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The *man_i said she_i would return*: English Pronominal Gender in Native Mandarin Speaking Learners, Examined Within A Comprehensive Theory of Language Acquisition

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The *man_i* said *she_i* would return: English Pronominal Gender in Native Mandarin Speaking Learners, Examined Within A Comprehensive Theory of Language Acquisition

Abstract

The project that led to this honors thesis was begun in the Fall semester of 2010, in a graduate-level psycholinguistics course taught by Dr. T. Daniel Seely. At that time, I was intensively studying Mandarin and had been living with a native speaker who was also in the process of learning English. The types of speech errors in her English, particularly the ones that appeared to have resulted from influence from her native Mandarin, interested me greatly. One of the most striking errors that she tended to make, however, was mismatching English gender-marked pronouns with the gender of the referent. *That is, she would frequently say things like The man driving the bus said she could bring me to Ann Arbor, or I love Lady Gaga, his style is so interesting.*

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***The man_i said she_i would return:* English Pronominal Gender
in Native Mandarin Speaking Learners, Examined Within A
Comprehensive Theory of Language Acquisition**

Honors Thesis

Rachelle Felzien

December, 2011

Introduction

The project that led to this honors thesis was begun in the Fall semester of 2010, in a graduate-level psycholinguistics course taught by Dr. T. Daniel Seely. At that time, I was intensively studying Mandarin and had been living with a native speaker who was also in the process of learning English. The types of speech errors in her English, particularly the ones that appeared to have resulted from influence from her native Mandarin, interested me greatly. One of the most striking errors that she tended to make, however, was mis-matching English gender-marked pronouns with the gender of the referent. That is, she would frequently say things like *The man driving the bus said she could bring me to Ann Arbor*, or *I love Lady Gaga, his style is so interesting*.

In Mandarin's spoken form, a single third-person pronoun *ta* corresponds to *he/she* or *him/her*. There are two different characters used in the written form to distinguish the gender of the pronoun, but in the spoken form, contextual information must be relied upon to infer the gender of the person *ta* refers to. Working with Chinese adult learners of English, I realized that errors of this sort were common – in fact, I observed almost every native speaker of Mandarin I knew sometimes making pronominal gender disagreement errors in English. The agreement errors went in both directions, too – men would be referenced with feminine pronouns, and women with masculine ones. Further, all case-marked and reflexive forms of the English gendered pronouns were affected: *he/she*, *him/her*, *his/hers*, and *himself/herself*. Because the native Mandarin speakers I observed frequently had good control over other aspects of English grammar pertaining to pronouns, such as case, number, and person, I was interested to know why pronominal gender was such an issue.

My final project for Dr. Seely's psycholinguistics course involved a small-scale study, in which I designed two different elicitation tests – one grammaticality judgment task, and one picture-description task – to be used on both native speakers of Mandarin and native speakers of other languages. The purpose of this was to determine whether subjects would produce, or accept as grammatical, sentences containing pronominal gender agreement errors. In brief, it was found that *only* native speakers of Mandarin accepted or produced sentences containing the errors in question. Speakers of other languages – all of which marked pronouns for gender in some manner – were never seen making the errors, or accepting sentences containing them as grammatical. The conclusion of the project was that Mandarin's pronominal reference system may be *transferred* into English learners' developmental grammars, manifesting itself in disorganized patterns of pronominal gender disagreement issues. The present study that led to the production of this thesis represents a more in-depth continuation of my previous pilot study.

Some Common Abbreviations

Before beginning the literature review below, it may be helpful to the reader to be aware of several common abbreviations in the second language acquisition literature:

L1A – First language acquisition

L2A/SLA – Second language acquisition

L1er/L2er/BFLAer – First language learner / Second language learner / Bilingual first language learner (that is, a child who learns two languages simultaneously)

UG – Universal Grammar

All other new pieces of terminology will be explained as they appear.

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**Monolingual Child Language Learning in Brief: UG's Birthplace and Point of
Reference for Second Language Acquisition Studies**

I begin my discussion of relevant language acquisition theory with a brief review of currently held ideas on the workings of monolingual child language learning. Particularly, I will focus on the so-called *logical problem of language acquisition*, and how current theory has attempted to answer it by way of a uniquely human, innate endowment for language learning. Language, as a psychological construct, consists minimally of a set of abstract rules for sentence formation (the grammar), a set of sounds (the phonology), and a lexicon of words and rules for altering those words (the morphology). The sum of all these parts creates an incredibly complex whole, and so the language acquisition researcher asks: *how could a system of such complexity be learned with such uniformity across speakers of a given language?* The most fundamental driving questions in psycholinguistics were born from inquiry into how children learn their first language, with the proposed answers to these questions forming contemporary theory on how language is acquired, represented in the mind, and used to produce and understand sentences in a language.

Child language acquisition involves the inferential learning of a grammar, with exposure to speech in a given language being the only information the child receives with which to build this representation. If children were only able to store and reproduce the sentences they have already heard, then the acquisition problem would be much simpler. But the child, having heard only a finite number of sentences, derives an internalized system that allows them to understand and generate an infinite number of productions.

Compounding the issue, White (1989) notes that even though all mature speakers of a given language possess the same underlying linguistic competence, their “exposure to data in the course of acquisition may have been quite different – they may have heard different input, or the same type of input in different orders”, or may not have been heard certain types of input at all. This is but the beginning of the logical problem of language acquisition.

Based in the rules and structures thought to be universal to all human languages, the theory of Universal Grammar (UG) was brought about by Chomsky in the late 1950s. From its earliest incarnations as Transformational Generative Grammar theory in the fifties and sixties, through Principles and Parameters in the early eighties, and the contemporary Minimalist Program, differences in approach have not altered the central goal: to account for the language-specific structures that exist in the minds of all humans -- the structure of the psychological endowment for language learning

The argument for Universal Grammar in language acquisition is based on the idea that, without some kind of pre-existing knowledge of the structure of the input to come, that it would be impossible for children to acquire language in all its complexity, particularly given deficiencies in input and the fact that the result is a computational system capable of accepting and producing an infinite number of sentences. With regard to the deficiencies in input, White (1989) reviews three often-discussed problems with the information children receive. Referring to the infinite productivity of the final system, we note first that the input *underdetermines* the final grammar. Second, the input is often *degenerate*, being subject to speech errors, including slips of the tongue, trailings off, and other disfluencies. Finally, the child receives no negative evidence -- the children’s

speech errors are not corrected by caregivers, but rather resolve on their own through development of the underlying productive system. These issues in the input that children receive will later be compared to issues in the input that second language learners receive, when the availability of this innate knowledge in second language acquisition is discussed.

On the first problem of input, *underdetermination*, we already know that the learning mechanism must be more powerful than to limit children to rote memorization of the sentences they hear. Further, however, White (1989) writes that “an acquisition problem arises if we impute to the child only some general cognitive ability to make analogies or generalizations on the basis of input”. That is to say, where learning in non-linguistic domains (like learning algebra or to play an instrument) depends upon general psychological capacities, child language learning seems to require a more specific set of mechanisms, as though certain structures are already available from birth. After all, every normal human acquires a language, but not everyone is able to learn so effectively in other domains. If learning were of this general type, White continues, “one would expect the child to make many false generalizations, to produce errors which have not been attested in child language, and to fail to work out certain properties of the language”.

As an example of such a property of language relevant to the present study, White discusses the learning of the distribution of reflexive pronouns, and how this complex rule could not be learned with general learning processes alone. Reflexive pronouns, in English, are of the form *him/her/them + self*, and are restricted in distribution in all languages by the position of the antecedent noun phrase with which they are coreferenced. Sentences such as:

(A) Mary_i likes herself_i, and

(B) *Herself_i likes Mary_i

where the reflexive must come after the antecedent might be easy enough to learn on generalization alone, but something like:

(C) Taking care of herself_i bores Mary_i. (adapted from White (1989))

would render such a generalization useless. Further distributional complexity arises in sentences with multiple potential antecedents, such as

(D) Mary_i said that Shelly_j likes herself_{*i/j}.

There are also the substantial issues of how reflexives can be the subject of non-finite embedded clauses, but not in finite ones, and how the closest noun phrase is usually, but not always, the antecedent (White, 1989). Even simple pronouns are subject to similarly complex rules regarding linear relationship between nounphrase and pronoun.

This single example illustrates the fact that there is some underlying structural rule governing distribution of pronouns that would not be readily learnable by general learning process based on the forms of the sentences. The Government and Binding framework, within which many important studies in first and second language acquisition were carried out (several of them being reviewed in the present paper), detailed a Binding Theory that was a part of Universal Grammar, which dictated the distribution of pronouns based on governing relationships in the hierarchy of the sentence (Chomsky 1981). While the details of the proposed distributional rules have been revised in recent years by the Minimalist Program, the central idea remains the same: the distribution of nounphrases, pronouns, and anaphors forms part of an innate system of linguistic knowledge, and does not have to be explicitly learned (White 1989). Thus, linguists argue that because children

are able to deduce a highly complex grammar from a small number of sentences, that UG would be needed to resolve the issue of input underdetermination.

The second mentioned problem with the input children receive is that the speech they hear is often *degenerate*, being to slips of the tongue, pauses, and other production issues that do not wind up forming part of the child's internalized representation.

Although there has been some debate as to whether the language that children hear is error-ridden enough to warrant motivation for UG (cf. Snow & Ferguson 1977; Brown 1977), the problem of underdetermination would still remain (White 1989). Even if children initially receive simplified input in caregiver speech, because complex sentences cannot be thought of as “sums of properties of simple sentences” (White 1989), the argument against input degeneracy based in early simplified child-directed speech merely postpones the issue of how complicated syntactic rules are acquired. The argument for UG is strengthened by the idea that, if children did not have some advance knowledge of language's general formal properties, that they'd wind up incorporating adult's speech errors into their final grammar, or forever remain at the most basic level of syntactic complexity.

Finally, it is argued that because children do not receive negative evidence – that is, correction – on their speech, they must have some pre-existing ability to work out properties of their language without external guidance. Children certainly produce grammatical errors, which, as anyone who has ever tried to correct a child's errors knows, are not immediately resolved, but rather seem to be worked out through linguistic development. Generally speaking, though, it has been found that children do not receive correction on their errors (Brown and Hanlon 1970). White (1989) writes that while

children do produce ungrammatical forms, they are apparently restricted in type, citing Otsu (1981), who found that children do not assume certain ungrammatical types of wh-movement to be acceptable. Transient incorrect representations of a language's grammar, then, may be phased out as children never hear those ungrammatical forms in caregiver speech. Further, the limited range of error types in child speech suggests that UG exists, and that it may consist of negative constraints that prevent certain types of errors from ever occurring.

White compares UG to a sort of blueprint as to what formal properties human grammar can possess, where details of individual languages are filled in by input and internalized by the child. Because monolingual child learners have been shown to progress through similar acquisition sequences, making the same kinds of errors at the same times, and having those errors eventually resolve, it seems that there must be some larger developmental mechanism existing in the minds of humans that enables them to acquire language with such uniformity.

Bilingual First Language Acquisition and the Present Study

The previously introduced theory of UG, however, was obtained via the study of monolingual children learning their first language, generally leaving out the cases of those who acquire two or more languages simultaneously from birth. Bilingual learning scenarios are common in immigrant communities, in which parents may be of mixed linguistic background, or in which one language is used at home, and the other in the community (Qi, 2010). Given the world prevalence of child bilinguals, it was surprising to see Genesee (2001) observe that “most current theories of language acquisition are

based on monolingual children, and are silent on the case of bilingual acquisition”.

Advances in BFLA studies are advances toward a general theory of language acquisition, but as Genesee continues, “we have scant descriptive information about bilingual acquisition and thus, little theoretical understanding of how two languages are acquired simultaneously”.

The study of bilingual first language acquisition (BFLA) concerns itself with the dual issue of how bilingual children make hypotheses about the two grammars, and how, if at all, the two systems interact during the learning process. Of corollary importance is the question of whether the developmental process resembles that of monolinguals in either language, with regard to timing of emergence of forms and to ultimate attainment. As the overarching goal of this thesis is to learn more about the acquisition and cognitive management of multiple linguistic systems in the minds of bi- or multilinguals, discussion of BFLA seems a natural starting point. Attention to both child bilinguals and adults who learn a second language will later permit comparisons between the two.

The Primary Issues in BFLA Studies

As one of the foremost questions in BFLA studies, Genesee and Nicolais (2005) ask: "is the developmental path and time course of language development in bilingual learners the same as that of monolingual children? By comparing the acquisition (or developmental) stages of BFLA children with monolingual L1A children, we might be able to say something on whether the two learning situations are guided by the same underlying mechanisms. We are additionally concerned with the content of the speech of the bilingual child -- do the two linguistic systems develop autonomously, similar to monolinguals in that there are no signs of influence from other linguistic systems (Yip &

Matthews, 2010)? Or, do the two languages develop interdependently, with observable transfer effects or some other mixing of elements in the child's speech? And if this mixing or transfer occurs, then why? Can this mixing be shown to be a purposeful communicative strategy (Genesee, 2001), or does it reflect a sort of grammatical "bootstrapping", or integration at the representational level?

The predictions of the 'interdependent systems' argument are not as straightforward as those of the 'autonomist's'. Yip and Matthews (2010) explain that the predictions would depend on the kinds of constraints assumed on transfer. In the context of adult SLA, they mentioned views ranging from Full Access/Full Transfer (Schwartz & Sprouse, 1996; Schwartz 1998) to more constrained views of transfer, such as Andersen's 'transfer to somewhere' (1983). In BFLA studies, authors from the generativist framework have focused on structural overlap and semantic ambiguity as potential triggers for developmental transfer effects (Hulk & Muller, 2000; Muller, 1998). An added variable in bilingual development involves the pairing of the target languages. Yip and Matthews (2010) write that, "among the many possible permutations, some language pairs are typologically and/or genetically distant, while others are closer". Citing that most studies of bilingual acquisition have involved English paired with European languages, they call for more work in language pairings such as English and Chinese. With a higher degree of grammatical contrast comes "new possibilities for interaction between a child's developing linguistic systems", in terms of grammatical properties, phonology, and lexicon.

Lastly, we ask: how is that children can distinguish between two or more languages to which they are exposed, and then form grammatical hypotheses that produce

two distinct linguistic systems in the mind? At what age or developmental stage have bilingual children been shown to maintain differentiated systems, and does the degree of differentiation change over time?

These questions all examine adjacent facets of the same issue – the management of multiple linguistic systems in the minds of bi- and multilinguals. From bilingual children, who are exposed to their two languages simultaneously from birth, we can get at questions of "the nature of the abstract knowledge (or competence) that underlies the bilingual child's language performance" with the specific question being whether young child bilinguals acquire "abstract constraints (or rules) that are different for, and specific to, each target language" (Genesee, 2001).

Currents in the Findings of BFLA Studies

Recent findings in BFLA studies suggest that bilingual children acquire proficiency levels equal to monolinguals in the same overall amount of time (Qi, 2010), but it is noted by Genesee (2001) that this does not mean the bilingual developmental path or representational system is exactly like that of a monolingual. Previously, observations of apparent transfer were taken as evidence by some researchers, namely Volterra and Taeschner (1978), to suggest an early unitary system -- that is, one in which the two languages were not differentiated in the minds of child learners. Volterra and Taschner (1978) proposed a three-stage model, whose initial stage was that of poor differentiation, with the final, third stage representing the end product of perfect competence in both, as though they were a monolingual speaker of either language.

Two important studies argued in opposition to Volterra and Taeschner, however, claiming that children are able to separate their two languages from early on. First,

Meisel (1989) studied German-French bilingual childrens' acquisition of word order and expression of subject-verb agreement.

The general conclusion of Meisel's study was that children separate their grammars from the very beginning, and that these grammatical domains were acquired differently, or autonomously, in both languages (Meisel, 1989). Second, in the same year (1989), Genesee addressed the issue of apparent transfer in early bilingual child grammars, and found that there are reasons for language mixing at the lexical level that are voluntary and grammatically constrained, these being opposite to those of genuine transfer. Specifically, it was reported that when the children under study used semantic or syntactic elements from their two languages in a single utterance, the productions contained no structural errors, and that it was conscious and purposeful. This is in contrast to genuine transfer, as generally erroneous and unintentional occurrences. In effect, Genesee stated that this voluntary and grammatically constrained blending of languages was actually evidence of childrens' high degree of simultaneous, monolingual-like control over both (1989).

Other analyses by Genesee, Nicoladis, and Paradis (1995), De Houwer (1990), Koppe (1997), Meisel (1996), and Muller (1998) arrived at the same conclusion: bilingual children are able to distinguish their two linguistic systems from very early on, and that they do not necessarily pass through a stage of fusion in their linguistic development. Thus, the current consensus is that bilingual childrens' languages develop autonomously, very much like monolinguals, albeit with some differences in timing, which are not so great as to put bilingual childrens' development outside the normal ranges for monolinguals (Qi, 2010). However, Genesee (2001) writes that although the development of two languages in a bilingual child may be largely autonomous, and that

their control over both permits grammar-sensitive blending, this does not immediately exclude the possibility that there can be influence from one language on another.

This influence is thought to be subject to constraints that may not apply to adult L2 learners. Hulk and Muller (2000) and Muller (1998), coming from a generative framework, take as their starting point the idea that bilingual children are constrained in hypothesis-building by Universal Grammar, and that the two languages develop autonomously. However, they propose that cross-linguistic influence may occur in specific syntactic domains, provided that the domain meets the following two criteria:

- (1) An interface level between two modules of grammar is involved, particularly the interface between syntax and pragmatics.
- (2) The two languages overlap at the surface level in the domain in question, creating an ambiguous learning situation in which more than one hypothesis regarding the correct grammar may be created by the child.

The first criteria concerning the interface between two modules of grammar is best explained by way of example. With respect to clausal structures, write Hulk and Muller (2000), "grammatical properties such as verb second, complementizers, and topicalization" are typical examples of phenomenon which they believe to be where syntax and pragmatics come into interplay. That is, Hulk and Muller have observed transfer effects to be limited to those grammatical structures whose use stays the general meaning of the sentence, but creates a different *reading*. For example, topicalization (or topic prominence) is noted by Yip and Matthews (2010) to be strongly preferred by Chinese, while English uses it only in particular circumstances. So where speakers of Mandarin would be more apt to say, for example, "*Old people, we must respect*", English

speakers would be likelier to say "*We must respect old people*".

The second criteria for transferability as given by Hulk and Muller (2000) states that there must be some ambiguity of input which would lead children to believe that a structure from one language may be legally used in the other. Both the above sentences are grammatical in both languages, but it is a pragmatic preference of Chinese to topicalize, and a pragmatic preference of English not to do so. Thus, if a child learner of Chinese and English hears topicalization frequently in Chinese, but more rarely in English, the rule on usage of it in either language may look ambiguous.

With these two criteria in mind, Muller (1998) and Hulk and Muller (2000) carried out investigations in German-Romance/English bilingual children to test their hypotheses. Romance languages (French, Italian) and English require non-verb-final verb placements in subordinate clauses. However, verb-final and non-verb-final orders are both allowed in German subordinate clauses, where both options maintain the sentence's general meaning, but create a slightly different interpretation. This represents an interface between syntax and pragmatics, and thus satisfies condition (1). Verb placement in subordinate clauses is optional in German, but in Romance languages and English, it is fixed – this is argued to create an ambiguous learning situation for BFLAers, satisfying condition (2). "We can predict", Muller (1998) writes, "that German word order in subordinate clauses represents something of a puzzle to the language learner". With this ambiguous input, bilingual learners of German and French/Italian/English may be "tempted to transfer features from the language presenting unambiguous (Romance) input into the one which is ambiguous (German)".

Bearing this in mind, Muller (1998) states that bilingual children have great

difficulty with word order in German subordinate clauses, as opposed to monolinguals, who reportedly never experience difficulty. Further, Muller writes that this "seems to be the case independently of whether German is the preferred/dominant language". Muller cites studies by Ronjat (1913), and Meisel (1996), which reported target-deviant uses of verb-final structure in German subordinate clauses by bilingual children. These children, who learned German along with French, Italian, or English, are thought by Muller to be much more easily "misled" than monolinguals children. That is, in order to cope with the problematic input of verb-final and non-verb-final word orders in German, bilingual children are hypothesized to initially transfer head-position parameter settings from the language with the unambiguous input -- in this case, French, Italian, or English. These BFLAers' intermediate grammars are, within the same amount of time as those of monolinguals, resolved into fully mature dual systems.

Beyond transfer effects relatable to Hulk and Muller's criteria, other blending of linguistic elements is seen ways that have been found to be grammatically constrained and contextually sensitive – code-switching (Genesee, 2001). Genesee and Nicoladis (2005) write that code-mixing is ubiquitous among bilinguals, both adult and child. Reiterating from above, it has been suggested (Genesee, 2001) that child code-mixing is a demonstration of monolingual-like competence in both languages, and, as in adult code-mixing, serves a variety of meta-communicative purposes.

Consensus in BFLA Studies

Genesee (2001), citing Celce-Murcia (1978), Johnson and Lancaster (1998), and Paradis (1996), reports that studies of phonological development have shown bilingual children to "demonstrate phonological patterns in each language even prior to the overt

use of syntactically-patterned language". That is, it is now the generally agreed-upon that the two languages of the bilingual child are "represented in underlyingly differentiated ways at least from the beginning of early language production, and possibly earlier". This ability to distinguish the two languages based on their phonology at the earliest developmental stages is thought to be a prerequisite capacity for creating distinct systems of cognitive representation.

While Nicoladis (2002) found that children may show signs of cross-linguistic transfer in areas beyond those predicted by the constrained criteria of Hulk and Muller, the larger consensus seems to be that we may assume autonomous bilingual development, in which cross-linguistic influence can be predicted to occur only in areas which are more "vulnerable", as defined by Hulk and Muller's (2000) criteria.

In other domains, it is assumed that bilingual children progress as monolinguals do – that is, they infer on the basis of input the grammar of both languages, and this forms the basis of their mental representations. It is understood that, given sufficient exposure to the two languages, bilingual children acquire the same grammatical competence in each of their languages as monolinguals (White & Genesee, 1996).

With these key issues discussed, I now segue into studies on the bilingual acquisition of personal pronoun systems in Chinese-English children, including more specific regard to the third-person pronouns whose acquisition in adult second language learners is a sub-focus of this thesis.

The Bilingual Acquisition of Personal Pronoun Systems by Chinese-English Children

Qi (2010) writes that studies on bilingual first language acquisition mainly concern the deeper, structural aspects of their language development, and that there is a dearth of in-depth studies on the development of pronominal reference systems. Qi mentions a handful of studies that have investigated bilingual personal pronoun acquisition – all of which have focused on European or English language pairings (De Houwer, 1990; Lanza, 1997; Meisel, 1990, 1994).

Qi's 2010 study focused on an individual child, J, over a period of 30 months from ages 1;07 to 4;0. The data set consisted of 65 tape-recorded sessions of naturalistic speech in context-based language use in either Mandarin or English, wherein Mandarin was used in the home and English in the community. Mean length of utterance (MLU) and Brown's Stages (1973) were used to provide a numerical measure of the syntactic complexity of the child's utterances, and to provide a rudimentary basis for comparison with monolinguals (Qi, 2010).

"Chinese personal pronouns, when considered as a purely linguistic system, appear rather simple compared to those in English or other European languages", writes Qi (2010). Mandarin pronouns are not marked for gender or animacy, and the markings for case do not change the common phonetic core. The only morphology that can be applied is the plural *-men* and the genitive *-de*. Compared to English, Mandarin makes lesser use of personal pronouns; instead, being a null-subject language, adult speakers tend toward using non-pronominal NPs or ellipsis. English declarative sentences must have an obligatory subject and use co-referential pronouns (Li & Thompson, 1981), which carry

more information than do their Mandarin counterparts -- gender, animacy, and case are all marked, and all these markings generally change the phonetic core.

Citing three studies (Hsu, 1987; Tseng, 1987; Xu & Min, 1992), Qi (2010) outlines the acquisition sequence of Chinese personal pronouns in the speech of monolinguals. First to emerge is the first person pronoun *wǒ*, second is the 2nd-person singular *nǐ*, and third is the 3rd-person singular *tā*. Qi notes, however, that these three studies cited above are "not much more than descriptive reports of chronological development, since, like many other Mandarin Chinese studies on pronouns, they do not supply MLU measure, do not adopt acquisition criteria, and do not describe the children's general syntactic development". Because of this, she writes, "comparisons with such data from Mandarin-speaking children can only be tentative".

With regard to English monolinguals, Qi (2010) cites Huxley (1970), Clark (1978), and Chiat (1986) in describing the chronology of personal pronoun emergence. Despite Qi's hesitation due to the descriptive deficiency in the Mandarin Chinese studies, the similarities in the personal pronoun acquisition sequences are remarkable. 1st person pronouns 'I' and 'me' appear first, at Brown's Stage I; the 2nd person pronoun 'you' appears second, at Brown's Stage I; and the 3rd person pronouns 'he'/'she' appear third, again at Brown's Stage I. Qi states that "the results confirm that linguistic complexity does not override other factors such as language-specific factors, input and intake, and pragmatic constraints. Further, she writes that the results of this study can be interpreted as evidence for the existence of some general underlying mechanisms in monolingual and bilingual native language development, without pointing out any particular theoretical framework.

Turning our attention now to J's development of the English and Mandarin pronominal reference systems, I first discuss Qi's criteria and evidence for establishing acquisition of a particular pronominal form. "A pronoun form was considered to have a consistently correct use when (1) it was only used correctly, or (2) when it was used incorrectly, but the correct uses passed certain independence criteria and the incorrect uses did not" (Qi, 2010). Independence, in this case, means that the pronoun functioned as an independent linguistic unit that the child was able to use freely in speech. This is in contrast to direct echoing of speech, or in the use of rote phrases, such as those in common greetings. "The pronoun form had to appear in at least two different syntactic contexts, at least one of which also occurred in combination with a different word, either a noun/pronoun or a verb/adjective" (Qi, 2010).

J produced his first personal pronoun in Mandarin -- the 3rd person singular *ta* -- at age 2;10;07, when his Mandarin was at Brown's Stage I. The next pronouns to appear, which came in at age 3;0;14 and 3;0;07 respectively, were the 1st person pronouns *mine* in English and *wo* in Mandarin. It is interesting to note that *mine* was J's first English pronoun, which came in while in English syntactic complexity was only at Brown's Stage I, while his Mandarin complexity was already at Stage III. This shows that, early in his development, J's Mandarin was slightly stronger than his English.

Perhaps the most interesting thing to note in the emergence of J's pronouns, however, is the fact that there were no instances of English 3rd person pronouns between the ages of 3 and 4 (Qi, 2010). Qi writes that this *could* be due to data sampling limitations, but that, upon closer examination of the recordings, it appears that J "preferred specifying 3rd person animate referents with non-pronominal NPs". Recalling

the tendency of Mandarin to prefer non-pronominal NPs or ellipsis, and that Mandarin was dominant in J's early development, there appears an interesting connection with the predictions made on areas 'vulnerable' to transfer in BFLA made by Hulk and Muller.

Addressing the issue of J's English 3rd person masculine/feminine singular pronouns, Qi (2010) writes that at later recording sessions between age 4;0 and 5;0 (where the bulk of Qi's study had concentrated on ages 1;07 to 4;0), there were 13 instances of English 3rd person gender-marked pronouns. It was at age 4;2;03, at Brown's Stage V, when 'he' and 'she' first appeared.

Despite the comparative simplicity of the Mandarin pronominal system, Qi (2010) reported that J progressed through three stages marked by "various non-target usages, such as the reversal of 1st person and 2nd person forms". J's development of English pronouns, however, seemed to be free of difficulty and error. Ultimately, J attained monolingual-like control over both systems, and although there were some variations in his timing of emergence, J achieved this control within the length of time generally taken by monolinguals (Qi, 2010).

The systematic errors children make in comprehension and production of pronouns are informative: they may tell us something about the child's construction of pronominal concepts or factors, which determine the development of the pronoun systems (Qi, 2010). The semantic concept of speech roles, Qi explains, is encoded by pronouns in the shifting point of reference with which pronouns are used. "Determining the referent of a pronoun (in comprehension) or selecting the appropriate pronoun (in production) requires shifting the relationship between referent and pronoun on the basis of who is speaking" (Qi, 2010).

Gathering the Findings and Drawing Conclusions for BFLA

While Muller (1998) mentions Gawlitzek-Maiwald and Tracy's (1996) theory that it could be the structural complexity of a particular construction, or lack of "perceptual saliency" which prevents early use, Qi (2010) writes in conclusion to her study of J that "the naturalistic data currently available seem to suggest that semantic complexity does not always override other factors in determining acquisition, since the order of acquisition does not always correspond with the order of complexity or the pattern of relationships in semantic analyses of pronouns (Chiat, 1986)". De Houwer (1990, 1995) also noticed that the formal complexity of linguistic forms is not in itself a determining factor in acquisition – rather, the more important consideration may be the quality and quantity of input.

Genesee and Nicoladis (2005), in review of other research in BFLA, write that in addition to syntactic development, other milestones of lexical acquisition in bilingual and monolingual children are also similar -- "bilingual children's rates of vocabulary acquisition generally fall within the range reported for same-age monolinguals". Underlying this similarity in performance is the ability of bilingual children to discern between their two languages at the earliest stages of development. Findings indicate that "infants possess the neuro-cognitive capacity to differentially represent and use two languages simultaneously from the one-word stage onward, and probably earlier" (Genesee, 2001). It is now thought that, following analyses of the syntactic organization of bilingual children, that it conforms to that of the target systems and generally resembles children acquiring the same languages monolingually (Genesee, 2001). In conclusion, White and Genesee (1996) remark that: "To date, the evidence indicates that,

for the most part, the linguistic systems of bilingual children develop autonomously and like that of monolingual children...We know from other research that, given sufficient exposure to the two languages, bilingual children can acquire the same grammatical competence in each of their languages as monolinguals in the long run".

Considering BFLA in the Study of Adult Second Language Learning

Bilingual children acquire their two languages in much the same way that monolinguals do. It is generally held that a cognitive endowment permits language acquisition in monolinguals, and given the evidence, it appears that this endowment also permits the acquisition of more than one grammar, resulting in a well-differentiated dual system.

In the next section, the studies on the change in this endowment over maturation will be reviewed. If it were found that those who begin the acquisition of a second language after some developmental period are not as successful (in terms of ultimate attainment) as those who began before that period, then we might suspect that whatever this endowment is, it somehow deteriorates with age. From the perspective that this endowment is comprised of access to the constraints of UG, then we might be interested in *how* this loss of access plays itself out in the acquisition of a second language. Furthermore, we ask whether there are other explanations outside loss of UG access that might explain this failure to reach native-like proficiency. Such questions are addressed by the debate on the critical period hypothesis as it pertains to SLA, which proceeds below.

The Critical Period Hypothesis in SLA

In most domains of behavior and learning, it is generally believed that competence and performance “increase with development, whether gradually or in stages” (Johnson & Newport, 1989). For example, expertise in music or an academic area is usually associated with age and maturity; it is highly remarkable when children come into adult-like competence in something like the cello or mathematics. However, a domain in which this age-to-mastery situation is reversed is that of language acquisition. Chiswick and Miller (2008) state: “It is generally agreed that learning a language is easier for younger than older people, where the measure of success is ultimate attainment”. In the study of age-related, or maturational, effects on language learning, some researchers have hypothesized a “critical learning period” (Chiswick & Miller, 2008).

Authors Johnson and Newport (1989, 1991), with regard to adult second language acquisition, characterize the critical period as the general, age-related decline in ability to learn a second language. Birdsong and Mollis (2001) elaborate, writing: “The level of attainment in L2A is constrained to a significant degree by the age at which learning begins. An ‘earlier is better’ rule of thumb captures the negative correlation between age of learning onset and eventual asymptotic performance”.

One of the first authors to promote the idea of a linguistic critical period was Lenneberg (1967), who, in the context of first language acquisition, hypothesized that language could only be acquired within the developmental time period spanning infancy to puberty. Johnson and Newport (1989) note that Lenneberg made no mention of whether the effects of this critical period would extend to second language acquisition,

after a single first language had already been learned. There is potential evidence for critical period effects in L1A from the rare cases of children isolated without linguistic exposure. Genie, as studied by Curtiss (1977), suffered insurmountable difficulties in acquiring language as a teenager, after having been largely shut away from human contact throughout her childhood. However, Johnson and Newport (1989) point out that there are potential confounds in the purported relationship between Genie's age of learning onset and ultimate attainment; her nutritional and cognitive deficits and lack of socialization make it harder to discern what exactly caused her linguistic impairment.

The previous section on bilingual first language acquisition discussed several studies and reviews (Qi, 2010; Muller, 1998; Hulk & Muller, 2000; Genesee & Nicoladis, 2005; Genesee, 2001), which all reported simultaneous child acquirers of two languages ultimately attaining perfect proficiency in both, despite slight differences from monolinguals in the timing and emergence of some forms (Qi, 2010; Muller, 1998; Hulk & Muller, 2000). Indeed, in Johnson and Newport's influential 1989 study on Chinese and Korean learners of English, which will be extensively reviewed below, the only group whose test performance was not significantly different from native controls were those who arrived in the United States from ages 3-7 years. In contrast, all other groups aged beyond 3-7 at time of arrival performed at levels variably below native controls – test scores were in strongly negative correlation with age of arrival among those who arrived after puberty.

But where Johnson and Newport (1989, 1991) proposed a monotonic decline in L2 performance that would be generalizable to all pairings of first and second languages, numerous other studies have since questioned both those points. Birdsong and Mollis

(2001) carried out a strict replication of Johnson and Newport's 1989 study, using native speakers of Spanish in place of Chinese and Korean speakers. Their results and discussion concluded that while there is a noticeable effect of maturation on ultimate performance, there is a significant degree of variability in later learners' (age of arrival >17) asymptotic performance, and that other factors aside from age of arrival may be implicated. Bialystok and Hakuta (1999), "unconvinced that performance differences for younger and older learners reflect more than simple correlation, and given alternative explanations for the patterns of data", conclude that there is no critical period for second language acquisition. Chiswick and Miller's 2008 examination of 2000 US Census data on self-reported English proficiency levels and age of arrival comes to the same conclusion – age of arrival in an immersive English-speaking environment, while inversely related with level of ultimate attainment, cannot alone be considered causal. Below, I consider studies that have reached conclusions both for and against critical period effects in SLA.

Support for the Critical Period Hypothesis – English-Specific Rules and Grammaticality Judgments

I base the majority of my review of the findings supportive of the critical period hypothesis on Johnson and Newport's 1989 and 1991 studies. By investigating the scores of Chinese and Korean learners of English on grammaticality judgment tests, Johnson and Newport compared age of arrival in the United States (AoA) with performance on 12 grammatical rules specific to English (1989) and on the purportedly universal principle Subjacency (1991). In brief, both studies reported a strong negative correlation between performance on test items and AoA – the older subjects were at the at first arrival in an

immersive English-speaking environment, the lower their test scores were. AoA was concluded to be the only significant predictor of test scores (Johnson and Newport, 1989, 1991).

Birdsong and Mollis (2001), while critical of Johnson and Newport's 1989 conclusions, remark that these findings and interpretations have been widely accepted, and the critical period hypothesis regarding maturational effects on ultimate attainment in L2A have been “promoted in mainstream L2 acquisition texts” (e.g: Gass & Selinker, 1994; Towell & Hawkins, 1994). In support of their account, Johnson and Newport (1989) cite previous studies from Oyama (1978) and Patkowski (1980), which reported superior test performance on L2 syntax questions in earlier learners over later learners. Oyama's study was pointed out by Johnson and Newport (1989, 1991) in particular, as its conclusions were in accord with their findings – that age of arrival is the sole factor to consider in predicting learners' ultimate attainment.

Johnson and Newport's 1989 study was motivated by 4 major questions, 2 of which are particularly relevant to the present paper:

- (1) Does age of L2A onset have an effect on the successfulness of grammar acquisition?
- (2) Which areas of the grammar are most and least difficult for mature learners (ie: AoA > 17)?

The subjects of the study were 46 Chinese or Korean speakers who learned English as a second language and were students or affiliates of the University of Illinois. Johnson and Newport decided upon those two languages for the subject population because of their typological dissimilarity from English – many morphological, syntactic,

and phonological contrasts, in addition to virtually no cognate words. No significant differences in test performance were found between the Chinese and Korean speakers – that is, subjects of the two L1 backgrounds averaged similarly on the experimental tests. Early arrivals were defined as those who had first been exposed to English in an immersive environment (the United States) before age 15; late arrivals were those who came after 17. Before coming to the United States, all the late arrivals had received between 2 and 12 years of mandatory formal English study in their home country – importantly, these pre-arrival years of English education were considered different from time spent living in an immersive English-speaking environment.

The grammaticality judgment tests were based upon 12 specific rules of English, involving (among others) determiners, pronominalization, and present progressive morphology. Subjects were presented with 276 sentences, which were either ungrammatical or grammatical, based on their violation of one (and only one) of the 12 rules. Of the 276 sentences, 140 were ungrammatical, being exactly the same as their grammatical counterpart the ungrammatical, with the exception of the single error. The test consisted of the aural presentation of the test sentences, with time for subjects to record their acceptability decisions after each.

Of particular interest to the present study, mastery of English pronominalization was tested through violations of case-marking, gender or number agreement, and forms of the possessive adjective. Specifically, gender and number agreement were tested through reflexive pronouns, which must agree with the nouns they are coindexed with. Because no mention was made of gender disagreement on third-person pronouns, it is assumed in this review that these were not examined in the test sentences.

Johnson and Newport (1989) reported that “both correlational and t-test analyses demonstrated a clear and strong advantage for earlier arrivals over the later arrivals”. Statistical breakdowns of the performance data and biographical information on the subjects led Johnson and Newport to conclude that these decreases were not the “result of differences in amount of experience with English, motivation, self-consciousness, or American identification”. In short, the only factor Johnson and Newport related to decreases in ultimate attainment (as measured by test performance) was the age of arrival in the United States. These results, they state in response to the aforementioned question (1), “support the conclusion that a critical period for language acquisition extends its effects to second language acquisition”.

As to the particular areas of grammar tested by the 12 English rules, Johnson and Newport note that “many of the late learners' errors do not appear to be random; rather, there are particular parts of the grammar that seem more difficult”. This is of particular interest in the study of second language learning, because, as they write, “when a subject marks an ungrammatical sentence as grammatical, (s)he must have failed to represent that structure under test as a native speaker would” (Johnson and Newport, 1989). This would constitute evidence for L1 influence, an issue which will be discussed in detail in the sections that follow. Correlation coefficients were calculated in the fitting of a regression line between age of arrival and performance on particular rule types. Reported correlations ranged from $r=.29$ (3rd person singular) to $r=.79$ (past tense), with pronominal errors correlated with AoA at $r=.73$ ($p < .01$). However, while decreased performance in pronominalization was strongly related to age of arrival, no further information was given on the three tested aspects of that rule. Therefore, it cannot be

determined from these data whether gender agreement in reflexive pronouns was an issue with this study's native Chinese and Korean speakers.

Johnson and Newport's 1989 study thus came to the conclusion that ability to learn a language declines through maturity, and “plateaus at a low level after puberty”, with the precise level of this plateau differing on an individual basis. Age of arrival was the only significant predictor of ultimate attainment, they reported, stating that “entirely non-maturational explanations for the age effects would be difficult to support”.

The Contested Maturational Account

Argumentation against critical period explanations for diminished attainment among adult L2 learners has focused on several issues. Bialystok and Hakuta (1999) argue that there are many confounding factors in the relationship between age of acquisition and ultimate attainment, where Johnson and Newport (1989, 1991) argued that AoA was the *only* significant variable. Among many possibilities, frequency of L2 use, L1-L2 pairing, motivation, and aptitude are examples of variables mentioned in the literature as potentially significant in predicting final proficiency (Bialystok & Hakuta, 1999; Chiswick & Miller, 2008; Birdsong & Mollis, 2001).

Bialystok and Hakuta (1999) define the critical period account for L2A as a “causal explanation for the differential success in acquisition of a second language by younger and older learners”, explaining that this account assumes “maturational changes in the brain that alter the possibility of successful acquisition”. But even while stating that children and adults probably approach the learning problem differently, and that there are likely to be “neurological differences in the brains of younger and older learners”, Bialystok and Hakuta (1999) remain unconvinced that these are sufficiently strong

justifications for age to be considered the *only* predictive variable. Strong formulations of the critical period hypothesis, then, might have to be abandoned in favor of a more holistic approach, if it were to be found that external variables played nontrivial roles, or if later learners were observed performing at native-like levels.

Taking issue with Johnson and Newport's 1989 assertion that critical period effects would be observed across all L1-L2 pairings, Birdsong and Mollis (2001) carried out a strict replication of the methodology used in their original 1989 study, using native speakers of Spanish instead. This greater syntactic similarity reduces the number of contrasting grammatical structures that must be acquired, and the presence of numerous cognate words certainly aids the learner – these factors motivated Birdsong and Mollis' choice for subject population language. Among later learners, they found a generally depressed, but much more variable, spread of grammaticality judgment test scores than those reported by Johnson and Newport. That is, while the replication yielded evidence for maturation-related performance declines, it also suggested that L1 influence is more important than had been previously claimed, and that “modest evidence of nativelike performance” was found. Unfortunately, Birdsong and Mollis gave no information on the scoring breakdown with regard to the 12 rule types of the original study; a detailed error comparison would be of great value to the discussion. Nevertheless, from these results, Birdsong and Mollis, then, in effect, argued for a less restrictive maturational account that included biographical factors and L1-L2 distance.

Finally, Chiswick and Miller (2008), carried out statistical analyses on 2000 US Census data between self-reported proficiency levels and a battery of 64 variables, including age of arrival, educational attainment, economic incentives, and attitudinal

factors as large categories. They also reached conclusions in opposition to purely maturational explanations – citing Hyltenstam and Abrahamson (2003), they report that factors such as quality of input and identity issues play important roles and interact with age effects, even at a low age. The influence of a number of lurking variables, high variability in the performance of later learners, and the lack of evidence for a clearly demarcated “sensitive” period all led Chiswick and Miller (2008), in accord with the studies previously reviewed, to conclude that age-only explanations for success in L2A are insufficient.

Universal Grammar, Transfer, and the Critical Period Hypothesis

With strong evidence to suggest that maturational changes in the language acquisition faculty cannot fully explain the differential success among later learners, I return now to the discussion of what these findings mean in the debate on the availability of Universal Grammar in adult L2A. If there is some marked change in performance that occurs in *all* learners who began after some age or age range, the question of the underlying change in language learning and storage mechanisms comes into play. Thus, if one body of evidence indicates that there is a universal decline across all L1-L2 pairings (Johnson & Newport, 1989, 1991), it is a closely related suggestion that this performance change is the result of the gradual loss of some endowment that previously permitted efficient and perfect acquisition of one or more linguistic systems. On the other hand, if another body of evidence were to indicate that declines were not necessarily general to all L1-L2 pairings, or if it was found that some learners attain very high, even native-like proficiency, then we might have to entertain a theory of SLA in which L2 learning is not mediated by UG. Under such a theory, learners would approximate the L2 grammar by

other learning and organizational mechanisms, including those previously known from experience with their L1.

Bialystok and Hakuta (1999) write that “if there is a language learning faculty that undergoes change as a function of maturation, neurological development, or atrophy”, then over time, observations of apparent transfer would be increasingly likely to involve surface features of individual languages, rather than abstract, syntactic properties of human grammars. This shift, they explain, could be a reflection of “the move away from the control over language acquisition residing in a specific language center that is both formally and functionally defined to more general cognitive processes”.

Native Versus Non-Native Language Learning: Different Situations and Divergent Performance

The general conclusion of the previous section was thus: although there's significant debate as to the particulars in terms of cut-off ages and the proportion of L2ers that progress to native-like proficiency, we can assume that second language acquisition is generally not as effective as first, or native, language learning. In discussing *why* this might be, in terms of differences in underlying acquisition and representational mechanisms, it would first be fruitful to compare the two learning situations. As Bley-Vroman (2009) writes, "foreign language learning contrasts with native language development in two key respects: it is unreliable, and it is non-convergent." Where normal children always acquire at least one language, whose grammar is equivalent to that of others in their speech community, the exact opposite can be said of second

language acquisition. As we have seen, there is no guarantee of successful L2 acquisition, and no guarantee that L2ers will arrive at grammars equivalent to those of others in similar learning situations. Thus, to address the learnability and psychological status of second languages, the acquisition system postulated must be one that is unreliable and does not converge (Bley-Vroman 2009).

The fact alone that the ending points of L1 and L2 acquisition are different strongly suggests divergences in the underlying language-learning process. However, there are a broad range of variables to consider in investigating what those divergences may consist of. Below, they are identified in four main categories:

- (1) Input quality and underdetermination -- the status of the projection problem in the context of SLA
- (2) L2ers as "blank slates" versus "already-imprinted" -- transfer effects and Universal Grammar
- (3) The nature of the interlanguage grammar
- (4) Grammatical processing in adult L2ers versus that of child L1ers and mature native speakers

Through discussion of these issues, theories of second language acquisition will be developed and reviewed, in anticipation of their explanatory potential for the present paper's learner data.

Infinite Grammatical Productivity with Finite, Flawed Evidence –

The Projection Problem in SLA

In native language learning, the TL input and system attained appeared to represent such a mismatch that an argument for an innate component in L1A was formulated. The /input/ was said to underdetermine the highly complex, infinitely productive system attained, and was furthermore subject to disfluencies which do not appear to be internalized in the developing L1 grammar. The L1 child also receives negligible negative evidence to aid in the revision of erroneous hypotheses. Rather, children appear to be able to adjust their underlying representations efficiently, and it was suggested that this process of revision is aided by the constraints of UG (White 1989). Examining the changed situation from the L2A perspective, input underdetermination and degeneracy, and the availability of negative evidence are discussed towards the development of a stance on whether the "instinct" for language learning is active, if even necessary, during adult second language learning.

At even low levels of L2 proficiency, learners can both produce and accept sentences that they have never heard before – that is, the L2 input underdetermines the IL grammar. This process of pattern extraction and generalization from a limited number of example sentences appears similar to that which takes place during L1A, although this doesn't necessarily mean that the psychological underpinnings are identical. In either L1A or L2A, it may be that components of the ability to learn languages, such as pattern-detection and recursive rule application, are general cognitive abilities co-opted by the language center (Bley-Vroman 2009).

On the other hand, White (1989) writes against such a theory for L1A, arguing that rules such as the distribution of reflexive pronouns could not be learned without some prior knowledge of how a sentence must be hierarchically structured. She extends that argument to the learning of second languages, citing findings (such as Coppeters (1986)) that may indicate that L2ers also internalize complex grammatical knowledge not clearly available in the input. In any event, we can affirmatively assume that this component of the projection problem of language acquisition applies to the SLA situation -- the L2 input underdetermines the system achieved. Thus, either UG or some other set of learning strategies enables adult L2ers to build a potentially subtle IL grammar from limited TL input.

It also seems that the L2 input received by learners is every bit as prone to disfluency, or *degeneracy* as that which L1 learners receive, although this assumption is not uncontroversial. Ellis (1986) suggests that the speech L2ers hear in the classroom environment or in interaction with speakers of the target language – *teacher-talk* or *foreigner-talk* – tends to be more carefully worded or simplified than the way the TL would be spoken between native speakers. Thus, L2ers would not hear so many filled pauses, false starts, slips of the tongue, or other such disfluencies in TL speech. Being relieved of the task of filtering out deprecated input might evoke an argument against the necessity of UG in L2A, because learners would no longer need to know what well-formed sentences must look like. However, White (1989) argues that if this were the case, no L2er would be able to attain high-level proficiency. After sufficient exposure, some proportion of L2ers progress to levels of proficiency that make such teacher or foreigner-talk unnecessary. Because using a language in any unconstrained setting will doubtless

result in speech errors of various sorts, it seems that L2ers would be totally unable to function outside the classroom if we imputed to them no ability to filter out deprecated input. After all, use of their native language presumably gave them plenty of experience in dealing with speech disfluencies, and incorporation of such errors as part of a developing L2 grammar does not appear to be attested. Whether or not the ability to filter out malformed input originates in innately-known constraints on sentence formation or in previous experience with the native language is an open question -- the point is that L2ers, like child L1ers, appear able to handle degeneracy in the input.

Where the issues of input underdetermination and degeneracy were more or less equally applicable in the contexts of both first and second language acquisition, the use of negative evidence represents an important difference between the two learning situations. In primary language learning, "knowledge of ungrammaticality is not acquired by means of negative evidence, and incorrect hypotheses do not have to be eliminated by means of correction" (White 1989). This is suggested to evidence some advance knowledge of linguistic structure in children -- activity of Universal Grammar. In SLA, however, language learning is frequently not entirely naturalistic -- classroom instruction and explicit correction play strong roles in the creation of learner hypotheses. And where child and adult language learners both revise their developmental grammars with input, children appear to do so with much greater efficiency than adults. Thus, we are left with a major point of dissimilarity between the two situations -- children make hypotheses and efficiently revise them with no assistance, while adults may require explicit instruction in both creating and revising hypotheses. Further, where children don't stop revising until their internal grammars are equal to those of others in their speech community, adults

may stop developing at any point, and remain indefinitely stuck with an immature IL (Selinker 1972).

The input problems that motivated a theory of Universal Grammar for native language learning are of altered nature when they are applied to SLA. While the TL input could still be thought of as underdetermining the grammar potentially attained, the question arises as to whether degenerate input handling comes from innate knowledge or experience with an L1. The non-availability of negative evidence in L1A, one of White's (1989) strongest arguing points for UG in native child acquisition, represents a major divergence with the L2 learning situation. These issues centrally concern the persistence of the unique capacity for language learning that drove child L1A. As has been related in the discussion of critical-period effects in second language learning, the ultimate outcomes of SLA are, for the most part, markedly below those of L1A. The fact that both the starting and ending points of first and second language acquisition are so different strongly suggests divergences in the underlying language-learning process.

Initial States, Transfer Effects, and Universal Grammar in Second Language Acquisition

As a means of reviewing differing viewpoints on the role of the L1 and action of UG in SLA, I will discuss two authors' hypotheses -- Full Access/Full Transfer (Schwartz 1992, 1998) and the contemporary formulation of the Fundamental Difference Hypothesis (Bley-Vroman 1989, 1990, 2009). In walking through the argumentation of Schwartz and Bley-Vroman, a nuanced understanding of the following questions will be

sought: (1)What is the L2 initial state?; (2)Where can we predict transfer effects? and; (3) Is UG active in SLA?

The L2 Initial State: Views on the Scope of L1 Influence

Expanding for explanation, question (1) concerns the psychological position in which adults begin the process of learning a second language -- do they view all TL input through the "filter" of their L1, or should there be minimal, even null, influence attributed to the L1? On one end of the spectrum, if L2ers begin learning as though they were "blank slates", and there were a null or minimal role attributed to it, we might expect that learners would never make errors that echo the structure of their L1. They'd be receiving no "push" in developing hypotheses about the TL input from their L1 -- rather, they'd be relying entirely either on problem-solving skills, Universal Grammar, or some confluence of the two. On the other end, we could, like Schwartz (1998), consider the L2 initial state to consist completely of the L1 grammar. Under this view, the learner *instinctively* transfers the entirety of the L1 grammar, meaning that properties of the L1 structure are likely to color the process of dealing with TL input and building an interlanguage grammar from it -- this is the "Full Transfer" in FA/FT.

There are intermediate positions on the "blank slates" to "already-etched" L2 initial state spectrum: Minimal Trees (Vainikka and Young-Scholten 1994, 1996) and Weak Transfer (Eubank 1993/94, 1996) both propose constrained types and amounts of L1 influence. Schwartz (1998) explains that Minimal Trees posits the transfer of L1 lexical projections (i.e: NP or VP structures) and their /linear orders/ into the L2 initial state, while functional projections (i.e: IP and CP structures) do not. Interlanguage development under Minimal Trees entails the learning of TL functional categories,

progressively working from lower to higher components of the sentence hierarchy -- thus, functional structures like IP are added before CP. Weak Transfer hypothesizes that both lexical and functional projections are transferred from the L1 as the L2 initial state, but that morphologically-driven syntactic information, such as verb inflection paradigms, are not. Thus, L2A under Weak Transfer revolves around the learning of morphology -- specifically, morphological paradigms.

Schwartz (1998) argues that both these theories are too restrictive in the degree of L1 transfer they anticipate. Longitudinal BFLA data from Haznedar (1995, 1997) evidenced transfer effects in a single 4 year-old's acquisition of English, where the Turkish SOV surface order was transferred in early production of English, which is SVO. Out of 22 samples of English speech taken over an 8 month period, the first 8 samples contained complete, or almost complete, usage of the Turkish OV structure. However, the ninth sample, taken just over two weeks after the eighth, demonstrated an abrupt and complete shift to usage of the English VO surface order -- from that point onward, the child's English surface order was almost entirely target-like.

This initial transfer is accommodated under both Minimal Trees and Schwartz's FA/FT. Under the Minimal Trees view, the constituent order of VP is transferred, and the process of acquiring an L2 VO structure entails acquiring a functional head to serve as a "landing site" for the verb raising out of VP, which is still head-final (or OV). This functional head was thought by Young-Scholten and Vainikka (1994, 1996) to belong to an underspecified, intermediate Finite Phrase, which should grow into a fully-formed Agreement Phrase after auxiliaries, modals, and appropriate inflectional morphology for the raised verb are stable. Schwartz (1998), on the other hand, argues out that functional

structure as instantiated in the L1 also appears to be transferred along with lexical projections to form the L2 initial state. Citing data from Haznedar (1995, 1997) on the same Turkish-English BFLA child's English negative placement, she argues that both verbal and nominal negatives show structure transferred from Turkish (i.e: *finish no*) in his earliest L2 development. Assuming Neg to be a functional head, this apparent transfer of neg-final ordering suggests that functional, as well as lexical, projections are transferred from the L1 to form the very earliest L2 grammar.

Another study reviewed by Schwartz (1998) in arguing for FA/FT was White (1990/91, 1991, 1992), who investigated the acquisition of L2 English adverb positions in adolescent (11 and 12 year-old) native speakers of Canadian French. Grammaticality judgment tasks, preference, and elicited production showed pervasive difficulties in handling English frequency adverbs in sentence-internal position. French and English use the opposite pattern with regard to adverb placement, relative to the verb -- the former has an SAdvO ordering ("Pierre mange *souvent* le fromage"), and the latter an SAdvVO ("Pierre *often* eats cheese").

As predicted under both Weak Transfer and FA/FT, learners appear to be influenced by their native French in readily accepting and producing English sentences with ungrammatical SAdvO structure. Weak Transfer (Eubank 1993/94, 1996) predicts that both lexical and functional projections will transfer from the L1 to form the L2 initial state, but that morphologically-driven syntactic information – strength of verbal inflection paradigms, for example – does not. This is because Eubank assumes raising (in this case, verb raising) to depend on the values of inflectional features, which are determined by morphological paradigms – for instance, English has a weaker verbal

paradigm, where French has a stronger one, and this verbal paradigm strength is associated with finite verb raising (Schwartz 1998). That is, because French has a strong verbal paradigm, there is verb raising, and because English has a weaker paradigm, there is no raising of the finite main verb. Thus, in order to acquire English SAdvVO ordering, verbal morphological paradigms must first be properly acquired.

But again, Schwartz (1998) sees no need to assume that strengths of morphological paradigms from the L1 do not transfer as part of the L2 initial state. If, under Weak Transfer, L1 lexical and functional projections transfer to form the L2 initial state, then we would expect L2 morphological paradigms to be built upon a "blank slate". That is, among L2ers of differing L1 backgrounds, we would expect to see no L1-related differences in the acquisition of morphological paradigms or movement related to it. Adult L2er data from Parodi et al. (1997), however, appears to show just such L1 group-related differences in the acquisition of German nominals, where L1 backgrounds represented in the subject population were Korean, Turkish, Italian, and Spanish. In German, Korean, and Turkish, adjectives must precede the noun, where in Italian and Spanish, adjectives follow the noun. Schwartz (1998) cites a base underlying structure configuration that all these languages share, in which NP consists of AdjP on the left and NP on the right. Surface orders for German, Korean, and Turkish thus reflect this base order, while Spanish and Italian requires a raising of the noun to some functional head, which results in the Noun-Adjective ordering.

Speakers of Korean and Turkish were not, at any point, found by Parodi (1997) to incorrectly produce the Noun-Adjective ordering in using German, because, as Schwartz (1998) writes, such an ordering would not be generable in their L1, and there would be no

evidence from German to induce them to do so. On the other hand, the Italian and Spanish speakers appear to contradict evidence from L2 German in using their L1 Noun-Adjective orderings – this effect persists from the initial stages of interlanguage and beyond. Because Eubank (1993/94, 1996) assumed raising to depend on the values of inflectional features (which surface as weak or strong morphological paradigms), Schwartz points out that these data constitute evidence against Weak Transfer. It appears as though native speakers of Italian and Spanish transfer their L1 inflectional features, where Eubank would have predicted only lexical and functional projections of the L1 to influence L2A.

In light of these descriptive inadequacies of Minimal Trees and Weak Transfer, Schwartz (1998) proposes the action of an instinct for second language learning, basing her theory in Pinker's (1994) conception of such an instinct for native acquisition. However, where Pinker concluded that age is the key factor in explaining reduced success in L2A, Schwartz holds that differences between initial states in L2ers are the source of these divergences in learning outcomes. Maturational accounts such as Pinker's generally cite a "dismantling" of the psychological constructs that guided L1A as being responsible learners' for pervasive difficulty in post-pubescent, non-native language acquisition. Schwartz, on the other hand, argues that this body of innate knowledge is fully active in L2A, and that it is complete transfer of the L1 as the L2 initial state that induces such patterns of variation in SLA outcomes. She writes for the dual nature of the 'second language instinct': First, she assumes there to be an /instinct/ for L2ers to transfer knowledge from their L1 grammar, to the result that the entirety of the L1 grammar represents the L2 initial state. Thus, referring back to question (2) above, which asked

/where/ we might expect transfer effects to occur, Schwartz (1998) has presented evidence to suggest that we can expect L1 transfer effects wherever there lies some structural difference between the L1 and the L2. The reasons for this psychological "primacy" of first languages over subsequently learned ones remains an open question -- all that can be potentially assumed at this point is that *any* grammatical property of the L1 might be reflected in L2 developmental (or interlanguage) grammars.

The Status of UG in L2A

The second half of Schwartz's FA/FT theory, however, involves renewed activity of Universal Grammar, which is argued to constrain the forms of interlanguage grammars and enable the learner to acquire L2 grammar beyond the familiar structures of the L1. Throughout the literature reviewed thus far, there has been substantial reference to the effects of Universal Grammar access (or non-access) in second language acquisition. But these references become problematic, because conceptions of what might comprise this innate base of linguistic knowledge have changed significantly. Bley-Vroman (2009), in working towards a contemporary formulation of the Fundamental Difference Hypothesis, makes central the issue of the properties that are attributed to UG, and the effects it is expected to have in first and second language acquisition.

As Bley-Vroman (2009) indicates, models of Universal Grammar as embodied in the Government-Binding/Principles and Parameters framework incorporated "extensive systems of built-in knowledge, thus minimizing what would need to be acquired and radically constraining the range of hypotheses that the learning device would need to consider". For instance, Johnson and Newport (1989, 1991) concluded that UG access was reduced, if not eliminated, in adult L2ers based on test subjects' acceptance of

ungrammatical English sentences violating Subjacency -- a principle from GB/PP that placed restrictions on element movement based on the hierarchical structure of the sentence. Such conclusions were thus necessarily rooted in a particular understanding of Universal Grammar, one whose principles and processes of language acquisition were thought to be distinct from other non-language-specific cognitive systems. On the "rich" nature of GB/PP-era Universal Grammar, Bley-Vroman describes subtheories with their own particular properties (such as bounding, binding, or theta theory), parametric "switches" and abstract parameters with ways to set their values – all of this detail was supposed to assign the language learner as little independent work as possible.

Developments in learning theory, psychology, mathematics, and philosophy have evoked changes in the way natural language is understood, and the Minimalist Program (Chomsky 1995, 2000, 2004, 2005) is a result of this. Contemporary conceptions of Universal Grammar increasingly assume the human language faculty to consist of only the most basic, fundamental functions: the creation of mappings between sound and meaning, lexical combination, recursive structure-building, and "some sort of displacement property to account for element movement" (Bley-Vroman 2009). Subjacency, and other such "formerly elaborate subsystems" are increasingly thought to be attributable to these basic mapping and structure-building capacities. Indeed, studies cited by Bley-Vroman report good reason to suggest that Subjacency, previously thought to involve deep and complex syntactic knowledge, actually has its roots in "some combination of processing and semantics-discourse structure" (Hawkins 1999, 2004).

What ever they may consist of, Schwartz (1992) argues that if the principles of Universal Grammar guide the process of the SLA, we would see *similar developmental*

sequences among both child and adult L2ers – that is, between BFLA children and L2-learning adults, where L1s are held constant. Problem-solving, or non-UG-mediated, approaches in adult language-learning would presumably result, then, in *divergent developmental sequences*, and interlanguage grammars that might violate whichever formal constraints we assume belong to UG.

Schwartz (1992) supports her purpose with data from Cancino, Rosansky, and Schumann (1978), who studied the acquisition of L2 English negation by native speakers of Spanish – two children, age 5; two adolescents, ages 11 and 13; and two adults. It was found that of the six subjects, *none* deviated from the following developmental sequence, in which the first phase represents full transfer of the Spanish negation structure:

- I. Neg + Verb
- II. *Don't* + Verb/Aux
- III. Aux + Neg
- IV. Analyzed *don't* (that is, target-like use of *don't*)

The conclusion drawn from this was that, because all three learner groups demonstrated the same acquisition sequence, the same underlying learning and representational mechanisms must be at work. However, Schwartz (1992) also notes commentary on this line of argumentation, which criticizes the use of negation structure as tests of L1A-L2A similarity. Even those adult learners who struggle greatly to acquire other aspects of the TL grammar are still generally able to learn L2 negation patterns in much the same way as native-speaking children. Thus, it is suggested that this might not be the most convincing evidence for the persistence of UG access in adult L2A.

The other sets of data discussed by Schwartz (1992) in support of UG in L2A

came from studies of L2 German word order acquisition among native speakers of Italian (Pienemann 1980, 1981), Portuguese (Clahsen 1984), and Spanish (Meisel, Clahsen, and Pienemann 1981). Although the L1 backgrounds of the subject population were different, the three Romance languages shared features pertinent to the study – all are null subject, S(I)VO, and allow preverbal clitics. Schwartz, then, assumes that for the purposes of the study, all subjects could be considered to have uniform L1 backgrounds. Again, the same developmental sequence was reported for all groups studied:

I. S V[+finite] (V[-finite]) O

II. (Adv/PP) S V[+finite] O

III. S V[+finite] O V[-finite]

Where particles, participles, and infinitives are in clause-final position

IV. XP V[+finite] S...

Subject-inversion/verb-second

V. S V[+finite] (Adv) O

VI. ... daß S O V[+finite]

Represents the distinction being made between root and embedded clauses.

These acquisition sequence results, in line with those above, are argued by Schwartz (1992) to evidence the action of UG in adult SLA.

However, she raises another key point regarding the interpretation of such data: sequence similarities may not be enough to conclusively prove that UG acts in L2A. It must be shown that an analysis of each stage can be accommodated within the constraints of UG – that interlanguage grammars conform to some sort of UG-based structural

criteria. But as was prefaced by the discussion above, this is problematic – the quantity and quality of pre-existing linguistic knowledge attributed to UG has not been conclusively defined; claims about the possible forms of interlanguage grammars have necessarily been based in their authors' assumptions on its psychological contents.

Clahsen and Muysken (1986, 1989) argued against the action of UG in SLA on the grounds that L2ers do not necessarily need anything but general learning strategies to approximate the TL grammar. That is, adult learners build grammars that may generate productions which, on the *surface*, appear to be target-like, but whose derivations are deviant from those that a native speaker would compute. Thus, there are plausibly two different types of language-learning going on between native and non-native learners – native speakers presumably had access to UG as children, and thus compute the same syntactic derivations as others in their speech communities. Adult L2ers, on the other hand, do not have have access to UG, and thus might be predicted to maintain underlying non-target-like grammars and compute non-native-like derivations, despite the fact that some may be able to approximate the TL at a high level. This idea that target system-like interlanguages can be achieved through approximate, possibly *shallow* grammars was further developed by Bley-Vroman (2009), in his contemporary reformulation of the Fundamental Difference Hypothesis.

The Fundamental Difference Hypothesis

Bley-Vroman proposed the original Fundamental Difference Hypothesis (FDH) in 1989/1990, during the height of GB/PP-based SLA research. Under this view, it was assumed that rich UG and parameter-setting as conceived of in GB/PP was *only* active in native language learning. It proposed that where children rely on UG to efficiently create

hypotheses about the TL grammar, adult L2ers lack UG access and thus their L1 grammar is the principle source of learner expectation on how the L2 input will be formed. Further L2 development was facilitated by general learning and information organization mechanisms, employed in a linguistic context. This elimination of UG and parameter setting from L2A was intended to accommodate the fact that SLA, in contrast to native language learning, is neither reliable nor convergent. That is, where normal children *always* acquire at least one language (reliability), whose underlying grammar is, for all intents and purposes, equivalent to those of others in their speech community (convergence), the adult L2A situation is exactly opposite.

Where the core elements of the logical problem of L2A remain unchanged from the time the original FDH was formulated, Bley-Vroman (2009) explains that other specific proposals of the theory rest on assumptions that have, in recent years, been critically undermined. As was described above, rich-UG theory is being increasingly supplanted by a minimal-UG, in which we assume the human language endowment to consist of only the most fundamental psychological structures needed for linguistic processing. Abandoning rich-UG and language-specific processes, Bley-Vroman (2009) proposes that:

- (1) Interlanguage grammars make central use of *patches*, which are, in the absence of ability to create abstract syntactic representations, superficial and situation/language-specific constructs built by the learner to approximate the TL grammar.
- (2) Processes not specific to the language center are used in SLA.
- (3) Online processing of foreign language relies heavily on *shallow parses* during comprehension.

Bley-Vroman's conception of patching is drawn from observed interpretation phenomena in native speakers, where unusual grammatical situations may result in the creation of specific, conscious rules for parsing input that cannot be handled by familiar routines. A study by Morgan (1972) on the interpretation of verb agreement in native speakers of English reported that sentences such as "Are/Is (either) John or his parents here?", or "Are/Is (either) John's parents or his wife here?" sometimes confused test subjects. Morgan writes that native speakers maintain a relatively simple principle of agreement that is robust enough to handle the majority of cases. However, complex cases of verb agreement as demonstrated in the above sentences seem to "boggle" the parsing mechanism – thus, Morgan hypothesizes that a patch is built as a sort of *extension* to the basic principle. In native speakers, Bley-Vroman thus assumes that patches are created on an ad hoc basis to handle situations in which normal processing routines struggle to handle unusually complex input.

Lasnik and Sobin (2000) developed a theory of *viruses*, which are very similar to Bley-Vroman's (2009) conception of patches. Again, drawing from grammaticality judgment task results in native speakers, Lasnik and Sobin demonstrated significant individual variability in the interpretation of particular structures. On the nature of grammatical viruses, they explain that "viruses comprise a subtheory of the Minimalist Program, distinct from the core system, though interactive with it" (2000). That is, although viruses are not a part of the deep, abstract grammar that forms the core competence of a native speaker, they are *linguistic*.

Bley-Vroman (2009) connects these native-speaker phenomena with the fact of non-convergence in SLA – if developmental grammars are thought of as individualized

and variable, then patch-driven L2A could be a potential source of this non-convergence. He proposes that where native language acquisition builds a parsing mechanism with “holes” that are few and far between, second language acquisition builds a parsing mechanism that is liable to be riddled with such knowledge gaps. Thus, where patches play a peripheral role in handling unusual native-language input, Bley-Vroman holds that they may a more central role in handling L2 input, although this is certainly an open research question. Review of the current FDH's notion of grammatical patching in L2A was carried out for the purposes of establishing a non-UG-mediated theory of second language learning. The remaining portions of the new FDH illustrate the intersection of studies in cognitive systems and linguistic processing in SLA; they are introduced to present the FDH in full, but their contents, particularly the third, will find fuller expansion in discussion of the similar Shallow Structures Hypothesis of Clahsen and Felser (2006).

On the second prong of Bley-Vroman's contemporary formulation of the FDH, it is explained that the basic functions that comprise minimal UG may not necessarily be the sole property of a language-specific cognitive module. “To say that the *processes* of the language faculty are not unique to the language faculty is not to say that a language module does not exist”, he writes. Rather, there may be a center in the brain that combines general processes, co-opting them for a particular purpose in much the same way as a piece of software makes use partial of the larger internal instruction set and memory management system of a computer.

Where previous, rich-UG-era study assumed that its intricate psychological constructs must belong to a specific module of the brain, the idea that many of the

language faculty's processes are not exclusive to this module is now being more popularly explored. Chomsky (2005) indicates that a modular view of learning need not entail that the component parts of that module are unique to it – that “we need no longer assume the means of generating structured expressions are highly articulated and specific to language”.

Finally, Bley-Vroman (2009) cites increasing evidence to suggest that language processing (native *and* non-native) makes use of both “shallow” and “deep” mechanisms, but that foreign language handling employs much more of the former than the latter. Clahsen and Felser (2006), with findings indicating different types of neurological activity between native and non-native language processing, propose that for L2ers, syntactic representations computed during comprehension are “shallower and less detailed than those of native speakers”. As previously mentioned, native speakers of a language are able to compute abstract syntactic representations of incoming linguistic material in an efficient fashion. Second language learners – even the highly proficient ones – lag greatly in this ability. In concord with this observation, Bley-Vroman writes that there is an increasing consensus that “some kind of dual-mechanism model will have a place in accounting for differences between native language acquisition and adult foreign language learning”.

Toward a Set of Guiding Assumptions – A Summation of the Debate on Transfer Effects and Universal Grammar in SLA

Reaching all the way back to the introduction of this section, in the interest of summarizing toward a workable theory of L2A, I reiterate the third driving question: *is UG active in SLA* ? Until a review of the evolution of UG and how it has been proposed

to act in L1A and L2A was carried out, I felt that this third issue could not be properly addressed.

Prior to the shift toward a minimalist perspective on the human language faculty, UG activity in SLA was thought to be evidenced by congruent developmental sequences between child and adult learners of a given L2 (assuming uniform L1 background), and by the constraint of L2er grammars according to the formal limits of UG (Schwartz 1992). However, there was strong opposition by Clahsen and Muysken (1986, 1989) to the notion of UG in SLA on the grounds that congruent developmental sequences could not be conclusively established, and, more importantly, that L2er syntactic derivations may deviate from those computed by native speakers in a way that would violate some formulation of UG. The first of Schwartz's (1992) supporting data sets covers the acquisition of negation structures, which are, as commentary mentioned, not likely to provide conclusive evidence. Further, the fact that there was such extended dispute over the German word order acquisition data in Schwartz (1992) makes it difficult to draw a workable conclusion with regard to issue of UG access in L2A. In light of changes in the way the components of the language faculty are conceived, it is similarly difficult to determine whether or not interlanguage grammars are constrained by UG.

Drawing evidence from BFLA studies and investigation of the critical period hypothesis in addition to what has just been discussed, I have determined the reviewed material sufficient to synthesize a working assumption on UG availability and transfer effects in SLA. These assumptions on the nature of L2 learning in adults will guide remaining discussion of interlanguage grammars and L2 processing, and will be applied toward analysis of the learner data gathered in the present study's investigation of

variable transfer effects in SLA.

My assumptions on UG, in response to question (3) are thus:

(1) Universal Grammar, as a body of innate linguistic knowledge and set of abstract guides for language learning, whose content has not yet been conclusively defined, has only been shown with any degree of consensus to be active in native language acquisition (both monolingual and bilingual). Given the arguments levied against its action in L2A by Clahsen and Muysken (1986, 1989) and the alternative explanation for the process of SLA by Bley-Vroman (2009), I assume that UG is not active in L2A. Bley-Vroman indicates that L2A could plausibly be facilitated by general cognitive systems employed by the language module, which interact with pre-existing linguistic knowledge in the form of the L1.

My assumptions on L1 transfer, in conference with Schwartz (1992, 1998) and Bley-Vroman (1989, 1990, 2009) are these:

(2) The entirety of the first language's grammar transfers as the L2 initial state and this transfer is instinctual (Schwartz 1998). The grammar of the first language molds learner assumptions about the forms that the second language can potentially take (Bley-Vroman 2009), and effects of L1 structural influence may persist from the initial stages of L2A onward.

In short, I base my working assumptions on an acceptance of the Fundamental Difference Hypothesis as presented in by Bley-Vroman (2009), with additional acceptance of Schwartz's (1998) notion of 'Full Transfer'. The nature of interlanguage grammars and the differences in processing between native and non-native languages will next be discussed, taking these assumptions as foundation.

Somewhere Between the L1 and L2: Interlanguage Systems and Their Variable Nature

Having established some basic assumptions on the L2 initial state, transfer, and the question of whether L2ers have access to the same psychological mechanisms that guided child language-learning, I now turn the discussion to the nature of interlanguage (IL) grammars. The IL can be characterized as the result of learners' systematic approaches to the L2 (Adjemian 1976; Corder 1973; Selinker 1972) – an internalization of both fully-formed and immature approximations of the target system. From those making their very earliest attempts to the *fossilized* grammars of the highly proficient, the interlanguage can be said to represent the learner's current attempt at organizing the TL input (White 1989).

Portions of the IL may be immature – that is, generating non-target-like productions – and those immature portions may never grow to become better approximations of the target grammar. It seems logical to assume that ILs would become increasingly good approximations of the TL with continued exposure to input, but, as Selinker (1972) indicates, IL grammars often stop developing at some point short of native-like productivity and remain in that state indefinitely – this is fossilization. Fossilized IL grammars can exhibit persistent violations of TL norms, which seem to resist correction even after years of immersion in an L2-speaking environment. Importantly, fossilization effects are noted to occur particularly in the IL grammars of adult L2ers (Selinker 1972). Thus, where children are apt to resolve issues in their developing L2 grammars efficiently, adults may simply fail to continue developing.

Acquisition of a particular construct is evaluated by examination of the

interlanguage, but as is noted by Tarone (1983) and White (1989), IL performance demonstrates a substantial degree of variability. Because performance factors can impinge on access to even fully-formed components of the IL grammar, a certain margin of error-tolerance should be permitted in determining the status of a construct in a developmental grammar. That is, where forces like stress, exhaustion, or anxiety are well-known causes of performance issues in the use of native languages, these effects are even more pronounced in the production of second languages.

Lakshmanan and Selinker (2001) report that a widely adopted criterion in the literature is Brown's (1973) 90% level, in which a rule is considered fully-formed if the learner uses it correctly at least 90% of the time. Lower rates, however, such as 80% or 60% have also been used in SLA research – high suppliance rates can be used to determine *mastery* of a form versus *knowledge* of it (Hyams & Safir 1991). Even in establishing mastery of a form, there is some empirical leeway given in suppliance rates to allow for the effects of performance variables, which affect production of developing grammars much more strongly than native ones.

The notion of systematic performance variability is dealt with by Adjemian (1981), who makes a crucial connection between transfer and L2 processing in studies of interlanguage production. There is a difference between the set of sentences a learner would deem grammatical and the set of sentences that the learner themselves ends up producing. Performance constraints are known to affect interlanguage production, but the actual results it might be expected to generate include L1 influence and overgeneralization, in addition to other failures related to item access in the bilingual mental lexicon (Wolter 2001). Of particular interest to the present study is the first of

these potential error types, which are variably present in otherwise high-proficiency speakers' TL production. This is hypothesized by Adjemian (1981) to occur because performance constraints render the interlanguage grammar *permeable* – that is, vulnerable to influence from other rule systems.

“The learner will, on occasion, produce sentences which are ungrammatical with respect to his IL grammar. That is, the internal systematicity of his IL grammar will be violated. This phenomenon is due to the fact that IL is permeable (Adjemian 1976), permitting the rules of the L1 to creep into the system, and also permitting overgeneralization of its own (IL) rules.”

Adjemian (1981)

Thus, learner utterances do not come from underlying IL competence alone; they also stem from other linguistic systems that have “invaded” the IL during performance, possibly due to the effects of situational difficulties (ie: performance constraints).

With the previously reviewed literature and Adjemian's key observations on the permeable nature of IL systems, we can now imagine a scenario like the following: A native speaker of some language X has learned a second language Y in adulthood, after their child-like ability to efficiently acquire languages has faded. Language X differs from Y with regard to some particular property, and, following from the assumption of complete L1 transfer into the L2 initial state, the learner had at one point shaped their expectations about the L2 grammar through the lens of this and other L1 properties. Some type of comparatively shallow or underspecified representation of the L2 exists as the learner's interlanguage, but this IL system has grown strong enough with continued effort such that it represents a good approximation of the L2. The learner's IL grammar,

although not as abstract or “deep” as that which a native speaker would maintain, produces sentences that are usually acceptable according to TL norms. Suppliance rates for the particular property of the L2 could be near 100%, ostensibly indicating mastery of the form, and the learner would easily judge L2 sentences with the transferred L1 form as ungrammatical. But sometimes they slip and make an error that echoes this structural property of the L1. The reason for this, if we combine Adjemian's theory with our running assumptions, is that the IL is, in its “patched”, shallow representation, prone to infiltration by previously-learned linguistic systems. Thus, patterns from the L1 are occasionally superimposed on production of the L2 when, for some indefinite reason, access to the TL system is disrupted, and the learner accidentally “defaults” to a property of their L1 grammar, which is presumably more stable in its internal representation.

In summation, there are three major points to take away on the nature of interlanguage systems. The first is that, as stated by Selinker (1972), fossilization effects commonly occur in the IL grammars of adult L2ers, meaning that non-target-like portions of the IL can persist despite substantial L2 exposure. Second, variability in production is an expected byproduct of the IL system. Where native speakers are assumed to almost always adhere to language norms, a wider range of suppliance rates are permitted for L2ers. That is, they are considered to have mastered an L2 property if they use it correctly at least 90% of the time. When a particular property is used erroneously in some case and the error appears to stem from the property's instantiation in the L1, Adjemian's observation comes into play. This third main point is that IL grammars are prone to influence from the L1 grammar. This is because IL grammars are *permeable*, or prone to infiltration by other rule systems. It is plausible that this is due to some cognitive

“default” onto a more stable grammar when production demands force the learner to generate sentences under compromised circumstances.

The final idea that second languages are dealt with in real-time cognitive processing in a fundamentally different way than first languages will next be discussed through the work of Clahsen and Felser (2006). We've seen evidence from a wide variety of studies that all indicate SLA to be generally less effective than native language learning, and that IL grammars can be considered less stable than native ones. Foreshadowing the next section, it may be that adult L2ers maintain comparatively shallow representations and compute more linear (or less syntactically detailed) parses during online production because native and non-native languages are managed differently in the brain.

Differences in Online Processing of Native and Non-Native Languages:

Shallow Representations and Semantic Mappings in L2ers

Clahsen and Felser (2006) undertook a comparative study of real-time linguistic processing between learners and mature native speakers of a given language, where the learner population consisted of both L1A children and L2 adults. The motivation behind partitioning the subject groups in this fashion was to investigate differences in how L1A children and L2 adults process TL input as opposed to adult native speakers – although data on native language processing is common, there is reportedly a relative dearth of information on the online handling of TLs among learners. Of particular interest to the present study is the comparison of adult learners' processing of TL input to that of child

learners. If studies indicate different types of activity between children and L2 adults during handling of the TL, this could lend support to the view that different psychological mechanisms govern child L1A and adult L2A, as the two would be handled by the brain in fundamentally different ways. In short, this is precisely what was found. Clahsen and Felser write that the “preliminary picture that has emerged thus far suggests that there are characteristic differences between the way mature monolingual speakers, child first language (L1) learners, and adult second language (L2) learners process the target language”.

General processing differences among the three learner groups include online integration of multiple information sources; automaticity; L1 influence in adult L2ers; and the availability of certain processing mechanisms (Clahsen and Felser 2006). Regarding the first of these differences, studies by (Felser, Marinis & Clahsen 2003; Traxler 2002; Tueswell, Sekerina, Hill, & Logrip 1999) indicate that, in parsing temporarily ambiguous sentences, children make greater use of structural information than lexical-semantic or contextual cues. Mature adult speakers were shown to involve all three types of information in making parsing decisions, while adult L2ers importantly appeared to rely most on non-structural information, such as context of utterance (Felser, Roberts, Gross & Marinis 2003; Papadopoulou & Clahsen 2003). It is suggested by Clahsen and Felser (2006) that children may prefer structural information in deciding on interpretations for ambiguous sentences because of limitations in working memory. That adult L2ers relied principally on extra-linguistic information suggests that they lack the ability to deal with TL input in a syntactically “deep”, or abstract, manner.

Automaticity of processing is another characteristic divergence in language

handling among the three subject groups. Event-related potential (ERP) investigations of how adult L2 learners handled semantic anomalies and pronounceable non-words in the TL reported N400 effects, which represent recognition of potential words or other meaningful stimuli (Ardal, Donald, Meuter, Muldrew & Luce 1990; Weber-Fox & Neville 1996; Hahne 2001). These N400 effects had a delayed peak latency compared to mature native speakers of the TL, simply meaning that it took L2ers longer to register the fact that something was not right with the anomalous TL input. The ability to automatically recognize semantically unusual or mal-formed input thus appears only to exist in mature native speakers, although L1 childrens' responses were not investigated, barring potential comparison.

Illustrating the interrelatedness of findings in psycholinguistics (the processing of language) and the study of SLA (the acquisition of linguistic competence), Clahsen and Felser (2006) explain that there have been contradictory results in studies on L1 influence in online L2 sentence processing. Where studies by Juffs (1998) and Frenck-Mestre & Pynte (1997) demonstrated evidence of L1 influence on L2 sentence processing strategies, others failed to replicate those results (Felser, Roberts, Gross & Marinis 2003). Such division among findings on L1 influence on L2 processing in the psycholinguistics literature echoes the division among findings in studies of L1 influence in the learning of second languages. Ullman (2001) argued that where representation and processing of native languages involves two different memory systems – the mental lexicon, based in temporal lobe structures, and a procedural memory responsible for combinatorial rules located in the front of the brain. Handling of non-native languages, however was held to be dependent upon lexical, or *declarative* memory. Translated into the language of the

SLA studies reviewed thus far, Ullman's psycholinguistic findings essentially mean that native language handling relies upon the interface of a mental lexicon and abstract syntactic knowledge. Non-native language, on the other hand, may be dealt with like a set of linear orderings, or other such syntactically underspecified representations. These theories make sense in light of the portion of Bley-Vroman's (2009) hypothesis which states that second language use makes frequent use of explicitly-remembered “patches”, but see below where Clahsen and Felser argue that “declarative-only” accounts of L2 processing are too simple.

The general conclusion of Clahsen and Felser (2006) was that children's parsing of the TL is carried out via the same mechanisms as mature native speakers (Crain & Wexler 1999; Fodor 1998). Children's preference for bottom-up, 'local' information-based parsing and generally reduced processing efficiency has been attributed to their comparatively limited working memory capacity. So the question arises as to whether the situation is similar among adult L2 learners – that is, whether adult L2ers handle TL input like native speakers, with L1/L2 differences attributable to processing-external factors such as incomplete TL knowledge, limitations in working memory, or L1 transfer effects.

First, Clahsen and Felser (2006) note that proper parsing of a TL string would appear to depend upon the strength of L2 grammatical knowledge. If learners are unaware of, or have poor control over, the “relevant combinatorial rules and grammatical constraints” of the TL, then the immature IL grammar may prevent native-like handling of the TL grammar. However, evidence from Papadapoulou and Clahsen (2003) suggested that even L2 adults who score like native speakers on grammaticality judgment tasks and language proficiency tests are still apt to demonstrate non-target-like processing

of TL sentences. Thus, where we could certainly expect low-proficiency L2ers to struggle with target-like L2 processing, it also seems that high-proficiency L2ers do not handle input in the same way as mature native speakers. This suggests that, although their knowledge of TL norms may be par with that of a native speaker, there is something underlyingly different about how that knowledge is represented by the second language learner.

On the issue of L1 influence in L2 parsing decisions, studies by Felser et al (2003) and Papadapolou & Clahsen (2003) are cited as providing evidence *against* the transfer of L1 ambiguity resolution preferences. Their results showed that subjects from mixed L1 backgrounds made similar decisions in processing L2 sentences, which suggests that the L1 does not have a strong effect on L2 parsing. However, other findings of studies mentioned by Clahsen and Felser involving agent-identification tasks suggest that learners in the beginning stages of SLA apply L1-specific interpretation strategies to the L2. These latter results echo the aforementioned predictions made by Schwartz (1998), to the effect that there is an instinctual transfer of the entire L1 grammar in the L2 initial state. The conflicting findings on transfer of L1 parsing preferences, however, prevent the formulation of a conclusive position.

In any event, Clahsen and Felser (2006), summarize that differences between the sentence processing of mature native speakers and adult L2ers cannot be attributed to shortages in working memory or differences in processing speed, L1 influence, or incomplete interlanguage grammars. They also, while briefly entertaining Ullman's (2001) account of declarative memory-based L2 knowledge, ultimately reject such hypotheses as being too simple. For instance, if procedural memory is not involved in

L2A, then L2ers would not be able to handle regular and irregular inflectional morphology in online processing. But Hahne et al (2003) demonstrated with that L2ers do indeed handle both types of inflectional morphology (in this case, noun plurals), suggesting that both procedural and declarative memory are active in L2 processing, and that Ullman's 'declarative-only' L2 knowledge theory thus imputes too little to the adult L2er's competence.

In light of the above issues, in which only partial explanations could be achieved for differences in adult L2 learners' TL processing characteristics, Clahsen and Felser (2006) propose the *Shallow-structure Hypothesis*. The hypothesis holds that the syntactic representations adult L2 learners create during online processing and comprehension are “shallower”, and not as detailed as those a native speaker would compute. Quoting directly, Clahsen and Felser (2006) characterize such shallow representations:

“...L2 learners essentially compute predicate-argument structure representations of the input that capture thematic roles and other aspects of lexical-semantic structure, but which lack hierarchical detail and more abstract elements of syntactic structure.”

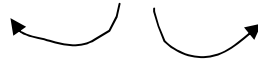
For example, suppose that a mature native speaker might compute the following syntactic representation of the sentence *The nurse who the doctor argued that the rude patient had angered is refusing to work late* (from Marinis et al, 2006):

[DP The nurse [CP [whoi] the doctor argued [CP [e2] that the rude patient had angered [e1]]]] ... is refusing to work late.

Clahsen and Felser provide a sample of how they hypothesize such a sentence's structure

would be computed, chunk-by-chunk, as it arrived during L2 comprehension. L2 processing is rudimentary compared to native language handling under this view, and what the learner computes is essentially a semantic, or conceptual, representation of the input, which is built up as pieces are incrementally received and parsed.

1. [The nurse] who [the doctor] **argued** [that...



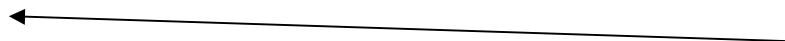
agent theme

2. [The nurse] who [the doctor] argued [that... [the rude patient] had **angered**



theme

3. [The nurse] who [the doctor] argued [that... [the rude patient] had **angered**



experiencer

is refusing to work late.

Note that this proposed representation contains no intermediate gaps, and that incremental representation development consists of assigning new thematic roles and “associating modifiers with their semantic hosts” (Clahsen and Felser 2006). This failure to represent syntactic gaps is hypothesized under this account not to result from lack of knowledge of subadjacency, but from inability to project the structure necessary for accommodating such gaps.

Just as Bley-Vroman (2009) indicated, while these “good-enough” representations appear likely to play a central role in L2 processing, they may also play a peripheral role in native language comprehension. Clahsen and Felser, in accord, suggest that shallow processing might be an option available to the human language comprehension system in general, but that adult learners are more restricted to it for L2 processing. Representations for language comprehension, then, lack syntactic detail and are based instead in direct form-function mappings.

Summation of Reviewed Literature and Its Application in Interpretation of the Data

A particular psychological endowment for language learning enables both monolingual and bilingual native language development. With regard to the latter, access to the properties of this endowment – whatever they may be – permit the acquisition of two languages simultaneously. Through the course of bilingual first language acquisition, transfer effects are limited or nil, and bilingual children (with some variations) follow developmental time courses similar to those of monolingual children in their two languages. Further, BFLA is nearly always successful, and children who begin young enough – perhaps 3-7 – are almost assured to progress to monolingual-like proficiency.

However, the type of language learning that occurs after the end of childhood/adolescence appears to be qualitatively different. In adult second language learning, L1 transfer effects are pervasive, and fossilization of a target-deviant interlanguage grammar is common – these are facts that the critical period hypothesis is based on. If it is true that there is a critical period for language learning, then acquiring a language (either first or second) typically becomes very difficult after a particular cut-off age because the mechanisms that guided child L1A have since been “dismantled”.

Studies arguing against the existence of a critical period for language learning have cited evidence of native-like proficiency levels being attained among adult L2 learners. This *could* be thought of as suggesting the persistence of the child-like linguistic endowment into adulthood. But it could also be that general learning mechanisms, basic knowledge of combinatorial rules, and a psychological “scaffolding” of the L2 onto the L1 can sometimes produce a “pretty good” approximation of the target grammar. This is

what the situation appears to be among adult L2ers.

As is demonstrated in the data below on English gendered pronoun acquisition among native Mandarin speakers, control over TL properties in the interlanguage grammar may approach native-like levels, in terms of accurate uses in a speech sample. But even in the most proficient of the learners, errors still occur that (1) appear to be traceable to the native language, and (2) do not appear to be attested among child L1 learners or mature native speakers. So although the learner may create an approximation of the target grammar that generates sentences deemed acceptable by TL norms *most* of the time, they are fundamentally different from the underlying grammars and derivations that native speakers use.

These approximative grammars may be less stable in memory and less detailed, and (seemingly consequently), more prone to the influence of other rule systems – namely the L1. Processing of the L2 in production and comprehension would involve treating the TL in an inherently different manner than a native language. Interlanguage grammars might be more driven by lexical orderings or other underspecified structures during online processing, rather than the abstract syntactic knowledge that comprises native language competence.

When spontaneous transfer effects appear in the speech of learners who otherwise have good control over TL properties, it suggests that something about the process of adult SLA and/or the nature of the interlanguage grammar results in a situation where the L1 structure is imposed on production of the L2. Learners ostensibly either have mastered or have strong knowledge of the L2 property under examination – and yet, the way the L1 instantiates that property sometimes appears to color the output of the TL.

The Mandarin Epicene Pronoun, The English Agreement Paradigm, and Pronominal Gender

Native speakers of Mandarin appear to struggle in maintaining control over the L2 English nominal agreement paradigm that marks 3rd-person pronouns for gender, number, and case. Particularly salient, to the native speaker of English, is their tendency to make mistakes in properly expressing pronominal gender on English third-person pronouns – the cause of this tendency is the subject of the following data discussion. These issues in handling English 3rd-person pronominal morphology appear to be caused by the fact that the system of personal pronouns in Mandarin is morphologically much simpler than that of English. In the spoken form of Mandarin, a single epicene (that is, genderless) pronoun *ta* signifies *he/she/it* and *him/her* (subjective and objective case), where suffixes indicating number (*-men*), genitive case (*-de*), and reflexivity (*-ziji*) do not change the common phonetic core. To infer the gender of the pronoun's referent, listeners must rely on the context of use – this single third-person pronoun is mapped onto a relatively wide number of functions in Mandarin. On the other hand, English uses gender-marked pronouns that carry information on number, and subjective, objective or possessive case. Semantically, quite a bit can be inferred from the content of these pronouns, as in English they maintain more specific mappings with particular reference situations or antecedent attributes.

When native speakers of Mandarin learn English, they must go from a morphologically bare language to one that is comparatively rich – this intuitively appears to be a complex learning task. Learners now must encode abstract information that was not dealt with in the morphology of their native language. So in examining the

conversational data, it's important to first note that performance issues with gender marking on English 3rd-person pronouns may not actually be due to transfer of Mandarin's nominal agreement paradigm. That is, even though the learners might say *she* when they meant *he* to refer to a man, this is not necessarily because they have transferred the mappings between pronoun and gender information that Mandarin uses. When they produce an error in English pronominal gender agreement, it may be that they're simply blurring out the wrong word because of the effects of performance constraints or limitations on the efficiency of L2 lexical access – and this could plausibly happen even in highly proficient L2ers.

The Study: Sample Population, Methodology, and the Null and Alternative Hypotheses

As mentioned above, pronominal gender disagreement errors are a salient aspect of native Mandarin speakers' L2 English production. The present study was constructed in order to find out why these errors sometimes occur in even the most proficient of Mandarin-English adult bilinguals. In particular, the focus of the study was the question of whether these errors are the result of transfer of properties of the Mandarin nominal agreement paradigm, or whether the errors should instead be attributed to issues in lexical access or other non-transfer-related factors.

Four undergraduate students at Eastern Michigan University between ages 21 and 23 were selected to participate in the study, hereafter referred to as C, M, J, and T. All four were born in the central or eastern regions of China and grew up speaking standard Mandarin only, receiving compulsory English education beginning at age 10, or 6th grade in a K-12 system. Further, all four had begun their college education at a large Chinese

university, and had come to Eastern Michigan University to complete their final two years through an exchange program. The participants were selected because of their surprisingly high degrees of English proficiency, given that all of them had only been living in the United States for one year or less. But despite their generally high degree of control over other aspects of the English nominal agreement paradigm (including case, person, and number), all were informally observed repeatedly experiencing difficulty in accurately producing gender-marked 3rd-person pronouns.

Methodology

Elicitation of 3rd-person English pronouns was achieved through a simple, 5-minute recorded conversation in which the topic was constrained to discussion of subjects' favorite singers, bands, movies and actors/actresses. Compared to the truth value judgment task and picture description tasks used in the earlier, pilot versions of the study, the constrained domain conversation proved to be the most fruitful in eliciting pronoun usage. The aim of the conversation task was to put in the subject in a discursal situation in which 3rd-person pronoun usage would become necessary to properly describe different celebrities or musicians. Some subjects readily made extensive use of 3rd-person pronouns, while others had to be indirectly coaxed into doing so by asking them to describe a person in more detail, or to explain why they liked a particular person. Conversations were recorded in a quiet location, and the contents were transcribed, making every attempt to faithfully represent filled pauses, half-starts of words, and other disfluencies in their speech.

Determining Relative Subject Proficiency, Establishing Relevant Variables, and Briefly Reviewing the Findings

Differences in proficiency levels among subjects were evident upon informal examination of the transcripts. For instance, C's end of the conversation consisted of many simple sentences, while T's responses were fewer, but were very long and involved more detailed use of English. Mean Length of Turn (MLT) was chosen as a means of capturing these differences in proficiency. This metric was calculated by counting all the words of any length and dividing over the number of turns taken, with the following caveats:

(5) Contracted forms such as *I'm*, or *it's* were counted as two words.

(6) Multi-word proper nouns, such as the names of movies or music groups, were counted as one word.

(7) Filled pause-related words such as *uh*, or *hmm* were not counted as words.

MLT appears to have been a reasonably reliable metric for representing subject proficiency – scores came in at 11.6, 18.0, 18.1, and 70.75, corresponding to C, M, J, and T respectively.

Next, the number of *all* pronouns used was counted, including those in first, second, and third person and question pronouns such as *who*. The number of gender-marked pronouns were then counted, including both incorrect usages due to gender disagreement, and clear half-starts of pronouns. For instance, M's sentence "*Sh-he-he's very handsome*" contains a half-start, and so both *she* and *he* were counted. Dividing the number of gendered pronouns used by the total number of pronouns, a percentage was obtained – of all the pronouns used by subjects, between 22% (J) and 57% (T) were third-person gendered ones.

A breakdown of counts (both correct and incorrect uses) for each type of gendered

pronoun was then compiled, including *he, she, him, her, his, hers, himself, and herself*. All these were used at least once, except for *herself*, with *she* occurring at least 4 times in every conversational data sample. Additionally, non-gender related errors in 3rd-person pronouns were sought in the data, but none were attested. That is, the *only* errors subjects made in handling 3rd-person pronouns involved gender agreement with the referent – all subjects demonstrated total control over case, person, and number markings.

Among erroneous uses of pronouns, each occurrence was counted by recording which pronoun was used in reference to which gender. For instance, when M used *she* to refer to a male singer, the error was recorded as “*she* with male referent”. Because immediate self-correction almost always occurred after the erroneous use of a gendered pronoun, its occurrence or non-occurrence was recorded with a Y or N.

Finally, Brown’s (1973) 90% mastery cut-off was employed in determining whether the subject should be considered to have mastered gender-marked 3rd-person pronouns. The number of correctly used gender-marked pronouns was divided by the total number of gendered-pronouns used, and this rational number was converted to a percentage, which was then compared to the 90% cut-off mark. For example, J used 10 gendered pronouns, but only used 8 of them correctly – the score was thus 80%, which falls below the cut-off for mastery of a form. On the other hand, T used 50 gendered pronouns but only made one mistake, producing a near-native-like score of 98%. The table containing all the aforementioned metrics and relevant counts is included below:

Subject	MLT	# All Pronouns	# Gendered Pronouns; % Gendered	Gendered Pronouns By Type, Including Errors	Non-Gender-Related 3 rd -Person Pronoun Errors	Errors in Gendered Pronouns; Immediate self-correction (Y/N)	% of Correct Gendered Pronouns; Comparison to Brown's 90% Mastery Score
C	11.6	25	11; 44%	<i>he</i> 4	0	1 total: 1-'she' with male referent; Y	91.00% >90%: Mastery assumed
				<i>she</i> 4			
				<i>him</i> 2			
				<i>her</i> 0			
				<i>his</i> 1			
				<i>hers</i> 0			
				<i>himself</i> 0			
				<i>herself</i> 0			
M	18	51	17; 33%	<i>he</i> 4	0	3 total: 2-'she' with male referent; Y, Y 1-'his' with female referent; Y	82.3% <90%; Strong knowledge
				<i>she</i> 5			
				<i>him</i> 0			
				<i>her</i> 7			
				<i>his</i> 1			
				<i>hers</i> 0			
				<i>himself</i> 0			
				<i>herself</i> 0			
J	18.1	46	10; 22%	<i>he</i> 0	0	2 total: 1-'him' with female referent; Y 1-'his' with female referent; N	80% <90% Strong knowledge
				<i>she</i> 4			
				<i>him</i> 1			
				<i>her</i> 3			
				<i>his</i> 1			
				<i>hers</i> 1			
				<i>himself</i> 0			
				<i>herself</i> 0			
T	70.3	87	50; 57%	<i>he</i> 26	0	1 total: 1-'he' with female referent; Y	98% >90% Near native-like
				<i>she</i> 6			
				<i>him</i> 7			
				<i>her</i> 4			
				<i>his</i> 6			
				<i>hers</i> 0			
				<i>himself</i> 1			
				<i>herself</i> 0			

Speculating on the Cause of Mandarin Speakers' English Pronominal Gender

Agreement Errors: Null and Alternative Hypotheses

The possibility that native speakers of Mandarin make pronominal gender agreement errors due to issues with lexical access and *not* because of transfer of more abstract features of Mandarin grammar represents my null hypothesis. If the null hypothesis is not rejected, then it will be concluded that gender disagreement errors in Mandarin speakers' L2 English do not derive from transfer of the Mandarin nominal agreement paradigm.

The alternative hypothesis, then, holds that the observed gender agreement issues can be attributed to the transfer of abstract features of Mandarin nominal agreement, in which gender is not encoded on pronouns. Under the alternative hypothesis, this type of transfer into L2 English surfaces as overly broad or disorganized uses of English masculine and feminine 3rd-person pronouns. If there is sufficient cause, as determined by investigation of the criteria below, to reject the null hypothesis, then it will be concluded that gender disagreement errors in Mandarin speakers' L2 English *do* derive from transfer of the Mandarin nominal agreement paradigm.

Testing the Null Hypothesis

There are several criteria to consider in testing whether the null hypothesis offers a satisfactory explanation for the subject data. Jarvis (2000) explains that transfer effects cannot simply be assumed wherever there is some structural feature of the L1 that appears to be surfacing in production of the L2. Other factors, such as non-transfer-related developmental errors or issues with L2 lexical access could be implicated instead – the fact that the observed TL errors in question appear to echo the structure of the L1

could be merely coincidental. In order to cultivate a greater degree of generalizability and standardization in the field of SLA studies, Jarvis proposed three criteria for concluding the effects of L1 transfer in interlanguage production:

(8) Intra-L1-Group Homogeneity in Learners' Interlanguage Performance:

Show that, all else equal, we expect native Mandarin speakers using English as a second language to make the same types of mistakes throughout the group.

(9) Inter-L1-Group Heterogeneity in Learners' Interlanguage Performance:

Show that this feature does not appear in the speech of learners of all other linguistic backgrounds, including native learners.

(10) Intra-L1-Group Congruity Between Learners' L1 and Interlanguage Performance:

Show that there is some evidence in the structure of the L1 that would motivate the investigated feature of their interlanguage performance.

Results from both the present study and previous pilot results will be included in evaluating whether transfer effects can be assumed in the present conversational data.

With regard to Jarvis' first criteria and the tabulated results of the conversational data, it is clear that pronominal gender agreement issues were a consistent feature of every subject's sample, no matter how proficient they were. Furthermore, previous pilot results from earlier iterations of this study indicate the same thing. Native speakers of Mandarin of all levels of English proficiency make mistakes in correctly matching the gender of the pronoun with the gender of the referent. Where those with near-native levels of control over pronominal gender made mistakes only infrequently, those subjects with lower levels of control made such mistakes more often. These results verify the first

of Jarvis' criteria – gender agreement errors are a pervasive aspect of native Mandarin speakers' English production.

While the current iteration of the study did not include a control group comprised of native speakers of other L1s (including native-learning English children), one of the pilot studies did, drawing from both live conversational interviews and the CHILDES database. The findings were that among adult native speakers of Arabic, Ibibio, and French and among child learners of English (accessed via the CHILDES database), pronominal gender disagreement errors were *never* attested. It should be noted, however, that none of the tested L1 languages contain epicene pronouns – all mark pronouns for gender in some fashion. In any event, the conclusion that may be drawn from these pilot findings is that it appears to be *only* native speakers of Mandarin who make these errors. They are not an attested developmental error in children's acquisition of English, and they are not attested in the interlanguage grammars of adults whose native language does not contain epicene pronouns.

Finally, as previously mentioned, the mappings between multiple pronominal reference situations and the single Mandarin pronoun are plausibly the cause of these observed apparent instances of L1 influence in L2 English production. Having satisfied all of Jarvis' criteria, it can be safely assumed that the overly broad or disorganized uses of English gender-marked pronouns among native speakers of Mandarin is a result of L1 transfer. The null hypothesis is thus rejected and the alternative hypothesis accepted.

Discussion of Findings

As was discussed above, Mandarin is a morphologically bare language, while English has a comparatively rich system of nominal morphological agreement. Mandarin

has a basic pronoun *ta* that is mapped onto *he/she/it* and *him/her*, with affixes that do not change the phonetic core. English, in the third person, marks for case, gender, number and reflexivity, resulting in a total of 8 different pronouns: *he, she, him, her, his, hers, himself, and herself*. Each of these 8 pronominal forms is mapped onto a specific function, unlike the Mandarin pronoun *ta*, which covers many functions. Examining the errors subjects made, we have the following pronoun-referent pairings, pooled for convenience: 3 instances of *she* with a male referent; 2 instances of *his* with a female referent; 1 *him* with female referent; and 1 *he* with female referent. There is no clear pattern in these errors – masculine and feminine pronouns of both subjective and objective case are shown to be used incorrectly with referents of both genders. Thus, it appears that the Mandarin nominal agreement paradigm and its epicene (or gender-ambiguous) pronoun, which consists of a single form mapped to many functions, results in a diffuse pattern of disorganized disagreement effects when it is transferred into English.

One of the other striking aspects of the present study's conversational data was that all subjects demonstrated perfect control over case, number, and reflexivity (although only one subject used this form). The only issue present in all the subject data was the fact that each of them made *at least* one error in matching the gender of the pronoun to the gender of its referent. It is hard to speculate with any feeling of accuracy on why this might be, if limited sample size and chance are excluded as factors. After all, the situation with case marking is much the same as gender marking; Mandarin doesn't mark for case (except genitive, but only with a simple suffix *-de*), while English does so for the subjective, objective and genitive cases. Indeed, the learning situation appears to be more

complex in marking for case, as the assignment of case is ostensibly more difficult for an L2er than the assignment of gender – the former is an abstract grammatical concept, where the latter seems to be more concrete. In light of this, it may very well be that if this study were run again with a larger number of subjects, there would be a higher incidence of issues with pronominal case marking, possibly exceeding the incidences of issues with pronominal gender.

Tentative Conclusions, Anecdotal Evidence, and Directions for Future Research

Taking everything into account now, we can conclude that there is something qualitatively different about the language learning that takes place after the end of some “sensitive” period, and that the mental grammar generated during this type of learning is less stable than that of a native speaker. Second language grammars are likely less detailed than those that native speakers of a language maintain, and they are prone to infiltration by other rule systems – namely first languages. The question of why native Mandarin speakers experience such difficulty in maintaining control over English pronominal gender was tricky, because the single form *ta* was mapped onto multiple reference situations. That is, if the property under question were something like surface word order, where the L1 had an SVO ordering but the L2 an SOV, and we kept seeing learners producing L2 sentences with SVO orderings, the source of the error could be singularly identified. But we saw generally disorganized patterns of control over gender agreement in the subject data, which appears to be due to *ta*'s multi-way mapping, in contrast to something more straightforward, like surface word order.

Because the present study was intended to be empirical and rigorous, I included none of the anecdotal information gathered from subjects on whether they *think* in

Chinese but speak in English, to the effect that they perform on-the-spot translations during online production. Indeed, every single one reported that they, even in rapid English conversation, first plan their responses in Chinese and then translate them word-for-word into English. Thus far, I have seen nothing in the literature on the psycholinguistic or other processing-related implications of carrying out L2 use through constant translation from the L1. Having reviewed the SLA and psycholinguistic literature to a fairly significant depth over the course of compiling this thesis, I believe that current understanding of the process of SLA would be much augmented if there were to be some sort of large-scale survey on how L2ers *think about* their L2. That is, rather than relying entirely on results from grammaticality judgments, elicited productions, or other such empirical tests, I am interested in investigating how people perceive and consciously deal with non-native languages. Understanding of the conscious experience of handling a second language could then be integrated with understanding of how they are unconsciously processed toward a fuller theory of language acquisition.

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