of words and digits once, and made efforts not to group them. Each correctly repeated word or digit in the correct order was given one point with the maximum score for memory span being 78. The Cronbach alpha for this subtest was .74.
**Logical Memory.** *Logical Memory* was designed to measure immediate recall for text. One short memory passage with 20 information bits, the context of which was revised to avoid cultural bias, was read once and the learners were then asked to retell immediately what they heard. Their retelling of the passage was rated according to the number of information bits provided with a maximum score of 20. The Cronbach alpha for *logical memory* was .76.

**Associate Learning.** *Associate Learning*, which involves the storage and retrieval of information from STM, was designed to assess processing capacity using six pairs of words, some semantically associated and considered as easy associations, and others unrelated and hence considered as hard associations. The six pairs of words were read once and the learners were then asked to recall the counterpart of the pair upon prompt. One point was given for a correct response to an easy association and two points were given to a correct response to a hard association. The maximum score for *associate learning* was 9. The Cronbach alpha for *associate learning* was .61.

**3.4.5. Attitudes and Motivation Questionnaire**

The Attitudes/Motivation Questionnaire used for the present study was administered in Mandarin. It was a self-report questionnaire, adapted and translated from Gardner and Lambert (1972). Five affective attitudinal and motivational variables which have received considerable investigation from a number of researchers (e.g., Burstall, 1970; Gardner, 1985; Gardner & Lambert, 1972; Gardner & MacIntyre, 1995) were taken into consideration in developing this instrument: (a) attitudes toward learning English; (b) desire to learn English; (c) integrative
orientation; (d) instrumental orientation; and (e) family/social support. There were altogether 28 statements in the questionnaire of which 24 were formulated in a positive way and four in a negative way.

The Attitudes/Motivation Questionnaire was administered in written form. Participants were asked to rate themselves on a scale of 1 to 5 as to what extent the statements were true of them. A decreasing scale of 5 to 1 was used for the statements formulated in a negative way. With respect to family support, two participants who lived in Toronto by themselves were advised to mark N/A to statements that did not apply to them. A score for each affective variable consisted of the sum on the scale divided by the total number of pertinent statements that applied to the learner.

3.5. Data Analyses

Following scoring and entry of data into computer files, I compared the performance of the two AOA groups on the measures of morphosyntactic accuracy and oral fluency in English using the nonparametric Mann-Whitney U test, a test of group differences without assuming normality of the population distribution (Hatcher & Stepanski, 1994). To investigate what may underlie the differential L2 proficiency outcomes of the two AOA groups, the same statistical procedure was employed to compare the two groups on the measures of language contact, intelligence, memory, and attitudes/motivation to learn ESL. I then used Spearman rank order correlations to determine whether there were any significant relationships between learners’ L2 proficiency outcomes and learner variables on which the two AOA groups were found to differ.
Next I used the interviews to further examine the research question of age and adult L2 acquisition from the perspective of the learners involved in the phenomenon. Although interviews have often been employed in studies of affective factors in L2 learning (Price, 1991) and in studies of adult ESL literacy (Cumming & Gill, 1992; Klassen, 1992; Klassen & Burnaby, 1993), the present use of them is the first attempt that I know of in studies of age-related differences in L2 acquisition. To analyse learners’ responses to the interview questions, and in recognition that adult L2 acquisition involves many previously unrecognized or inadequately described variables, I turned to a descriptive approach as a way of exploring more personal and experiential aspects of adult L2 acquisition (Klassen & Burnaby, 1993), drawing comparisons between the two AOA groups with reference to their experiences and perceptions of learning ESL. An obvious advantage of the descriptive approach is that it allowed me to look at the ways in which the learners interpreted their own lived experiences (see e.g. Pun. 1997) of learning ESL, and to use the learners’ insights as a source of information in addressing the second research question. Taking a relative view of objectivity (Barone, 1992; Eisner, 1992), I would argue that quantitative and qualitative approaches are complementary: while the quantitative approach trades in observable facts, the qualitative seeks to explicate the subjective ‘meaning’ behind the statistics (Lakomski, 1992, p.199). To this end, qualitative data are as foundational and legitimate as are quantitative data, since each approach is differentially specialized for the investigation of certain problems and each contributes uniquely to our understanding of the complex phenomena observed in this study.
Chapter 4

RESULTS

In this chapter, results from this empirical study of L2 acquisition by earlier and later AOA groups are presented in three sections, the first section being devoted to the first research question and the last two sections to the second research question of the present study. In Section 4.1, the earlier and later AOA groups are compared with respect to their proficiency outcomes on measures of morphosyntactic accuracy and oral fluency in English, and with respect to their accurate production of each of the six morphosyntactic features under study. Section 4.2 then presents the results of a comparison of the two AOA groups on the measures of four sets of learner variables under study. Learner variables on which the two AOA groups were found to differ were then analysed in relation to their performance on three criterion measures of oral English proficiency. Section 4.3 describes the learning experiences and perceptions of the earlier versus the later AOA learners in the hope of gaining a better understanding of the personal and experiential factors that are associated with their differential L2 proficiency outcomes.

4.1. Comparison of the Earlier and Later AOA Groups on the Measures of Morphosyntactic Accuracy and Oral Fluency

The learners' morphosyntactic accuracy was measured using two speech tasks: an elicited imitation test (EIT) and a guided oral interview (OI). As stated in Section 3.2, the focus of the accuracy rating was on the accurate production of six English morphosyntactic features. I first
rated the learners' performance on the two speech tasks. Interrater reliability was assessed by having a second rater rescore a random subsample of nine transcribed tapes (30% of the total data). With the six morphosyntactic features rated separately for each learner, the total number of second ratings on each measure was 54, of which seven ratings on the EIT measure and twelve on the OI measure differed slightly from those of the first rater, with the remaining pairs of ratings in perfect agreement. The percentage of exact agreement of the two ratings was 87% for the EIT measure, and 78% for the OI measure. The first rater's scores were then taken as the learners' final scores for morphosyntactic accuracy.

The learners' oral fluency (OF) was assessed by two raters using excerpts taken from the guided oral interviews. The focus of the OF rating was on delivery, rhythm, stress, and prosody. Interrater reliability was assessed and an agreement level of 57% was obtained. Thirteen of the total of 30 pairs of ratings differed slightly with one of the raters rating consistently higher than the other, and the remaining 17 pairs were in perfect agreement. Because of the relatively low agreement between the raters, I calculated the learners' final OF scores as an average of the scores given by the two raters.

Intercorrelations among the three criterion measures revealed a strong relationship between the EIT measure of morphosyntactic accuracy and oral fluency ($r= .76, p<.0001$) and a moderate relationship between the OI measure of morphosyntactic accuracy and oral fluency ($r=.47, p<.01$). The correlation between the EIT and OI measures of morphosyntactic accuracy was also moderate ($r=.45, p<.05$), but insufficient to justify constructing a consolidated set of measures of accuracy on additive scales; therefore, the results of the two accuracy measures will be presented separately. To assess differences between the earlier and later AOA groups with respect to their performance on each of the accuracy measures and on the measure of oral
fluency, the nonparametric Mann-Whitney U Test, which is a test of group differences based on rank orders, was used since the distribution of the earlier AOA group's OF scores displayed a negative skew with a significant departure from a normal distribution. The \( p \) values reported below are set at a .05 level of significance and are one-tailed as the overall hypothesis of the present study (that the earlier AOA group would do better than the later AOA group) is a directional one. Thus the primary question to answer here is whether the earlier AOA group outperformed the later AOA group on the two summary measures of morphosyntactic accuracy and on the measure of oral fluency.

**Overall Morphosyntactic Accuracy Score.** Table 4.1 provides the overall mean scores, ranges, and standard deviations on the EIT and OI measures of morphosyntactic accuracy for the earlier and later AOA groups. Note that the overall mean scores of the earlier AOA group on the two accuracy measures are consistently higher than those of the later AOA group. When group differences were tested with the Mann-Whitney U Test, the earlier and later AOA groups were found to be significantly different from each other. The earlier AOA group obtained significantly higher scores than the later AOA group on the EIT measure (\( z = -2.18, p < .05 \)) and the OI measure (\( z = -2.34, p < .05 \)) of morphosyntactic accuracy. There was a similarly large variance in both groups and across the two measures, and both groups were on average within a relatively low range of L2 proficiency outcomes (see the two test scores on Table 4.1 expressed as percentages).

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>EIT M</th>
<th>Range</th>
<th>SD</th>
<th>OI M</th>
<th>Range</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier</td>
<td>15</td>
<td>48.4%</td>
<td>61.4</td>
<td>17.8</td>
<td>54.1%</td>
<td>30.5</td>
<td>9.1</td>
</tr>
<tr>
<td>Later</td>
<td>15</td>
<td>32.6%</td>
<td>63.8</td>
<td>19.0</td>
<td>44.7%</td>
<td>42.2</td>
<td>10.3</td>
</tr>
</tbody>
</table>
**Separate Morphosyntactic Feature Score.** The two AOA groups' accurate production of each of the six morphosyntactic features was also assessed. The mean scores, ranges, and standard deviations on the six morphosyntactic features for the earlier and later AOA groups were computed separately. These are presented in Tables 4.2 and 4.3. Note that the variance of each of the six morphosyntactic features in both groups remains large, and remarkably similar in the two groups. When group differences in the accurate production of the six morphosyntactic features were tested, the following results emerged. On the EIT measure of morphosyntactic accuracy, significant differences favouring the earlier AOA group were found between the two groups in the use of noun plurals ($z=-2.16, p<.05$), determiners ($z=-2.80, p<.005$), and auxiliaries ($z=-2.19, p<.05$). A near-significant difference was found between the two groups in the use of the simple past tense ($z=-1.99, p=.056$). The group means show that to varying degrees the earlier AOA group used all these six morphosyntactic features more accurately than the later AOA group. However, no significant differences between the two groups emerged in the use of the third person singular ($z=-1.25, p=.22$) or the progressive marker ($z=-.27, p=.81$).

**Table 4.2**

Group means, ranges, and standard deviations for the six morphosyntactic features on EIT

<table>
<thead>
<tr>
<th>Feature</th>
<th>Earlier (n=15)</th>
<th></th>
<th>Later (n=15)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>Range</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Plural</td>
<td>58.6</td>
<td>66.7</td>
<td>19.7</td>
<td>43.5</td>
</tr>
<tr>
<td>Past tense</td>
<td>47.8</td>
<td>100.0</td>
<td>31.1</td>
<td>23.9</td>
</tr>
<tr>
<td>3rd person</td>
<td>39.5</td>
<td>81.8</td>
<td>24.8</td>
<td>27.7</td>
</tr>
<tr>
<td>Progressive</td>
<td>55.6</td>
<td>100.0</td>
<td>32.2</td>
<td>52.2</td>
</tr>
<tr>
<td>Determiners</td>
<td>49.8</td>
<td>67.5</td>
<td>19.3</td>
<td>29.2</td>
</tr>
<tr>
<td>Auxiliaries</td>
<td>39.2</td>
<td>83.3</td>
<td>24.6</td>
<td>19.1</td>
</tr>
</tbody>
</table>
Table 4.3
Group means, ranges, and standard deviations for the six morphosyntactic features on O1

<table>
<thead>
<tr>
<th>Feature</th>
<th>Earlier (n=15)</th>
<th>Later (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>Range</td>
</tr>
<tr>
<td>Plural</td>
<td>64.5</td>
<td>71.4</td>
</tr>
<tr>
<td>Past tense</td>
<td>33.8</td>
<td>66.7</td>
</tr>
<tr>
<td>3rd person</td>
<td>34.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Progressive</td>
<td>55.1</td>
<td>65.9</td>
</tr>
<tr>
<td>Determiners</td>
<td>58.5</td>
<td>49.3</td>
</tr>
<tr>
<td>Auxiliaries</td>
<td>77.9</td>
<td>47.4</td>
</tr>
</tbody>
</table>

On the OI measure of morphosyntactic accuracy, a significant difference was found between the earlier and later AOA groups in the use of determiners ($z=-2.24, p<.05$), and a near-significant difference in the use of the simple past tense ($z=-1.92, p=.056$). In both cases, the earlier AOA group outperformed the later AOA group. However, the two groups were not significantly different from each other in the use of noun plurals ($z=-.35, p=.74$), the third person singular ($z=-.98, p=.37$), the progressive marker ($z=-1.08, p=.29$), or auxiliaries ($z=-.37, p=.71$).

A striking feature of these learners’ performance on the two accuracy measures was the wide variation in the accurate production of the six morphosyntactic features. This variation was characteristic of the performance of both AOA groups. It is of interest to know whether some morphosyntactic features created more problems than others for these Mandarin-speaking learners of English. To answer this question, two-way analyses of variance were performed for the two accuracy measures, using the six morphosyntactic features and two ages of arrival in Canada. The results of the ANOVA for the EIT measure of morphosyntactic accuracy showed a significant effect of AOA, $F(1,168)=17.22, p<.0001$, and a significant effect of
morphosyntactic feature, $F(5,168)=4.39, p<.001$, but no significant interaction between AOA and morphosyntactic features was registered: $F(5,168)=0.62, p>.05$. Similar results were obtained for the OI measure of morphosyntactic accuracy. There was a significant effect of AOA $F(1,168)=7.55, p<.01$, and a significant effect of morphosyntactic feature, $F(5,168)=23.52, p<.0001$, but there was no significant interaction between AOA and morphosyntactic features, $F(5,168)=1.11, p>.05$.

These results illustrate the following points. First, the main effect of AOA in the L2 environment is simply a reproduction of the finding that earlier AOA learners outperformed the later AOA learners on the two accuracy measures. Second, the significant effect of morphosyntactic feature shows that learners’ errors were not random; rather there were some morphosyntactic features that were more difficult for these Mandarin-speaking learners than others. Third, the nonsignificant interactions between AOA and morphosyntactic features indicate that the earlier and later AOA groups responded in a similar and relatively consistent manner to the six morphosyntactic features on the two measures of morphosyntactic accuracy.

The pattern of accurate production for each group across the six morphosyntactic features on the two accuracy measures can be seen in Figure 4.1 and 4.2. As Figure 4.1 shows, the patterns of accurate use of the six features for the two AOA groups on the EIT measure are strikingly similar. The somewhat jagged nature of the two lines illustrates the variability of learners’ accurate production of the six morphosyntactic features. Both groups performed relatively well on the use of noun plurals and the progressive marker, but relatively poorly on the use of the simple past tense, the third person singular, determiners, and auxiliaries.
Figure 4.1: Patterns of accurate production for the two AOA groups across the six morphosyntactic features on the EIT measure.
Figure 4.2: Pattern of accurate production for the two AOA groups across the six morphosyntactic features on the OI measure.
As can be seen in Figure 4.2, the patterns of accurate production for the two AOA groups across the six morphosyntactic features on the OI measure were remarkably similar, though somewhat different from those found on the EIT measure. While both groups performed relatively well on the use of auxiliaries and noun plurals, they both had particular problems in the use of the simple past tense and the third person singular.

Despite some discrepancies between the patterns of accurate use of the six morphosyntactic features on the two accuracy measures, there was a parallel tendency for both groups to do well in the use of some morphosyntactic features and to do less well in the use of others on each measure. A note is in order here: These current findings are patterns of accurate production, but they do not necessarily imply any acquisition order, since only a few learners had acquired certain morphosyntactic features if based on the criterion of 90% accurate use to indicate that an item has been acquired (see Dulay & Burt, 1974).

**Oral Fluency Score.** Table 4.4 provides the group means, ranges, and standard deviations of the OF scores for the earlier and later AOA groups. With the maximum possible OF score being 12, the ranges and standard deviations shown in Table 4.4 reveal large variance in each group. The mean score of the earlier AOA group, however, is notably higher than that of the later AOA group. The difference between the two groups proved to be significant ($z=-2.06, p<.05$). The group mean scores indicate that the earlier AOA group scored significantly higher than did the later AOA group on the OF measure.
Table 4.4
Group means, ranges, and standard deviations on the OF measure

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>%</th>
<th>Range</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier</td>
<td>15</td>
<td>7.4</td>
<td>61.7</td>
<td>8.5</td>
<td>3.25</td>
</tr>
<tr>
<td>Later</td>
<td>15</td>
<td>4.4</td>
<td>36.7</td>
<td>12.0</td>
<td>3.54</td>
</tr>
</tbody>
</table>

Note: Maximum=12

To summarize, the mean scores on the EIT and OI measures of morphosyntactic accuracy and on the measure of oral fluency are graphed in Figure 4.3. Considered as a whole, they permit the conclusion that the earlier AOA group had a consistent advantage over the later AOA group on the three criterion measures. However, with respect to the accurate production of each of the six morphosyntactic features, the earlier AOA group outperformed the later AOA group on the use of some morphosyntactic features, while the two groups remained more or less the same on the use of others. The results of the ANOVA computed for the six morphosyntactic features for the two accuracy measures showed that both AOA groups made more errors on some morphosyntactic features than on others, suggesting that some morphosyntactic features were more problematic for these Mandarin-speaking learners relative to other features.
Figure 4.3: Mean scores for the two AOA groups on the three criterion measures.
4.2. Comparison of the Earlier and Later AOA Groups on Learner Variables

As presented in Section 3.3, the earlier and later AOA groups were comparable in terms of their LOR in Canada and years of L1 education; but the later AOA learners had received significantly more ESL instruction since their arrival in Canada than had the earlier AOA learners. These comparative data eliminate the possibility that higher scores attained by the earlier AOA group on the three criterion measures were due to advantageous differences on these variables. The consistent advantage of the earlier arrivals over the later arrivals on the two measures of morphosyntactic accuracy and on the measure of oral fluency indicates that AOA in the L2 environment probably was a relevant factor in these adult learners’ L2 acquisition. However, chronological age is not an explanation in itself. Seeking potential explanations for the differential proficiency outcomes in L2 between the earlier and later AOA groups, I compared the two groups on measures of the following sets of learner variables: language contact (L2 contact and L2 use), intelligence (crystallized intelligence and fluid intelligence), memory (memory span, logical memory, and associate learning), and attitudes/motivation (attitudes towards learning ESL, desire to learn ESL, integrative orientation, instrumental orientation, and family/social support for learning ESL).

To assess group differences on measures of these four sets of learner variables, the nonparametric Mann-Whitney U tests were used (without assuming a normal distribution of scores). As an exploratory aspect of this study, no specific hypotheses were formulated with respect to these learner variables, so the p values reported below are, therefore, two-tailed.
**L2 Contact and L2 Use.** The 30 adult learners all completed the L2 Contact/Use Questionnaire. The variety of contact the learners reported having with English and their amount of use of English on a daily basis were scored separately following the procedures described in Section 3.4.2. Each learner was assigned a score out of 30 for contact with English (maximum score of 2 points for each of the 15 items). The score for L2 use was the amount of time (in hours) that the learner reported using English on a daily basis (no maximum score). The correlation between the two measures was moderately strong ($r=.59, p<.001$). For the 15 situations related to daily life listed in the questionnaire, an average of 29.3% of the earlier AOA learners reported having contact in English, 12% reported having contact in both Chinese and English, 36.5% in Chinese exclusively, and 22.2% checked the N/A responses. In comparison, an average of 17.8% of the later arriving learners reported having contact in English in these daily situations, 12.9% reported having contact in both Chinese and English, 44.4% in Chinese exclusively, and 24.5% checked the N/A responses (see Table 4.5). The percentage of learners having contact exclusively in English was relatively low for both groups, especially for the later AOA group, suggesting that a sizeable proportion of the adult learners in this study conducted their daily affairs primarily in their L1.

<table>
<thead>
<tr>
<th>Language(s)</th>
<th>Earlier (n=15)</th>
<th>Later (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>29.3%</td>
<td>17.8%</td>
</tr>
<tr>
<td>Chinese/English</td>
<td>12.0%</td>
<td>12.9%</td>
</tr>
<tr>
<td>Chinese</td>
<td>36.5%</td>
<td>44.4%</td>
</tr>
<tr>
<td>N/A</td>
<td>22.2%</td>
<td>24.5%</td>
</tr>
</tbody>
</table>
Of the responses to the six items eliciting information on the amount of daily use of English, all the earlier AOA learners reported using English for about 2 hours or more on a daily basis. In comparison, only 46.7% of the later arrivals reported using English for about 2 hours or more on a daily basis, whereas 33.3% reported using English for about 1 hour, 13.3% for about 30 minutes, and 7% reported not using English at all (see Table 4.6). A further finding was that the L2 use reported by both AOA groups was more receptive (e.g., watching TV) than productive (see Table 4.7).

<table>
<thead>
<tr>
<th>Amount of time</th>
<th>Earlier (n=15)</th>
<th>Later (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>c.30 minutes</td>
<td>0%</td>
<td>13.3%</td>
</tr>
<tr>
<td>c.1 hour</td>
<td>0%</td>
<td>33.3%</td>
</tr>
<tr>
<td>c.2 hours &amp; more</td>
<td>100%</td>
<td>46.7%</td>
</tr>
</tbody>
</table>

Table 4.7

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Productive</th>
<th>Receptive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>Range</td>
</tr>
<tr>
<td>Earlier</td>
<td>15</td>
<td>.45</td>
<td>2.30</td>
</tr>
<tr>
<td>Later</td>
<td>15</td>
<td>.28</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: Time calculated by minutes

When group differences were tested by the nonparametric Mann-Whitney U Tests, the earlier and later AOA groups were found to be significantly different from each other on the measure of L2 contact ($z=-3.10, p<.005$) and on the measure of L2 use ($z=-3.50, p<.0005$). The earlier arrivals had exposure in a wider variety of contexts and used substantially more English on a daily basis than the later arrivals.
Intelligence. As outlined in Section 3.4.3, the Intelligence Measure, which was administered in Mandarin, consisted of two components assessing crystallized intelligence and fluid intelligence. I first rated the learners' responses and a second rating of the responses of eight randomly selected learners (26.7% of the total) was conducted. The interrater reliability was .98, \( p < .0001 \). Of the 168 items given second ratings, only three differed from the first ratings, and the remainder were in total agreement. The first ratings were taken as the learners' final scores. Correlation between the two measures of intelligence was moderate \((r = .49, p < .01)\). Results are presented separately for each measure, given the prediction implicated by the developmental cognitive theory of learning (see Section 2.5.2). Table 4.8 provides the mean scores, ranges, and standard deviations for the earlier and later AOA groups on the measures of crystallized intelligence and fluid intelligence.

<table>
<thead>
<tr>
<th></th>
<th>Crystallized IQ (Max=20)</th>
<th>Fluid IQ (Max=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( M )</td>
<td>%</td>
</tr>
<tr>
<td>Earlier</td>
<td>15.2</td>
<td>75</td>
</tr>
<tr>
<td>Later</td>
<td>14.6</td>
<td>70</td>
</tr>
</tbody>
</table>

As the above percentage scores show, the two AOA groups performed equally well on the measure of crystallized intelligence, but the earlier AOA group outperformed the later AOA group on the measure of fluid intelligence. When group differences were tested statistically, the two groups were not significantly different from each other on the measure of crystallized intelligence \((z = -.61, p = .57)\), but on the measure of fluid intelligence, the earlier AOA group scored significantly higher than the later AOA group \((z = -2.30, p < .05)\).
**Memory.** As outlined in Section 3.4.4, the Memory Measure, which was administered in Mandarin, consisted of three components assessing memory span, logical memory, and associate learning. I first rated the learners' performance on the three measures. On the measure of logical memory where subjectivity could have affected ratings, a second rating for eight randomly selected learners (26.7% of the total sample) was conducted, and the interrater reliability was .93, p<.001. Of the total of 160 items receiving a second rating, eight differed from the first ratings, and the remainder were in perfect agreement. The first ratings of the three aspects of memory were taken as learners' final scores. Results of the three aspects of memory are presented separately because intercorrelations among them revealed only a moderate relationship between memory span and associate learning (r=.36, p<.05), and a near-significant correlation between memory span and logical memory (r=.31, p=.099).

<table>
<thead>
<tr>
<th>Measure</th>
<th>Earlier (n=15)</th>
<th>Later (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>%</td>
</tr>
<tr>
<td>Mem1</td>
<td>68.3</td>
<td>87.7</td>
</tr>
<tr>
<td>Mem2</td>
<td>13.7</td>
<td>68.5</td>
</tr>
<tr>
<td>Mem3</td>
<td>5.5</td>
<td>61.1</td>
</tr>
</tbody>
</table>

Note: mem1 = memory span (max=78)  
mem2 = logical memory (max=20)  
mem3 = associate learning (max=9)

Table 4.9: Memory scores for the two AOA groups

Table 4.9 presents the mean scores, ranges, and standard deviations for the two AOA groups on the measures of the three aspects of memory. The group percentage scores shown in Table 4.9 indicate that both groups performed very well on the measure of memory span relative to their scores on the measures of logical memory and associate learning. While the
mean scores of the earlier AOA group on the measures of these three aspects of memory are consistently higher than those of the later AOA group, the differences between the two groups turned out to be statistically non-significant ($z=-.50, p=.62; z=-1.25, p=.21; z=-.74, p=.46$ respectively).

**Attitudes/Motivation.** The Attitudes/Motivation Questionnaire described in Section 3.4.5 concerns five affective aspects of attitudes and motivation that may be relevant to the learning of ESL: attitudes towards learning English, desire to learn English, integrative orientation, instrumental orientation, and family/social support for learning English. Intercorrelations among the five aspects of attitudes and motivation revealed a significant positive relationship between integrative orientation and family/social support ($r=.43, p<.05$), a near-significant positive correlation between attitudes toward learning English and desire to learn English ($r=.32, p=.08$) and between attitudes towards learning English and integrative orientation ($r=.33, p=.08$). Results for the five affective aspects of attitudes and motivation are presented separately in Table 4.10, which shows the mean scores, ranges, and standard deviations for the earlier and later AOA groups. Both groups scored high on all five aspects, particularly on the measure of instrumental orientation, leaving little room for variability. Not surprisingly, therefore, no significant differences were found between the two groups on any of these measures of attitudes and motivation, apparently because of a ceiling effect ($z=-.21, p=.83; z=-.67, p=.50; z=-.17, p=.87; z=-.77, p=.44; z=-1.03, p=.31$ respectively).
Table 4.10: Attitudes and motivation in the two AOA groups

<table>
<thead>
<tr>
<th>Measure</th>
<th>Earlier (n=15)</th>
<th></th>
<th></th>
<th></th>
<th>Later (n=15)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>Range</td>
<td>SD</td>
<td></td>
<td>M</td>
<td>Range</td>
<td>SD</td>
</tr>
<tr>
<td>Attitudes</td>
<td>87.6%</td>
<td>20.0</td>
<td>6.3</td>
<td></td>
<td>86.3%</td>
<td>25.0</td>
<td>7.8</td>
</tr>
<tr>
<td>Desire</td>
<td>87.1%</td>
<td>34.3</td>
<td>11.5</td>
<td></td>
<td>85.3%</td>
<td>4.0</td>
<td>9.7</td>
</tr>
<tr>
<td>Integrative</td>
<td>87.7%</td>
<td>24.0</td>
<td>8.5</td>
<td></td>
<td>86.4%</td>
<td>40.0</td>
<td>13.2</td>
</tr>
<tr>
<td>Instrumental</td>
<td>96.0%</td>
<td>26.7</td>
<td>7.9</td>
<td></td>
<td>96.8%</td>
<td>35.3</td>
<td>9.5</td>
</tr>
<tr>
<td>Family/Social</td>
<td>81.1%</td>
<td>40.0</td>
<td>11.4</td>
<td></td>
<td>84.5%</td>
<td>64.0</td>
<td>16.3</td>
</tr>
</tbody>
</table>

Summing up this section, the above comparisons of the earlier and later AOA groups on the four sets of learner variables under study show that the two AOA groups were not significantly different from each other with respect to crystallized intelligence, the three aspects of memory, and the five affective aspects of attitudes and motivation. However, the earlier and later AOA groups were significantly different from each other on the measures of L2 contact, L2 use, and fluid intelligence, with the earlier AOA learners having an advantage over the later AOA learners in this regard. Given the significant differences between the two groups on measures of these three learner variables, it was important to establish whether these learner variables were predictive of the relative success of these learners on the measures of oral English proficiency. Spearman nonparametric rank order correlation coefficients were calculated for the entire sample of learners. As can be seen from Table 4.11, the results show moderately strong correlations between these three learner variables and the three criterion measures respectively, almost all at significant levels (with one at a near-significant level). The correlations between the three learner variables and learners’ L2 proficiency outcomes revealed a linear trend, indicating that the relative success of the earlier AOA learners in the present study was associated with wider contact with English, a greater amount of L2 use on a daily basis, and a higher level of fluid intelligence.
Table 4.1
Spearman correlations of L2 contact, L2 use, and fluid intelligence with criterion measures

<table>
<thead>
<tr>
<th>Variables</th>
<th>EIT</th>
<th>OI</th>
<th>OF</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2 Contact</td>
<td>.50 **</td>
<td>.29 p=.057</td>
<td>.58 ***</td>
</tr>
<tr>
<td>L2 Use</td>
<td>.51 **</td>
<td>.47 **</td>
<td>.42 *</td>
</tr>
<tr>
<td>Fluid IQ</td>
<td>.53 ***</td>
<td>.66 ***</td>
<td>.49 **</td>
</tr>
</tbody>
</table>

* one-tailed p<.05  
** one-tailed p<.005  
*** one-tailed p<.001

4.3. Descriptive Account of Learning Experiences and Perceptions among the Earlier versus the Later AOA Learners

The significant differences between the earlier and later AOA groups on the measures of L2 contact, L2 use and fluid intelligence reported in the above section may help to explain the differential L2 proficiency outcomes of the two AOA groups on the three criterion measures. To substantiate these findings and also to broaden our understanding of the personal and experiential factors that may have affected the L2 acquisition of the two AOA groups in the given context, it is desirable to look at what these learners had to say about their experiences in learning ESL, and whether age made any difference in their experiences and perceptions. Language learning is, after all, a personal experience, and one’s perceptions of language learning are likely to influence and be influenced by one’s experiences as a language learner.

These descriptive data were obtained through individual interviews in Mandarin, in which I asked the learners three sets of questions regarding their experiences and perceptions of learning ESL (see Section 3.1 for the questions used in the interview). In each individual interview I posed in most cases the questions in their original form, but the questions were not
always phrased precisely as drafted because I also tried to achieve a natural flow to each individual conversation. All the questions and answers were in Mandarin, and some answers were more detailed than others. The quotations from the descriptive data presented in this section are therefore translations, with EL:1-15 referring to earlier AOA learners and LL:16-30 to later AOA learners. It should be pointed out that not every one answered all the questions; therefore the percentages reported below are the percentage of responses obtained.

**Learners’ Experiences with English.** The first set of interview questions concerned learners’ experiences in learning ESL. Most learners (66%) reported that it was difficult for them to learn English; 21% of them indicated it was very difficult, whereas 14% reported that it was not difficult. The responses of the earlier and later AOA groups were remarkably similar. It was interesting to note that those who did not consider learning English as difficult drew a distinction between ‘learning’ English and ‘using’ English. For them, it was not difficult to learn English analytically, but to use English in oral communication remained a challenging task:

I don’t think it is difficult to learn English. It is not learning that is difficult. For me the difficulty is how to use it. (EL:15)

A great majority of learners across the two AOA groups (72%) reported learning to speak as the most difficult aspect of learning English; however, the difficulties they experienced varied. Twenty-one percent of the earlier arrivals versus 47% of the later arrivals mentioned that they experienced particular difficulty in pronunciation.

Sometimes the teacher corrects my pronunciation. It’s very hard for me to correct myself. For example, ‘sometimes’, I just pronounce it as [səmtʃ]. (EL:03)
I think my pronunciation is not accurate ... When I speak English, it's very difficult for me to pronounce the words accurately. English pronunciation is very difficult for me. (LL:17)

Some learners expressed great difficulty in listening comprehension:

The difficulty is I can’t understand ... I can never understand what they are saying. (LL:22)

Listening comprehension is extremely difficult because they speak very fast. Listening comprehension is most difficult for me. (LL:28)

Particularly noteworthy is that the learners who mentioned specific difficulty in listening comprehension were all later arrivals (40%), whereas none of the earlier arrivals reported this. These differences between the two AOA groups in regards to pronunciation and listening comprehension are consistent with learners’ responses to the question as to which aspect of language they had made most progress in since their arrival. While 67% of the earlier AOA learners reported that they made most progress in listening comprehension, only 33% of the later AOA learners reported this. Likewise, more earlier arrivals (25%) than later arrivals (8%) reported making most progress in speaking English. In contrast, 42% of the later arrivals versus 8% of the earlier arrivals reported making most progress in writing English, and 33% of the later arrivals versus 8% of the earlier arrival reported making most progress in reading English.

Forty-eight percent of the learners across the two AOA groups also indicated experiencing difficulty in learning English vocabulary. The majority of them attributed this difficulty to their ‘failing’ memories. In this respect, difference between the two AOA groups was much narrower. The following quotations from the interviews illustrate their frustrations:

Vocabulary is difficult. My memory is not good. It’s very difficult for me to remember [the English words]. I just can’t remember the new words. (EL:01)
I think it's very difficult. The vocabulary is so large that it's very difficult for me to remember. My memory is not good any more. I can't remember. (EL:03)

I think my biggest problem is vocabulary ... If I run into a new word, I'll have to look it up in the dictionary five to ten times before I can remember it. I just can't remember it. It seems as if I have never seen it before. No trace at all. (EL:06)

Contrary to common belief, however, only a few learners across the two groups (14%) considered grammar as the most difficult aspect of learning English. This finding clearly indicates, in line with Singleton's (1989) general observation, that adult learners perceive little particular difficulty in recognising and assimilating the grammatical system of an L2 (p.256). But this does not mean that they had no problems using grammar, as illustrated in the following quotation:

As to grammar, it's easy to understand, and I know how it should be used. But when I speak, my grammar is gone. But when I write, I know what tense to use. (EL:04)

However, a substantial number of learners, 57% of the earlier arrivals versus 43% of the later arrivals, experienced difficulty, not so much in speaking itself, but rather in getting access to language-acquisition contacts to learn and practise speaking English:

I think it's very difficult to learn English. The difficulty is lack of opportunities to speak [English]. (EL:02)

I think it's difficult to learn English ... My difficulty is in speaking. I seldom speak. There is no opportunity to speak [English]. (EL:10)

The biggest hurdle for me is lack of opportunities to speak [English]. (LL:23)
It was apparent that both AOA groups experienced a lack of language situations where they could learn to speak and practise English. For many of them, their inability to find opportunities to speak English created a great deal of frustration in learning to speak English. In spite of the difficulties that the learners experienced in learning ESL, most of them (86%) considered themselves to have fairly favourable learning conditions, especially as compared to learning English as a foreign language in their native land. When asked whether they had experienced any barriers to their learning English, their responses varied, but they were in many ways similar across the two AOA groups. Some learners (29%) reported having no barriers, which can be taken as an indication that these learners tried to control their own learning and attributed their success or failure to their own efforts. Thirty-six percent of the learners reported that their biggest barrier was lack of opportunities to learn and practise their oral English.

As to barriers, the barrier that I have is everybody in the family speaks Chinese. If everybody speaks English, I won't have any barrier. (EL:10)

Some learners (21%) considered themselves as the barrier to learning, as illustrated in the following quotations:

[My learning condition] is supposed to be good. The barrier is myself. I have the language environment; I have help from friends, but I just can't get into speaking English. I usually don't speak English. (EL:14)

I have psychological barriers. I seldom speak [English]; sometimes I am afraid to open my mouth to speak [English]. (LL:24)

Further barriers indicated by the learners across the two AOA groups included failing memory, personal commitments to other matters (i.e., family responsibilities, employment, etc.), pronunciation, and reading. While there are similarities between the earlier and later AOA
groups in their responses, there were some interesting differences as well. A noteworthy finding is that those who considered failing memory as the major barrier to their learning of English were all later arrivals, representing 29% of the later AOA group. As mentioned above, the earlier arrivals also complained about their memories failing them, but none of these earlier arrivals reported it as an important barrier to learning. In contrast, of those who viewed an inadequate language environment as an important barrier, 60% of them were earlier AOA learners and 40% were later AOA learners. These differences in the earlier and later arrivals' perceptions of barriers may reflect their ways of learning English, suggesting a tendency for the later AOA learners to place more reliance on memorizing L2, and for the earlier AOA learners to rely more on obtaining language-acquisition contacts.

Learners' Perceptions of Oral English Development. The second set of interview questions concerned the learners' perceptions of oral English development. Learners were asked to estimate the length of time necessary for them to be able to speak English fairly fluently. The majority of learners believed that reasonable oral proficiency in English was achievable; however, their estimates of further time needed varied over a full range of possibilities, from half a year (9%) to 1 year (4%), 2 to 3 years (26%), 3 to 5 years (13%), and impossible (22%). These estimates, however, were made based on their current learning situations. If they were given the most favourable language learning environment, some learners (17%) claimed the length of time needed to be considerably shorter. For example,

It's difficult to estimate. If my husband were a Canadian, I would have been able to speak English fluently by now. (EL:04)
If I had a speaking partner to practice English with, I am quite confident that I would be able to speak English very well in half a year. (EL:06)

I think if I have a very good language learning environment, it will take me three months to half a year to be able to speak English very well. I think environment is extremely important. (EL:15)

A striking difference was found in regard to the two AOA groups’ estimation of the time necessary to develop oral English fluency. The earlier arrivals appeared to be more optimistic about the prospect of their ultimate L2 proficiency than the later arrivals. In fact, two earlier arrivals considered themselves to be relatively fluent speakers already, and overall it was only earlier AOA learners who believed that they would be able to speak English fairly fluently in a short time if they were given the most favourable language environment. The earlier AOA learners’ optimistic estimations can be taken as an indication of self-confidence, which according to Clément (1980) develops as a result of positive experience in contact with the target language community and serves to motivate individuals to learn the L2. In contrast, those who considered it impossible to achieve a reasonable level of oral fluency were all later arrivals, representing 42% of the later AOA group. Their lack of confidence is illustrated in the following quotation:

It’ll be very difficult for me. I don’t think it’s possible. It’ll be something if only I could understand [when people speak English]. To be able to express myself will be difficult. (LL:23)

Such beliefs are critical to learners’ development of their expectations for and commitment to L2 acquisition. According to Keller (1983), learners who think they are likely to succeed are, in general, more likely to be motivated than those who expect to fail. Therefore, a belief that it would take them forever to achieve a reasonable level of oral fluency is obviously
Later AOA learners did not believe so. In reference to the way in which age may affect L2 that age affects L2 acquisition, whereas only 14% of the earlier AOA learners and 20% of the overwhelmingly majority of the learners across the two groups endorsed the common belief concerning learners' perceptions of the relationship between age and adult L2 acquisition. An

Learners’ Perceptions of Age and L2 Acquisition. The third set of interview questions

vocabulary and grammar rules at the expense of practicing use of the language
demands on their memories, and also to have led them to invest much of their time in memorizing
by rote. These learners emphasized on learning by rote is likely to have led them to put strenuous
learners shared this belief, with a substantially 43% considering that English could be better learned
(93%) believed in learning English through use. In comparison, only 60% of the later AOA
AOA groups responded differently. An overwhelming majority of the earlier AOA learners
However, on the question of whether English is better learned through use or by rote, the two
acquisition contexts is very different from knowing how, or being able, to establish them.
opportunity to learn and practice oral English. This clearly indicates that wanting language
(Pierce, 1993). In fact, both learner groups expressed great disappointment at their lack of
with English-speaking Canadians, though very few of them reported being able to do so (see also
English was to be exposed to an English-speaking environment and to practice speaking English
is most effectively learned, the majority of the learners considered that the best way to learn oral
In response to interview questions concerning their perceptions as to how oral English
Learning
acquisition, there were more similarities in the responses of the two groups than differences.

Fifty-nine percent of all the learners held age directly responsible for their declining memories:

One factor is age. It has to do with age. I learn a little and then I forget a little. I forget whatever I learn. (LL:24)

I think it's very difficult for me to learn English because my memory is not good. I think maybe because I'm getting older and my memory is very bad. I forget whatever I learn. (LL:17)

However, when learners were asked to self-evaluate their memories, differences between the two AOA groups were observed. Not surprisingly, nobody claimed to have a good memory, since modesty is considered a virtue in Chinese culture, and this may have affected their comments on their own memory capacities. But it is worth noting that 71% of the earlier arrivals claimed that their memory was so-so, and 29% claimed that their memory was bad. In comparison, the later arrivals were more negative: 40% of the later AOA group claimed that their memory was so-so, 47% claimed that their memory was bad, and 13% claimed that their memory was very bad.

Fourteen percent of all the learners believed that their tongue muscles were getting stiffer with age, which affected their pronunciation, and 7% associated age with slow responses. However, one striking difference between the two AOA groups was that 20% of the later arrivals (and none of the earlier arrivals) believed that adults would never successfully learn an L2 like children do because they could never have the natural language environment that children enjoy. For instance,

Maybe because I have very limited contact to speak English and to listen to it. My daughter, the reason why she learns so fast is because people around her speak English. (LL:24)
Language has to be learned early. Like my son, he doesn’t work hard, but he plays around at school and now he speaks very well. I go to school too, but my progress is minimal. (LL:22)

On the other hand, 21% of the earlier AOA group associated age with more commitments in adult life, resulting in a lack of concentration and energy for learning English, as indicated in the following quotation:

As you get older, you have a family and other commitments. Your life is wider and with lots of things bothering you. So you don’t have the energy to learn. When you learn, you’re likely to forget. (EL:07)

The above descriptive account of learners’ experiences and perceptions of learning ESL reveals some interesting similarities as well as differences between the two AOA groups. These findings broaden our understanding of these earlier and later arrivals’ L2 acquisition. They also provide an additional perspective on the quantitative findings from the two groups and suggest several possible variables that may have affected these learners’ acquisition of English.

First, it strikes me as more than a coincidence that the earlier arrivals, who had a consistent advantage over the later arrivals on the three criterion measures, perceived themselves to have made most progress in listening and speaking English, whereas in contrast proportionally more later arrivals felt they had made most progress in reading and writing English. The particular difficulty experienced by some later arrivals in pronunciation and listening comprehension may also be related to their relatively low OF scores.

Second, the difference between the two AOA groups in their estimations of further time needed to develop oral fluency is also noteworthy. If, as Keller (1983) argued, language learners who think they are likely to succeed are more likely to actually be successful than those who
expect to fail, then the earlier AOA learners' optimistic anticipations of success could have had a positive impact on their L2 acquisition. Their optimistic anticipations are also suggestive of their positive learning experiences, which are likely to foster positive attitudes and enhance motivation to learn ESL.

Third, the apparent difference between the two AOA groups in their self-evaluations of their memory capacities forms an interesting contrast to the finding that the two groups were in fact comparable on the objective memory measure (as reported in the previous section). However, the later arrivals' lack of confidence in their memory can be better understood with reference to the observation that a substantial number of later arrivals considered English could be better learned by rote, an indication that they may have been learning with more deliberate reliance on memorization. Their emphasis on learning by rote may have led them to put undue demands on their memory, only to feel disappointed when it let them down.

Fourth, the later arrivals' emphasis on learning by rote may have also led them to invest a greater proportion of their time in memorizing vocabulary and grammar rules at the expense of practising use of the language and making language-acquisition contacts. In fact, as reported in the previous section, the later arrivals had significantly less contact with English than the earlier arrivals did, thus limiting their opportunities for learning oral English directly through using it.

The similarities between the two AOA groups are just as striking as their differences. What seems to characterize the two groups of learners is their strong desire to learn English and their longing for an optimal language learning environment, a finding in support of the attitudes and motivation questionnaire that both groups were highly motivated. However, what the
questionnaire did not show, but yet was revealed in the descriptive interview data, was learners' frustrations behind their integrative motivation, that is, their inability to establish language-acquisition contacts to learn and practise oral English. This issue is taken up in Chapter 5.

4.4. Summary

In this chapter, I have presented the results from the study in relation to the two research questions. In addressing the first research question, the present data demonstrate a clear advantage of the earlier AOA group over the later AOA group on the two accuracy measures and on the measure of oral fluency. Further comparisons of the two groups on the accurate use of each of the six morphosyntactic features show that the effect of AOA was not found in the use of every feature tested. Despite some discrepancies between the patterns of accurate use of the six morphosyntactic features on the two accuracy measures, there was a parallel tendency for both AOA groups to do well in the use of some morphosyntactic features and to do less well in the use of others on each measure.

As to learner variables that may underlie the differential L2 outcomes of the two AOA groups, the present data appeared to suggest that contact with English, daily use of English and fluid intelligence were contributing factors. The descriptive interview data also revealed some interesting differences and similarities between the two AOA groups. Learners' experiences and perceptions of learning ESL provide additional information and perspective on the quantitative findings to the present research questions. More importantly, they revealed the complexity of adult L2 acquisition, which involves factors not only pertaining to the learners themselves, but also to their societal contexts for L2 learning.
Chapter 5

DISCUSSION OF FINDINGS

The present study was conducted to answer two key empirical questions about adult L2 acquisition: (a) whether, among adult learners, differential L2 proficiency outcomes continue to be related to learners’ AOA in the L2 environment, and (b) what factors may underlie the possible effect of AOA on L2 proficiency outcomes among adult learners. In this chapter, I will discuss the empirical findings in relation to each of the two general research questions in turn.

5.1. Research Question 1

Does differential L2 proficiency outcomes among adult learners continue to be related to learners’ AOA in the L2 environment?

In relation to the research question, a directional hypothesis was formulated for the present study:

Adult learners with AOA in the L2 environment between 25 and 35 are likely to achieve a higher level of oral proficiency in L2 than adult learners with AOA between 40 and 55.

In addressing this research question and the related hypothesis, four important findings warrant review and discussion. First, the earlier AOA learners as a group outperformed the later AOA group on the two summary measures of morphosyntactic accuracy and on the measure of oral fluency. Second, the effect of AOA was not found on every morphosyntactic feature tested in the study. Third, significant effects for morphosyntactic feature were found on both accuracy measures. Fourth, both AOA groups were characterized by large variance in their L2 proficiency outcomes.
5.1.1. *Age of Acquisition and L2 Proficiency Outcomes*

The first research question in this study was to determine whether among adult learners, differential L2 proficiency outcomes continue to be related to learners’ AOA in the L2 environment. Results of the analyses reported in Section 4.1 show a clear advantage for the earlier arrivals over the later arrivals on the three criterion measures of oral English proficiency. The effect of AOA was evident on the two measures of morphosyntactic accuracy and on the measure of oral fluency. These findings clearly indicate that differential outcomes in L2 morphosyntactic accuracy and oral fluency among these adult learners continue to be related to learners’ AOA in the L2 environment, thus providing strong empirical support to the overall hypothesis of the present study.

Note that although the earlier arrivals consistently outperformed the later arrivals on the two measures of morphosyntactic accuracy, the mean scores of both groups were found to be within a low range of performance. This suggests that a high level of morphosyntactic accuracy is difficult for adult learners to attain given a relatively short LOR and a low amount of ESL instruction. However, this finding has held true in other studies which have tested age differences in adult learners’ ultimate attainment beyond 5 years of residence (Johnson & Newport, 1989; Patkowski, 1980).

This continued pattern of lower performance in L2 morphosyntax and oral fluency by the earlier AOA versus the later AOA group is in accord with results from previous studies (see Section 2.3), despite the fact that these studies used different L2 proficiency measures. Some studies used integrative tests tapping overall L2 proficiency (d’Anglejan & Renaud, 1985; von Elek & Oskarsson, 1973; Thorndike, 1928); some assessed L2 proficiency in a specific domain,
particularly in listening comprehension (Scott, 1994; Serioght, 1985), and others investigated the development of specific morphosyntactic features (Birdsong, 1992; Klein & Dittmar, 1979). The present study extends these findings by providing a more detailed examination of the acquisition of some basic English morphosyntactic features and oral fluency. The present findings are distinct in the following ways. Unlike most previous studies, which investigated learners of adjacent age groups, the effect of AOA on L2 proficiency outcomes evidenced in the present study was found between learners of two age ranges representing young adulthood and middle age. The continued declining pattern in L2 proficiency outcomes was found not only in morphosyntax, but also in oral fluency, which has not been studied before in relation to the age issue. With reference to L1, the effect of AOA was found among learners from a homogeneous language background, and yet typologically different from English. Compared to previous studies, in which the relationship between age and L2 outcomes was typically analysed either by judging from group mean scores (von Elek & Oskarsson, 1973; Thorndike, 1928) or by a correlation of AOA and L2 scores (Birdsong, 1992; Klein & Dittmar, 1979), the present study used the Mann-Whitney U test, a conservative statistical analysis to compare the L2 proficiency outcomes of the two AOA groups, thus the resulting AOA effect is all the more convincing.

Taken together, these converging results further confirm Bialystok and Hakuta's (1994) observation that a general pattern of declining attainment in L2 does not come to an end at around puberty, and point to the conclusion that there is a further decline in L2 outcomes in adulthood. The superior L2 performance of the earlier AOA group relative to the later AOA group evidenced in the present study hence leads to a rejection of the assumption implied by the CPH that there should be no continuing age effect after puberty.
5.1.2. Age of Acquisition and Morphosyntactic Features

While the earlier adult AOA was found to be associated with relative success on the two accuracy measures, the effect of AOA was not found on every morphosyntactic feature tested in this study. In particular, on the EIT measure of morphosyntactic accuracy, the earlier AOA learners performed significantly or near-significantly better than the later AOA learners on the use of noun plurals, determiners, auxiliaries, and the simple past tense, but there were no differences on the use of the third person singular or the progressive marker. On the OI measure of morphosyntactic accuracy, significant and near-significant differences were found between the earlier and later AOA groups on only two of the six features: the use of determiners and the simple past tense. That the effect of arrival age was evident for more morphosyntactic features on the EIT measure than on the OI measure illustrates clear task effects, presenting a not unusual case in which L2 learners vary in the accuracy of their production when performing different tasks (e.g., Larsen-Freeman, 1976; Tarone, 1988; Tarone & Parrish, 1995). A comparison of the mean performance of the two AOA groups on the two morphosyntactic measures revealed that both groups’ accuracy was substantially higher in the use of noun plurals and auxiliaries on the OI measure, where the performance of the two groups was not significantly different. This finding indicates that the OI measure was less discriminating than the EIT measure in assessing these areas of morphosyntax. It is not clear why the use of noun plurals should have been less accurate on the EIT measure. One possible explanation, according to Young (1988) who studied the marking of plural -s on English nouns in the speech of Chinese learners, is that the presence of another marker of plurality (such as a numeral) is likely to have triggered the use of
-s in the case of the oral interview. There is also a possible explanation for the discrepancy in the use of auxiliaries on the two accuracy measures. Unlike other morphosyntactic features tested in this study, the category of auxiliaries is pluralistic, comprised of a number of grammatical items representing mood, tense, and aspect. The possibility of avoidance of some forms or of using only those in which the learners had confidence could have been a contributing factor in these learners' better performance in the use of auxiliaries on the OI measure.

The results on the two accuracy measures are nonetheless consistent in showing significant and near-significant effects of AOA in the use of determiners and the simple past tense. Equally consistent are the results on the two measures that showed no effect of AOA in the use of the third person singular and the progressive marker. It appears to be the case that, although the effect of AOA on L2 proficiency outcomes persists into adulthood, it does not necessarily affect the acquisition of all morphosyntactic features, but may instead be confined to certain L2 grammatical features only. This finding is consistent with one from a study by Johnson (1992). Using a written version of the grammaticality judgment task employed by Johnson and Newport (1989), Johnson found when comparing early childhood arrivals (ages 3 to 7) and adult arrivals (ages 17 to 39), that the effect of age of acquisition was taken up mainly by determiners, noun plurals, and subcategorization, with the remaining nine rule types tested in the study showing no significant correlations with age of acquisition. In short, results from the present study and those of Johnson (1992) suggest that, regardless of LOR in the L2 environment, age of exposure may affect the acquisition of some, but not necessarily all, basic L2 structures, contrary to the claim made by Johnson and Newport (1989).
5.1.3. The Effect of Morphosyntactic Feature

The results of a two-way ANOVA using the six morphosyntactic features and the two ages of arrival in the L2 environment showed a significant effect for morphosyntactic feature on both accuracy measures, suggesting that learners' errors were not random, but rather that some morphosyntactic features were more problematic for these adult learners than other features. It is of interest to know which particular morphosyntactic features created the most and least problems for these Mandarin-speaking learners of English.

Despite the variability between the patterns of accurate use of the six morphosyntactic features on the two accuracy measures, there was in general a parallel tendency for both AOA groups to do better in the use of noun plurals and the progressive marker and to do less well in the use of the simple past tense, the third person singular, and determiners. However, the patterns of accurate production of the six morphosyntactic features evidenced in the present study do not correspond to those reported by Johnson and Newport (1989) or Johnson (1992). (See Table 5.1).

Table 5.1. Ranking of relative accuracy ordered by mean percentage scores on the six morphosyntactic features

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<td>1. -ing</td>
<td>1. Auxiliaries</td>
<td>1. Plurals</td>
<td>1. -ing</td>
<td>1. Auxiliaries</td>
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<tr>
<td>2. 3rd person</td>
<td>2. -ing</td>
<td>2. Plurals</td>
<td>2. Plurals</td>
<td>2. Plurals</td>
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</tr>
<tr>
<td>5. Plurals</td>
<td>5. Plurals</td>
<td>5. 3rd person</td>
<td>5. Past tense</td>
<td>5. 3rd person</td>
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In particular, the most problematic features of English for the adult learners in Johnson and Newport (1989) and Johnson (1992) were determiners and noun plurals. The adult learners in Johnson and Newport's study did relatively well in the use of the simple past tense, auxiliaries, and the third person singular, with the progressive -*ing* being the least problematic feature for those learners. In comparison, the adult learners in Johnson (1992) performed almost as well as the early childhood group (3 to 7-year-old arrivals) on the use of the third person singular, the simple past tense, and the progressive -*ing*, with auxiliaries being the least problematic for those learners. In the present study, however, the third person singular and the simple past tense were consistently among the most problematic features across the two accuracy measures for both AOA groups. In contrast to Johnson and Newport (1989) and Johnson (1992), noun plural was one of the more accurate features used by both groups in the present study. As mentioned earlier, a clear task effect was observed in the use of auxiliaries on the two measures, with both groups performing significantly better on the use of auxiliaries on the OI measure than on the EIT measure. There was a significant age-related effect in the use of determiners, with the earlier AOA learners making fewer errors in the use of determiners than the later AOA learners. It is worth noting, however, that the relative ease of the progressive marker for learners in the present study on the EIT measure bears some resemblance to that found in Johnson and Newport's study, and the relative ease of auxiliaries on the OI measure appears to be consistent with the findings of Johnson (1992).

The patterns of accurate use of the six morphosyntactic features for the Mandarin-speaking learners of English in the present study challenge Johnson and Newport's (1989) claim that the rule type effects they obtained are "at least in part reflections of what is generally difficult or easy for a late learner" (p. 88). It could be that the present findings hold only at an
early developmental stage of L2 as opposed to the ultimate state. This interpretation is certainly at odds with Slavoff and Johnson’s (1995) claim that “What is difficult during the early stages of learning, therefore, appears to continue to be a problem at asymptote 4” (p.13). Obviously what appear to be the most problematic morphosyntactic features for the Mandarin-speaking learners of English in the present study do not fully correspond to the most problematic features for the Chinese- and Korean-speakers of English at their ultimate state as reported in Johnson and Newport (1989).

The heterogeneous language backgrounds of the learners in the studies of Johnson and her colleagues is another possibility accounting for the different accuracy orders found in their studies and those in the present study. Recall that the learners in Johnson and Newport (1989) and Johnson (1992) were native speakers of Chinese and Korean, and the learners in Slavoff and Johnson (1995) were Chinese, Korean, Japanese, and Vietnamese. While all these languages are typologically different from English, it does not mean that they are similar in the use of all the relevant linguistic features. There is always the danger in generalizing, since although “the most diverse languages may share typological features” (Kellerman, 1995, p.228), differences also exist among languages in the same language family. It is, therefore, of interest to look at the possible effect of L1 on the acquisition of L2.

In light of Johnson’s (1992) study, in which the three grammatical features that showed age effects “are expressed through different kinds of structures in Chinese and English grammar” (Bialystok, 1997, p.124), both Kellerman (1995) and Bialystok (1997) argue that the relationship between L1 and L2 may be responsible for the manner in which age of acquisition affects L2

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4 A stable state indicating that a maximum final level has been attained.
learning. Assuming that reliance upon L1 is an important part of L2 acquisition, Kellerman (1995) claims:

There is an interaction between L1 and L2 features and age of acquisition, such that learners attempting to acquire certain (but not all) features in the L2 which have no L1 equivalents must have acquired those features by the age of x or they will never acquire them. Features of the L2 with clear L1 analogues, on the other hand, can in principle be mastered whatever the age of onset of learning. (p.229)

Kellerman’s approach offers a refinement of the CPH by taking account of previous evidence in its favour as well as according an important place to L1 in the L2 acquisition process. However, Kellerman did not specify any upper bound for the acquisition of those L2 features that have no equivalents in L1. Instead, as Kellerman (1995) put it, he left it open as an invitation for people to “fill in your own favoured upper bound for the CPH” (p.230). In a similar way, Bialystok (1997) claims:

... language learners will find it difficult to master a structure that was not a defining feature of the first language and relatively easy to master a structure shared across the two languages. These differences may be exacerbated for older learners, but there should be no age differences in the ability to learn structures that are shared across the two languages. (p.126)

In support of this argument, Bialystok quoted a study by Yew (1995) of 31 native speakers of Chinese (who arrived in Canada at different ages) and their acquisition of three grammatical structures that correspond in Chinese and English (the future, the present progressive, and some aspects of subcategorization) and of three structures that contrast in the two languages (noun plurals, determiners, and some other aspects of subcategorization). Yew reported that there was no effect of age, but rather a significant structure effect, suggesting that
“the three structures that were the same in the two languages were consistently easier [for the learners] than the three structures that were different” (Bialystok, 1997, p.128).

Yew’s (1995) and Johnson and Newport’s (1989) studies of Chinese speakers of English demonstrate considerable confusion as to which grammatical features are considered to contrast between Chinese and English. For example, Yew (1995) classified the present progressive as corresponding in Chinese and English, and noun plurals and determiners as contrastive in the two languages. In contrast, Johnson and Newport (1989) claimed that noun plurals, the present progressive, and determiners are all lacking in Chinese. While divergence from English is considered the norm, some grammatical elements in Chinese, such as noun plurals, the simple past tense, and the progressive, do correspond, at least partially, to those in English. To the extent that Chinese does have marking of noun plurals, the simple past tense, and the progressive, an important difference is that the use of these markers is limited and often optional in Chinese. Optionality may have affected the learners’ performance in the use of some of these features in English, leading to negative transfer, as shown in the present study, especially obvious in the use of the simple past tense. Similarly although there are no determiners in Chinese, there are semantic near-equivalents, the use of which is again not obligatory in Chinese. Chinese-speaking learners of English do find it hard to make consistently correct use of determiners, as shown in the present study as well as in those of Johnson and Newport (1989) and Johnson (1992). Of the six morphosyntactic features under study, the third person singular represents an absolute grammatical contrast in the two languages in that it does not exist in Chinese at all. Therefore, for Chinese-speaking learners, the representation for this totally alien grammatical feature needs to be created from scratch. The category of auxiliaries is pluralistic and each one
needs to be treated individually. Some auxiliaries represent contrasts in the two languages and others represent partial correspondences. As an example of a contrast, Chinese does not have anything comparable to the English auxiliary ‘do’ in forming questions and negatives. However, other auxiliaries such as those used to form the future and present perfect do have semantic near-equivalents in Chinese.

The above brief discussion of these six features is intended to illustrate the complex nature of contrast and correspondence in the two languages and should alert second language researchers to be circumspect about any conclusion regarding the difficulty of acquisition of these features for Chinese speakers of English. Obviously, Johnson and Newport (1989), who view noun plurals, the present progressive, and determiners as totally lacking in Chinese, may have been led to underestimate the effect of the different L1s in their study and their possible influence on the acquisition of English as L2.

If L1 has a major, direct, and straightforward influence on which grammatical features L2 learners are able to learn, then the two AOA groups in the present study should have performed better on the morphosyntactic features that partially correspond in the two languages than on those that contrast. This was not exactly the case. While both groups demonstrated a markedly low level of accuracy in the use of the third person singular (which is an obvious contrast in the two languages), suggesting an effect of L1, the present data do not lead to the simple generalization that morphosyntactic features that partially correspond in the two languages are less problematic than features that contrast. As mentioned earlier, both AOA groups did relatively well in the use of noun plurals and the progressive marker, but poorly in the
use of the simple past tense. Obviously these three features that partially correspond in Chinese and English did not show a similar degree of difficulty for the adult learners in this study.

These results suggest that there is some effect of L1 in the acquisition of grammatical features in L2, but it seems to be less than some researchers have claimed (Bialystok, 1997; Kellerman, 1995; Yew, 1995), yet more than Johnson and Newport (1989) have proposed. It is equally evident that the nature of L1 itself cannot fully explain the difficulties of these adult learners, especially the differential outcomes in the acquisition of some grammatical features by the two AOA groups.

5.1.4. Large Variance in L2 Proficiency Outcomes

Although the earlier AOA group outperformed the later AOA group on the measures of morphosyntactic accuracy and oral fluency, a striking feature of learners’ L2 proficiency outcomes was a wide variation, which was characteristic of both AOA groups. In addition, neither the earlier nor the later AOA groups had progressed very far as shown by their mean scores on the three criterion measures. While the slow progress may reflect the difficulties of learning English by these Mandarin-speaking learners, this finding is not unique to the learners in this study. A similar observation was made by Zhang (1995) in her study of adjustment experiences of recent immigrants from mainland China.

The substantial individual variation in learners’ L2 performance evidenced in this study is consistent with that observed in previous studies (Johnson, 1992; Johnson & Newport, 1989; Patkowski, 1980). While previous studies interpreted the variance among adult learners simply
as a reflection of the large individual variation in their ultimate ability to learn an L2, the present study, drawing on the descriptive interview data of learners' experiences, argues that adult L2 acquisition is affected by a set of variables pertaining not only to the learners themselves but also to their learning situations. The following quotations from the interview data illustrate the heterogeneous situations in which these learners learned their L2:

... I can't concentrate [on learning English], not like I used to when I was young. It's impossible now. Sometimes I have confidence, but when I get home, there are so many things to worry about, such as job, housing, daily life problems. So many problems at the same time. (LL:23)

Learning English is not easy for me. I always have housework to do. I can't wholeheartedly concentrate on learning English. I have been thinking of getting a job. Once I had one (which didn't require English), and then I wanted to learn English. I want to work and I want to learn English too. This is my dilemma. (LL:28)

Like many other adult immigrants, these Mandarin-speaking learners understood the importance of learning English in their life in Canada and were very eager to learn ESL (see also Zhang, 1995). However, they were burdened by certain inevitable characteristics of living an adult life and feeling unable to reorganize their lives to create the favourable language learning conditions that most children enjoy. Despite their strong desire to learn English, language learning was only one aspect of their settlement into life in their new country. Obviously these two adult learners were not the only ones who were trapped in this dilemma. If only they could be freed from all the encumbrances of adult life and be able to concentrate on learning English!
If as Cumming (1991) observed, under the best conditions it takes adult learners two to seven years to develop fluency in L2 skills depending on the target level they aspire to, it is likely to take longer for these learners to learn English in such heterogeneous situations. The dilemma that these adult immigrant learners faced has not been dealt with by the major L2 acquisition theories, which are often conceptualized to provide explanations as to why some learners learn and some do not when given a fair chance of learning. While opportunity for learning is often taken for granted by L2 acquisition theorists, finding opportunities for learning for some of the learners in the present study seemed to be a daily life struggle. It was a struggle not because lack of motivation (Gardner, 1985; Gardner, Day, & MacIntyre, 1992), nor was it due to social and psychological distance from the target language community (Schumann, 1975, 1976), but rather it was a struggle as part of their frustrating life as settlers and as women (see also Cumming & Gill, 1992; Peirce, 1993). It is this daily life dilemma that has deprived many adult immigrants of a fair chance to learn English and typically slowed their rate of acquiring English. Their dilemma illustrates that individual learning situations can be independent of cognitive and affective factors, thus leaving many adult immigrant learners at a disadvantaged starting point compared with more 'privileged' learners (e.g., children) in an unfair race of L2 acquisition. It is conceivable that the above quotations illustrate only one of the many situational factors that could have put barriers in the way of these adult learners' acquisition of English. The heterogeneous conditions under which these adult immigrants learned English as a part of their settlement life in their new country may constitute at least a partial explanation for the large variance in their L2 learning outcomes.
5.2. **Research Question 2**

What factors may underlie the possible effect of AOA on the L2 proficiency outcomes among these adult learners?

As presented in Section 3.3, the two AOA groups were comparable in terms of LOR and years of L1 education, but the later AOA group had received more English instruction since their arrival than the earlier AOA group. To examine the potential effects of these variables on the earlier and later AOA learners' L2 performance on the three criterion measures, the reader is referred to Table 5.2.

**Table 5.2**

Spearman correlations of LOR, years of L1 education, and instruction hours with criterion measures for the two AOA groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>EIT Earlier</th>
<th>EIT Later</th>
<th>OI Earlier</th>
<th>OI Later</th>
<th>OF Earlier</th>
<th>OF Later</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOR</td>
<td>-.17</td>
<td>.25</td>
<td>-.04</td>
<td>.19</td>
<td>-.16</td>
<td>.51</td>
</tr>
<tr>
<td>L1 education</td>
<td>.72 **</td>
<td>.04</td>
<td>.20</td>
<td>-.04</td>
<td>.50</td>
<td>-.04</td>
</tr>
<tr>
<td>Instruction</td>
<td>-.27 **</td>
<td>-.40</td>
<td>-.03</td>
<td>-.01</td>
<td>-.47</td>
<td>-.12</td>
</tr>
</tbody>
</table>

** two-tailed $p<.005$

Note that there is a lack of significant correlations between LOR and the three criterion scores within each group, a finding which is consistent with those of previous studies (Birdsong, 1992; Johnson & Newport, 1989; Oyama, 1976; Patkowski, 1980). The previous findings had indicated that there was no significant effect of LOR on L2 attainment for learners beyond the first few years of exposure to L2; the present finding indicates that even within the first five years, the effect of LOR on L2 development of the present population was not significant. It
seems reasonable to assume that in a multilingual metropolitan city like Toronto, where there is a large, well-established Chinese community, LOR can be independent of exposure to English (see also Hart & Cumming, 1997). Extent of L2 contact, as shown in the present data, may be a more relevant factor in L2 acquisition than mere LOR.

As to years of L1 education, it appears to have significant effects only among the earlier arrivals, correlating positively with their accuracy scores on the EIT measure ($r = .72, p < .005$) and with their OF scores at a near-significant level ($r = .50, p = .058$), but no significant correlation was registered for their accuracy scores on the OI measure ($r = .20, p > .05$). What is noteworthy is that no significant correlations were found between years of L1 education and the later arrivals' performance on the three criterion measures ($r = .04, p > .05; r = .04, p > .05; r = .04, p > .05$ respectively). Given that the two AOA groups were comparable in terms of years of L1 education, this finding appears to suggest that effect of L1 education is not static, and is likely to be offset by the lapse of time. It is reasonable to assume that insofar as skills have been increased by training, they may be expected to decrease when years pass with little or no exercise of them.

Another interesting finding was that neither the earlier nor the later AOA groups' L2 performance was sensitive to the large differences in the amount of English instruction they had received. For example, both relatively higher and lower achievers were found among the learners who had received more than 700 hours of classroom instruction, suggesting that they had not benefitted from formal classroom instruction to the same degree. This result implies that L2 learning in the classroom can be dominated by other factors.
The significant differences between the two AOA groups on the three criterion L2 proficiency measures indicate that AOA in the L2 environment was an important factor in these adult learners’ L2 acquisition. To address the second research question as to what may underlie the effect of AOA on the L2 proficiency outcomes among these adult learners, I now turn to the discussion of each of the four sets of potentially explanatory learner variables under study, drawing on both quantitative and descriptive interview data.

5.2.1. L2 Contact and L2 Use

Results of the analyses reported in Section 4.2 indicate that the earlier AOA group had significantly more exposure to English in a wider variety of social contexts and used substantially more English on a daily basis than the later AOA group. The significant correlations of L2 contact and L2 use with the three criterion scores respectively (see Table 4.11) make plausible an environmental account of the differential L2 proficiency outcomes of the two AOA groups, though one needs to be cautious about inferring a direct causal link between them.

The finding that L2 contact and L2 use were associated with learners’ L2 proficiency outcomes is in perfect agreement with Klein and Dittmar’s (1979) and Scott’s (1994) results. In both studies, informal contact with native speakers was found to be an important predictor of variance among their younger and older adult learners. While Klein and Dittmar (1979) attributed the advantage of the younger adult learners over the older ones to their willingness and ability to establish social contacts with native speakers, Scott (1994) reported that the younger missionaries in her study had the convenient advantage of working with native-
speaking companions while the older missionaries who served as married couples had less opportunity to do so. The present study, drawing on descriptive interview data, found that both AOA groups were willing to have language-acquisition contacts, and yet the advantage of the earlier arrivals over the later arrivals in this regard could be mediated by their perceptions of how oral English can be effectively learned. With a substantial number of later arrivals (40%) reporting their preference for learning oral English by rote, it is conceivable that these learners’ emphasis on rote learning led them to invest much of their time in memorizing vocabulary and grammatical rules at the expense of making language-acquisition contacts to learn English through use. On the other hand, the view held by the majority of the earlier AOA learners (93%) that English can be effectively learned through direct use may have encouraged them to be more open to new experiences in L2. While these learners’ preference for learning by rote could be a reflection of personal learning styles, the descriptive interview data revealed that it may be suggestive of a higher level of anxiety and lack of confidence experienced by some later AOA learners. LL:24 made the point clear when she said:

If I pick up a book and read it, for me that is easy and I am not afraid because you just read. But in oral communication, I will panic and get frustrated. (LL:24)

While communication and interpersonal anxiety experienced by learners is often associated with their oral skills (Spolsky, 1989), it is also likely to result from the way that learners process L2:

When I speak, it’s very, very difficult as if I have obstacles, very straining. That’s because I have to translate Chinese into English, and then translate it back into Chinese. I can’t handle it. (LL:28)
Chinese and English are so different. I am used to [Chinese], so I often make mistakes [in English]. Subjectively, we are likely to bring Chinese into English, like a transfer. When you ask me a question, I translate it into Chinese, and then translate [what I want to say in Chinese] into English. This is how I respond. (LL:21)

These learners’ experiences clearly illustrate that “The adult’s standard of comprehension, however, is likely to be his ability to translate what he hears into his own language—a very high standard, indeed” (Burling, 1981, p.286). In a similar way, they are likely to translate what they want to say in their L1 into an L2 which they are still struggling with. For many of the learners in this study, it was this constant predicament of being tempted to say more than their linguistic resources allowed them to that created a lot of anxiety and correspondingly put them in a danger of being discouraged. For many of these learners struggling with English, it was typically easier not to initiate a conversation or to stop the conversation than to go through the pain of making themselves understood. As a result, their opportunities even to listen to English-speaking Canadians in conversations were severely restricted. This may have led to their L2 learning in further isolation as a way to avoid communication anxiety, and hence learning by rote became their last resort for ‘comfort’.

The relative advantage of the earlier AOA learners over the later AOA learners with respect to L2 contact and L2 use has one implication in relation to classroom instruction. Given that the two AOA groups’ test performance was not sensitive to the large differences in the amount of English instruction they had received, the present finding appears to suggest that their exposure to L2 in a natural setting had more substantial impact on these adult learners. Presumably, learning in meaningful communication through direct contact enables L2 to be more easily absorbed (Glass & Denny, 1987, p.110). In this respect, the present finding
shows an advantage for natural L2 acquisition, lending empirical support to L2 acquisition theories that regard quantity and quality of informal contact as a major contributing factor to L2 learning success (Krashen, 1982; Schumann, 1975; Spada, 1984; Spolsky, 1989).

It should be made clear that although the earlier arrivals had significantly more L2 contact and L2 use than the later arrivals, both AOA groups were characterized by having relatively limited contact with the target language community, a finding in accord with d’Anglejan and Renaud’s (1985) observation that both good and poor immigrant learners in their study had very limited social contact with the target language community outside the classroom. It is also consistent with findings from Hart and Cumming’s (1997) survey of Cantonese learners of English from LINC in Ontario. The present finding can be better understood with reference to the paradoxical positions of the participants in Peirce’s (1993) study: “On the one hand, they need access to anglophone social networks in order to practice and improve their English; on the other hand, they have difficulty gaining access to these networks because common language is an a priori condition of entry to them” (p.78). With low proficiency in English, many of the learners in this study reported that their access to English-speaking social networks were severely restricted. If the workplace symbolizes ‘Canada’ for the participants in Peirce’s (1993, p. 227) study, where they need to fight for the right to speak, most of the learners in the present study were kept out of that Canadian milieu. Many reported being unable to find a job, and most of those who had a job worked mainly in a non-English-speaking environment. The following quotation illustrates the learners’ frustration:

I have obstacles, that is, I don’t have a job. And I can’t find a job in an English-speaking environment. This is the biggest hurdle. (EL: 02)
Being denied the opportunity to have a job in an English-speaking environment means more than a denial of desirable employment, but rather a denial of access to one of the most meaningful language-acquisition environments which could provide these immigrant learners more opportunities to learn and practise oral English. As Peirce (1993) pointed out, the reality that immigrants have had to confront is that “their education and experience had no symbolic value in Canada ... This had an important impact on their access to desirable social networks ... and their opportunities to speak” (p.65). Therefore, the limited contact that these immigrant learners had with the target language community must be understood with reference to their learning of English under conditions of social marginalization.

5.2.2. Intelligence

Results of the analyses reported in Section 4.2 indicate that the earlier and later AOA groups were not significantly different from each other on the measure of crystallized intelligence, but they differed significantly on the measure of fluid intelligence, with the earlier AOA learners outperforming the later AOA learners. This finding is not surprising since fluid intelligence is expected to decrease with increasing age, while crystallized intelligence tends to be more stable (Horn & Cattell, 1967, 1982). This result appears to confirm the conceptualization of crystallized intelligence and fluid intelligence as two relatively independent aspects of cognition.

Spearman correlation coefficients showed significant positive correlations between the fluid intelligence measure and the three criterion L2 proficiency scores respectively, thus providing initial empirical support to the notion that fluid intelligence is an associated factor in adult L2 acquisition success. The present finding of a statistically significant decline in fluid
intelligence across the age of the two groups has a significant implication. Since fluid intelligence is concomitant with age, it makes it a plausible internal factor that may underlie the effect of AOA on the L2 proficiency outcomes among these adult learners. It is likely that in performing a recurring cognitive task, such as L2 learning, learners’ cognitive flexibility is taxed. Presumably if learners bring a higher degree of cognitive flexibility to the task of acquiring L2, this is likely to put them in a better position to efficiently develop an appropriate L2 mental representation. However, only two subtests on fluid intelligence were used in the present study to measure reasoning and information-processing efficiency. It is likely that the addition of other components tapping fluid abilities would have added more predictive value.

The apparent advantage of the earlier arrivals over the later arrivals on the measure of fluid intelligence is consistent with research on the relationship between cognitive ability and L2 proficiency (Carroll, 1981, 1993; Harley, 1986; Skehan, 1986), and with d’Anglejan and Renaud’s (1985) study in particular, in which nonverbal intelligence was reported to be the most powerful predictor of L2 achievement. If nonverbal intelligence is categorized as fluid intelligence (Carroll, 1993; Salthouse, 1989), the present study provides an interesting complement to that of d’Anglejan and Renaud in that both studies imposed a time limit in assessing processing efficiency. This may account for the contradictory result from Seright’s (1985) study, in which reaction time was not incorporated along with accuracy rating on the nonverbal intelligence measure administered in that study.

The results of the present study underline the importance of including fluid intelligence among predictor variables when investigating L2 acquisition in adulthood, a factor that has up till now not been taken into account. What is not clear, however, is whether the present finding with respect to this particular set of adult learners would generalize to other adult groups.
5.2.3. Memory

As reported in Section 4.2, the two AOA groups performed better on the measure of memory span than on the measures of logical memory and associate learning. It may be that the semantic context actually made the logical memory and associate learning tasks more difficult for these adult learners. However, it is evident from the present data that there were no significant differences between the two groups in terms of memory span, logical memory, and associate learning, suggesting that among adult learners, at least within the age ranges reported in the present study, declining memory capacity is likely to be minimal. This finding is consistent with that reported by Scott (1994). In her study of adult learners of two different, but relatively wider, age ranges than the one in the present study, the younger and older groups were reported to be not significantly different from each other on the measure of memory span.

That the two AOA groups were comparable on the measures of three aspects of memory forms an interesting contrast to learners’ self-evaluations of their memory capacities. As indicated in the descriptive interview data, the earlier arrivals showed much more confidence in their memory than the later arrivals. Although both groups complained about their inability to memorize English words, there seems to be a lack of correlation between memory complaints and performance on the objective tests of memory. But it is important to note that none of the earlier arrivals mentioned failing memory as the major barrier to their learning of English as did a substantial number of the later arrivals. The descriptive interview data also illustrate that memory as a relevant variable in learners’ success of L2 acquisition cannot be viewed in isolation. In fact, it is likely to interact with other factors, as several of the participants themselves observed:
I think it's very hard. I feel I am learning as if everything is blurred. I can remember it the moment I am studying it, and then I'll forget it the next moment. (EL: 08)

The difficulty for me is I can't remember [what I've learned]. This has to do with my age. I just can't remember any more. Sometimes I study very hard. For example, when I study the Bible, I copy the new words, and then I work very hard to remember them, and then I forget everything. (LL:22)

The above quotations illustrate learners' frustration at not being able to remember the English words they learned. While these learners blamed their memory, the following statements illustrate that it was maybe not so much that their memory was failing them as the way they were learning English:

My memory is not good. What I learn in the morning, I may not remember it in the afternoon. But when I took my daughter shopping for clothes [the other day], the salesperson repeated 'style', and I remember it. But I can't remember what the teacher teaches [in the classroom]. (LL:29)

I can remember most of the words, but if I don't use them, I'll forget all. (EL:02)

There is no use remembering new words. You can only learn in practice. I've never learned words of chemistry, but because I need to use them, I remember them very fast. (LL:22)

The experience of these learners brings out the issue of the relationship between memory and the way an L2 is learned. It illustrates how memory seems to work best when learners have opportunities and need to use the language, preferably in an environment that allows them to learn not in linguistic isolation but in a social context where the meaning is unmistakable (Burling, 1981, p.283). Obviously, for many of these learners, especially the later AOA learners, learning English with a limited chance of using it in meaningful social contexts
put strenuous demands on their memory and created a situation in which their rate of learning had to compete with their rate of forgetting (Burling, 1981, p.288). In many cases, the learners in the present study had to learn the same thing all over again. Long before they had the chance to practise what they had learned in social contexts, they may already have exhausted their confidence in themselves and concluded that they did not have the capacity to remember things any more. This observation provides a new angle on the issue of the relationship between memory and L2 acquisition, suggesting that as much as memory capacity counts in L2 acquisition, its effect is likely to be exaggerated if L2 is learned in isolation.

5.2.4. Attitudes/Motivation

It is doubtful that the effect of AOA on the L2 proficiency outcomes among these adult learners is due to differences in their attitudes and motivation to learn ESL, since the earlier AOA group did not differ significantly from the later AOA group with respect to the five dimensions of attitudes and motivation. In fact, as reported in Section 4.2, both AOA groups scored highly on all the measures, and particularly highly on the measure of instrumental orientation, leaving little room for variability. This finding can be interpreted in two ways. From a measurement perspective, it is indicative that the attitudes/motivation measures demonstrated a ceiling effect and hence failed to adequately distinguish the learners in this study. On the other hand, with the frequency distribution characterized by learners clustering at the higher values, it is indicative of a population with positive attitudes and high motivation to learn ESL. This is not surprising given that the learners in this study were attending the LINC program on a voluntary basis and exhibited regular attendance, an indication of high motivation and sustained interest in learning ESL. In this respect, the sample was less heterogeneous than on other individual characteristics.
In light of the uniformly high motivation of these immigrant learners, the large variance in the L2 proficiency outcomes among the earlier and later AOA learners calls into question the explanatory adequacy of Pulvermüller and Schumann's (1994) model for language acquisition, which attributes the large variance among adult learners simply to differences in their degree of motivation. It also provides counterevidence to any claim that draws a direct causal link between motivation and L2 acquisition success (Gardner, 1985; Gardner & MacIntyre, 1995). What these researchers fail to capture in their conception of motivation and its relationship with L2 acquisition are the situations of adult immigrant learners, particularly women immigrants (Cumming & Gill, 1992; Peirce, 1993), and the frustration behind their high motivation when L2 acquisition is conducted with limited access to L2 exposure:

I very much want to learn English, but all my family members and friends come from Canton. None of them speak English. It's difficult for me. I learn here [referring to the English class], but I'll forget when I get home because nobody speaks English to me. (EL:01)

The place where I live, everybody speaks Chinese. There is no chance to communicate in English. ... If I were married to a Canadian, I would have the opportunities to speak English. (EL:04)

Like many immigrants, these adult learners came to Canada with the belief that English could be learned faster once they were immersed in the L2 environment. However, the above learners' accounts illustrate how limited their exposure to English was outside the classroom and how difficult it was for them to get access to it. They also clearly illustrate a gap between learners' strong desire to have language-acquisition contacts and yet their feeling of being helplessly unable to do so. This phenomenon exposes the relevant limitations of L2 acquisition theories that have been developed on the premise that "the language learner's access to the
target language community is a function of the learner's motivation" (Peirce, 1995, p.12). As evidenced in the descriptive interview data, lack of language-acquisition contacts can severely dampen learners' motivation to learn the L2:

> When I first came to Canada, I forced myself to learn English. I didn’t find it difficult at first. As long as you often speak English and hear it spoken, [it shouldn’t be]. But I don’t have the [language] environment. I’ve learned English for some time and I still can’t speak English. I’ve lost confidence ... In addition, I am getting old, and I can’t remember [new words] any more. (LL:24)

This learner’s description of her learning experience illustrates that as much as positive attitudes and motivation count in L2 acquisition, lack of language-acquisition contacts can easily erode one’s motivation and dissolve one’s self-confidence, not to mention how it stretches out acquisition time. The finding that these adult learners had the attitudinal and motivational advantages that should have spurred them on to more language contacts (e.g., Gardner, 1985; Gardner & Lambert, 1972; Krashen, 1981; Schumann, 1975), but that most of them experienced great difficulty in doing so, indicates that other factors were clearly at work.

In any case, the role of motivation in L2 acquisition needs to be better formulated in terms that are relevant to the situations of adult immigrant learners (Cumming & Gill, 1992). Peirce’s (1995) concept of *investment* rather than *motivation* suggests a framework for the interpretation of some of the present data. While the notion of investment is to “capture the complex relationship of language learners to the target language and their sometimes ambivalent desire to speak it” (Peirce, 1995, p.9), the present data emphasize the issue of availability and accessibility of opportunities for learners to speak. In fact, many learners in this
study who tried to gain access to more exposure to English found it was not totally at their disposal. In describing her attempt to practise English at home, LL:22 reported the following:

Nobody speaks English at home. This is the least favourable environment. I want to speak English to my son, but he doesn’t want to. (LL:22)

Obviously, for the success of any linguistic encounter, the learner needs not just motivation, but also the willing participation of another person. EL:06 reported a similar experience:

I have no one to speak English to. I thought about speaking English with my husband at home, but it’s not practical. (EL:06)

Language is the medium we use to communicate, to share our reality, and to act within it. The language shared by a family, in many ways and often beyond awareness, structures our lives. If our communication is structured by the language we speak, it can also be limited by the language we are learning to speak. EL:06 felt limited and inadequate when she tried speaking English to her husband. She quickly gave up.

The limited ability of many of the learners in this study to express themselves in the L2 led to more than just communication frustrations; it often limited these learners’ communications in the language-acquisition contacts they did have, as this quotation shows:

What do you say when you don’t know how to say it? When I meet my neighbour, I just say ‘Hello!’ and smile, and that’s it. (LL:19).

Some learners, who definitely qualify as good learners by taking every opportunity to practise their English (Naiman, Fröhlich, Stern, & Todesco, 1978), reported that once they had the opportunity to speak, they often had to confront the reality of being unable to engage
people in a conversation however much they wanted to, as suggested in the following quotation:

At work, I try to talk rubbish (referring to broken English). I just talk; I don’t care if it’s right or wrong. They all know I can’t speak well. So they don’t care what I say. They don’t listen. Very often I don’t know what to say. I just say one word. (LL:19)

The learners’ attempts and failures to capitalize on opportunities for L2 use in the above situations illustrate how restricted their occasions were to learn English in a direct way; they also illustrate the complexity of adult L2 acquisition in informal settings, which involves factors not only pertaining to the learners themselves, but also to the societal contexts in which the L2 is learned.

The importance of socio-psychological factors for adult L2 acquisition (Schumann, 1975) is also evident in the descriptive interview data. For adult learners learning ESL, the temptation to resort to their L1 is irresistible and is often socially determined. As EL:06 described, whenever she was with someone who was a bilingual fluent speaker of English, be he/she a family member, a friend, or a relative, she felt too embarrassed to speak English and, of course, the embarrassment was always mutual. Very often the fluent speaker did not bother to shift into English. Simply speaking Chinese was the safest way to be polite and respectful of each other. This accords with the iron law of bilingualism summarized by Burling (1981): “When two bilinguals of unequal ability meet, they avoid the worst speaker’s worst language” (p.287). On the other hand, as LL:25 described, whenever she was with someone of her own language background who was also struggling with English, there was no need to speak
English, because it was simply not natural to communicate with someone in a language that both did not feel comfortable with, as illustrated in the following quotation:

Among us students we usually don't speak English. We like to talk in our own language. (LL:25)

Drawing on the descriptive interview data, I have illustrated that despite the learners’ willingness and motivation to learn and practise oral English, their opportunities for L2 exposure were socio-contextually constrained. It is, therefore, problematic to assume that L2 exposure is ‘out there’ and L2 learners can choose when and how to avail themselves of it. Socio-contextual factors have not been very much studied in relation to age and adult L2 acquisition, and yet they surely place constraints on learners’ access to L2 exposure. It is these socio-contextual factors that kept many adult learners in the present study wandering in the gap between wanting to have language-acquisition contacts and feeling helplessly unable to do so. This gap certainly needs to be bridged so that learners’ integrative motivation is not frustrated.

5.3. Summary

In this chapter, I have discussed findings from the study drawing on both quantitative and descriptive interview data. With reference to the effect of AOA on learners’ L2 proficiency outcomes, this study is consistent with previous research, indicating that AOA continues to be a factor associated with L2 acquisition in adulthood. The effect of AOA is manifested in the learners’ development of morphosyntactic accuracy and oral fluency. However, it is important to note that although AOA may affect the acquisition of some basic morphosyntactic features, it does not necessarily affect all of them.
With respect to the effect of morphosyntactic feature, it appeared that some morphosyntactic features were more difficult for the Mandarin-speaking learners than other features. However, the discrepancies between the patterns of accuracy order found in the present study and those of Johnson and Newport (1989) and Johnson (1992) cast doubt on the generalizability of Johnson and Newport’s (1989) claim of universal learnability. It is also evident from the present data that adult learners learned English under a heterogeneous set of conditions, far more varied than the conditions under which children learn their L2. This may constitute at least a partial explanation for the large variance in the L2 proficiency outcomes among these adult learners.

The significant differences between the two AOA groups on the measures of L2 contact, L2 use, and fluid intelligence, and more importantly the significant correlations of these learner variables with criterion scores, make these variables plausible contributing factors that may underlie the effect of AOA on the L2 proficiency outcomes among these adult learners. Moreover, the learners’ descriptive accounts of their experiences and perceptions of learning ESL further facilitate our understanding of the differences between the earlier and later AOA groups. Given the complexity of adult L2 acquisition, it is reasonable to assume that the effect of AOA on adult L2 acquisition is likely to be accompanied by many other factors, not only pertaining to the learners themselves, but also to the social contexts in which the L2 is learned.
Arguments for and against the CPH have raged ever since Lenneberg's (1967) volume appeared, and in recent years the CPH in various formulations has renewed an intensive debate in the field of L2 acquisition (e.g., Bialystok, 1997; Johnson & Newport, 1989; Kellerman, 1995; Klein, 1996; Long, 1990; Singleton & Lengyel, 1995). Assuming that there is a critical period for L2 acquisition that draws to a close at around puberty, critical period studies designed to test this hypothesis have typically taken one of the two approaches: (a) comparing L2 attainment of learners of a wide range of onset ages, including both pre- and post-pubertal learners; and (b) investigating the capacity of adult learners to master an L2 (Neufeld, 1977, 1988) or attempting to produce postpubertal learners who have achieved native or native-like proficiency in spite of a late start (e.g., Birdsong, 1992; Ioup, Boustagui, El Tigi, & Moselle, 1994; Long, 1990; Novoa, Fein, & Obler, 1988; Obler, 1989). However, there are some problems with each of these approaches. An obvious problem of studies testing the hypothesis by comparing learners of a wide age range is that they tend to confuse age of onset with the terminus of the CPH. As Harley (1997, personal communication) points out, assuming a critical period comes to its close at puberty, those learners who initiate L2 acquisition at the last minute before this hypothesized closure would need several years to acquire the language. Existing findings imply that the terminus of a critical period may have to go well beyond puberty; and whether and when such a turning point occurs still needs to be established (Harley
& Wang, 1997, p.37). This is an important point that has been missed by many critical period studies. As mentioned earlier, the problem with Long’s (1990) challenge to falsify the CPH by producing a postpubertal learner who can ‘pass for native’ is that his criterion of complete native-like proficiency itself needs to be reconsidered (Cook, 1992).

The present study took an alternative route by testing the assumption implied by the CPH that there should be no continuing age effect after puberty (Bialystok and Hakuta, 1994). By testing this tacit assumption, this study has aimed to make a contribution to our understanding of the issue of age and L2 acquisition. If L2 acquisition is indeed subject to a critical period ending at around puberty, then looking at L2 acquisition initiated after maturity at puberty by different age-groups of mature adult learners can be informative to the theoretical issue of whether there is a maturation-linked terminus for L2 acquisition. Cases which demonstrate a further decline in L2 performance across adult onset ages surely carry an important implication for critical period theories.

6.1. Overview of Findings

To test the assumption that there would be no continuing age-related effect on L2 acquisition in adulthood, I compared the L2 proficiency outcomes of two mature adult groups of different onset age ranges, representing young and middle-aged adults upon arrival in the L2 environment. The assumption was not supported by the present data. On the contrary, significant differences were found between the two AOA groups on the two measures of morphosyntactic accuracy and on the measure of oral fluency, with the earlier AOA group consistently outperforming the later AOA group. Additional support for the age effect on
learners’ L2 performance comes from the descriptive interview data. More earlier AOA learners reported that they had made most progress in speaking since their arrival. Conversely, more later AOA learners reported experiencing difficulty in English pronunciation and listening comprehension. It is important to keep in mind that the morphosyntactic features tested in the present study were basic structures in English. It is conceivable that a test of more complicated structures would reveal more marked differences between the two AOA groups. With respect to data from the present study, it appears that there is a continuing decline in L2 morphosyntactic accuracy and oral fluency with increasing AOA in the L2 environment. Insofar as comparable data are available from other studies of adult L2 acquisition, they show that this continued pattern of declining performance in L2 among mature adults persists (d’Anglejan & Renaud, 1985; Birdsong, 1992; Klein & Dittmar, 1979; Scott, 1994; Seright, 1985)

The present findings of a continued decline in L2 proficiency outcomes among adults of different arrival ages invite scrutiny of the potential sources of age-related differences. The significant difference between the two AOA groups on the measure of fluid intelligence, which was positively correlated with the three criterion scores, makes it a plausible internal age-related factor that may underlie the differential L2 proficiency outcomes of the two AOA groups. In addition, there were substantial differences between the two groups in their experiences and perceptions of learning ESL. Compared to the earlier AOA group, the later AOA group had less contact with English and made less use of English on a daily basis; they were less confident in their prospect of L2 acquisition; they tended to have higher level of anxiety in oral communication in English, and preferred to learn with more reliance on memory
than through direct contact. These experiential factors co-varying with age may also have had a bearing on these adult learners’ L2 proficiency outcomes.

6.2. Comments on the Method

There is a consensus in the literature that learner performance tends to vary from task to task. This variability in learner performance has been discussed by a number of researchers (Ellis, 1994; Larsen-Freeman & Long, 1991; Tarone, 1988). As Ellis (1994) pointed out, “A particular task creates specific contexts of use which influence the forms a learner chooses to use” (p.139); therefore, task-induced variability is a phenomenon that needs to be taken into account in assessing learners’ performance. It is interesting to note that authors of critical period studies, especially those who are interested in linguistic universals, tend to come to conclusions based on data from a single task, often a grammaticality judgment task (e.g., Johnson, 1992; Johnson & Newport, 1989). However, variability in learner performance is evident when comparing Johnson and Newport’s and Johnson’s studies, in which the same grammaticality judgment task was used but in different modes, and thus produced somewhat different results.

From the beginning of this study, it was deemed wise to look at learners’ morphosyntactic accuracy using two speech tasks. In this way, separate but coherent results were obtained within and across the two AOA groups. Findings from the two measures indicate some task effects on learners’ use of some morphosyntactic features, but the two measures produced fairly consistent results with respect to other features. Converging results
from the two tasks certainly make the present findings more reliable than if they were drawn from one single task.

With reference to learner variables, the present study first compared the two AOA groups on four sets of learner variables and then used correlational analyses. Findings from these statistical analyses are definitely crucial and informative, yet they fall short when they come to the question ‘why’. For example, why did the learners not have much language-acquisition contact when they desperately needed and wanted it? What prevented them from availing themselves of opportunities for contact? What made it so difficult for learners to remember the English words they learned? Why was there such large variance in learners’ proficiency outcomes despite their uniformly high motivation? It is in answering these questions that the descriptive interview data are most revealing. Valuable information was found here where the statistics were silent. The descriptive data provide a great deal of subtle information about the role of age in adult L2 acquisition. They also illustrate learners’ frustrations and the constraints they experienced in learning English in a natural language setting, thus providing an additional perspective on the quantitative findings of the present study. Findings provided by the interview data indicate the benefit of using interviews as a constructive approach to explore the personal and experiential aspects of the complex issue of age and adult L2 acquisition.

6.3. Limitations of the Study

The analyses I have presented in this thesis are important in that they show significant onset age effects in the acquisition of some morphosyntactic features and oral fluency among adult learners which have not previously been reported. However, these findings should be
treated cautiously for the following reasons. First, while efforts were made to control the 
quality of the criterion measures used in the study, I had no control over the A-LINC 
assessment which was administered by A-LINC raters. Second, the measures of crystallized 
telligence and attitudes/motivation may have lacked a sufficient degree of precision since the 
Cronbach alphas for these measures were relatively low. One possible reason is that there was 
an insufficient number of questions in each measure. Third, given the complexity of adult L2 
acquisition, it is likely that other factors may also have affected these learners' proficiency 
outcomes. For example, instructional differences among classes within the LINC program was 
a possibly relevant variable. Learners' ability to cope with learning in the classroom setting was 
another relevant variable (Burnaby, 1992), which was not measured and therefore not 
controlled in any way in this study. Fourth, the study was not designed to answer the question 
as to how much variance in these learners' L2 proficiency outcomes can be accounted for by 
AOA and the learner variables on which the two groups were found to differ. Given the small 
sample size, it was not feasible to use more powerful statistical analyses than simple 
correlations in this study.

A final remark concerns the sample and the unique population of Mandarin-speaking 
learners of English in Toronto. In terms of their L1, educational background, L2 proficiency, 
their personal goals, and especially their status as Chinese immigrants in Toronto, where there 
is a large local Chinese community in which services are available in their L1, these learners 
represent a very specific group of adult immigrant learners. Therefore, what is characteristic 
of these immigrant learners may not necessarily be generalizable to learners of different 
language and educational backgrounds and in different learning situations. It should also be 
pointed out that since the sample in this study consisted of female learners only, findings from 
this study may not necessarily apply to male immigrant learners given the potentially different
effects of gender on L2 development. However, it is interesting to note that findings from this study with respect to uses of English, motivation, and learning barriers are consistent with those reported by other studies of immigrant learners (Hart & Cumming, 1997) and particularly of women immigrant learners (e.g., Cumming & Gill, 1992; Klessen & Burnaby, 1993; Peirce, 1993).

In spite of these limitations, it is clear that we need more data of the sort presented in this thesis in order to learn more about the role of age in L2 acquisition in adulthood, and in order to be able to draw stronger conclusions about the phenomena observed in the present study and how they may vary.

6.4. Theoretical Implications

The findings of this study challenge the existing critical period theories which consider differences in onset age as irrelevant in postpubertal L2 acquisition (Bialystok & Hakuta, 1994; Bialystok, 1997). If "the function of any theory is to provide explanations for some range of observed phenomena" (Ritchie, 1978, p.2), then the present study provides three important findings that any theory concerning the role of age in L2 acquisition would have to account for: (a) there was a continuing decline in L2 proficiency outcomes associated with increasing AOA in adulthood; (b) some morphosyntactic features were more likely to be age-dependent than others; and (c) adult learners' L2 performance was characterized by a low range of proficiency outcomes and great variability within, as well as across, age groups. The significant differences between the two AOA groups on the measures of fluid intelligence, L2 contact and L2 use, along with their differential experiences and perceptions of learning ESL, indicate that a
theoretical account of the role of age must consider not only internal factors, but also experiential and socio-contextual factors that tend to co-vary with age.

6.5. Educational Implications

If AOA is a factor in adult L2 acquisition and if learners’ age-related language experiences and perceptions have an effect on their L2 acquisition, as was shown in the present study, then it is no longer adequate to treat all adults as one global group. In fact, as Long (1990) pointed out,

Therefore it is erroneous to speak of “the adult ESL learner” as if there is a generic adult that can represent all adults. ... Physiologically, psychologically, and sociologically, adults are more diverse than children. Variability across the life span generally may be represented by a V. Younger individuals are more likely to share more critical common variables than older adults ... (p.25)

Understanding adult L2 acquisition as a dynamic process, in which age is one of the relevant factors, has important educational implications for curriculum development and classroom teaching.

First, our perceptions and understanding of adult learners directly affect curriculum development and classroom practice. Differences in learners’ experiences and perceptions of L2 acquisition are valuable information for educators and ESL teachers, suggesting that a centralized ESL curriculum is unlikely to provide for the full range of learning situations in which adult immigrant learners of different age ranges find themselves. Therefore, understanding their learning situations and meeting their specific needs should be the core of any well-established curriculum for adult immigrant learners (Cumming, 1991).
With reference to the age-related differences in L2 proficiency outcomes, it becomes clear that L2 learning objectives may be common to all, but the means of achieving them cannot and, indeed, should not be identical for all. Therefore, there is a need to release adult learners from the expectation to learn all at the same rate. Flexible L2 learning arrangements are needed to attend to the characteristics of adult learners of different age ranges.

Concerning contact with English and daily use of English, it is important for teachers to understand the gap between many learners’ strong desire to have language-acquisition contacts and their feeling of being unable to do so. This gap should be taken seriously. At the curriculum level, creating links between L2 learners and the L2 community should be an essential component of a curriculum for adult immigrant learners. Classroom activities should be geared to meet these specific needs of the learners. As Singleton (1989) summarized:

‘Real’ communication presumably refers to using the target language to interact in ways similar to those in which one interacts in one’s native language, that is to say, using the language for the sake of relationships to be maintained, business to be transacted, information to be exchanged or aesthetic pleasure to be received or given, rather than for the sake of forms to be practised. In this sense, real communication can actually occur within the classroom, as the entire literature on communicative language teaching makes clear. (p.257)

One recommendation put forth by Glass and Denny (1987) was to develop “appropriate communicative contexts [in the classroom], which are reflective of social situations and of personal needs” (p.115). Similarly, Peirce (1993) has emphasized the importance of teachers understanding of what opportunities are available for learners to speak the target language outside the classroom. By relating L2 learning to the social context in which it will be used, teachers can help bridge the gap between learning in the classroom and learning outside the
classroom. For adult learners who want to establish language-acquisition contacts, it is important that they view the classroom as a place for learning through communication rather than a place limited to ‘studying’ an underlying system of grammatical relationships. For that to happen, teachers need to give learners a great deal of encouragement and positive reinforcement for them to use the target language actively in meaningful contexts.

If, as Wenden (1986) pointed out, learner beliefs about language learning may have an important impact on how they go about it, then it is essential for teachers to know what their learners’ perceptions are concerning how L2 should be acquired. With reference to the finding that the later AOA learners tended to learn with deliberate reliance on memory, it is important that learners’ learning styles should be understood and accommodated in choosing instructional approaches; in fact, different instructional approaches should be recognized as necessary within L2 teaching and learning. Assuming that some perceptions of L2 acquisition are likely to lead to more effective L2 learning (Horwitz, 1987; Wenden, 1986), teachers should help create a language learning environment in which learners can explore alternative ways of learning.

Given that the average performance of the two AOA groups in this study fell within a low range of attainment in L2 after an average of 2½ to 3 years’ residence and with an average of around 600 to 900 hours of classroom instruction, it is important to recognize that adult L2 development takes longer time than most people think (Cumming, 1991). This suggests that, from an educational perspective, short-term L2 language training programs designed for new immigrants may not reflect the real needs of the learners. The present data also suggest that basic language training provided to new immigrants may not be enough to prepare them to be able to get access to English-speaking social networks and employment in an English-speaking environment, which offer them the opportunity to be meaningfully involved in L2 acquisition.
To summarize, it should be recognized that research on the role of age in L2 acquisition in adulthood, as one of the many inputs into the adult ESL curriculum process, is an important one. Findings from the present study provide information that should be considered in curriculum development and classroom practice with a view to meeting the needs of adult immigrant learners.

6.5. Implications for Further Research

Although the three criterion measures converge on the conclusion that L2 proficiency outcomes continue to be related to adult learners’ AOA in the L2 environment, the evidence presented in this thesis is far from decisive. Further research is now needed to determine whether similar findings apply to L2 learners of other language backgrounds and to male learners as well. Should the present findings be substantiated and confirmed with other populations, it would confirm the conclusion that age continues to be related to L2 acquisition in adulthood.

As to what may underlie the onset age effect on adult L2 acquisition, the present data highlight the importance of fluid intelligence, L2 contact, and L2 use, which were positively correlated with learners’ L2 proficiency outcomes. Future research is needed to further establish fluid intelligence, L2 contact, and L2 use as internal and external predictors of adult L2 acquisition in other contexts. With reference to learners’ descriptive information on their experiences and perceptions of learning ESL, it is clear that L2 acquisition in adulthood is likely
to be affected by factors pertaining not only to the learners themselves, but also to the situational contexts in which the L2 is learned.

I hope findings from this study will spark further research on the adult age issue in L2 acquisition, using both quantitative and qualitative methodologies. What might be of particular interest to explore are relationships between age and confidence in learning an L2, age and anxiety in L2 oral communication, and age and L2 contact with the target language community. Another relevant issue worth investigating is the interaction between L1 and L2 and age of acquisition (Bialystok, 1997; Kellerman, 1995). In this regard, Flege's (1992) research on L2 speech offers some insight as to the extent of L1 effect on the acquisition of L2. Moreover, further information is needed about personal, social, and contextual variables that may have an effect on adult L2 acquisition. Increased understanding of the variables involved in adult L2 acquisition can form the foundation for more effective programs tailored to meet the specific needs of adult learners.
REFERENCES


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APPENDIX A: INFORMATION AND CONSENT TO PARTICIPATE IN THE STUDY
(This is the translated version of the information and consent form distributed to the learners in Mandarin)

Dear . . .,

I am a doctoral student in the Department of Curriculum, the Ontario Institute for Studies in Education. As part of my doctoral research, I am examining age-related effects in adult second language (L2) acquisition. I would like to invite you to participate in my research study. This letter is to clarify the nature of the study, what you are being asked to do and the measures I will take to safeguard your anonymity.

People commonly believe that success in L2 acquisition depends on the age of the learner; however, the relationship between age and L2 attainment among adult learners has remained unclear and controversial. This is why I propose to conduct a study to determine whether, among adult learners, differential L2 proficiency outcomes are related to learner age, and to identify factors that may be associated with learners' L2 proficiency outcomes.

During the study you are going to be asked to: (a) fill in written questionaries designed to elicit information about you as an ESL learner and your attitudes and motivation in learning ESL; (b) take an IQ test and a memory test; and (c) take an oral English proficiency test. You are also invited to describe your experiences and perceptions of learning ESL. Your responses and the results of the tests will be analysed completely confidentially. For confidentiality, I will remove your name from the tests and no one else will have access to them. In the analyses of the data in my thesis or a related article, I will use an ID number instead. You will be provided with a summary of the results once the analyses are completed. Your participation in this study is entirely voluntary. You may withdraw from the study at any time.

Please read over this information carefully. If you have any questions about the research or would like to know more about it, please do not hesitate to ask. I can be reached at (xxx) xxx-xxxx. Please fill in and sign the attached consent form and return it to me as soon as possible. Thank you.

Sincerely yours,

Wendy W. Wang
CONSENT FOR PARTICIPATION IN THE STUDY

I, __________________, consent to participate in the study on age-related effects in adult second language acquisition. I understand that my participation is entirely voluntary and that I may withdraw at any time by contacting Wendy W. Wang at (xxx) xxx-xxxx.

Name: __________________ Telephone Number: ____________
Signature: _______________ Date: ____________________

I, ____________________, do not wish to participate in this study.

Signature: _______________ Date: ____________________
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<td>Mrs. Chen <em>lives</em> in a big house with <em>four</em> bedrooms, one big living room, and <em>a</em> large kitchen.</td>
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<td>2.</td>
<td>Li Chen <em>was</em> a high school teacher before he <em>came</em> to Canada.</td>
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<td>3.</td>
<td>Lin’s father <em>works</em> in <em>a</em> supermarket and his mother <em>works</em> at home.</td>
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<td>4.</td>
<td>Ping <em>has</em> studied English for <em>three</em> years and she <em>speaks</em> English very well.</td>
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<td>5.</td>
<td>Alice <em>is going</em> to look for <em>a</em> job when she <em>finishes</em> the ESL program.</td>
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<td>6.</td>
<td>Every day Mrs. Lao <em>makes</em> three <em>meals</em> for her husband and <em>three</em> children. She <em>loves</em> them very much.</td>
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<td>8.</td>
<td>There are <em>ten</em> students in the <em>class</em>: <em>three</em> students <em>are reading</em> newspapers, <em>four</em> students <em>are writing</em>, and <em>the others</em> <em>are talking</em>.</td>
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<td>(1) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(6) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(4) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(1) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(1) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(6) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(4) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td>9.</td>
<td>What <em>will</em> Zhang Hong do when he <em>graduates</em> from the University of Toronto?</td>
<td>(6) 0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(3) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>(5) 0</td>
<td>1</td>
<td>*</td>
</tr>
<tr>
<td>10.</td>
<td>Where <em>did</em> Wang Ming and her husband live in 1950 and what <em>did</em> they do then?</td>
<td>(2) 0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(2) 0</td>
<td>1</td>
<td>*</td>
</tr>
</tbody>
</table>

(1) Plural: 9; (2) Past tense: 4; (3) 3rd person: 11; (4) -ing: 4; (5) Determiner: 10; (6) Auxiliaries: 6. Total: 44.
Sample Protocol: Elicited Imitation Test (EL:04)

1. Mr. Chen live with four ...[four bedrooms, one is big. They have ... he have a large kitchen.

2. Li Chen is a high school teacher before she came to Canada.

3. Lin’s father worked in a supermarket; his mother worked at home.

4. Ping has studied English three years; she can speak English fluently.

5. Alice will go to looking for a job when she finish LINC program.

6. Mr. Lao every day make three meals for their three children and her husband. (Prompt in Mandarin) She love them very much².

7. Mary has a brother, but she don’t like ... doesn’t like him and he still don’t like her.

8. Ten student in the class: three class ... three students are reading, four ... four student are writing, the others are talking.

9. What does Zhang Hong do when she finishes study University of Toronto?

10. Where does Wang Ming lived before 1950? (Prompt in Mandarin) What they are do²

---

¹ ... = short pause

² Segment after prompt was eliminated from consideration in scoring.
APPENDIX C: GUIDED ORAL INTERVIEW (IN ENGLISH)
(Directions: Please answer the following questions as completely as possible. Questions may be repeated upon request)

1. How long have you been in Canada?
2. How long have you been in this LINC program?
3. Open question: Can you tell me something about your family?
   --How many people are there in your family?
   --How many brothers and sisters do you have?
4. Where did you live before you came to Canada?
5. What was your occupation in your native land?
6. Open question: Can you tell me something about your job in your native land?
   --Where did you work?
   --What did you do on the job?
   --How did you go to work?
   --How many hours did you work every day?
7. What work does your husband (son or daughter) do in Canada?
8. Where does your husband (son or daughter) work?
9. Open question: Can you tell me something about your husband's (son or daughter) daily activities?
   --What does he do every day?
10. Look at the picture and describe what each one is doing (attached3).
11. Open question: Do you live in a house or an apartment? Can you please tell me something about it?
    --Where is it located?
    --How many bedrooms do you have?
    --What do you have in your living room?
12. Do you like your neighbour(s)? Why or why not?
13. Open question: Can you tell me something about your classmates?
    --How many students are there in your class?
    --Do you like your classmates?
    --Do they like you? Why or why not?
14. What are you going to do tomorrow?
15. What are you going to do when you finish this LINC program?
16. Please ask the interviewer six questions (Yes/No questions and wh-questions)?

---

3 The picture is taken from Harley (1989).
Sample Protocol: Guided Oral Interview (EL:04)

Please answer the questions as completely as possible. Questions may be repeated upon request.

Q: How long have you been in Canada?
A: More than two years.

Q: How long have you been in this LINC program?
A: Almost half years.

Q: Can you tell me something about your family?
A: No problem. My husband is a student, studying in university. I have a son, just 7 years old. He is now studying in Grade 1. Before I am working in a sewing machine factory, but now I am studying in LINC program.

Q: How many hours do you study every day?
A: Every day just 5 hours.

Q: Is it 5 days a week?
A: Yes.

Q: Where did you live before you came to Canada?

Q: What was your occupation in China?
A: I am working in airport. I am xxx 4. I am working in booking office sell the booking tickets.

Q: How many hours did you work every day?
A: Just 8 or 7 hours.

Q: Oh 7-8 hours, 5 days a week?
A: No, 6 days.

Q: How did you go to work?
A: I usually ride the bicycle to work.

Q: Did you work during the day or did you work at night?
A: I worked day time.

Q: Your husband is a student?
A: Yes.

Q: Does he work part-time?
A: No, but he got scholarship.

Q: That’s great! Can you tell me something about his daily activities?
A: You mean my husband ... 5 his study program?

Q: His daily activities, like what does he do every day?
A: Every day ... usually my husband day time he went to school to study, but evening usually here to study. So the day time, day time he just study. No other thing to do.

Q: Can you tell me something about your son’s daily activities?

4 xxx = not clear

5 ... = a short pause
A: My son just came here 6 months ago, so now he cannot speak any English, just simple words, no sentence. But he is now study in Grade 1. At school, I think here the education different ... China. It’s very very simple. So every day I think my son just play. He just play the computer, because here he don’t have any friend to play together. So daytime just stay home.

Q: When does he get up in the morning?
A: Usually ... if they need go to school, usually 8 o’clock. But now the summer vacation, she usually get up 9 o’clock.

Q: When does he go to bed every day?
A: Usually 11 o’clock.

Q: I have a picture here. Can you tell me what each one is doing?
A: This one? The left ... left boy use left hand point ... point another girl. Top of the picture, the boy was clean the floor. The four picture, lady is step on the ... ladder and hanging something. Two picture is girl was standing by the table. I don’t know what she is doing. The sixth picture, the girl was carry a cake, maybe cake. The five picture, the boy was taking the chair, standing there. Top of the picture, the girl point the top, maybe the sky, I don’t know.

Q: Do you live in a house or an apartment?
A: I live in apartment.

Q: Can you tell me something about your apartment?
A: My apartment? I live one bedroom and one living room apartment. My apartment is near ... in the downtown. Around the apartment, there are a lot of store, very convenient, this area. In this building just for student to rent, so my neighbour all is student, but we can we cannot talk each other because they come another country. So every day we just meet, didn’t say anything to each other.

Q: Do you like your neighbours?
A: Yes.

Q: Do you talk to them very often?
A: No, everybody is very busy; so the day time, we cannot meet each other. But the evening, usually at home to study, because I have some problem. My English is not good. Every day I need speak ... practice my English and reading and writing, try to improve my English. So I don’t have time to go outside to talk with other people.

Q: How about your classmates? Do you like your classmates?
A: Of course. My classmates all come from different country. They are all friendly. Some classmates they have good job in their country, but they immigration to here, they have a lot of trouble, because they cannot find the same job before ... before their country. So they must to learn English, but ... I think my classmate ... all is ... most of them is clever.

Q: Do you have any plan for tomorrow? What are you going to do?
A: Tomorrow I just go to school.

Q: What are you going to do when you finish this LINC program?
A: If it’s possible, I’ll go to college, take some course to study. Maybe I’ll find a job to do, I don’t know, depend on my English.

Q: Your English is very good.
A: No, I don’t think so.
Q: Which level are you at right now?
A: LINC level 3.
Q: I would like you to ask me six questions
IQ\(^6\): How ... how do you live in Canada ... before ... right now you come from another
country?
IA\(^7\): ...
IQ: How do you found your job?
IA: ...
IQ: I want to know .. in Canada you make some friend is easy or difficult do you think?
IA: ...
IQ: How long have you been here?
IA: ...
IQ: How long do you learn your English in your country?
IA: ...
IQ: You mean high school?
IA: ...
IQ: Why do I ask you these questions today? (Laugh)
IA: ...

\(^6\)IQ = invited questions

\(^7\)IA = interviewer's answer
APPENDIX D: RATING CRITERIA FOR ORAL FLUENCY IN ENGLISH*

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Delivery</strong></td>
<td></td>
</tr>
<tr>
<td>* Very slow delivery with very frequent and unusually long pauses and/or hesitations</td>
<td>0</td>
</tr>
<tr>
<td>* Slow delivery with frequent and long pauses and/or hesitations</td>
<td>1</td>
</tr>
<tr>
<td>* Delivery a little slow with some long pauses and/or hesitations</td>
<td>2</td>
</tr>
<tr>
<td>* Normal delivery</td>
<td>3</td>
</tr>
<tr>
<td><strong>Rhythm</strong></td>
<td></td>
</tr>
<tr>
<td>* Jerky rhythm</td>
<td>0</td>
</tr>
<tr>
<td>* Frequent irregular rhythm</td>
<td>1</td>
</tr>
<tr>
<td>* Some irregular rhythm</td>
<td>2</td>
</tr>
<tr>
<td>* Regular rhythm</td>
<td>3</td>
</tr>
<tr>
<td><strong>Stress</strong></td>
<td></td>
</tr>
<tr>
<td>* Poor placement of stress (on a word or phrase)</td>
<td>0</td>
</tr>
<tr>
<td>* Frequent errors in stress</td>
<td>1</td>
</tr>
<tr>
<td>* Some errors in stress</td>
<td>2</td>
</tr>
<tr>
<td>* Placement of stress generally correct</td>
<td>3</td>
</tr>
<tr>
<td><strong>Prosody</strong></td>
<td></td>
</tr>
<tr>
<td>* Very harsh intonation (prosody that causes discomfort and irritation)</td>
<td>0</td>
</tr>
<tr>
<td>* Frequent harsh intonation (prosody causes some discomfort and irritation)</td>
<td>1</td>
</tr>
<tr>
<td>* Intonation generally correct</td>
<td>2</td>
</tr>
<tr>
<td>* Appropriate intonation (prosody similar to that of a native speaker)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Score: 12

*This four point scale Oral Fluency Rating was adapted and translated from Hart, Lapkin, & Swain's (February, 1988) Global Rating, Early and Middle Immersion Program: Linguistic Outcomes and Social Character. Final Report to the Metropolitan Toronto School Board. Toronto: Modern Language Centre, OISE.
APPENDIX E: BACKGROUND AND L2 CONTACT/USE QUESTIONNAIRE
(This is the translated version of Background and L2 Contact/Use Questionnaire administered orally in Mandarin)

Please complete this questionnaire as carefully as you can. Your responses will be analysed statistically and completely confidentially.

Part I: Background Information

1. Name: ________________________ 2. Gender: ________________________

3. Contact Tel. No: ________________________

4. Address: ________________________

5. Place of origin: ______________ 6. First language: ________________________

7. Other language(s) you know: ________________________


10. Number of years of formal education: ________________________

11. Highest level of education obtained:

<table>
<thead>
<tr>
<th>Middle School</th>
<th>( )</th>
<th>High School</th>
<th>( )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational school</td>
<td>( )</td>
<td>College</td>
<td>( )</td>
</tr>
<tr>
<td>University</td>
<td>( )</td>
<td>Others</td>
<td>( )</td>
</tr>
</tbody>
</table>

12. Did you know any English when you came to Canada? Yes ( ) No ( )

a) If yes, how much did you know?

<table>
<thead>
<tr>
<th>Reading</th>
<th>None ( )</th>
<th>A little ( )</th>
<th>Some ( )</th>
<th>A lot ( )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing</td>
<td>None ( )</td>
<td>A little ( )</td>
<td>Some ( )</td>
<td>A lot ( )</td>
</tr>
<tr>
<td>Listening</td>
<td>None ( )</td>
<td>A little ( )</td>
<td>Some ( )</td>
<td>A lot ( )</td>
</tr>
<tr>
<td>Speaking</td>
<td>None ( )</td>
<td>A little ( )</td>
<td>Some ( )</td>
<td>A lot ( )</td>
</tr>
<tr>
<td>Grammar</td>
<td>None ( )</td>
<td>A little ( )</td>
<td>Some ( )</td>
<td>A lot ( )</td>
</tr>
</tbody>
</table>
b) How did you learn English?
- Took lessons ( )
- Self-study ( )

c) How long did you learn English?
- Year: _____
- Month: _____
- Hours per week: _____

13. Which program are you currently registered at? ____________________________

a) Which level are you at? ____________________________

b) When did you start? ____________________________

c) How many instruction hours per day? ____________________________

d) How many days per week? ____________________________

e) How is your attendance? Regular ( ) Irregular ( )

14. Have you ever enrolled in other ESL programs?

- Yes ( )
- No ( )

a) If yes, how long were you in that program?
- Month: _____
- Year: _____

b) How was your attendance?
- Regular: _____
- Irregular: _____

c) How many instruction hours per week?
- 2 hrs ( )
- 4 hrs ( )
- 8 hrs ( )
- More ( )
### Part II: L2 Contact/Use Questionnaire

#### Section 1: Contact with English

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Chinese</th>
<th>Chinese/English</th>
<th>English</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What language(s) is spoken regularly in your home?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>In which language(s) do you speak to your family members?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.</td>
<td>In which language(s) do they speak to you?</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>In which language(s) do you speak to your neighbours?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Have you ever worked or volunteered in Canada? If yes, what language(s) have you spoken when you have been at work?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Are you still working now? If yes, what language(s) do you now speak when you are at work?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>What language(s) do you use in the following situations?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) watching TV:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) watching videos:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) listening to radio/cassettes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) reading newspapers/magazines:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) attending church:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) at community centres:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>g) shopping:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>h) at government/financial institutions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) at socials:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 2: Amount of L2 Use

<table>
<thead>
<tr>
<th>Productive Use</th>
<th>Non</th>
<th>c.30m</th>
<th>c.1hr</th>
<th>c.2hr/+</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. When you are not at school or at work, about how much time each day do you spend talking in English with people who are native or fluent speakers of English?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. When you are not at school or at work, about how much time each day do you spend talking in English with people who have difficulty speaking English?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. When you are at work, about how much time each day do you spend speaking English?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Receptive Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. How much time each day do you spend watching TV programs in English?</td>
</tr>
<tr>
<td>12. How much time each day do you spend listening to radio programs in English?</td>
</tr>
<tr>
<td>13. When you are not at school, how much time each day do you spend reading English newspapers or magazines or textbooks?</td>
</tr>
</tbody>
</table>

Part III: Open Questions

1. Describe your learning experience. Is it difficult for you to learn English? What is it that makes it most difficult for you? In terms of speaking, listening, reading and writing, in which aspect do you think you have made most progress? Do you think you have favourable learning conditions to learn English? What obstacles have you experienced in learning English?

2. How long do you think it will take for you to be able to speak English fairly fluently? What do you consider as the best method to improve your oral English? Do you think oral English is better learned through use or by rote?

3. How would you rate your memory? Are you able to remember what you have learned in class and use it in social contexts? Why or why not? Do you think age is a factor in learning a second language? If yes, in what way?

Thank you for participating in this study.