

THE SELECTIVE FOSSILIZATION HYPOTHESIS:
A LONGITUDINAL STUDY OF ENGLISH LANGUAGE LEARNERS'
PERSISTENT ERRORS

by

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Date 20 May 2020

Submitted in partial fulfillment of the
requirements for the Degree of Doctor of Education in
Teachers College, Columbia University

2020

ABSTRACT

THE SELECTIVE FOSSILIZATION HYPOTHESIS: A LONGITUDINAL STUDY OF ENGLISH LANGUAGE LEARNERS' PERSISTENT ERRORS

Rosette Bambino Finneran

Fossilization, the stagnation of second language (L2) learning despite propitious conditions, is an inescapable reality for virtually all L2 learners. The study presented in this dissertation has endeavored to contribute to our current understanding of fossilization by examining, both longitudinally and cross-sectionally, persistent errors in the writing of adult learners of academic English for whom Spanish is a first language (L1). The theoretical framework is the Selective Fossilization Hypothesis (SFH), introduced by Han in 2009, which offers an extrapolative and explanatory framework for analyzing persistent errors in the developing grammars of L2 learners.

This research was conducted in two parts. Part I consisted of a cross-sectional investigation of 60 English language learners (ELLs) grouped into three proficiency levels: low intermediate, high intermediate, and advanced. Part II was a longitudinal case study that followed two ELLs over a period of 28 and 56 months, respectively. For both parts of the study, naturalistic data consisting of college placement, diagnostic, and exit

essays were collected at the research site, a large community college in the Northeastern United States, and analyzed quantitatively. Descriptive statistics were computed to identify persistent errors in the participants' writing. Following that, the longitudinal data were subjected to further analysis, revealing robust evidence of selective fossilization both among and within the target subsystems of English articles, prepositions, and number, and offering empirical support for the SFH.

These findings have some implications for second language research and practice. By providing evidence of selective fossilization, they may help challenge earlier conceptualizations of fossilization as a global phenomenon, and, by extension, the myth of the 'fossilized' ('unteachable') learner. Additionally, they contribute to extant research on the developing academic writing of post-secondary learners, a population and genre largely underrepresented in the L2 research. Finally, by offering empirical support for selective fossilization and the SFH, they provide L2 practitioners with the means to predict and explain learner errors, enabling them to set more realistic learning goals and achieve more successful outcomes.

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DEDICATION

I dedicate this dissertation to my parents, Anthony Bambino and Marie Giuca Bambino,
with deepest love and appreciation.

ACKNOWLEDGMENTS

I would like to extend my sincere thanks to all who supported me in my doctoral studies. First and foremost, I would like to express my profound gratitude to my advisor and dissertation sponsor, Dr. ZhaoHong Han, whose encouragement and support were instrumental in bringing this dissertation to completion. It was an honor and privilege to study with someone whose knowledge of second language acquisition in general, and fossilization in particular, is second to none. I would also like to thank Dr. Erika Levy for her insightful comments on my proposal and dissertation, and Dr. Bob Fecho for sharing his unique perspectives on my research. To the chair of my dissertation committee, Dr. Howard Williams, I would like to express my heartfelt appreciation: some of my happiest times at TC were spent in Dr. Williams' classes, and I thank him for the kindness and encouragement he has so willingly extended not only to me, but to all his students. My sincere thanks also go to Dr. Leslie Beebe, who accepted me into the TESOL/AL Program at Teachers College, and whose thoughtfulness and generosity of spirit will never be forgotten. I would also like to thank the members of my doctoral seminar, past and present for their friendship and support, particularly Farah Akbar, Alice Chen, Charles Combs, Tim Hall, Ji-Yung Jung, Adrienne Lew, Shaoyan Qi, and Yayun Anny Sun. Last but not least, I would like to acknowledge Mr. Russell Gulizia and Ms. Dana Klainberg of the Office of Doctoral Studies at Teachers College for their kindness, professionalism, and guidance, and the outside reviewers for their careful reading of this dissertation.

Before I came to Teachers College, I attended graduate school at Hofstra University in Hempstead, NY, where I met two extraordinary instructors who would later become my mentors. Dr. Ruth Formanek and Dr. Robert Leonard were/are leaders in their respective fields of psychology and linguistics, and they are remembered here not only for their many professional accomplishments, but also for their ability to motivate and inspire students. I would also like to thank the English Language Learners who participated in my research, particularly “Lisa” and “Sandy,” whose writing comprised the longitudinal corpus of the study, and to offer my warmest congratulations to Sandy on her recent graduation from Columbia University.

Finally, I am deeply grateful for having family I consider friends and friends who are like family, particularly, my children, Eric and Erin Finneran; my granddaughters, Amaya, Skylar, and Cameryn; my brother and sister-in-law, Robert and Patricia Bambino; and dear friends Ann Lindeborg, Emilee McGarvey Feldman, Marcia Eiven Fisher, Karen Antoinette Cuprill, Maureen Ryndel, and Dr. David Foster. I would also like to acknowledge four faithful family members, Katie, Hannah, Emma, and Charlie, whose friendship and companionship I will always cherish, and my grandparents, Rose and Frank Giuca and Rose and Angelo Bambino, whose challenges as first generation Americans inspired me to become an ESL instructor. My deepest gratitude, however, goes to God for His countless blessings to me and my family, and to my parents, Marie and Anthony Bambino, in whose memory this dissertation is dedicated.

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Chapter I

INTRODUCTION

According to the U.S. Department of Education, 9.5% of students enrolled in public schools in the United States are English Language Learners (ELLs), an increase of roughly 1.4% since the fall of 2000 (McFarland et al., 2018, p. 70). Of this growing population of 4.8 million learners, the overwhelming majority are native speakers (NSs) of Spanish, who comprise the single largest cohort of ELLs in the nation. Indeed, as reported by researchers at the Migration Policy Institute in Washington, D.C., 71 per cent of ELLs studying in the United States claim Spanish as their first language (L1) (Ruiz Soto, Hooker, & Batalova, 2015, p. 1).

As an English as a Second Language (ESL) writing instructor and ESL writing placement coordinator at a large two-year college, I have worked with literally thousands of ELLs from as many as 60 countries and 35 language backgrounds. Similar to the national averages, the single largest cohort of ELLs at the college are native speakers (NS) of Spanish. In this discreet-skills ESL program, where writing, communication, and reading are taught separately, English composition – and particularly English grammar – have historically proven most challenging for the majority of students, approximately half of whom fail their writing classes one or more times before passing out of ESL and into credit-bearing classes. When I was first accepted into the doctoral program in Applied Linguistics at Teachers College, Columbia University, my motivation for studying

second language¹ (L2) learners was largely pedagogical and reflected the day-to-day concerns of an ESL practitioner. However, once immersed in the academically rigorous learning environment at Teachers College, my interests soon expanded to include second language acquisition “in all its manifestations – the process, product, mechanism, processing,” and more (Han, 2017, p. 3).

When the time came to finalize the topic of my doctoral dissertation, I selected as the broad topic of my research a long-standing academic and professional interest, *fossilization*, the cessation of L2 learning despite favorable conditions, and knew I wanted to investigate academic writing. I chose the largest single cohort of ELLs at the college, NSs of Spanish, as study participants not only to improve my chances of collecting sufficient data to conduct my research, but also because any significant findings could, potentially, benefit the greatest number of learners.

The decision to adopt the Selective Fossilization Hypothesis (SFH) (Han, 2009, 2013b) as the theoretical framework for this dissertation was motivated by two factors. The first is its universality: because the SFH is derived from “general” Second Language Acquisition (SLA) research, it is “broader scope” and “more inclusive” (Han, 2013b, p. 145) than other fossilization hypotheses, making it accessible to individuals of all theoretical orientations. The second is its unique potential to predict and explain the persistent errors of L2 learners. Of particular importance is the latter, as it satisfies Selinker’s (1972) assertion that the only “adequate” theories of L2 learning are those that can explain fossilization (p. 216).

¹ The term “second language” (L2) is also used to refer to any language learned in addition to the mother tongue (e.g., a 2nd, 3rd, or 4th language).

1.1 Focus of the Study

The focus of the study presented in this dissertation is persistent errors in the academic writing of adult L1 Spanish learners of English. This study endeavored to first establish and then explain L2 writers' persistent errors via a bottom-up textual analysis motivated and informed by the SFH. The study was divided into two phases: the first followed a cross-sectional design and set out to identify persistent errors in the college placement essays of 60 low intermediate, high intermediate, and advanced learners; the second, a within-learner study, looked to establish longitudinally by following two low-intermediate writers over time.

Descriptive statistics were computed and analyzed for both phases of the study, followed by a target-like use (TLU) analysis of the longitudinal data in Part II. English articles, prepositions, and number were identified as the most persistent grammatical errors in both the cross-sectional and longitudinal corpora and thus constituted the three broad linguistic targets of the study. With the TLU analysis, the study's focus shifted to a more granular analysis of the grammatical targets, including the participants' use of English articles in different linguistic environments (e.g., generic NPs, idioms), their use of number by noun type (e.g., count/noncount nouns), and their use of individual prepositions in their writing.

1.2 Theoretical Background

As noted above, the focus of this dissertation is persistent L2 errors. But what is persistence in second language acquisition, and how does it compare to two related phenomena, IL stabilization and fossilization?

To begin, researchers have historically identified the persistence of non-target-like structures in the IL of non-native speakers (NNSs) as a key indicator of fossilization. However, the presence of persistent L2 errors does not in itself constitute evidence of fossilization. Instead, these errors can be viewed as “likely candidates for fossilization” (Han, 2004, p. 88). Recall that fossilization is the cessation of L2 learning despite abundant exposure to the L2 input, sufficient motivation to improve, and ample opportunities for communicative practice. Hence, in the absence of evidence of the above, one could not make a solid case for fossilization, nor would it be possible to procure evidence of fossilization in anything other than a longitudinal study tracing the IL development of an individual learner over time.

In this dissertation, persistence is defined as the “remaining errors in the interlanguage² of advanced learners” (p. 88) and has been operationalized as follows. For the longitudinal phase of the study, persistence is used to describe a non-target-like structure that can be observed in the learner’s written output over time; for the cross-sectional phase, it denotes a non-target-like structure that is observed at all three levels of writing proficiency – including, and most significantly, the advanced.

If persistent L2 errors can be viewed as likely candidates for fossilization, the next step is to consider whether these non-target-like forms have become temporarily stabilized or permanently established (i.e., fossilized) in the L2 learner’s IL. Han (2004) offers a clear explanation of the difference. As conceptualized by Han, stabilization and fossilization are not the same, but rather form two points on a continuum. In her view,

² Interlanguage (IL) is an intermediate linguistic system consisting of the learner’s developing knowledge of the L2.

stabilization is “directly observable” while fossilization is inferential (p. 103). Further, she asserts that stabilization can manifest itself in three ways: “a temporary stage of getting stuck, interlanguage restructuring, [and] long-term cessation of interlanguage development” (p. 102) with only the third, long-term stabilization, being a precursor to, and ultimately indistinguishable from, fossilization (Han, 2004, 2013b; Selinker & Han, 1996).

Having compared these three related (and occasionally conflated) terms, we turn now to a discussion of fossilization, a key construct in the SFH. The term fossilization was introduced to the field of SLA in 1972 by Larry Selinker who, from early childhood, was at once intrigued and frustrated by his immigrant grandmother’s lifelong struggle with English (Selinker, 2006). Like most adult learners, Selinker’s grandmother was never able to master her second language completely, leading him to wonder, “‘What’s going on here?’; ‘Why can’t she do that?’; ‘How can this be?’” (2006, p. 201). Years later, Selinker published his thoughts on what he calls his “one big idea” (p. 201) in his 1972 paper, *Interlanguage*. In this seminal work, Selinker coined two terms that are fundamental to the field of SLA: “interlanguage,” which describes the learner’s developing L2 competence, and “fossilization,” the end of that process of development.

According to Selinker, interlanguage (IL) is an intermediate stage in a learner’s linguistic development comprised not only of elements from the learner’s native language (NL) and the TL, but also elements that cannot be found in either. Selinker describes these unique elements as consisting of non-target-like, learner-generated rules arising from the learner’s attempt to impose systematicity on the TL input, especially when he or she is engaged in spontaneous, meaningful communication. What is more, he considers

these “new” forms to be the “empirical essence of interlanguage” (Gass & Selinker, 2008, p. 14).

In Selinker’s view, “successful” language learning requires learners to reorganize linguistic material from an IL “to identify with a particular TL” (Selinker, 1972, p. 229). Hence, IL can be viewed as both a process and product of L2 acquisition: a “process” because it refers to the learner’s dynamic, idiosyncratic progression from NL to TL, and a “product” because it refers to the language produced by the learner. As regards the former (i.e., IL as a *process* of L2 acquisition), Selinker delineates five central psycholinguistic processes underlying IL behavior: language transfer, transfer-of-training, strategies of second-language learning, strategies of second-language communication, and overgeneralization of TL linguistic material. These five central processes are summarized in Table 1.1, below.

All the above processes contribute to fossilization, a “permanent cessation of IL learning before the learner has attained TL norms at all levels of linguistic structure and in all discourse domains in spite of the learner’s positive ability, opportunity, and motivation to learn and acculturate into target society” (Selinker & Lamendella, 1978, p. 187). It is further suggested that the interaction of these processes has a significantly greater impact on the IL than any one process alone (Han, 2013b), resulting in what Selinker termed “entirely fossilized competencies” (1972, p. 217). Hence, in his earliest conceptualization, fossilization is seen as a global phenomenon impacting the entire IL system of the learner, and the sole identifiable causes are the five psycholinguistic processes noted below.

Table 1.1

Five Central Psycholinguistic Processes Underlying IL Behavior

Process	Definition	Example
	<i>Fossilizable items, rules, and subsystems that occur in IL performance as a result of:</i>	
“Language Transfer”	...the native language (NL)	A native speaker (NS) of French placing the adjective after the noun in L2 English (<i>*the car blue</i>)
“Transfer-of-Training”	...identifiable items in training procedures (i.e., language instruction)	Serbo-Croatian speakers who did not distinguish between he/she in English because their textbooks and teachers almost always presented drills with <i>he</i> and never with <i>she</i>
“Strategies of Second-Language Learning”	...an identifiable approach (i.e. learning strategy) by the learner to the material to be learned	The widespread tendency for learners to reduce the target language (TL) to a simpler system (<i>*He has two car</i>)
“Strategies of Second-Language Communication”	...an identifiable approach by the learner to communication with native speakers of the TL	The widespread tendency for learners to avoid troublesome grammatical forms
“Overgeneralization of TL Linguistic Material”	...a clear overgeneralization of TL rules and semantic features – a phenomenon well-known to language teachers	The overgeneralization of ‘drive’ to all vehicles (<i>*I drive my bicycle to school</i>)

Note: Adapted from Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics*, 10: 209-231.

According to Selinker, “fossilizable linguistic phenomena” are “linguistic items, rules, and subsystems which speakers of a particular NL will tend to keep in their IL relative to a particular TL, no matter what the age of the learner or amount of explanation and instruction he receives in the TL,” and “fossilizable structures” are structures that

“tend to remain as potential performance, reemerging in the productive performance of an IL even when seemingly eradicated” (1972, p. 215). This definition was later reframed to include “cessation of further systematic development in the interlanguage” (Selinker, 1992, cited in Selinker & Han, 1996, p. 3).

Interestingly, Selinker’s original (i.e., 1972) conceptualization of fossilization traced its origins to L1 acquisition theory. In fact, as Han (2014) explains, Selinker’s overall construct of fossilization may be seen “as a theoretical explanation for the general lack of success of SLA relative to first language acquisition” (p. 53). Extrapolating from biologist Eric Lenneberg’s claim of a discrete, innate “latent language structure” responsible for triggering L1 acquisition, Selinker proposed a “latent psychological structure” responsible for the acquisition of a second language (Han & Selinker, 2005, p. 456). This latent psychological structure, “an already formulated arrangement in the brain” (Selinker, 1972, p. 229), was thought to contain a cognitive mechanism, known as the fossilization “mechanism” that “putatively prevents the learner from acquiring the target language norms in a permanent way” (Han, 2013b, p. 132). As conceptualized by Lenneberg, the “latent language structure” would, barring injury, illness, or cognitive disability in the child, be realized into a natural language, resulting in successful acquisition of the mother tongue (1967). Selinker, on the other hand, postulated that the “latent psychological structure” may never be activated or realized into a natural language, resulting in incomplete acquisition of the target language, or failure (1972, p. 230).

Selinker initially hypothesized that all but 5% of second language learners fall prey, in due course, to fossilization (1972). The success of this small cohort of learners he

attributed *not* to explicit instruction, but rather to their ability to reactivate the latent language structure that Lenneberg described. In later years, Selinker would abandon even these modest predictions of success, conceding that “no adult L2 learner[s] can hope to achieve native-like competence in all discourse domains...no matter what they do” (Han & Selinker, 2005, p. 457).

It has now been over 40 years since Selinker’s notion of fossilization “spur[red] the field of Second Language Acquisition...into existence” (Han, 2009, p. 137), and in this time as many perspectives of fossilization have emerged (Han, 2004). These different perspectives can be grouped into three broad categories or approaches to SLA – linguistic, psychological, and social – each with its own research interests, theories and methodologies (Seville-Troike, 2012). Rather than work cooperatively to further conceptual confluence in SLA, however, adherents of competing strands of research have tended to be exclusionary and insular in their views to the point of rejecting outright the contributions of those with different theoretical leanings (Han & Finneran, 2014). Consequently, “the field has advanced little in theory construction and has produced a sizable but essentially idiosyncratic research database lacking in congruence and generalizability” (Han, 2012, p. 1912). With the SFH, however, Han proposes a fossilization hypothesis that brings together several different strands of research in what she has described, fundamentally, as a “cross-linguistic, usage account of fossilization as a cognitive and psycholinguistic phenomenon” (personal communication). It is this perspective of conceptual confluence that guides the present study as well. Considering that fossilization is the result of multiple factors working together (Han, 2013b), it may be argued that it should not be viewed through just one conceptual lens.

1.3 Gaps in the Literature

Despite the proliferation of L2 research over the past decades, a number of research gaps remain. For example, relatively few empirical studies of fossilization exist (Han & Odlin, 2006, p. 5), especially those that *establish* (rather than assume) fossilization or endeavor to *explain* it. Another, related to the first, is the “continuous paucity of longitudinal evidence;” this is particularly concerning since longitudinal studies are generally considered the most promising for procuring “reliable and valid evidence of fossilization” (p. 5). Yet another is L2 writing, an area that has largely been overlooked in the L2 literature, particularly at the post-secondary level.

This dissertation attempts to address these gaps. By adopting a two-pronged approach that combines cross-sectional research with a true longitudinal study, it sets out to establish fossilization empirically, using the SFH to *explain* learner outcomes. More specifically, it offers an explanatory account, via the SFH, of *selective* fossilization, the causes of which have received relatively little attention among researchers despite growing acceptance that IL fossilization is local, or selective, in nature, and not global, as once assumed. Indeed, as Han (2011) points out, few studies in second language acquisition have attempted to explain *why* fossilization affects only select subsystems of a learner’s IL or why it varies across learners:

[W]ithin-field systematic attempts at explaining both learning and lack thereof have remained sparse and scattered. Moreover, theoretical attempts have been few and far between to account for inter-learner differential success/failure and are almost non-existent when it comes to intra-learner differential success/failure. (n.p.)

Finally, considering the comparatively small number of fossilization studies investigating academic writing at the college level (passim the SLA literature) and a

projected 27% increase between the years 2011 and 2022 in college enrollment among Latinos (Hussar & Bailey, 2013), 36% of whom were born outside the U.S. (Snyder & Dillow, 2015), it may be argued that a study investigating persistent errors in the academic writing of adult L1 Spanish learners of English fills a research gap in the existing literature and holds potential value for the field.

1.4 Definition of Terms

Second Language Acquisition is a multidisciplinary field with ties to theoretical and applied linguistics, language education, educational psychology, cognitive psychology, and neuroscience, to name a few. Given the preponderance of theories imported from disciplines outside the field and the competing strands of research within, “Terminological confusion is rampant in both the theoretical and empirical spheres [of SLA]” (Han, 2012, p. 1912). As a result, defining key terms presents a challenge in any area of SLA research, and the study of fossilization is no exception. That said, we turn now to a brief overview of key terms and constructs relevant to fossilization and the SFH.

Error

Broadly speaking, an error is a linguistic item³ that “in the same context and under similar conditions of production would, in all likelihood, not be produced by the...native speaker” (Lennon, 1991, p. 184). In the present study, which focuses on academic writing, the term “error” is used to refer to a linguistic item that under similar

³ “Linguistic item” is broadly defined here, as it is throughout much of SLA, as a meaningful unit of language, (e.g., a morpheme, word, or phrase).

conditions of production would not be produced by a native speaker using a variety (e.g., Standard Written English) of Standard American English.

Fossilization

As explained at length in Section 1.2, above, fossilization in second language acquisition refers to the stagnation of L2 learning despite propitious conditions, including ample exposure to and practice with the target language and sufficient motivation to improve. In this study, fossilization is operationalized as the relative frequency of occurrence for non-target-like forms that persist in the written output of advanced learners. Fossilization that affects only subsystems of a learner's IL system is known as **selective fossilization**.

Frequency

One of two key sub-variables (along with variability) of the SFH. According to Han (2012), the frequency variable “captures the quantitative property of a given usage either in the L1 or the TL” (p. 145): otherwise stated, the number of times a given form appears in the input (Han, 2014).

Input

All the meaningful language, be it written or spoken, to which the learner is exposed.

Input robustness

As per the SFH, **input robustness** is comprised of two sub-variables, frequency and variability (consistency), where frequency refers to the number of times a given form

appears in the input, and variability, to “the form-meaning-function relation intrinsic to that form” (Han, 2014, p. 61). According to Han (2012), any given TL usage will fall somewhere on a continuum of input robustness, with “robust” (TL input that is frequent and *invariable/consistent*) at one end and “non-robust” (TL input that is *infrequent* and *variable/inconsistent*) at the other. Critically, in Han’s (2014) view, input is *not* isomorphic with the TL: that is, where the TL tends to be stable, the input is more “precarious” (i.e., variable, erratic).

Language transfer

The influence that a learner’s knowledge of a first (or other) language has on the language being learned. In the present study, it refers to the influence of L1 Spanish on L2 English.

Markedness

In the SFH, markedness is comprised of two sub-variables, frequency and variability (consistency). According to Han (2012), any given usage in the L1 will fall somewhere on a markedness continuum between “marked” (an L1 form that is *infrequent* and *variable/inconsistent*) and “unmarked” (an L1 form that is frequent and *invariable/consistent*). It should be noted that Han’s conceptualization of markedness as it applies to the SFH is somewhat unique in that it differs from more “traditional” (i.e., generative or functional-typological) definitions of the construct. For example, in generative linguistics, markedness is defined in terms of “core vs. non-core properties” such as linguistic universals (Han, 2013b, p. 145), whereas in functional-typological

linguistics, it is defined as a given structure's "relative frequency or generality...across the world's languages" (Eckman, 1996, p. 198).

Selective Fossilization Hypothesis (SFH)

The SFH is a fossilization hypothesis that attempts to explain and predict inter- and intra-learner differential success in terms of the interaction between L1 influence and L2 input. Specifically, "the hypothesis posits an intersection of two variables, L1 markedness and L2 input robustness, each, in turn, derived from the interaction of two sub-variables: frequency and variability" (Han, 2013b, p. 145). According to the SFH, acquisition of a TL structure is more likely to occur when the TL input is robust and the L1 influence, weak, whereas fossilization is viewed as "a function of the interaction of an unmarked usage in the L1 and a piece of non-robust input providing weak evidence for some TL usage" (p. 145).

Variability

Within the context of the SFH, the variability variable captures the "inherent relationship between the linguistic form, its semantics and pragmatics, or, simply, form-meaning-function mapping (FMF) in a given linguistic usage" (Han, 2013b, p. 145). Put more simply, Han's notion of variability is isomorphic with inconsistency (2009).

1.5 Outline of the Dissertation

The remaining chapters of this dissertation are organized as follows. Chapter II reviews the literature and introduces the SFH. Following that, a brief overview of typical errors in Spanish-English IL – the broad linguistic focus of this dissertation – is provided,

and the research questions are posed. Next, Chapter III lays out the methodology of the study. Following that, Chapter IV presents the results from Parts I and II of the study, and Chapter V discusses key findings as they relate to the research questions. Lastly, Chapter VI summarizes the main findings and addresses the study's implications, limitations and future directions.

Chapter II

REVIEW OF THE LITERATURE

This chapter reviews the literature on fossilization. It opens with an examination of early and current studies that underscore the field's evolving understanding of the construct and offers empirical support for selective fossilization. An introduction to Han's (2009, 2013b) SFH follows. Next, the chapter provides an overview of typical errors in Spanish-English IL, and concludes by introducing the research questions that guided the study.

2.1 Fossilization Studies: Past and Present

More than 40 years have passed since Selinker introduced the term 'fossilization' to the nascent field of SLA. While far from complete, our understanding of fossilization has nonetheless been enriched through the efforts of scholars, past and present, who have been eager to explain the near-universal failure of adult learners to master another language.

2.1.1 Early Understanding

When Selinker's paper, "Interlanguage," was accepted for publication in the *International Review of Applied Linguistics* back in 1972, no one, including the author, could have predicted the extent of its influence. Reaction to the paper was strong and swift, not only among L2 researchers, but L2 practitioners as well (Han, 2013b). The fossilization hypothesis, in particular, captured the immediate attention of the readers,

“sparking much empirical research and an abundance of speculation” (p. 134). Fueling this speculation was the term’s inherent ambiguity: in its earliest conception, fossilization was at once described as a product, a process, and a mechanism of IL development (Selinker, 1972). The scope and complexity of the term invited conjecture, with researchers of various theoretical perspectives weighing in with their own idiosyncratic (and often divergent) understandings of the construct. The result was a bewildering “lack of uniformity in interpretation and application” (Han, 2003, p. 95) of the term, and this was reflected in the studies of the time.

Nowhere was this more evident than in studies that attempted to identify the probable causes of fossilization. Early researchers began by examining the five central processes of the Latent Psychological Structure, identified by Selinker (1972) as the sole drivers of fossilization, and then set out to explore other possibilities. Over time, the number of explanatory accounts increased, “with almost every existent perspective on SLA represented” (Han, 2004, p. 26). Indeed, in her comprehensive review of fossilization research, Han (2004, p. 29) identifies over four dozen putative causal factors of fossilization, among them “internal” causes, such as the influence of the L1, age of the learner, and lack of acculturation, and “external” ones, including the absence of corrective feedback, lack of instruction, and insufficient exposure to target language input.

Early research attempted to examine both learner-internal and learner-external causes of fossilization. As an example, Zobl (1980) identified L1 influence, an internal variable, as a primary cause of fossilization. He investigated the acquisition of the English negative by L1 speakers of Spanish and found that developmental and cross-

linguistic factors, working in tandem, were responsible for the persistence of non-target-like preverbal negation [e.g., **No understand*] in their output. Zobl (1980) compared the early developmental stage of preverbal negation in English [e.g., **No go*] to the terminal stage of negation in Spanish [e.g., *No voy*], and concluded that “L2 structures that show influence from the L1 may in certain cases be more recalcitrant to restructuring; in other words, they show a tendency toward fossilization” (pp. 476-477).

Taking a quite different approach, Scovel (1969) fixed his attention on the age of the learner, another learner-internal variable presumed responsible for fossilization. In his work on “foreign accent,” Scovel attempted to isolate the maturational factors affecting learner outcomes by comparing the acquisition of L2 phonology in children and adults. Specifically, he looked at the onset of cerebral dominance at puberty, an age when L2 learners begin to lose their ability to reliably discern phonetic differences between the L1 and L2. As a result of his investigations, Scovel concluded that what we now call fossilization was indeed a biological artifact of natural aging – namely, the loss of brain plasticity that occurs as the brain matures and language is taken over by the left hemisphere – a process known as lateralization (Yule, 2014).

Corder (1978) offered yet another perspective. Citing socio-affective factors as a possible causal variable of fossilization, Corder argued that the IL systems of adult naturalistic learners develop through their attempts at meaningful communication and stop when their communicative needs are met. In other words, if the learner has no need to communicate, or if his present knowledge of the TL is sufficient for his present needs, then “his interlanguage grammar will *fossilize* at the point in its development where his needs are satisfied” (1978, p. 281, italics included in original). A similar view was held

by Schumann (1975), who claimed that socio-affective factors can have an even greater impact on learner outcomes than biological maturation (p. 209). According to Schumann's Model of Second Language Acquisition (p. 231, Figure 3), 'initiating factors' such as attitude toward the target language and culture, motivation to learn, and inhibition can either activate or block the cognitive processes (e.g., generalization, inference, analogy, memory) driving second language learning. When the cognitive processes are activated by the affective factors, Schumann argued, they (i.e., the cognitive processes) are free to act upon the L2 data, triggering IL restructuring and the acquisition of TL forms. Conversely, when they are blocked, the L2 data remain unanalyzed, and acquisition is inhibited.

Along with learner-internal variables such as L1 influence, maturational factors, and lack of acculturation, external causal variables were of interest to early scholars as well. For example, in addition to socio-affective factors, Schumann (1975, 1978) also cited insufficient exposure to L2 input as a possible cause of fossilization. In Schumann's view, social and psychological factors such as those described above often have the effect of limiting the adult learner's exposure to the L2, with unfavorable results. As he explains, "problems with the adult's attitudes, motivation and/or empathic capacity which are brought about by either general social-psychological development or language and culture shock prevent him from getting involved in communication which will lead to successful second language acquisition" (1975, p. 232). Schumann (1976, 1978) later substantiated this claim in his now-famous ten-month case study of 'Alberto,' a 33-year-old Costa Rican learner of English whose limited exposure to the TL – a direct consequence of his social and psychological alienation from the TL group – allowed for

“very little linguistic development over the course of the study” (Schumann, 1978, p. 367).

In addition to insufficient exposure to the L2, the external variable of L2 instruction also captured the attention of early SLA researchers. As an example, Vigil and Oller (1976) were interested in the role of pedagogical feedback in the L2 classroom, claiming it was the exclusive source of rule fossilization among instructed learners. They proposed a hypothetical model designed to predict the effects of various forms of feedback (positive, negative, and neutral; cognitive/objective and affective/subjective) on the developing grammars of L2 learners and concluded that “unless learners receive appropriate sorts of cognitive corrective feedback concerning errors, those errors can be expected to fossilize” (p. 294).

While Vigil and Oller (1976) were investigating pedagogical feedback, Seliger (1975) and Krashen and Seliger (1975) were exploring another possible cause of fossilization, the absence of explicit instruction. Krashen and Seliger (1975) compared instructed versus classroom learners and determined that the explicit teaching of TL rules and lexical items not only “produces significant increases in second language proficiency for adults” (p. 173) but also is “necessary for all adults in learning a second language” (p. 182). The success of some adult naturalistic learners they credited to explicit instruction from sources outside the classroom, such as bilingual dictionaries and grammars and/or corrective feedback from “helpful” native speakers (p. 181). In Krashen and Seliger’s view, these successful uninstructed learners in no way constituted counter-evidence to their claim that formal instruction is more beneficial to post-pubertal learners since they “are really using formal instruction as defined here” (1975, pp. 181-182).

Having established the value of formal instruction to adult L2 learners, Seliger (1975) went on to explore the relative efficacy of two different types of instruction: “inductive,” in which rules are presented before learners are given examples, and “deductive,” whereby examples are given first and learners are asked to infer the rules. With English pre-noun modifier order (e.g., three small black cats) as the linguistic target, Seliger (1975) compared two groups of adult L2 learners – one that had been taught inductively, and the other, deductively – and found that while both groups showed roughly equal gains on an immediate post-test, the +deduction group performed “significantly better” than the +induction group on a delayed post-test given three weeks later (1975, p. 15). These findings led Seliger (1975) to assert that learning is more efficient and durable when grammatical rules are taught deductively.

As these early studies attest, researchers soon looked beyond Selinker’s five central psycholinguistic processes for possible causes of fossilization right from the start, a development that has continued to the present day.

2.1.2 Current Understanding

Over the years, interest in fossilization has remained high. More importantly, the concept has itself “substantially developed, as has the methodology for empirical research” (Han, 2013b, p. 134). Whereas methodological weaknesses and lack of conceptual congruence compromised the credibility and, ultimately, usefulness of earlier studies (p. 137), present-day research “has shed substantive light” on our current understanding of the construct (Han, 2014, p. 54). Today, a number of different research methodologies are used to study fossilization, among them longitudinal case studies, hypothesis-driven experiments, and behavioral and brain-based studies (e.g., PET scans,

fMRI, ERP, EEG), the latter of which have been used to investigate the neurophysiological changes in the brain some (e.g., N. Ellis, 2002, 2006, 2007; MacWhinney, 2001; Scovel, 1969; Ullman, 2001) believe are responsible for fossilization. Neuroimaging techniques such as functional magnetic resonance imaging (fMRI) and event-related potential (ERP) studies, for example, allow researchers to measure the activity level of various areas of the brain as they carry out specific cognitive tasks, among them language tasks comparing subjects' use of their L1 or L2 (Tolentino & Tokowicz, 2011). The addition of these new research methodologies to existing strategies has broadened the scope of fossilization research and paved the way for more rigorous investigations of learner potential. As a result, our understanding of fossilization is now "more nuanced and sophisticated" than before (Han, 2014, p. 69).

In her 2013b paper, "Forty Years Later: Updating the Fossilization Hypothesis," Han reviews four decades of fossilization research and concludes with four "robust" generalizations:

1. Fossilization is selective.
 2. Fossilization affects the acquisition of TL structures encoding variable form, meaning, and function (discourse pragmatics) relations.
 3. Fossilization is inspired by an L1-relativized mind, induced or reinforced by L2 input attributes.
 4. Fossilization is most evident in spontaneous production in which the learner engages in manufacturing his [or her] own meaning and linguistic expression.
- (p. 165)

Each, in turn, will be addressed below. Given the essential role selective fossilization plays in our understanding of the SFH, relatively more attention will be paid to the first finding than to the others.

To begin, one of the most compelling findings to emerge from the current literature is that fossilization is selective. Recall that in its earliest conception, fossilization was perceived as a global phenomenon affecting the whole of the learner's IL system, creating "entirely fossilized competences" (Selinker, 1972, p. 217), the opposite of what we now know to be true. Indeed, as noted in Han (2013b), both "past and current research has consistently converged on the finding that fossilization is local, not global. In other words, fossilization hits the subsystems of interlanguage [e.g., phonology, semantics, morphology, syntax] only selectively, rather than its GESTALT" (p. 137).

Compelling evidence of selective fossilization can be found within the SLA literature. One widely cited example is Lardiere's (1998, 2006, 2007) longitudinal case study of "Patty," a native speaker of Chinese and adult learner of English. When Lardiere first recorded 22-year-old Patty in 1986 as part of a class assignment, she had no idea that interview would constitute the beginning of what many consider a seminal work in the study of fossilization. Lardiere had been introduced to her young subject by a mutual friend, and the two women soon developed a long-standing friendship of their own. Years later, when Lardiere listened again to the recording of the 1986 interview, she was shocked by how little Patty's English had improved (Rothman, 2008). What has amounted to one of the longest case studies in SLA research ensued.

Lardiere began collecting additional linguistic data from Patty when her subject had been living in the United States for approximately 10 years. When the study ended, Patty had been married to a native speaker of American English for about 6 years and was “totally immersed in a nearly exclusively English-speaking environment” (Lardiere, 1998, p. 12). By that time, her self-reported estimated use of English was 95%-98%. During her 8½ year study of Patty, Lardiere audio-taped three conversations (34, 75, and 31 minutes, respectively, in length) from which she collected both naturalistic and elicited data. The first conversation was recorded when Patty had been living in this country for about 10 years; the second, about 8½ years later; and the last, two months after that (p. 13).

Over the course of the study, Lardiere (1998) monitored Patty’s acquisition of English L2 tense morphology and pronominal case marking (p. 1). A careful examination of the data revealed that despite continual exposure to “massive” amounts of target language input from native speakers (p. 17), Patty’s suppliance of past tense marking in obligatory contexts had stabilized at approximately 34%, a figure that remained constant throughout the period of observation. Quite surprisingly, however, “her suppliance of nominative case in obligatory contexts [was] *absolutely perfect* at 100%” (p. 17, emphasis added). These findings strongly suggest that in developing grammars, acquisition and fossilization go hand in hand, with fossilization affecting only some, rather than all, subsystems of the learner’s IL. In a follow-up study, Lardiere (2006) reported that the results of two grammaticality judgment tasks administered 18 months apart “converged” with those of the production data, confirming her earlier observations (p. 45). Taken together, these findings provide robust evidence of selective fossilization.

Longitudinal case studies by Long (2003) and Han (1998, 2000, 2006, 2010) also offer evidence of the locally-impacted nature of fossilization. In his seminal study of “Ayako,” Long (2003), for example, observed this adult learner’s acquisition of English morphology over the course of 16 years and found “marked variability” in her suppliance of inflectional morphemes for plurality and past tense. Ayako was born in Japan in 1926, and in 1948 immigrated to Hawai’i as a young “war bride” following her marriage to a third-generation Japanese-American and native speaker of Hawai’i Creole English (2003).

Long began studying Ayako, whom he describes as popular and acculturated, in 1985, when she was 59 years old. At that time, she had already been living in the Hawai’i for 37 years (p. 508). With the exception of her first three or four years in the U.S., English was Ayako’s primary language, although in 2003 she reported that she still used Hawai’i Creole English and Japanese for a “variety of purposes” (Long, 2003, p. 508). More specifically, Ayako estimated that her use of English was about 75% when she was at home with her husband and “even more” when she was out (p. 508).

Data for the study consisted of oral output elicited from a battery of six tasks – a semi-structured interview; a brief, open-ended discussion; two picture descriptions and two repetition tests. The data were collected at two points – once in 1985 and again in 1995 (Long, 2003, p. 508). In later years (i.e., 1996, 1998, and 2000) the same series of tasks was repeated with the exception of the two repetition tests, which had become “too difficult” for his aging informant (p. 509).

Analysis of the data, conducted at the level of both type and token, revealed “numerous lexical gaps, little complete syntax, and many persistent morphological

errors” in Ayako’s oral production (2003, p. 509). Of particular interest to Long were errors in plural *-s* and past time marking. As an example, he found that Ayako’s suppliance of plural *s*-marking in obligatory contexts was 71% in 1985, but only 48% in 1995 (p. 509). On the other hand, her suppliance of past tense markers in obligatory contexts remained steady at 50% (p. 509). Subsequent analyses revealed marked variability in her suppliance of morphological affixes for both plurality and past tense, at times “within just a few lines” of transcribed speech (p. 510). Taken together with Long’s (2003) observation that Ayako rarely, if ever, added inflectional morphology to a small subset of nouns and verbs, these findings provide additional empirical support for the claim that fossilization is not global, as once believed, but local and selective.

Han (1998, 2000, 2006, 2010), too, provides compelling evidence of selective fossilization in her on-going longitudinal case study of two adult Chinese users of English. When the study began, her subjects, a 32-year-old post-doctoral civil engineer and a 36-year-old astrophysicist, had each lived for nearly three years in an English-speaking country (Han, 2000). Both men were advanced speakers and writers of English who had “published extensively in the leading international journals in their respective fields” (p. 88).

The target of Han’s benchmark study was the IL subsystem of passivization, a typical IL construction for L1 Chinese learners of English that is comprised of three related constructions: “pseudo-passives,” a characteristic error of Chinese-English IL (**The letter has received*); “passivized unaccusatives,” a type of “over-passivization” (**The cough was disappeared*); and a subset of “target-like passives” (*Your email message was received*) (Han, 2004, p. 100).

Two research questions framed Han's research: (1) "Is L1 influence a primary factor leading to long-term stabilization?" and (2) "Can long-term stabilization arise independently of L1 influence?" (Han, 2004, p. 99). Data collection consisted primarily of spontaneous written output from academic papers, and both formal and informal letters. In addition, experimental data were collected from two translation tasks, a grammaticality judgment (GJ) and correction test, and a cloze test (Han, 2000; Long, 2003). Qualitative and quantitative analyses of the data revealed that (1) L1 influence is indeed a primary factor leading to long-term stabilization, and (2) long-term stabilization can also arise from the complexity of the L2, independent of L1 influence (Han, 2004, p. 100).

In a follow-up study published in 2006, Han revisited her informants who, by the time of the first data collection, had each been living in an English-speaking country for five years. For this study, Han adopted a "longitudinal comparative approach" that compared data elicited from GJ tests to existing naturalistic production data for the purpose of assessing the reliability of the GJ tasks (p. 71). She also included an adult male NS of American English to provide baseline data on English unaccusatives, the linguistic focus of the paper. As in her 1998 study, Han (2006) found reason to reject the notion of a global end state. Instead, she maintained that individual L2 learners can evince "multiple local end states to be reached at different points in time, with some showing fossilization...and others complete acquisition" (p. 77). Collectively, these findings led Han to conclude that "success and failure co-exist" in a given IL (Han, 2014, p. 54), providing further evidence of selective fossilization.

In addition to longitudinal and empirical studies, behavioral and brain-based research also supports the assertion that fossilization is selective. For example, Sorace (2003, 2005) uncovered behavioral and neuropsychological evidence (e.g., fMRI and ERPs) of selective fossilization with her brain-based studies of language attrition in near-native speakers of Italian and English. Unlike most other L2 researchers, who tend to focus on either failure or success in L2 acquisition, Sorace targeted “optionality,” which applies to both. As defined by Sorace (2003), optionality is “the existence of two or more variants of a given construction that are identical in meaning and have a clear correspondence in form” (p. 135), with one variant being the “more grammatical” of the two (p. 137). She further distinguished between optionality and variation, with optionality existing at the competence level and variation, at the level of performance.

According to Sorace, optionality is “one of several non-obvious differences that distinguish *both the L1 and L2 grammars* of the near-native speaker from the grammar of the monolingual native speaker” (p. 131, italics included in original). Drawing upon data from near-native (L1 English) learners of Italian and native speakers of Italian whose L1 had suffered attrition from long-term exposure to English, Sorace (2005) reported that optionality in both L2 acquisition and L1 attrition occurs “at the interface of syntax and discourse,” resulting in residual L2 optionality on the one hand, and emergent L1 optionality on the other (p. 55). She further contended that while optionality is only a temporary phenomenon in the L1, L2 optionality tends to persist even at advanced competence levels (2003).

Citing null/overt subjects and pre/postverbal subjects as an example, Sorace drew a parallel between “the end-state knowledge of English near-native speakers of Italian

and the native knowledge of Italian near-native speakers of English under attrition” (2005, p. 67). Sorace noted that in both cases, variation from native speaker norms is “selective,” affecting some subsystems of the IL and not others. Here it should be noted that as a ‘pro-drop’ language with rich inflectional morphology, Italian allows under certain pragmatic conditions for both the ‘dropping’ or deletion of overt subject pronouns and the positioning of subjects both before and after the verb, as illustrated in this example¹ of three bickering siblings:

1. Maria: **Roberto** ha mangiato il mio biscotto! [*overt/preverbal* subject: **Roberto**]
Robert has eaten my cookie!
2. Roberto: No! L'ha mangiato **Antonio**! [*overt/postverbal* subject: **Antonio**]
No! It has eaten *Antonio* [No! *Antonio* ate it!]
3. Antonio: No, non l'ho mangiato! [*null* subject]
No, not it have eaten! [No! I didn't eat it!]
4. Mother: Basta!
Enough!

In the example above, Sentence 1 includes an overt preverbal subject: “Roberto.” In Sentence 2, the overt subject, “Antonio,” is placed after the verb for emphasis. An example of a null subject can be found in Sentence 3, in which the non-lexically realized *io* (English: *I*) constitutes the null subject. Here an overt subject is grammatically (and pragmatically) superfluous, as the verb phrase (*ho mangiato*) clearly identifies the subject as the Italian first person singular *io*.

¹ The grammatical and pragmatic accuracy of the example above was confirmed by Maria A. Mann, Ph.D., Professor of Foreign Languages (Italian).

Sorace's research revealed that while the "computational features of syntax responsible for the licensing of null subjects are acquired completely[;]...only the syntax discourse interface conditions on pronominal subjects are affected by attrition" (p. 67). In sum, having identified sub-systems of IL affected by both L1 and L2 attrition, Sorace concluded that while "the final outcome of L2 acquisition may be divergent from the outcome of first language acquisition...the divergence is **selective** (i.e., it is not found across the board)" (2005, p. 56).

Lastly, Franceschina's (2005) empirical study of the role of L1 in the acquisition of grammatical gender in Spanish uncovered "persistent selective divergence" in the end state grammars of her participants, calling attention to adult learners' "selective insensitivity to L2 input" (2005, p. 3). In this study, Franceschina set out to investigate the causes of "divergence in the endstate of L2 morphosyntactic development" (p. 1) by examining the role of L1 in the acquisition of grammatical gender in L2 Spanish. Three research questions were identified: (1) "Can adult learners acquire nativelike knowledge of grammatical gender in the L2?" (2) "In adult L2 learners, is the possibility of nativelike attainment in the area of grammatical gender determined by the learner's L1?" and (3) "If it is found that even nearnatives have divergent representations of grammatical gender in the L2, what prevents them from reaching the same endstate knowledge as L1 speakers?" (2005, p. 5).

For this study Franceschina assembled two experimental groups of near-native speakers (N=68) of the TL, Spanish, and one control group of (N=42) native speakers. The first experimental group consisted of 15 participants whose NL, English, does not observe the property of grammatical gender (- gen). The second was comprised of 53

participants from six different language backgrounds (i.e., Arabic, French, German, Greek, Italian, and Portuguese) for which the targeted feature, gender, is observed (+gen).

All in all, 110 subjects participated in a battery of tests, which included a guessing game, a missing word task, a cloze/multiple choice exercise, a grammaticality judgment task (GJT), a novel word task, a gender assignment check, and an oral interview. The data were analyzed quantitatively, yielding the following observations. Firstly, adult learners can acquire nativelike knowledge of grammatical gender; however, their L1 plays a crucial role in determining whether nativelike attainment of grammatical gender is possible. Secondly, Franceschina found evidence of “persistent selective divergence” in the endstate grammars of her participants, providing additional support for selective fossilization (Franceschina, 2005, p. ix).

Along with providing empirical evidence of selective fossilization, current research also suggests that the successful acquisition of a second language involves more than just the acquisition of target-like forms, as Selinker’s (1972) original hypothesis implied. Indeed, the greater challenge for learners is to acquire target-like conceptualization of experience, which involves “the ability to map form-meaning-function relations, and to do so in real-time spontaneous communication” (Han, 2013b, p. 138). Take, for example, the English definite article. It is not enough for a learner to know the form of the definite article (“the”) and its meaning; he or she must also understand its pragmatic function (i.e., its appropriate use in different discourse conditions). Hence, while the learner may know that it is possible to say “the dog” in English, he or she may not know when “the dog” refers to a specific entity (e.g., *The dog*

in the picture is a golden retriever) or when it is being used generically (e.g., *The dog is a faithful animal*). Moreover, he or she may also be unaware that the generic pattern THE + SINGULAR NOUN (*The dog is a faithful animal*) conveys a more formal register in English than does the generic pattern \emptyset + PLURAL NOUN (*Dogs are faithful animals*). For learners whose native language lacks a particular target language structure (e.g., articles), the task of mapping form-meaning-function relations is even more daunting.

Current research also suggests that for L2 learners, the influence of the native language may reach beyond the well-attested domains of phonology, morphology, and syntax, to the learner's conceptualization of experience. The idea that the structure of the language we speak can influence how we perceive the world is known as "linguistic relativity" (Yule, 2014). In second language acquisition, "a major prediction made on the basis of linguistic relativity (LR) is that the acquisition of an additional language... will never be complete, due to the interference of the L1-based conceptual system" (Han, 2008b, p. 65). In other words, errors in morphosyntax should never be attributed solely to the learner's incomplete acquisition of TL forms. Instead, they should be viewed, at least in part, as evidence of "a long-lasting learnability problem" (p. 61) instigated by interference from an L1-relativized mind. A number of examples come to mind.

To begin, recall that in her longitudinal case study of two adult Chinese users of English, Han cited L1 influence as a "primary factor leading to long-term stabilization" (2004, p. 100). More recently, Han (2013b) has identified L1 influence as "the major shaping force in fossilizable speech behavior" (p. 137). She goes on to argue that its influence is so strong that "the ability to restructure L1-based conceptualization and articulation is something that can permanently evade L2 learners, whatever the learning

conditions” (p. 138). As an example, Hawkins (2000) relegated morphological variability to a deficit in representation. He further claimed a critical period for the selection of parameterized grammatical features beyond which “those...not instantiated during L1 acquisition may permanently be either absent or defective in adult L2 acquisition” (Han, 2009, p. 152).

N. Ellis (2006), too, attributes fossilization to L1 interference from a mind “already tuned and committed” to the native tongue (p. 109). For instance, he cites a “failure of noticing” as another putative explanation for the non-native proficiency so characteristic of adult L2 learners, particularly where competing cues in the TL input can be found: “A failure of noticing must clearly be one cause of cases in which, despite high frequency in the input, second language learners fail to acquire a particular pattern or feature” (N. Ellis, 2002, p. 306). He refers to one instantiation of failing to notice as “blocking,” a phenomenon of associative learning in which “redundant cues are overshadowed for the historical reasons that learners’ first language experience leads them to look elsewhere for the cues to interpretation” (N. Ellis, 2006, p. 110). For instance, in the sentence *Yesterday he walked to the park*, the learner is likely to ignore the morphological past-tense marker *-ed* and focus instead on the meaning-rich temporal adverb.

Like N. Ellis, MacWhinney (2001) also identifies the influence of the L1-based conceptual system as a probable impediment to L2 acquisition. For example, MacWhinney’s studies of adult learners of English revealed that both L2 comprehension and production suffer when learners imposed the cue strength hierarchy of their L1 onto English. As an example of the former, he cites evidence of a “syntactic accent” in

sentence interpretation – evidence that has been supported in over a dozen studies spanning a multitude of second language learning situations (2001, p, 84). As MacWhinney describes it, a syntactic accent can manifest itself in a sentence that is “structurally correct, but pragmatically inaccurate” (p. 12), as in L1 Hebrew speakers’ underutilization of the English passive. In another example, he tells of a highly accomplished and educated L1 speaker of German who, despite having lived in the United States for over 30 years, continued to process English sentences using the “cue strength hierarchy” of German (p. 84). Although this native speaker of German had attained sufficient proficiency in English to publish several influential textbooks in his field, he continued to ignore English word order when it competed with the more salient (to him) cues of animacy and agreement, even when processing simple sentences in English. Unfortunately, by transposing the L1 cue strength hierarchy of German onto L2 English, his comprehension of even simple English sentences suffered, leading MacWhinney to posit the notion of fossilized comprehension.

Additional support for the assertion that fossilization is inspired by an L1-relativized mind can be found in Lardiere’s (1998, 2006, 2007) study of Patty. For instance, it has been argued that Patty’s failure to acquire English past tense morphology can be attributed directly to interference from her L1. As White (2003) explains, “Chinese has no overt tense or agreement morphology. Thus, it is possible that the problems exemplified by Patty are, at least in part, a consequence of the total absence of overt inflection in the L1” (p. 190). Similarly, Franceschina (2005) found that L1 played a crucial role in her participants’ acquisition of grammatical gender, noting that subjects

whose L1 observed the targeted structure (+ gen) were more successful than those whose L1 did not.

We close this discussion of the field's current understanding of fossilization by revisiting Selinker's (1972) claim that fossilization is most evident in spontaneous, "meaningful performance," defined as "the situation where an 'adult' attempts to express meanings, which he may already have, in a language which he is in the process of learning" (p. 210). In Selinker's view, the only "relevant" L2 data are those that capture a learner's spontaneous attempts at self-expression, that is, "those behavioral events which would lead to an understanding of the psycholinguistic structures and processes underlying 'attempted meaningful performance' in a second language" (1972, p. 210). This claim has been supported by current research investigating the relative allocation of computational resources among L2 learners engaged in real-time meaningful production. Skehan's (1998) Single Resource Model of Attention, for example, proposes that whenever learners attempt to express themselves in an L2, there is a "trade-off" between attention to form and attention to meaning. In other words, "When attention is allocated to form, learner output will be more accurate but less fluent; conversely, when attention is allocated to meaning, the output will be more fluent but less accurate" (Han, 2014, p. 59).

Having reviewed relevant empirical and theoretical studies of fossilization and provided some empirical evidence of selective fossilization, we now turn to a discussion of the SFH (Han, 2009, 2013b), the focus of the present study.

2.1.3 The Selective Fossilization Hypothesis (SFH)

Han introduced the SFH in her (2009) paper, "Interlanguage and Fossilization: Towards an Analytic Model." Citing empirical evidence from the L2 initial state to the

L2 endstate, Han (2009) attempts to explain how it is that fossilization “only hits certain linguistic features in certain subsystems of the interlanguages of individual learners while other linguistic features in the same subsystems are successfully acquired or continue to evolve” (Han, 2004, p. 22).

According to the SFH, predictions about which forms are more likely to be acquired by an individual learner and which are more likely to fossilize can be made by examining the interaction of “L1 markedness” and “L2 input robustness.” Here L1 markedness is conceptualized as “frequency and form-meaning-distribution variability,” and L2 input robustness as “+/- frequent, +/- representative, +/- relevant, +/- variability” (Han, 2008a, p. 5), with “frequency” denoting the number of times a particular linguistic form appears in the input and “variability,” its consistency. Otherwise stated, a form that is “unmarked” in the L1 is one that is frequent and invariable (i.e., consistent), and one that is a “marked” is infrequent and variable (i.e., inconsistent). Similarly, a “robust” form in the L2 is one that is frequent and invariable, whereas a “non-robust” form is both infrequent and variable in the target language input. According to Han (2014), the variability dimension of L2 input robustness follows along a continuum from simplicity to complexity, as illustrated in Figure 2.1, below.

In sum, the SFH posits that “fossilization is largely a function of an unmarked usage in the L1 and a piece of non-robust input providing weak evidence for some TL usage” (Han, 2013b, p. 145), as is its converse. That is, if a usage is marked in the L1 (i.e., less frequent or habitual) a prognosis of acquisition can be made, the reason being “if the form is less habitual in the L1, it is less likely to interfere with the learning of the L2 feature” (Han, 2009, personal communication).

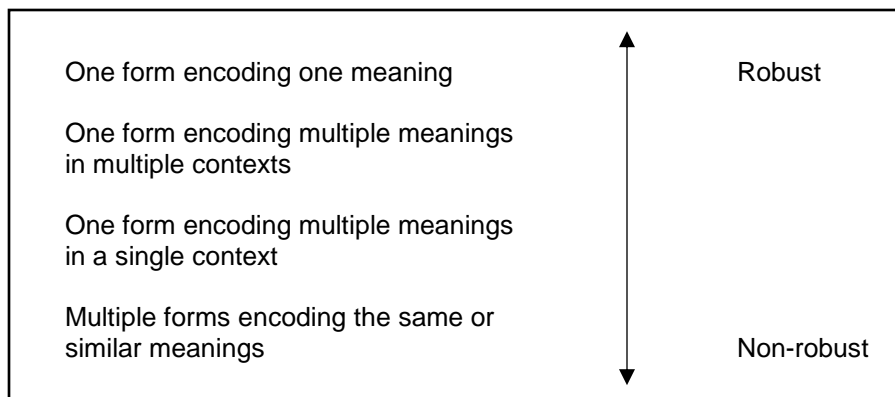


Figure 2.1. The Variability of Input Robustness

Reprinted from Han, Z.-H. (2014). Revisiting the construct of fossilization. In Z.-H. Han & E. Tarone (Eds.), *Interlanguage: Forty years later*. Philadelphia: John Benjamins Publishing Company, p. 61.

Figure 2.2, below, provides a graphic representation of LI markedness. Here a horizontal axis denotes a possible range of variability in the L1, whereas a vertical axis denotes the degree of frequency. Both axes intersect to create four possible outcomes for a given L1 feature: (I) quite unmarked, (II) unmarked, (III) quite marked, and (IV) marked.

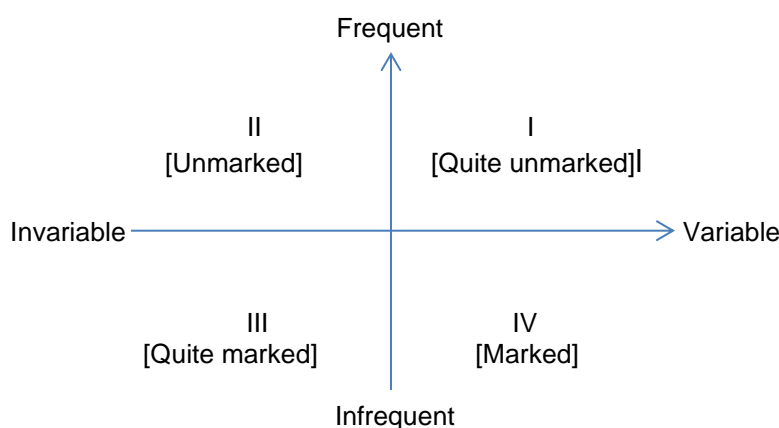


Figure 2.2. The SFH: L1 Markedness

Reprinted from Han, Z.-H. 2009. Interlanguage and fossilization: Towards an analytic model. In V. Cook & L. Wei, Eds., *Contemporary applied linguistics*, Vol. I: Language Teaching and Learning, London: Continuum, p. 143.

Alternatively, Figure 2.3 illustrates L2 input robustness, with the horizontal axis representing a continuum of variability in the L2, and the vertical axis, a continuum of frequency. The intersection of these two axes creates four possible input conditions for a given L2 feature: (I) quite robust, (II) robust, (III) quite non-robust, and (IV) non-robust:

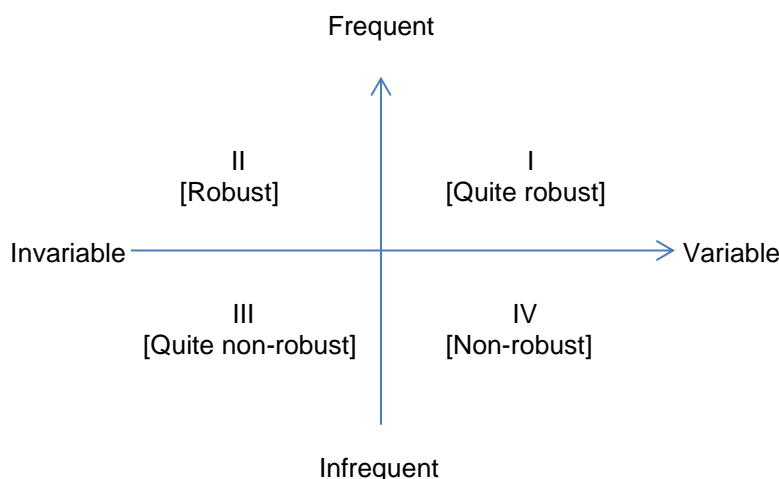


Figure 2.3. The SFH: L2 Input Robustness

Reprinted from Han, Z.-H. 2009. *Interlanguage and fossilization: Towards an analytic model*. In V. Cook & L. Wei, Eds., *Contemporary applied linguistics*, Vol. I: Language Teaching and Learning, London: Continuum, p. 144.

Han (2013b) further postulates that it is the interaction of L1 markedness and L2 robustness that determines a possible prognosis of L2 acquisition or fossilization (p. 144). This interaction is schematized in Figure 2.4 below. Here a horizontal axis represents the continuum of L1 markedness, its left end “marked” (i.e., denoting a form that is infrequent and variable, or inconsistent, in the L1), and its right end “unmarked” (i.e., indicating a form that is frequent and invariable in the L1). Alternately, a vertical axis represents the continuum of L2 input robustness, its low end “robust” (i.e., denoting a form that is frequent and invariable in the L2), and its high end “nonrobust” (i.e., indicating a form that is infrequent and variable in the L2 input).

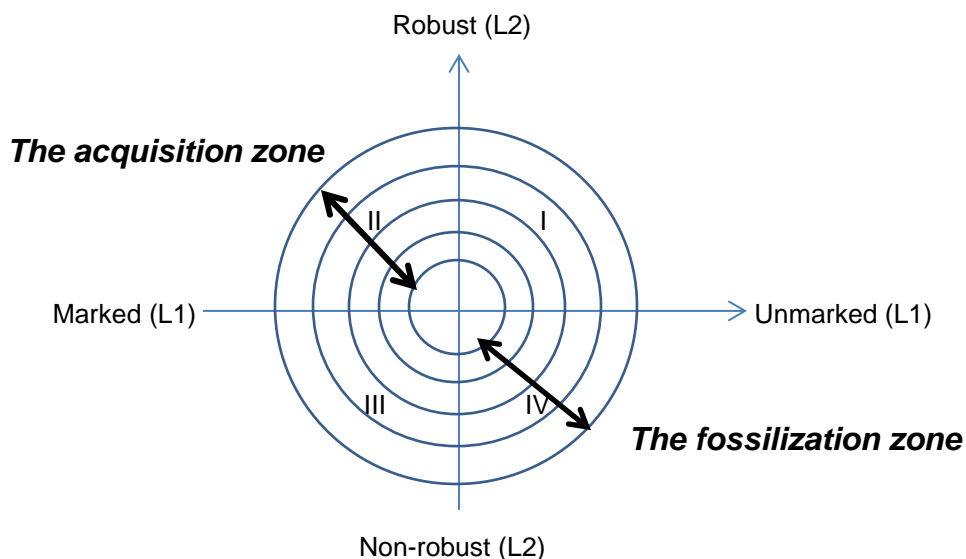


Figure 2.4. SFH: Prognoses about Acquisition and Fossilization

Reprinted from Han, Z.-H. 2009. Interlanguage and fossilization: Towards an analytic model. In V. Cook & L. Wei, Eds., *Contemporary applied linguistics*, Vol. I: Language Teaching and Learning, London: Continuum, p. 147.

According to Han (2008a), constructions that are marked (i.e., infrequent and variable) in the L1 and robust (i.e., frequent and invariable) in the L2 input are more likely to be acquired (Zone II), while those that are unmarked (frequent and invariable) in the L1 and non-robust (infrequent and variable) in the L2 input tend to fossilize (Zone IV). Finally, two broad areas of indeterminate prognoses are created in Zones I and III – putative “gray areas” in which “either acquisition or fossilization may occur, depending on the function of individual learners’ abilities such as memory and sensitivity” (p. 6). Hence, in these two neutral zones, individual learner attributes such as working memory capacity and *input sensitivity* (a trait that is constant within learners but varies among learners) interact with *perceptual salience* (the frequency, communicative salience, and semantic weight of a target structure), to determine learner outcomes (Han, 2014; Long, 2003). As a result, the SFH also allows predictions to be made about the acquisitional

complexity of individual linguistic features and their “degrees of complexity vis-à-vis specific linguistic features” (Han & Lew, 2012). This property of the SFH is schematized in Figure 2.4, above, where the outer circles represent a greater degree of complexity, and the inner circles, a lesser degree (Han, 2009).

2.2 Overview of Typical Errors in Spanish - English IL

Because the present study focuses on persistent errors in the writing of learners whose NL is Spanish, a brief history of the language and an overview of some typical errors in Spanish-English IL will be provided. To begin, with approximately 437 million native speakers and tens of millions of secondary speakers, Spanish ranks as the second most widely spoken language in the world today (Tinsley & Board, 2017, p. 52). It is the national language of 21 countries and is spoken by 30 to 40 million native speakers in the United States, home to the largest Spanish-Speaking population in the world (p. 52).

The first written record of Spanish dates back to the latter part of the 10th century, “the date of a religious text from the monastery of San Millán in the Rioja region, whose scribe openly acknowledged the discrepancy between Latin and spoken vernacular by annotating the words and phrases he knew would be unintelligible” to his Latin-speaking contemporaries (p. 198). Given its long history of continuous use and wide dispersal throughout the world, it is not surprising that a number of dialects of Spanish have emerged. As Green (1987) writes, “Like all pluricentric languages, Spanish is subject to regional and sociolinguistic variation,” though the range of variation is rarely so great that it impedes mutual comprehensibility (p. 197).

As members, respectively, of the Italic and Germanic branches of the Indo-European Language Family (Crystal, 1987), and with a common ancestral bond in Latin, Spanish and English share a common alphabetic writing system and a large subset of Latin-based cognates (Bravo, Hiebert & Pearson, 2007). Broad grammatical similarities and differences between the two languages are summarized in Table 2.1, below, and examples are given for each.

Having identified some basic similarities and differences between Spanish and English, we now turn to an examination of the more specific dissimilarities and the ‘typical’ errors associated with each. Generally speaking, the writing of L1 Spanish learners of English – even at the most advanced levels – often includes errors in word order, question formation, negation, and possession, as well as inaccuracies in the use of verbs, infinitives, articles, prepositions, and number. Each of these errors, in turn, will be discussed below.

Word Order

Although classified primarily as an SVO language, word order is much freer in Spanish than in English, allowing not only SVO, but also VSO and OVS. Not surprisingly, then, errors in syntax are commonly found in the writing of L1 Spanish learners of English (Swan & Smith, 2001). However, this does not mean that Spanish is without syntactic constraints. While it is true that in Spanish, subject noun phrases (NPs) “are not fixed by grammatical requirements at a particular point in the sentence,” there are, nonetheless, “strong constraints on word order *within* the main syntactic constituents” (Green, 1987, p. 211). Moreover, Spanish adjectives post-modify nouns (**the house white*), adverbials and object complements are placed before direct objects

Table 2.1

Grammatical Similarities/Differences: English and Spanish

Similarities	Differences
<p>Both English and Spanish:</p> <ul style="list-style-type: none"> • have singular and plural forms of nouns [e.g., English: 1 <i>man</i>, 2 <i>men</i>. Spanish: 1 <i>hombre</i>, 2 <i>hombres</i>] • have definite and indefinite articles [i.e., English: definite: <i>the</i>; indefinite: <i>a</i>, <i>an</i>. Spanish: definite: <i>el</i>, <i>los</i>, <i>la</i>, <i>las</i>; indefinite: <i>un</i>, <i>una</i>, <i>unos</i>, <i>unas</i>] • have regular and irregular verbs [e.g., English: regular verbs: <i>walk</i>, <i>jump</i> <i>play</i>; irregular verbs: <i>eat</i>, <i>read</i>, <i>go</i>. Spanish: regular verbs: <i>hablar</i>, <i>comer</i>, <i>vivir</i> (speak, eat, live); irregular verbs: <i>estar</i>, <i>ir</i>, <i>dar</i> (be, go, give)] • have past and present tenses [e.g. English: past: <i>Marie visited</i>; present: <i>Marie visits</i>. Spanish: past: <i>Maria visitó</i> (Maria visited); present: <i>Maria visita</i> (Maria visits)] • have perfect and progressive verb forms [e.g.. English: perfect: <i>Marie has visited</i>; progressive: <i>Marie is visiting</i>. Spanish: perfect: <i>Maria ha visitado</i> (Maria has visited); progressive: <i>Maria está visitando</i> (Maria is visiting)] 	<p>Compared to English, Spanish:</p> <ul style="list-style-type: none"> • has a highly inflected verb system [compare English, which has 2 verb forms in the simple present: <i>I/we/you/they live</i>, <i>he/she lives</i>, with Spanish, which has 4: <i>yo vivo</i> (I live); <i>vivimos</i> (we live); <i>ellos viven</i> (they live), <i>ustedes viven</i> (2nd person plural: you live); <i>usted vive</i> (2nd person singular: you live), <i>él vive</i> (he lives), <i>ella vive</i> (she lives)] • has freer word order [e.g., words to be emphasized may be placed first or last (<i>Yesterday played very well the children</i>; <i>The children played very well yesterday</i>); frequency adverbs can assume several possible positions (<i>Often she has helped</i>; <i>She often has helped</i>; <i>She has helped often</i>)] • shows gender and number in adjectives and nouns [e.g., tall boy (<i>chico alto</i>: masculine, singular); tall boys; (<i>chicos altos</i>: masculine, plural); tall girl (<i>chica alta</i>: feminine, singular); tall girls (<i>chicas altas</i>: feminine, plural)] • uses no auxiliaries with questions [compare English: <i>Marie eats fish.</i> / <i>Does Marie eat fish?</i> with Spanish: <i>Marie come pescado.</i> / <i>¿Marie come pescado?</i>] • uses the passive much less [Although Spanish has a passive form that follows the same construction as the English passive (<i>be</i> + past participle), it tends to use a form similar to the English reflexive for passives with no agent (<i>*The house built itself last year.</i>)]

Note: Adapted from *Learner English*, by M. Swan and B. Smith (Eds.), 2001.

(**I like very much classical music*; **Keep clean your room*), and indirect objects require the preposition *a*, meaning ‘to’ (**They gave to the winner a prize*) (Sofer & Raimés, 2002; Swan & Smith, 2001).

Questions

Furthermore, unlike English, Spanish has no set word order for questions and uses no auxiliaries. As a result, questions in English are difficult for learners to interpret and produce, giving rise to **Who John Lennon killed?* meaning *Who killed John Lennon?* as well as **Who the dog bit?* and **Why you don’t learn how to drive?* (Swan & Smith, 2001).

Negatives

As in all Romance languages, the two-part negative is standard in Spanish, resulting in transfer errors such as **He don’t have no time*. Moreover, auxiliaries are not used, and the negative particle is ‘no,’ giving rise to **She no like that* and **I no understand*.

Possession

Possessive forms are late-acquired in many languages, and this is true for first and second language learners alike (Larsen-Freeman, 1976). The fact that English has two ways to signal possessive forms and Spanish, only one, may explain why L1 Spanish learners of English often use these forms incorrectly (Celce-Murcia & Larsen-Freeman, 1999). On the one hand, possession in English is expressed by the use of either inflected (*John’s book*) or periphrastic (*the cover of the book*) expressions. The inflected form –s is used with animate head nouns (*the baby’s bottle*) or with inanimate head nouns “when

the noun could be viewed as performing an action” (the plane’s arrival), whereas the *of* form is “preferred in all other instances (pp. 314-315). On the other hand, possession in Spanish is expressed exclusively by way of the *of* form, giving rise to **the book of Marta* or **the bottle of the baby*.

Verbs

Unlike English, Spanish has no separate category of modal auxiliaries, so learners find “the concept, the simplicity of their forms, and their uses difficult to grasp” (Swan & Smith, 2001, p. 101). For example, whereas English modal auxiliaries are characterized by their lack of tense and inflection, Spanish uses fully inflected verbs to express equivalent meanings and functions. Hence L1 Spanish learners of English often may to conjugate English modals as they would “ordinary” English verbs, producing, for example, **She cans speak French*, and **He musts do his homework* (Celce-Murcia & Larsen-Freeman, 1999). Moreover, learners frequently struggle with English phrasal verbs (e.g., *hang up, hang on, hang out, hang in*), since “the meaning of the English compound is not deducible from the meanings of the parts” (p. 101); hence, they often misuse them or use the Latin-derived synonym instead. Lastly, many phrases consisting of ‘be + adjective’ in English are expressed as ‘have + noun’ in Spanish, so learners produce **have hunger* and **have reason* (p. 101).

Infinitives

Spanish has no gerund form, so learners may use the infinitive form in its place: **To smoke is bad for your health*; **They enjoy to travel* (Sofer & Raimés, 2002; Swan & Smith, 2001).

Articles

Although English and Spanish both have definite and indefinite articles, there are some important differences in their use. For one, Spanish does not discriminate between the indefinite article and the number one (**I live in one house*). Furthermore, Spanish requires the definite article with mass nouns and plural count nouns that express a general meaning, resulting in **Do you like the compact cars?* and **The freedom is more important than the life*. Spanish also uses the definite article with possessive pronouns, giving rise to **That is the yours, and this is the mine* (Swan & Smith, 2001, p. 104).

Prepositions

As Catalán (1996) writes, “For a long time teachers of English as a foreign language have been aware of the great difficulty that Spanish students encounter in mastering English prepositions” (p. 171). Although the core meaning of Spanish and English prepositions is the same there are many exceptions, most notably with ‘in/on/to’ (**in Friday, *on June, *riding on a car*), ‘to/at/in’ (**arrive to the campus, *go at the movies, *take a trip in Long Island*), and ‘during/for’ (**We lived in New York during two years*). Additionally, since prepositions in Spanish must always go with their NP and never at the end of a clause, learners have difficulty with English sentences such as *I don’t know who he’s asking for* (p. 108).

Number

Unlike English, “all Spanish nouns can appear in both numbers: singular and plural” (Marrero & Aguirre, 2003), and as a result, many words take plural forms in Spanish where English uses a mass noun. Indeed, even the most advanced learners

produce **furnitures*, **advices*, and **informations*. Moreover, since Spanish marks number “on all modifiers within the noun phrase” (Green, 1987, p. 213), constructions such as **reds cars* and **hers news toys* are not uncommon. Lastly, Spanish has no irregular plurals, so errors such as the following may persist: **childs*, **childrens*, **mens*, **a people* (Swan & Smith, 2001).

2.3 Research Questions

The overriding purpose of this dissertation was to investigate whether persistent grammatical errors in the writing of adult second language learners of English are consistent with the predictions of the SFH (Han, 2009, 2013b). This investigation was completed in two parts. Part I presents a cross-sectional study of 60 adult L1 Spanish learners of English grouped into three proficiency levels, and Part II, a within-learner longitudinal case study of two individual learners. The cross-sectional study was motivated by two research questions:

- (1) *Which grammatical errors persist in the participants’ written output at the advanced proficiency level?*
- (2) *Are the persistent grammatical errors identified in the cross-sectional corpus consistent with predictions of the SFH?*

Next, the longitudinal study, which endeavored to shed a clearer light on the data and delve more deeply into the relationship between the data and the SFH, posed four research questions, namely:

- (1) *Which grammatical errors persist in the participants’ written output over time?*

- (2) *Do the cross-sectional data and longitudinal data on persistent errors converge?*
- (3) *Do the persistent errors identified in the longitudinal corpus provide evidence of selective fossilization?*
- (4) *Are the persistent grammatical errors identified in the longitudinal corpus consistent with the predictions of the SFH?*

We return to these questions in Chapter V.

Chapter III

METHODOLOGY

Chapter III describes the methodology of the study. It begins by providing context for the research, including information regarding the methodological background and setting. This is followed by a description of the study's design, participants, and production tasks. The chapter concludes with an explanation of the procedures used to select, code and analyze the data.

3.1 Context

This section contextualizes the study both methodologically and situationally. It begins with an overview of research methodologies used in studies of second language acquisition and the theoretical frameworks from which they are drawn. Next, a review of methodological approaches common to studies of second language acquisition is provided, followed by a brief appraisal of their relative strengths and weakness. Following that, the research setting for the study, a large suburban community college, is introduced, along with the English language programs offered and the international students they serve.

3.1.1. Methodological Background

Given the multidisciplinary nature of SLA, it is not surprising that those who study it draw their research methodologies from a number of related fields. As Mackey and Gass (2012) aptly note, research methods “cannot be understood in a vacuum...[as]

they are dependent on the theories that they are designed to investigate” (p. 1). These theories, in turn, are tied to the conceptual frameworks from which they are drawn. Hence, any discussion of research methodologies in SLA would not be complete without first acknowledging the various theoretical perspectives that comprise the field.

Broadly speaking, SLA research can be grouped into three interrelated disciplinary perspectives: linguistic, psychological, and social (Saville-Troike, 2012). **Linguistic** perspectives have assumed two-distinct foci – one *internal* (e.g., innatism) and one *external* (e.g. structuralism, functionalism). The former lays emphasis on the learner’s underlying knowledge of language, or linguistic competence, and the later, the learner’s linguistic performance (2012). **Psychological** perspectives, on the other hand, have concentrated on three areas of interest: *languages and the brain* (e.g., neuro-linguistics), *learning processes* (e.g., emergentism), and *learner differences* (e.g., humanistic models). Lastly, **social** perspectives underscore the importance of “social and contextual variables as they affect the learning and production of a second language” (Gass et al., 2013, p. 293). Some researchers, such as interactionists, bring elements from two or more of the above-named disciplines (e.g., linguistics, cognitive psychology) to their study of SLA. From these three disciplinary perspectives – linguistic, psychological, and social – have emerged the three theoretical orientations underlying SLA research: *innatism* (a linguistic approach), *interactionism* (a linguistic – psychological approach), and *emergentism* (a psychological approach). A brief description of each follows.

The first, *innatism*, introduced in the 1960s through the work of Noam Chomsky (e.g., Chomsky, 1965), has produced “the most known and researched theory in the field,” namely, Universal Grammar (UG) (VanPatten & Williams, 2007, p. 13), the belief

that human beings are endowed with mental structures designed solely for the purpose of acquiring a language (Lightbown & Spada, 2017, p. 219). Although all innatists share the common belief that language acquisition is guided by “dedicated computational resources,” or UG (Franceschina, 2005, p. 2) and minimize the importance of the linguistic environment in L2 acquisition (Nor & Rashid, 2018), they often disagree on other issues, for example the degree to which UG is available to the L2 learner and the relative importance of L1 and L2 in the acquisition of an L2. The second, *interactionism*, gained prominence in the early 1980s (Norris & Ortega, 2003, p. 723). A learning theory that recognizes both learner-internal and learner external processes in L2 acquisition (R. Ellis, 1991, p. 299), interactionism focuses more on the linguistic environment in second language acquisition than does innatism and rejects the notion of an internal mechanism exclusive to language or language acquisition. Conceptually, interactionism can be seen as lying somewhere between innatism and *emergentism*, a usage-based model of language acquisition with roots in cognitive psychology (Lightbown & Spada, 2017). Introduced in the 1990s, emergentism, maintains that “the basic units of language representation are *constructions*...form-meaning mappings, conventionalized in the speech community and entrenched as knowledge in the learner’s mind” (VanPatten & Williams, 2007, p. 78). In contrast to generative UG models of second language acquisition, emergentism eschews the idea of an innate UG and, for the most part, draws no distinction between competence and performance in L2 learners (Gasser, 1990). Generally speaking, proponents of each of these research paradigms tend to use different methods to collect and analyze data and interpret their research findings in different ways

Saville-Troike, 2012). Nevertheless, all share challenges endemic to second language acquisition research, which will be described below.

Those who study second language acquisition face common obstacles, the most notable being that the phenomenon they wish to investigate cannot be directly observed. Although advances in brain-based research have allowed researchers (e.g. N. Ellis, 2002, 2006, 2007; MacWhinney, 2001; Scovel, 1969; Ulman, 2001) to identify areas of the brain that are activated as second language learners perform various language tasks and put forth some broad observations about differences in L1 and L2 use, it is still quite impossible to know what, exactly, is happening in the language learner's mind, particularly as regards the learner's implicit linguistic knowledge, or *competence*.

As Ellis and Barkhuizen (2005) note, "For many SLA researchers, the goal of SLA is the description and explanation of L2 learners' *competence* and how this develops over time" (p. 5). Linguistic *competence*, or what the language learner knows, is often distinguished from linguistic *performance*, or what the learner does – that is, the way he or she actually uses the language (Lightbown & Spada, 2017). Unfortunately, only the latter, linguistic performance, is directly observable. As a result, researchers have relied on various research methods, such as analyses of naturalistic production data (e.g. text analysis), language tasks (e.g., grammaticality judgment tasks, translation tasks, and cloze exercises), and neuroimaging techniques (e.g., fMRI and EEG studies) to draw inferences about a learner's implicit knowledge, or linguistic competence. However, these methodologies are, at best, a window to a learner's underlying competence.

A related challenge for researchers is the highly variable nature of learner language, a hallmark of L2 acquisition characterized by backsliding and inconsistent

progression (Abrams & Rott, 2017, p. 158) attributable not only to environmental factors such as task complexity (Abrams & Rott, 2017), but also to social and psychological factors such as the perceived sociolinguistic status of the interlocutor, the degree of attention paid to linguistic form, and the interaction of the two (Ellis & Barkhuizen, 2005, p. 6). Hence, the heterogeneity of linguistic performance further confounds the researcher's ability to tap into the learner's linguistic competence, which is itself dynamic and variable. To address these issues and the methodological challenges they pose, Ellis and Barkhuizen (2005) advise researchers to utilize multiple sources of performance data to probe learner competence and to look for points of confluence as evidence of what the learner knows (p. 7). By doing so, researchers can improve the validity of their studies, that is, the likelihood that the measure they have chosen is, in fact, measuring what it set out to (Polio, 2012). Nevertheless, despite the researcher's best efforts to choose the most appropriate method of investigation for his or her study, it is important for him or her to recognize that all methods of analysis in SLA "call for all kinds of interpretive decision making on the part of the researcher" (Ellis & Barkhuizen, 2005, p. 369). In other words, no methodological approach is infallible: all have their strengths and weaknesses, which will be discussed, in turn, below.

Not surprisingly, the diversity of methodological approaches available in second language acquisition research can be traced directly to the multidisciplinary nature of the field. Indeed, as the number of theoretical approaches to second language acquisition has grown over time, so too has the variety of research methodologies available. As an example, in their seminal text, *Doing Second Language Research* (2002), Brown and Rodgers identify seven basic types of research design organized into two broad

categories: qualitative research (case studies, introspection research, classroom research) and quantitative research (descriptive statistics research, correlational research, quasi-experimental research, and evaluation research), each of which can be realized in a number of ways. Moreover, in their influential text, *Analyzing Learner Language*, R. Ellis and Barkhuizen (2005) cite 12 different methods for investigating L2 learner language, among them: error analysis, obligatory occasion analysis, target-like use (TLU) analysis, frequency analysis, functional analysis, interactional analysis, and conversational analysis. Meanwhile, in Mackey and Gass's (2012) *Research Methods in Second Language Acquisition: A Practical Guide*, which itself covers a wide range of methodological approaches, a chapter devoted exclusively to L2 writing identifies eight types of research methods for analyzing L2 learners' written production, including surveys, interviews, ethnographies, meta-analyses, and three subcategories (descriptive, comparative/correlational, and experimental), of text analysis and process analysis (Polio, 2012). Since the focus of the present study is L2 persistent errors, the remainder of this section will focus on the methodological approaches typically found in studies of a similar nature (e.g., fossilization research) – namely, longitudinal and cross-sectional studies, language tasks (e.g., grammaticality judgment tasks, cloze exercises, text analysis), and brain-based studies.

Cross-sectional and longitudinal studies. Cross-sectional studies are a type of 'one-shot case study' that enable researchers to determine whether an association holds between two variables (Schutt, 2006, p. 215). They are often used in studies with a nonexperimental, descriptive design. In L2 research, cross-sectional studies are typically used to compare groups of learners at different ages or proficiency levels to make

inferences about language development (Lightbown & Spada, 2017). While it has been argued that cross-sectional studies, by definition, “can only produce a general picture, not a specific one, of what is going on in each individual’s interlanguage” (Han, 2004, p. 98), they do offer some advantages. First of all, cross-sectional studies allow researchers to collect large quantities of data in a relatively short period of time. In contrast, longitudinal studies are, by definition, time-consuming, some (e.g., Han, 1998, 2000, 2006; Lardiere, 1998, 2006, 2007; Long, 2003) spanning decades. As a result, long-term studies are not always practical, or even possible. Furthermore, because of their larger sample size, cross-sectional studies allow researchers to “draw general conclusions...that cannot be drawn from studies with a smaller number of participants” (Ritchie & Bhatia, 2009, p. 31), and this, in turn, increases the reliability and generalizability of their findings (Bialystock & Swain, 1978). Finally, the larger sample size of cross-sectional studies increases the likelihood that sufficient tokens of the linguistic targets will be collected, allowing the study to move forward. Part I of the present study follows a cross-sectional design.

Longitudinal studies, on the other hand, allow the researcher to track individual learners’ language development diachronically (Lightbown & Spada, 2017). Longitudinal research, defined as a “data-gathering procedure in which data are gathered from one or more learners over a prolonged period of time in order to gather information about change over time” (Gass et al., 2013, p. 527), is often used in studies of second language acquisition to explore the genesis of an individual learner’s IL development. For this reason, it is particularly well-suited for studies of persistence. While admittedly lacking in the reliability and generalizability characteristic of cross-sectional studies, longitudinal

research nonetheless has much to offer. As has been seen in the seminal case studies of Han (1998, 2000, 2006), Lardiere (1998, 2006, 2007), and Long (2003), longitudinal studies make it possible to track language learners' development, allowing for detailed, learner-specific analyses of IL development as it unfolds. Hence, they provide a breadth and depth of analysis that cannot be attained elsewhere. Part II, a case study chronicling the IL development of two adult learners of English for 28 and 56 months, respectively, follows a longitudinal design.

Language tasks. Language tasks, such as grammaticality judgment tasks, cloze exercises, and text analyses are widely used in studies of second language acquisition, either singly or in combination, to make observations about a learner's language development. Grammaticality judgment tasks (GJTs) are often used to make inferences about a learner's linguistic competence by eliciting his or her intuitions about the second language. Though the format of these tests varies, they all require learners to read sentences in the target language and judge whether, in their opinion, they are grammatical or ungrammatical. In some cases, learners are asked to quantify their responses by providing a "magnitude estimation" of the sentences' perceived acceptability. In others, they are directed to rank a set of sentences from most to least grammatical, or perhaps to identify and correct the parts of the sentences they believe to contain errors (Ellis & Barkhuizen, 2005).

Although the reliability and validity of GJTs have been called into question, and they are not generally thought to provide a "direct window for viewing learner's interlanguage" (p. 19), they do have some advantages. For one, they allow researchers to test language learners' knowledge of linguistic structures that are difficult to elicit

through naturalistic production data alone. What is more, when used in tandem with naturalistic data, GJTs can improve the validity of a study. For example, both Han (2006) and Lardiere (2006) have used GJTs to augment naturalistic production data in their longitudinal studies of adult learners of English, and both have cited a broad confluence between the two. Han (1998, 2000) has also used other types of language tasks, such as translation exercises, correction tests, and cloze tests, to augment the spontaneous written output (i.e., academic papers, business and personal correspondence) of her participants. While acknowledging the superiority of naturalistic data, Han concludes that language tasks can also have a place in studies of L2 acquisition, particularly when the linguistic target (in Han's case, the English passive) is relatively infrequent in the L2 input. Similarly, Long (2003) used a battery of six language tasks (i.e., a semi-structured interview, a brief open-ended discussion, two picture description tasks, and two repetition tests) administered at three different points in time in his longitudinal case study of an adult L2 learner of English. This practice of using multiple data elicitation techniques to cross-validate findings is known as "methodological triangulation" (Brown & Rodgers, 2002, p. 242).

Brain-based studies. Brain-based research in second language acquisition has been utilized by researchers of all theoretical orientations. As is seen in the work of Birdsong (2006), Sorace (2003, 2005), and Ullman (2001), neuro-linguistic evidence from lesion, neuroimaging (e.g., PET and fMRI), and electrophysiological (e.g. ERPs, EEG) studies has provided valuable information about the way first and second language speakers process and retrieve L2 input. As an example, event-related potentials (ERPs), a derivation of the electroencephalogram (EEG) studies from which they derive, measure

variations in electrical activity via electrodes placed on the scalp (van Hell & Tokowicz, 2010), providing researchers with an “on-line, millisecond-by-millisecond” (p. 43) record of the extent and timing of the brain’s neural activation during syntactic processing of the L2. ERPs allow researchers to measure the learner’s response to, for example, the presentation of a specific linguistic target, or, alternatively, to compare differences between native and non-native speakers’ reactions to L2 violations (2010). Taken together, these findings point to decreased automaticity in the syntactic processing of L2 speakers, resulting in diminished processing speed and working memory, and suggest a neurological basis for the persistence of errors in learners’ L2 output.

3.1.2. Setting

This section provides a brief description of the college at which the study was conducted: its placement practices, student population, and the English language programs available to ELLs.

To begin, both the cross-sectional and longitudinal research was conducted at a large state-run community college in the American Northeast, pseudonymously referred to as “Countywide Community College” (CCC). CCC educates nearly 20,000 students, including a growing population of ELLs from more than 35 language backgrounds and 43 countries. Approximately 30% of these students are Spanish speakers from 13 different countries: Chile, Columbia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Peru, Puerto Rico, and Venezuela (H. Fortuna, Placement Testing Coordinator, personal communication, September 26, 2018).

Since CCC is an open admissions college, all prospective students are required to take an in-house placement exam to assess their proficiency in reading, writing, and

mathematics. ESL students, who are tested separately from their native speaker peers, must also complete an assessment of oral fluency, and their reading, writing, and communication exams are scored by ESL-trained faculty from the college. Non-native speakers of English who fail the reading, writing, and/or communication component(s) of the exam are then placed into one of two non-credit ESL programs: the Pre-College Language Immersion Program, which provides instruction for low to intermediate-level students, or the college ESL program, which provides instruction for high-intermediate to advanced learners.

The Pre-College Language Immersion Program offers a 4-level, holistic program of academic reading, writing, speaking, and listening: classes meet 20 hours per week for 15 weeks, and successful completion of the program allows students entrance into the college's ESL program. The college ESL program, on the other hand, offers a 15-week discrete-skills, multidisciplinary program consisting of high-intermediate to advanced classes in English, Reading, and Communication. Students must pass departmental exams in each of the above-named disciplines before they can 'graduate' from the college ESL program and register for credit-bearing courses (e.g., English 101, Reading 101, Communications 101).

As Coordinator of ESL Writing Placement at CCC, the researcher has ready access to all ESL English placement and exit exams, as well as any diagnostic exams written in her assigned classes. It is from this large collection of essays that the corpus for the study was drawn.

3.2 The Present Study

The present study examines persistent errors in the writing of adult L2 learners of English from both a cross-sectional and longitudinal perspective. Academic writing was chosen as the broad focus of the study for a number of reasons: (1) a perceived gap in the literature: relatively few studies in SLA have focused on adult ELLs' spontaneous written output in the L2, particularly at the post-secondary level, (2) the researcher's long-term professional interest, as both a college ESL writing instructor and ESL writing placement coordinator, in L2 academic writing, and (3) the researcher's ready access to student papers. Native speakers of Spanish were chosen as the study's participants, as they comprise the largest population of ELLs at the college where the researcher is employed. The production data that comprised the 24,495-word corpus were collected naturalistically and analyzed quantitatively, as described below.

Part I, the cross-sectional phase of the study, compares three levels of ESL writing – low intermediate, high intermediate, and advanced – for evidence of persistent errors in the essays of 60 L1 Spanish learners of L2 English. Essays were selected from either students' written placement exams, diagnostic essays (essays given the first day of all college-level ESL writing classes to confirm placement results), or exit exams (departmental essay exams given in all ESL writing classes to determine whether students are ready to pass into credit-bearing English 101 or move up to a higher level ESL class). The cross-sectional data were compared for each level and persistent L2 errors analyzed vis-à-vis the SFH to identify likely candidates for selective fossilization.

Part II, a longitudinal study, was designed as a follow-up to the cross-sectional study. The researcher, having identified three persistent grammatical errors in the 60-

essay corpus, next endeavored to investigate whether a long-term study would yield similar findings. More importantly, given the “impossibility” of establishing fossilization “on the basis of data from a cross-sectional study” (Long, 2003, p. 500), the researcher aspired to undertake a deeper, more fine-grained analysis of IL development than the cross-sectional data would allow. To this end, she selected two L1 Spanish learners of English from the original 126-learner participant pool and collected samples of their writing over a period of 28 and 56 months, respectively.

Nine essays were collected in all: one placement, one diagnostic, and two exit exams from one participant, and one placement, one diagnostic, one exit exam, and two follow-up essays from the other. As with the cross-sectional data, persistent errors were identified and analyzed in terms of the SFH (Han, 2009, 2013b) with one important difference: in this longitudinal case study, the researcher makes a case for selective fossilization.

3.2.1 Part I: Cross-Sectional Study

Design. The cross-sectional study examined a 21,694-word corpus of 60 student essays grouped into three proficiency levels: low intermediate, high intermediate, and advanced. As noted above, the essays were selected from students’ written placement, diagnostic, or exit (final exam) essays. Essays were coded by error type, and descriptive statistics were computed – first for individual participants, and then for each of the three proficiency levels. Following that, the cross-sectional data were compared for each level, and the three most persistent L2 errors were identified. Lastly, keeping in mind that one cannot make a case for fossilization based a one-shot, group-based cross-sectional study,

the persistent errors were analyzed in terms of the SFH to identify likely candidates of selective fossilization.

Participants. The participants in the cross-sectional study included 60 adult learners of English, 22 male and 38 female, who applied for admittance and/or attended classes in either the CCC Pre-College Program or college ESL program between August 2009 and January 2010. The participants varied in age (17 to 54 years, at the time the data were collected), educational level, (i.e., GED, foreign or American high school or university degree), proficiency level (as determined by the college writing placement, diagnostic, or exit exam), and national origin, but all shared a common mother tongue: Spanish. Low-intermediate students placed into the third level of the 4-tiered Pre-College Language Immersion Program, high-intermediate students placed into college-level non-credit ESL writing classes, and advanced students placed out of the ESL writing classes and into credit-bearing English 101 (see Appendices A & B for placement criteria). Of the 60 subjects, 12 were from El Salvador, 8 from Peru, 7 from the Dominican Republic, 7 from Ecuador, 6 from Colombia, 5 from Guatemala, 4 from Honduras, 3 from Chile, 2 from Argentina, 2 from Cuba, with 1 each from Brazil, Bolivia, Nicaragua, and the Philippines¹: 14 countries in all.

Production tasks. For the purposes of this study, “fossilization” was operationalized as the relative frequency of occurrence for non-target-like forms that persist in the written output of advanced learners, and “selective fossilization” as fossilization that affects, to varying degrees, only subsystems of a learner’s IL system. Non-target-like forms were defined as linguistic forms which “in the same context and under similar conditions

¹ The sole Filipina participant self-identified as a NS of L1 Spanish.

of production would, in all likelihood, not be produced by the...native speaker” (Lennon, 1991, p. 182). Since this was a one-shot, cross-sectional study comparing groups of L2 learners at three different levels of proficiency and not a case study tracking the IL development of individual learners over time, the objective was not to procure evidence of selective fossilization, but rather to identify, vis-à-vis the SFH, potential candidates for fossilization. Finally, since the participants were all current or prospective college students whose writing was assessed in terms of its grammaticality, the variety of the target language chosen for this study was Standard American English.

The cross-sectional corpus consisted entirely of extended production tasks: specifically, timed persuasive writing tasks consisting of community college placement, diagnostic, and exit essays. It bears mentioning that while the conditions under which the essays were written (all were timed, proctored essays written in an institutional setting) and the genre of the writing samples (argumentation/persuasion) were the same for all, the participants were not all given the same prompts. This was not a concern, however, since all prompts were controlled for level of difficulty and accessibility of topics. Moreover, in an empirical study examining the effects of essay prompts and topics on learners’ writing, Brown, Hilgers and Marsella (1991) found that although genre (e.g., analysis vs. narration) had a significant effect on how language learners’ essays were evaluated, topic had no effect at all.

Something that could not be controlled for in the present study, however, was L2 learners’ tendency to avoid using linguistic features they perceive to be difficult (Lightbown & Spada, 2017, p. 45), a communication strategy known as *avoidance*. Widely recognized as a limitation of naturalistic data, avoidance may lead to the absence

of certain errors in participants' performance, leaving the researcher with an incomplete picture of the learner's interlanguage (p. 45). While other methods of data elicitation may be better suited for eliciting these putatively underrepresented features in learner production, there is always a tradeoff, as the result is often a "constrained, constructed response" (p. 36). Nonetheless, it bears noting that the systematic avoidance of 'difficult' grammatical constructions on the participants' part would likely have impacted the study's findings. For example, avoidance that results in the absence of certain errors from the written production data may have the effect of artificially 'inflating' the relative frequency of other errors, resulting in an incomplete or misleading representation of the learner's developing grammar.

Finally, the decision to study student essays was motivated by the fact that evidence of fossilization "is most reliably found in learners' natural and spontaneous output" (Han, 2013b, p. 146). Using authentic samples of learner language such as college essays can also establish construct validity, since "the performance it taps reflects, as far as possible, the kind of use for which language is designed and acquired" (Ellis & Barkhuizen, 2005, p. 21). While some might maintain that timed college essays are neither "natural" nor "spontaneous," it is argued here that these are relative terms. For one, college essays are more natural than strictly controlled data, such as translation exercises, cloze tests, and experimentally elicited samples. Moreover, like the essays comprising the learner corpora in the present study, they are "natural" in the sense that they were produced for real-life purposes rather than for purposes of research (30). It is further asserted that they are more spontaneous, as the participants who produced them were engaged in extemporaneous, meaningful performance, described by Selinker (1972)

as situations in which the learner “attempts to express meanings, which he may already have, in a language in which he is in the process of learning” (p. 210). Hence, when compared to some (e.g., more controlled) data types, they may be considered more natural, and when compared to others, less.

Target structures. The linguistic targets for the cross-sectional study were English articles, prepositions, and plurals, the three most frequent grammatical errors for all three proficiency levels.

Data collection and analysis. Data for the cross-sectional study were collected at CCC in the fall of 2010. The 60 essays chosen for inclusion in the study were gleaned from a total pool of 126 previously graded (See Appendices A and B for grading criteria) ESL placement, diagnostic, and exit exam essays written between June 2009 and January 2010. All essays were handwritten. All were timed, proctored exams developed by the researcher in her capacity as coordinator of ESL Writing Placement at the college. As noted above, placement exams were administered in the CCC Placement Testing Center between June 2009 and January 2010. Diagnostic and exit exams were given by the participants’ classroom instructors in either September or December 2009.

Participants were given a choice of three questions, all argumentative/persuasive in nature, for which they were directed to write an essay of at least 250 words. All placement essays were read by normed college English Department ESL faculty and scored according to the college’s ESL Placement Rubric (Appendix A). Those that scored below the college level were also read by a normed member of the CCC Pre-College Language Immersion Program faculty and scored in accordance with the Pre-College Program’s Rubric (Appendix B). College-level diagnostic essays were scored in

accordance with the CCC English Department ESL Placement Rubric (Appendix A) by the participant's ESL writing instructor, and exit exams, by the participant's instructor and another member of the CCC English Department ESL faculty. In the event the first reader (i.e., instructor) and second reader disagreed on a score, a third reader was called in to decide the final placement. That is to say, a student's final placement was not determined until two normed CCC English Department ESL faculty agreed on a score.

Data selection. Of the 60 essays chosen for inclusion in the study, 18 had been scored at the low-intermediate (pre-college) level, 20 at the high-intermediate (non-credit college) level, and 22 at the advanced (credit-bearing 'mainstream' English 101) level, resulting in a fairly even distribution of writing proficiencies. The researcher, who is responsible for norming all placement readers and classroom teachers at the college, selected the essays, choosing only those deemed (1) legible, and (2) representative of their assigned levels vis-à-vis the aforementioned rubrics.

Data coding. Twenty-six distinct errors were identified by the researcher and broadly grouped into three domains – grammar, orthography and punctuation, and vocabulary, using an adaptation of the coding scheme introduced by Swan and Smith (2001) (Appendix C) in their seminal text, *Learner English*. A fourth category, phonology, was not included for obvious reasons. Throughout the text, Swan and Smith outline what they refer to as “characteristic difficulties” (p. ix) of English learners from more than 20 different L1s, and it is from the chapter devoted to native speakers of Spanish that the coding protocol for the study was derived.

For purposes of expediency and ease of coding, the typical errors of L1 Spanish learners of English described in the text (e.g., those involving “pronouns” and “number”)

were either abbreviated or assigned a symbol (e.g., *pn*, #), and, whenever possible, the abbreviations and symbols were chosen to correspond with those typically used by CCC faculty. A list of error types and their corresponding symbols can be found in Table 3.1, below, and examples are provided for each.

It should be noted that the decision to use familiar symbols was made not only to expedite the coding process, but also to improve the reliability, or “the extent to which data are categorized consistently,” of the coding protocol (Révész, 2012, p. 204). In other words, it was reasoned that the data would be coded with greater consistency and accuracy if the coders used familiar symbols for which the meanings were clear and (relatively) unambiguous. Moreover, since “reliability in coding is a prerequisite for validity” (p. 204), it can be argued that any improvements to the reliability of the coding protocol would also serve to improve its validity, or “the degree to which the coding categories and procedures allow for accurate and meaningful interpretations” of the data (p. 204).

With the coding scheme in place, the 60 essays were then coded iteratively by the researcher. To establish intra-rater reliability, the researcher repeatedly coded the data until she was satisfied with its consistency. Following that, the second coder, a member the CCC ESL faculty who holds a Ph. D. in Linguistics from New York University and is herself a simultaneous Spanish-English bilingual, independently read and coded a randomly chosen subset (N=10, or 16.7%) of the 60 essays. Similar to the researcher, the second coder is a normed ESL placement reader with over 20 years’ experience reading and assessing ESL students’ essays at the college. Both were normed by the researcher prior to the coding session.

Table 3.1

Classification of Error Types

Symbol	Referent	Example
<i>Art</i>	Error in article use	*Now we live in ___ United States.
<i>Cap</i>	Error in use of capital letter	*We came here from <u>h</u> aiti.
<i>p/CS</i>	Punctuation error: Comma Splice	*It's very simple, the minority are Hispanics.
<i>p/Fr</i>	Punctuation error: Sentence Fragment	*There is a new world out there for you. <u>New friends, new opportunities.</u>
<i>Id</i>	Error in use of idiomatic expression	* <u>In</u> the other hand...
<i>Inf</i>	Error in use of infinitive	*It is necessary <u>go</u> to college.
<i>M</i>	Modal error	*This <u>musts</u> be possible.
<i>Neg</i>	Negation error	*Some are nasty and <u>not</u> respect <u>no</u> one.
<i>#</i>	Error in number	*Students need to do their homework <u>s</u> .
<i>P</i>	Punctuation error	*Latino laborers, are working for low wages.
<i>PhV</i>	Error in use of phrasal verbs	*We have nobody <u>to take care as us</u> . *We should not <u>discriminate</u> them.
<i>pn</i>	Pronoun error	*When a student lives with <u>their</u> parents...
<i>Poss</i>	Possession error	*Working is the key to <u>everyones</u> freedom.
<i>Prep</i>	Preposition error	*We are who we are because ___ our customs.
<i>Q</i>	Error in question formation	*Why they didn't get a job? *Where you from?
<i>p/RO</i>	Punctuation error: Run-On sentence	*I have a friend ___ she is very smart.
<i>S/d</i>	Double subject	*These children <u>they</u> have to work very hard.
<i>S/m</i>	Missing subject	*In my country ___ is difficult to go to school.
<i>Sp</i>	Spelling error	*We must work <u>alot</u> during our <u>collage</u> years.
<i>S/V</i>	Error in agreement of subject & verb	*My <u>father</u> <u>pay</u> for my tuition.
<i>T</i>	Error in verb tense/aspect	*We <u>have moved</u> to the U.S. in 2010.
<i>V</i>	Verb missing	*Some people think we ___ all criminals.
<i>Vc</i>	Vocabulary error	*They can get in <u>problem</u> with the police.
<i>WF</i>	Word form error	*We can act <u>different</u> , but he still won't like us.
<i>WO</i>	Word order error	*They do not <u>speak perfectly</u> the language. *It depends on where <u>were you</u> born.
<i>?</i>	Meaning is unclear	*Also they gives all their power to have been opportunity then they have been dispossessed for thing that they can do it.

Adapted from Swan, M. and Smith, B. (Eds). 2001. *Learner English*. New York: Cambridge.

Interrater reliability for both readers for the cross-sectional data was calculated at 98.3%. Any conflicts that occurred were resolved via discussion. The concordance of scores between the two coders may be attributed to measures taken by the researcher to avoid, as much as possible, common threats to interrater reliability, among them: ambiguity in the coding system, inadequate coder expertise or training, coder bias, and coder drift (Révész, 2012). Steps taken to reduce ambiguity in the coding protocol have already been described above, as has the coders' extensive training and experience. To help reduce coder bias, the researcher removed any identifying information from the essays and provided the readers with only 'clean' (unmarked) photocopies of the original essays. Moreover, to help prevent coder drift, drinks and nutritious snacks were on hand throughout the coding process, which, because of the relatively small subset ($n = 10$) of essays read, was relatively brief – approximately 90 minutes, including a brief, mid-session break. Finally, to avoid interruptions and other distractions, the coding session was held in the relative privacy of the researcher's office.

Descriptive statistics. The essays were read and coded in accordance with the coding scheme described above. Next the total number of words and the total number of errors per essay were counted. From these two figures the total percentage of errors per essay was derived by dividing the number of errors in the essay by the number of words. Then, the errors were tallied according to type (article, preposition, spelling, etc.), and both the number and relative percentage of errors were determined for each (Appendix D). To calculate the relative percentage of article errors in a particular essay, for example, the number of article errors in the essay was tallied, and that number was divided by the

total number of errors in that essay. This process was repeated for each of the 25 remaining identified errors.

Once the descriptive statistics for the individual essays in all three groups (i.e., low-intermediate, high-intermediate, and advanced proficiency) had been computed, the data were then subjected to further analyses. First, the mean number of words and then the relative percent of errors per essay were calculated for each proficiency level. Next the mean percent of errors was calculated for each of the 26 error types for each proficiency level. Following that, the descriptive data (i.e., mean number of words, mean number of errors, mean percent of errors, and mean percent of errors for each error type) for all three levels were organized into tables and bar charts for ease of comparison. Finally, the data for all three proficiency levels were compared to identify and analyze persistent grammatical errors in the students' writing, and the results interpreted relative to the SFH (Han, 2009, 2013b).

3.2.2 Part II: Longitudinal Study

Design. The second part of the study examined a 3,091-word corpus of timed persuasive essays written at CCC by two study participants between August 2009 and July 2014. The diagnostic essay of the first participant, "Lisa," was also included among the 60 essays included in the cross-sectional study. The diagnostic essay of the second participant, "Sandy," was among the initial pool of 126 essays, but was not included in the 60 essays that comprised the cross-sectional study.

This 3,091-word corpus consisted of a total of nine writing samples. Four essays (one placement, one diagnostic, and two exit exams) were collected from Lisa over a

period of 28 months, and five (one placement, one diagnostic, one exit exam, and two follow-up essays) were collected from Sandy over 56 months.

Participants. Two adult, female, L1 Spanish learners of English were selected to participate in the within-learner study. Both were enrolled in the researcher's non-credit, high-intermediate ESL writing class at CCC during the 2010-2011 academic year.

The first participant, "Lisa," was 16 years old when she arrived in the United States from Peru in March of 2009. Approximately one year before she emigrated to the U.S., Lisa had studied English for four months at a private English school in her native country. There she practiced writing, reading, listening, and speaking in English for 90 minutes every weekday morning before attending classes at the local middle school. The English school offered 12 levels of instruction, and shortly before Lisa left Peru, she had completed level 9. Upon arriving in the U.S., Lisa immediately ("the next day") enrolled in classes at the local high school, where she eventually completed 12th grade.

Lisa took the ESL Placement test at CCC in August of 2009. In January 2010 she began taking classes in the CCC Pre-College Language Immersion Program, where she successfully completed Levels 3 and 4 of the Program and, in December 2010, 'graduated' to the college ESL program. One month later, in January 2011, she enrolled in, but ultimately failed, the researcher's Spring 2011 high-intermediate ESL writing class. Despite her failing score, however, Lisa had shown sufficient improvement to warrant her placement the following semester, Fall 2011, into a higher level non-credit ESL writing course. In December 2011 she passed this more advanced ESL writing class, placing out of ESL and into credit-bearing writing classes. In Fall 2012, after taking a one-semester break from college, Lisa enrolled in and passed freshman English

composition (ENG 101). Following that, she attended classes intermittently until the fall of 2014, her last semester at CCC. By then, Lisa had earned 46 credits towards a 64-credit associates degree with a cumulative grade point average of 2.13.

The second subject, known pseudonymously as “Sandy,” immigrated to the United States from Argentina in 2008. She was 19 at the time. Between the ages 12 and 14, Sandy studied what she described as “basic” English in an Argentinian middle school. Throughout middle school and high school, Sandy became involved in a number of volunteer activities. At the same time, Sandy cared for her three younger brothers while her mother worked several jobs to support the family. As an older teen, Sandy visited local middle schools to inform students of the dangers of drugs and alcohol, visited orphanages to help care for the young residents, and successfully completed high school.

When she arrived in the United States, Sandy promptly enrolled in adult education classes at a local high school because she could not afford college tuition. A little over a year later, in November 2009, she took the Placement test at CCC and was placed into Level 4 of the Pre-College Language Immersion Program. After passing Level 4, she ‘graduated’ to the college ESL program, where she attended and passed the researcher’s Fall 2010 high-intermediate English writing class, placing out of ESL. Once in mainstream classes, Sandy became active in student life at CCC, serving as a New Student Orientation leader, a student aid for the Office of Student Activities, and Vice-President of the Student Organization of Latinos. She also served on several campus-wide committees and was elected senator of the CCC Student Government Association. A member of the CCC Phi Theta Kappa honor society, Sandy graduated magna cum laude in December 2012 with an A.S. in Criminal Justice and a cumulative grade point

average of 3.83. In Fall 2012, she was admitted to the Columbia University Financial Economics Program on a full academic scholarship.

Lisa and Sandy were selected for inclusion in the longitudinal phase of the study for a number of reasons. For one, they were found to have been among the 126 students whose essays comprised the original pool for the cross-sectional study, thereby providing the researcher with writing samples (i.e., college placement essays) dating back to 2009. What is more, when the researcher was actively seeking participants for the intra-learner study, both Lisa and Sandy were agreeable not only to having their previously written essays included in the study, but also to contributing follow-up essays in the future.

Production tasks. As in the cross-sectional phase of the study, “fossilization” was operationalized as the relative frequency of occurrence for non-target-like forms that persist in the advanced learners’ written output. However, in contrast to the cross-sectional study, the term “advanced learner” was used here *not* to describe the written output of a relatively large, homogeneous group of advanced learners, but rather the written output of the two study participants when they had at last attained the status of advanced learners (i.e., had placed out of ESL and into credit-bearing college writing classes). Finally, like the cross-sectional study, the longitudinal corpus consisted of extended production tasks, more specifically, timed persuasive writing tasks.

Target structures. The targeted linguistic structures for the longitudinal study were the same as those for cross-sectional phase – namely, articles, prepositions, and plurals – as these were the most persistent grammatical errors in Lisa’s and Sandy’s writing as well.

Data collection and analysis. As noted above, both participants were students in the researcher’s high-intermediate college-level writing class during the 2010-2011 academic year. As a result, in addition to their placement essays written more than a year before, the researcher also had access to the participants’ diagnostic and exit exams. In Sandy’s case, two follow-up essays were also collected, each written in the researcher’s office: one on November 28, 2012, and the other on July 28, 2014. On both occasions, the researcher followed the same protocol observed for college placement, diagnostic, and exit exams; that is, the essays were timed, supervised, and argumentative/persuasive in nature.

Table 3.2 summarizes the essay type (e.g., placement, diagnostic, exit), author (i.e., participant), and composition date for each of the writing samples collected.

Table 3.2

Longitudinal Corpus: Writing Samples Classified by Date and Type

Participant	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Duration of Study
	Placement Exam	Diagnostic Exam	Exit Exam	Follow-up Essay	Follow-up Essay	
“Lisa”	8-07-09	1-18-11	5-10-11	12-15-11	--	28 months
“Sandy”	11-09-09	9-2-10	12-14-10	11-28-12	7-28-14	56 months

Data coding. For the sake of consistency, and to allow for comparisons between the two data sets, each of the nine essays comprising the longitudinal corpus was coded in the same manner as the 60 essays used in the cross-sectional study. A list of the 26 identified errors and their corresponding symbols can be found in Table 3.1, above.

Descriptive statistics. As in Part I, the total number of words and the total number of errors per essay were counted, and the total percentage of errors per essay was derived by dividing the number of errors in the essay by the number of words. Then, the errors were tallied according to type (article, preposition, spelling, etc.) and both the number and relative percentage of errors were determined for each writing sample for each of the 26 coded errors (See Appendix D). Next, a second reader, the same normed CCC ESL faculty member who coded a subset of essays for Part I of study, independently read and coded eight of the nine essays that comprised the longitudinal data. A ninth essay, Lisa's college placement exam, was not compared, as the second coder had difficulty reading the cramped, single-spaced hand-written paper.

Interrater reliability for both readers for the longitudinal data was calculated at 97.21%, any disagreements having been resolved via discussion. Once again, the researcher attempted to minimize the risk of known threats to interrater reliability by using the same well-trained and experienced coder; removing all identifying information from the essays, including the dates on which they were written; presenting the essays in random order (in terms of author and date written); using only 'clean' (unmarked) photocopies of the nine original essays; and allowing for short breaks during the coding process. This preliminary analysis identified three persistent grammatical errors – articles, prepositions, and number – the same ones that had been found in the cross-sectional study. As in Part I, intra-rater reliability was established through repeated coding of the data.

Target-like use analysis. To calculate the accuracy of the participants' use of articles, prepositions, and number, the researcher next subjected the three target structures

to a target-like use (TLU) analysis, a type of performance analysis developed by Pica (1983) to determine a language learner's "correct use, underuse, and overuse of a particular linguistic item" (Ahmed, 2017, p. 24), using the formula below (Ellis & Barkhuizen, 2005, p. 80):

$$\frac{n \text{ correct suppliance in contexts}}{n \text{ obligatory contexts} + n \text{ suppliance in non-obligatory contexts}} \times 100 = \text{per cent accuracy}$$

Pica's motivation for developing TLU analysis was to counter criticisms of obligatory occasion analysis (OOA) (Brown, 1973), an earlier instantiation of performance analysis that counts only standard-like supplings of linguistic structures in obligatory contexts. By also taking into account a learner's over-suppliance of linguistic structures in non-obligatory contexts, TLU analysis offers a more complete and accurate picture of the learner's developing IL.

In the present study, TLU analysis was used during the second phase to obtain a more finely-grained analysis of the target structures, namely, the participants' use of number by noun type (i.e., count/noncount nouns, regular/irregular plural count nouns), individual prepositions, and articles in different linguistic environments. With respect to the latter, the participants' article use was subjected to a second round of coding by way of Huebner's (1983) dynamic paradigm, a model widely used to investigate L2 learners' acquisition of articles (Ekiert, 2004). Modeled on the Work of Bailey (1973) and Bickerton (1975), Huebner's paradigm (1983) offered an alternative to the more traditional 'order of acquisition' approaches (e.g., Brown, 1973) available at the time. In

Huebner's model, we find four linguistic environments, or noun phrases (NPs) in which articles can appear. For each of these linguistic environments, the semantic and pragmatic function of the NP determines the form of article (i.e., *a/an*, *the*, \emptyset) used. As Ekiert (2004, p. 2) explains:

According to the model, English NPs are classified by two discourse features of referentiality—namely, whether a noun is a specific referent [+/-SR], and whether it is assumed as known to the hearer [+/-HK]. These two aspects of referentiality thus give rise to four basic NP contexts that determine article use. Nouns classified as Type 1, [-SR, +HK] are generics, and are marked with *a*, *the*, or *zero* [\emptyset]. Nouns classified as Type 2, [+SR, +HK], are referential definites and are marked with *the*. Type 3, [+SR, -HK], includes first mention nouns, whose referent is identifiable to the speaker but not the listener, e.g. nouns that the speaker is entering into the discourse for the first time. These are marked with *a* or *zero* [\emptyset]. Type 4 nouns, classified as [-SR, -HK], are nonreferentials. This type includes nouns that are nonspecific for both the speaker and the hearer; *a* and *zero* [\emptyset] are the relevant articles. [Emphasis added.]

An adaptation of Huebner's paradigm, summarized in Table 3.3, below, was used in the present study to help identify subtle differences in the participants' use of English articles and to investigate whether these differences (a) could be construed as evidence of selective fossilization, and (b) were consistent with the claims of the SFH. Because the focus of the current study was written rather than oral output, however, minor alterations were needed. For one, 'writer' and 'reader' were substituted for 'speaker' and 'hearer'. Hence, where Huebner writes [\pm HK] to indicate the presence or absence of assumed *hearer's* knowledge of a NP, we write [\pm RK] for assumed *reader's* knowledge. Moreover, to account for idiomatic expressions and other conventional uses, which often flout more conventional parameters of semantics and syntax, a fifth classification (Type 5) was included, as in Ekiert, 2004; Ekiert, 2007; Butler, 2002; and Thomas, 1989.

Table 3.3

Environments for the Appearance of English Articles a/an, the, and Ø

Type	Features	Environment	Articles	Examples
Type 1	[-SR, +RK]	Generic nouns	<i>a/an, the, Ø</i>	A dog is a faithful animal. <i>The</i> washing machine is another creation of modern technology. <i>Ø</i> Amnesty is a good solution...
Type 2	[+SR, +RK]	Referential definites previous mention	<i>the</i>	<i>The</i> Pope; <i>The</i> President; <i>The</i> sun; Residents of the US say ...I agree with <i>the</i> residents...
Type 3	[+SR, -RK]	Referential indefinites first mention	<i>a/an, Ø</i>	Evelyn was brought up in <i>an</i> environment...This environment...; Evelyne falls in love with <i>a</i> sailor....The sailor...
Type 4	[-SR, -RK]	Nonreferential nouns	<i>a/an, Ø</i>	Her role as <i>a</i> sister and <i>a</i> daughter...; People with <i>Ø</i> college degrees can find <i>a</i> job.
Type 5		Idioms; Other conventional uses	<i>a/an, the, Ø</i>	As <i>a</i> matter of fact; On <i>the</i> one hand; In <i>the</i> 1800s; Going to <i>Ø</i> work

Note: Adapted from Ekiert (2004), Butler (2002), Huebner (1983), and Thomas (1989)

Finally, once the TLU analysis had been completed, the participants' earlier and later essays were compared to identify persistent errors and reveal within-learner changes over time, and the findings subjected to analysis by way of the SFH.

Chapter IV

RESULTS

Chapter IV reports the results of the study and addresses the research questions proposed at the end of Chapter II. It begins by presenting descriptive statistics collected during Part I of the study to compare the spontaneous written output of low-intermediate, high-intermediate and advanced learners and to identify persistent errors in their writing. Following that, descriptive statistics and the results of a target-like use (TLU) analysis conducted in Part II are presented to identify persistent errors in two participants' essays over time and shed light on their use of the linguistic targets. An interpretation of the findings in view of the existing data and the SFH may be found in Chapter V.

4.1 Part I: Cross-Sectional Study

Part I was an exploratory, cross-sectional study designed with two objectives in mind: to see which errors persisted in the writing of advanced learners of English and then to analyze them retroactively by way of the SFH. To that end, two research questions were proposed: (1) *Which grammatical errors persist in the participants' written output at the advanced proficiency level?* and (2) *Are the persistent grammatical errors identified in the cross-sectional corpus consistent with the predictions of the SFH?* Only the first question will be addressed in this section. The second involves applying the SFH to the existing data and interpreting the findings; hence, it will be addressed in the discussion of results.

Section 4.1 is organized as follows. First, descriptive statistics comparing the length and overall grammatical accuracy of the participants' essays are reported to provide a general picture of the participants' writing at each level of proficiency. Next, findings related to an analysis of 26 discrete errors found at each of the three proficiency levels are presented, from which three persistent grammatical errors were identified. Finally, descriptive statistics for the three targeted errors were compared at each proficiency level, and the results are reported below.

Mean Number of Words/Mean Percent of Errors

Descriptive statistics were first computed to determine the relative fluency and accuracy (as measured, in turn, by the mean number of words and mean percentage of errors) of the participants' writing at each level, revealing that as the participants' proficiency increased, so did their fluency and accuracy. As an example, the low-intermediate group averaged 283 words per essay, the high-intermediate group, 346 words, and the advanced group, 440 words: an increase of 18.2% words from the lowest proficiency group to the middle group, and 21.4% from the middle proficiency group to the highest group, for a 32.7% increase overall. At the same time, the total percentage of errors per essay decreased from an average of 19% for the low-intermediate group to nearly half that amount (10.6%) for the high-intermediate group, and less than half that again (4%) for the advanced group, a 78.9% reduction in the mean number of errors per level overall. These data are represented graphically in Figures 4.1 and 4.2, below.

It is worth mentioning that these results were not entirely unexpected, given that the accuracy and fluency of the essays were closely tied to writing proficiency as delineated by the CCC Placement Rubrics (Appendix A and B). Nevertheless, they did

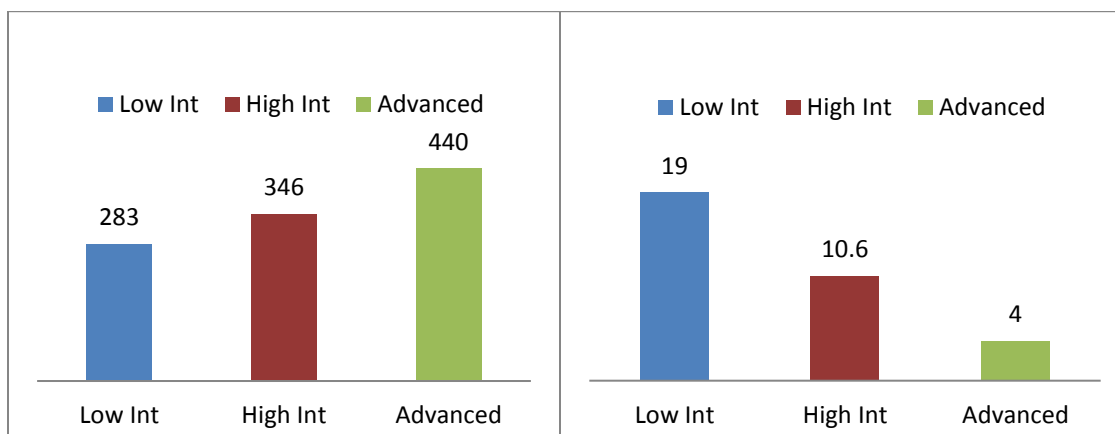


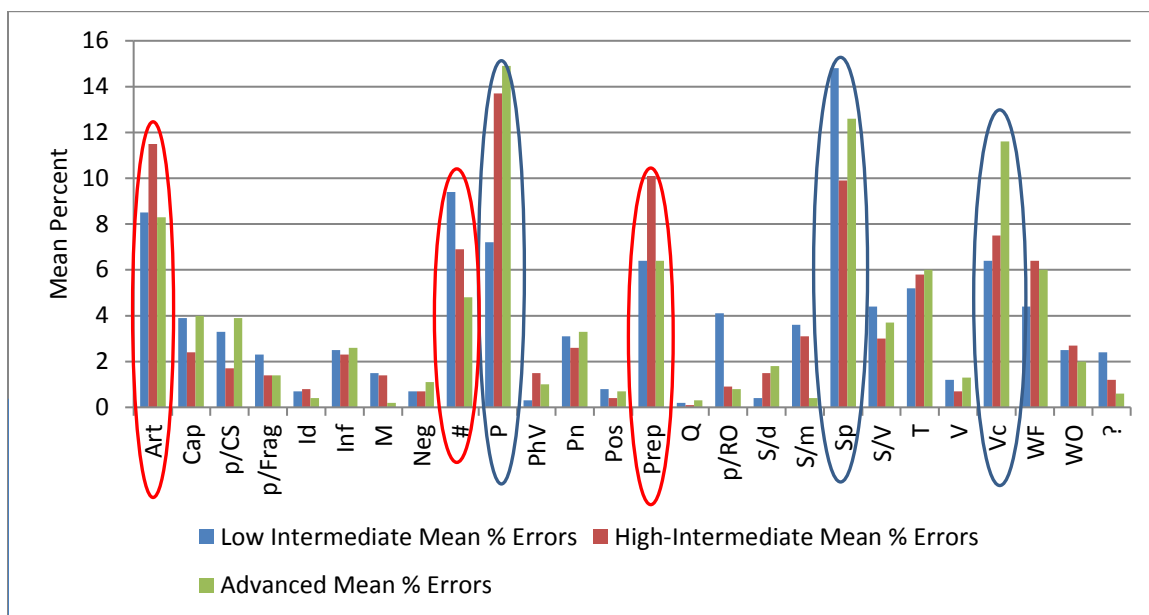
Figure 4.1. Mean Number of Words per Essay

Figure 4.2. Mean Percent of Errors per Essay

serve as a check on the accuracy of the participants' initial placements and helped to confirm that the essays chosen for inclusion in the study were representative of their respective proficiency levels.

Mean Percent of All Coded Errors

This section next presents findings from an analysis of more than two dozen discrete learner errors and endeavors to answer the first research question. To this end, the mean percent of each of the 26 coded errors identified in the corpus was computed for each of the three writing proficiency levels to identify which, if any, grammatical errors remained in the writing of the advanced learners. These results are summarized in Figure 4.3 and Table 4.1, below. The vertical bars in Figure 4.3 represent the mean percent of errors per coded error for each proficiency level, and the most persistent grammatical errors are circled in red. A more detailed explanation of the 26 coded errors listed in the Legend and examples of each may be found in Table 3.1. Table 4.1 organizes the data in tabular form.



Legend

Art- article	Neg- negation	Q- question form	V- verb missing
Cap- capitalization	#- number	p/RO- run-on	Vc- vocabulary
p/CS- comma splice	P- punctuation	S/d- double subject	WF- word form
p/Frag- fragment	PhV- phrasal verb	S/m- missing subject	WO- word order
Id- idiom	Pn- pronoun	Sp- spelling	?- meaning is unclear
Inf- Infinitive	Pos- possession	S/V- subject/verb agreement	
M- modal	Prep- preposition	T- Tense	

Figure 4.3. Mean Percent of 26 Coded Errors by Proficiency Level

Table 4.1

Mean Percent of 26 Coded Errors by Proficiency Level

	Art	Cap	p/CS	p/Frag	Id	Inf	M	Neg	#	P	PhV	Pn	Pos	Prep	Q	p/RO	S/d	S/m	Sp	S/V	T	V	Vc	WF	WO	?
Low-Intermediate	8.5	3.9	3.3	2.3	0.7	2.5	1.5	0.7	9.4	7.2	0.3	3.1	0.8	6.4	0.2	4.1	0.4	3.6	14.8	4.4	5.2	1.2	6.4	4.4	2.5	2.4
High Intermediate	11.5	2.4	1.7	1.4	0.8	2.3	1.4	0.7	6.9	13.7	1.5	2.6	0.4	10.1	0.1	0.9	1.5	3.1	9.9	3	5.8	0.7	7.5	6.4	2.7	1.2
Advanced	8.3	4	3.9	1.4	0.4	2.6	0.2	1.1	4.8	14.9	1	3.3	0.7	6.4	0.3	0.8	1.8	0.4	12.6	3.7	6	1.3	11.6	6	2	0.6

As the data reveal, punctuation, vocabulary, spelling, article, preposition, and number errors were the most frequent error types for learners at all three proficiency levels. Curiously, punctuation and vocabulary errors *increased* as learners gained in proficiency. For example, the mean percent of punctuation errors nearly doubled (7.2 to

13.7) from the low intermediate group to the high-intermediate group, and then increased slightly from the high-intermediate group to the advanced (13.7 to 14.9). A similar increase was also found in the mean percent of vocabulary errors, which rose slightly (6.4 to 7.5) from the low-intermediate to the high-intermediate groups, and then more dramatically (7.5 to 11.6) from the high-intermediate to the advanced. Spelling errors were also found to persist in the participants' writing. These accounted for 14.8, 9.9, and 12.6 of the mean percent of errors for each successive level of proficiency, suggesting that the intricacies of English spelling continued to pose a challenge for learners, even at the most advanced level.

In sum, the most persistent errors identified in the cross-sectional corpus were those involving punctuation, vocabulary, spelling, articles, prepositions, and number. However, since the unique focus of the study was grammatical errors, only the latter three were selected for further analysis and thus comprised the linguistic targets of the study.

Mean Percent of Targeted Errors

Next, descriptive statistics comparing the mean percent of article, preposition, and number errors are presented to more clearly illustrate the participants' use of the three target structures at each proficiency level. As Figure 4.4 graphically illustrates, errors involving all three structures were still relatively frequent in the participants' writing, even at the most advanced level. Nevertheless, we can also see a decline in the mean percent of errors from the high intermediate level to the advanced. For example, article and preposition errors, while increasing in frequency at the high-intermediate level, declined by 27.8% and 36.7%, respectively, at the advanced level.

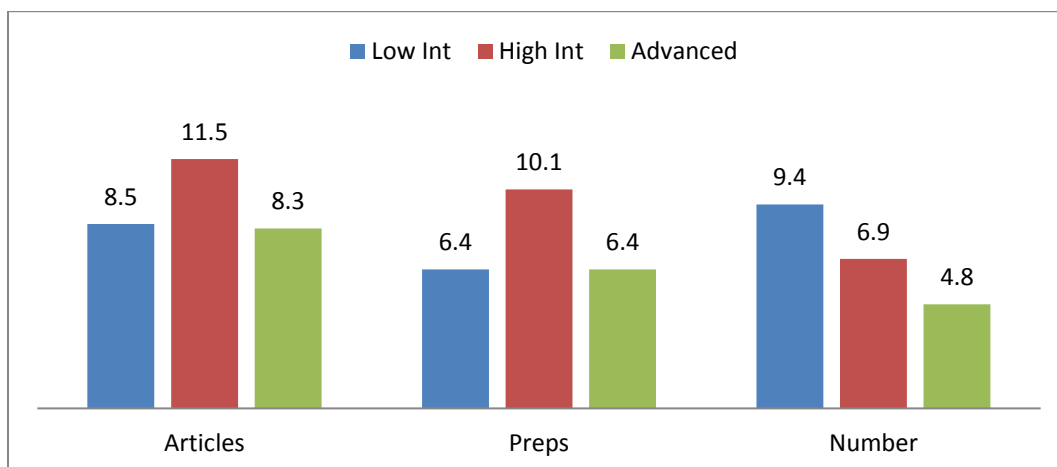


Figure 4.4. Mean Percent of Errors per Level for Three Linguistic Targets

Additionally, the cross-sectional data for articles and prepositions reveal an almost perfectly symmetrical U-shaped pattern in the mean percentage of article errors (8.5, 11.5, 8.3) from the lowest to highest proficiency groups, and a perfectly symmetrical U-shaped pattern (6.4, 10.1, 6.4) for the mean percentage of preposition errors. Finally, as Figure 4.4 reveals, the only individual error type for which the mean percentage of errors steadily decreased was number. Here the mean percentage of error (9.4, 6.9, 4.8) declined with each successive level of proficiency, as evidenced by the 26.6% and 30.4% reduction in number errors between successive proficiency levels and a nearly 50% decrease overall. Putative reasons for the persistence of these errors will be addressed in the discussion of results.

To summarize, the results presented in this section point to English articles, prepositions, and number as the three most persistent grammatical errors in the written output of the learners who participated in the study. These results not only shed light on the first research question, but also lay the groundwork for a discussion of the second. They will be revisited in Chapter V to test the explanatory potential of the SFH.

4.2 Part II: Longitudinal Study

Part II of the study, a longitudinal investigation examining the spontaneous written output of two adult learners of English, was designed to follow up on the preliminary findings of Part I. Its purpose was to identify persistent errors in the longitudinal data, explore their relationship to both the findings from the cross-sectional study and the predictions of the SFH, and, ultimately, to answer the four research questions guiding the study: *(1) Which grammatical errors persist in the participants' written output over time? (2) Do the cross-sectional data and longitudinal data on persistent errors converge? (3) Do the persistent errors identified in the longitudinal corpus provide evidence of selective fossilization? and (4) Are the persistent grammatical errors identified in the longitudinal corpus consistent with the predictions of the SFH?*

This section reports the results as they relate to the research questions above. To answer the first and second research questions, descriptive statistics were computed to determine the number of words and total percentage of errors per essay, the total percentage of errors per essay for the 26 coded errors, and the total percentage of errors per essay for the three most persistent grammatical errors. To answer the third, a comprehensive TLU analysis of the most persistent errors was conducted to look for evidence of selective fossilization. The fourth research question involved applying the SFH to the data and interpreting the findings; therefore, it will be addressed in the discussion of results in Chapter V.

4.2.1 Descriptive Statistics

To answer Research Questions 1 and 2, descriptive statistics were first computed for each of the nine writing samples comprising the 3,091-word longitudinal corpus to identify persistent errors in the data and to see whether the findings from the longitudinal and cross-sectional data converged. As in Part I, these writing samples consisted of timed persuasive essays written under the supervision of the CCC ESL Placement Testing Coordinator or a member of the CCC ESL faculty. A summary of data elicitation events and dates may be found in Table 4.2.

Table 4.2

Corpus for Longitudinal Study: Data Elicitation Events and Dates

Participant	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Duration of Study
	Placement Exam	Diagnostic Exam	Exit Exam	Follow-up Essay	Follow-up Essay	
“Lisa”	8-07-09	1-18-11	5-10-11 (failing)	12-15-11 (2 nd exit exam: passing)	--	28 months
“Sandy”	11-09-09	9-2-10	12-14-10 (passing)	11-28-12	7-28-14	56 months

Total number of words/total percent of errors per essay. Descriptive statistics for the number of words and total percentage of errors per essay were first computed to present a general picture of the participants’ writing at each data collection point and to allow for comparisons to be made between the longitudinal and cross-sectional data. The results are reported below.

Participant 1: Lisa. As indicated in Table 4.2, above, the four writing samples collected from Lisa over the course of the 28-month study included one college placement essay, one diagnostic essay written on the first day of her college ESL English class, one (failing) final exam, and one (passing) follow-up exam. Together, these four essays comprised the 1,142-word Lisa Corpus.

To begin, descriptive statistics summarizing the total number of words and total percentage of errors per essay reveal that while the fluency of Lisa's writing fluctuated over the course of the study, her accuracy steadily improved. The first writing sample, a 280-word college placement essay composed in August of 2009, was scored at the low intermediate level, placing Lisa in Level 3 of the 4-tiered CCC Pre-College Program. Although the word-count of her essay exceeded the 250-word minimum required for a college placement essay, the grammatical accuracy of her paper was deemed insufficient for direct placement into the college.

For the second writing sample, a departmental diagnostic exam written in January of 2011 on the first day of Lisa's high intermediate ESL writing class at the college, Lisa produced an essay of only 200 words – nearly 30% fewer than the first. However, whereas her fluency decreased from the first writing sample to the next, the accuracy of her writing increased. Specifically, with 20 months' immersion in the target language culture between writing samples and the successful completion of Levels 3 and 4 of the CCC Pre-College Program behind her, the total percentage of errors in Lisa's written output dropped from nearly 25% for the first writing sample to 15.5% for the second.

A third writing sample, a departmental final exam, was written four months later in May 2011. Descriptive statistics reveal that while Lisa's fluency (N=375 words),

increased between the second and third writing samples, her grammatical accuracy (total % of errors=15.5) remained precisely the same. As a result of her perceived lack of progress, Lisa failed her high-intermediate ESL writing class and, as per college policy, was obligated to repeat it the following semester.

Lisa's fourth and last writing sample was a passing final exam written seven months later, in December 2011. At 295 words, this essay exceeded the requisite 250-word minimum. Moreover, the total percentage of errors for this second attempt at the final exam had dropped from 15.5% on her previous attempt to 11.6%, earning her a passing score in ESL writing and placing her into credit-bearing English 101. Figures 4.5 and 4.6 below, provide a graphic representation of the data.

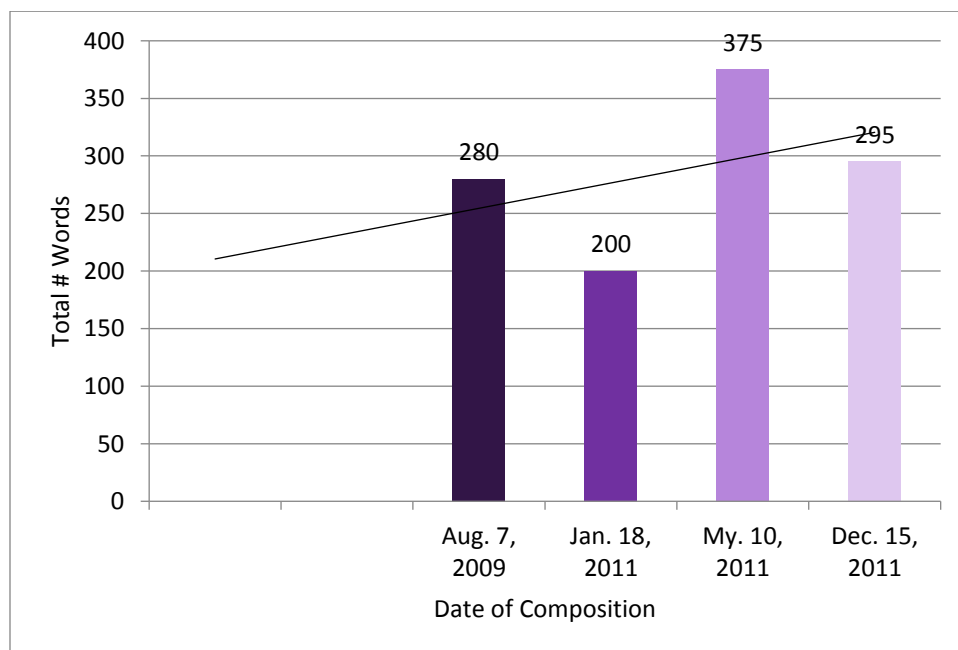


Figure 4.5. Lisa: Total Number of Words per Essay

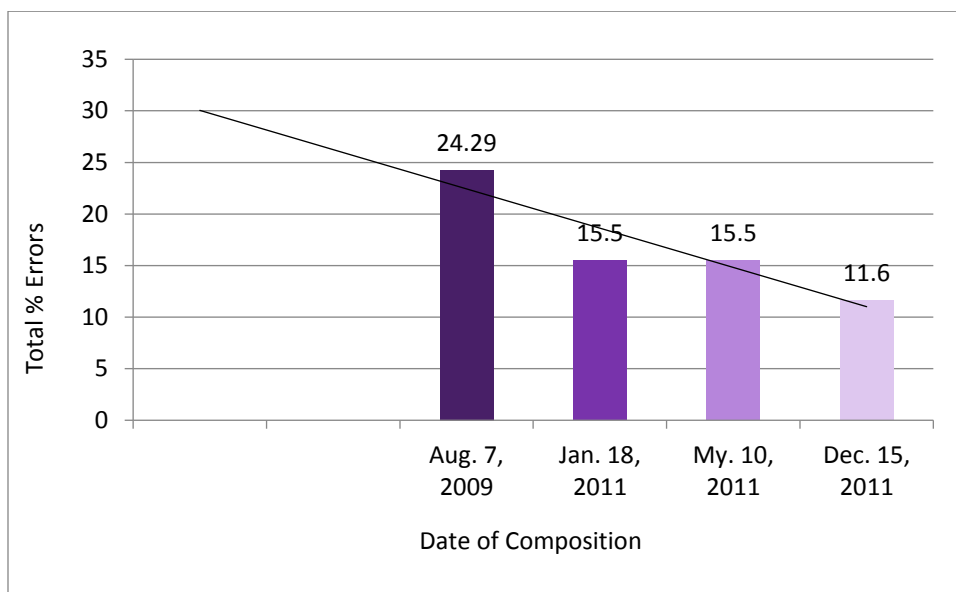


Figure 4.6. Lisa: Total Percent of Errors per Essay

In sum, the descriptive statistics reported above revealed that the total number of words Lisa produced per essay tended to increase over the course of the study as the total percentage of errors decreased. These results reflected the same general trends for fluency and accuracy observed not only in the cross-sectional data, but also in the longitudinal data for the second study participant, Sandy, as will be demonstrated next.

Participant 2: Sandy. Five writing samples were collected from the second participant over a period of 56 months; together they comprised the five-essay, 1949-word Sandy corpus. Descriptive statistics were computed for the overall fluency and accuracy of each of the five writing samples, and the results are reported below.

To begin, with six years' residence in the United States, two years of intensive English language instruction, and three years of college behind her, Sandy's writing at the time of the fifth/final writing sample had improved rather dramatically in terms of both fluency and accuracy. As illustrated in Figure 4.7, below, the data reveal a marked

increase in Sandy's fluency from the first essay to the last. At 765 words, Writing Sample 5, composed in July 2014, is nearly double the length of the first writing sample, a 397-word college placement essay written in November 2009. However, this pronounced increase in essay length did not occur until the end of the 56-month study. Indeed, in the nearly 15 months that elapsed between Writing Samples 2 and 4, the total number of words per essay remained relatively unchanged (i.e., $N=289$ and $N=309$) for Writing Samples 2 and 4.

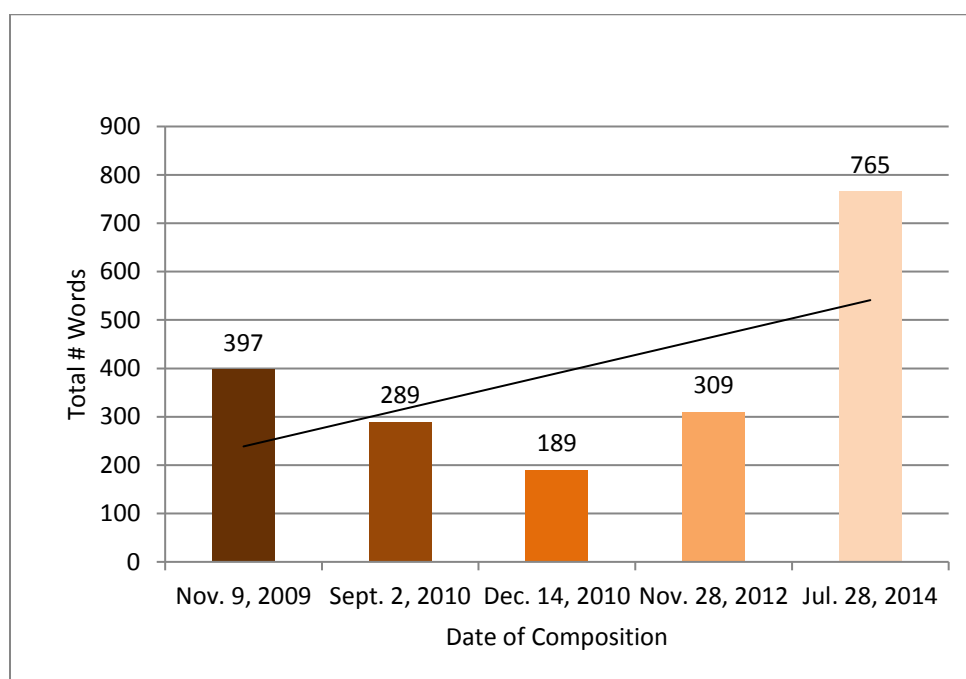


Figure 4.7. Sandy: Total Number of Words per Essay

In addition, as the fluency of Sandy's writing increased, so did her accuracy. Sandy's college placement essay, written in November 2009, was scored at the intermediate level, placing her at the fourth and highest level of the CCC Pre-College Language Immersion Program. The total percentage of errors for this first writing sample was calculated at 18.4%, a figure consistent with the mean percentage of errors (i.e.,

19%) for Part I participants with a similar level of proficiency. With the exception of a slight (18.4% to 20.7%) increase between the first and second writing samples, the total percentage of errors per essay declined steadily from the time Sandy composed the first writing sample in November 2009 until July 2014, when she penned the last. Indeed, by the end of the study, the total percentage of errors per essay had dropped to 6.7%, a 36% decrease from the first to the fifth/final essay. Figure 4.8 tracks the developing accuracy of Sandy's written output from November 2009 through July 2014: a period of 56 months.

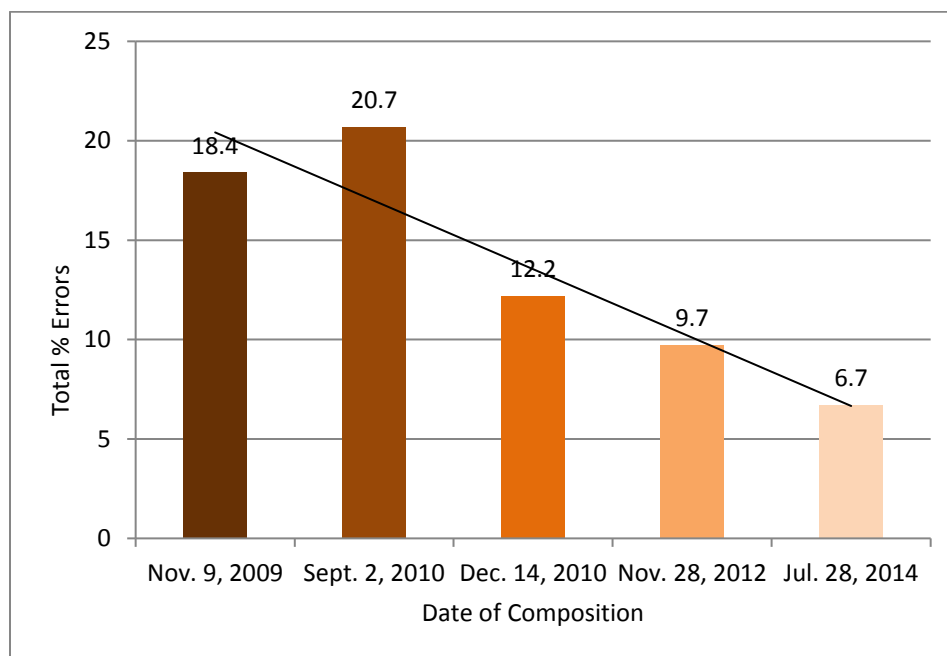


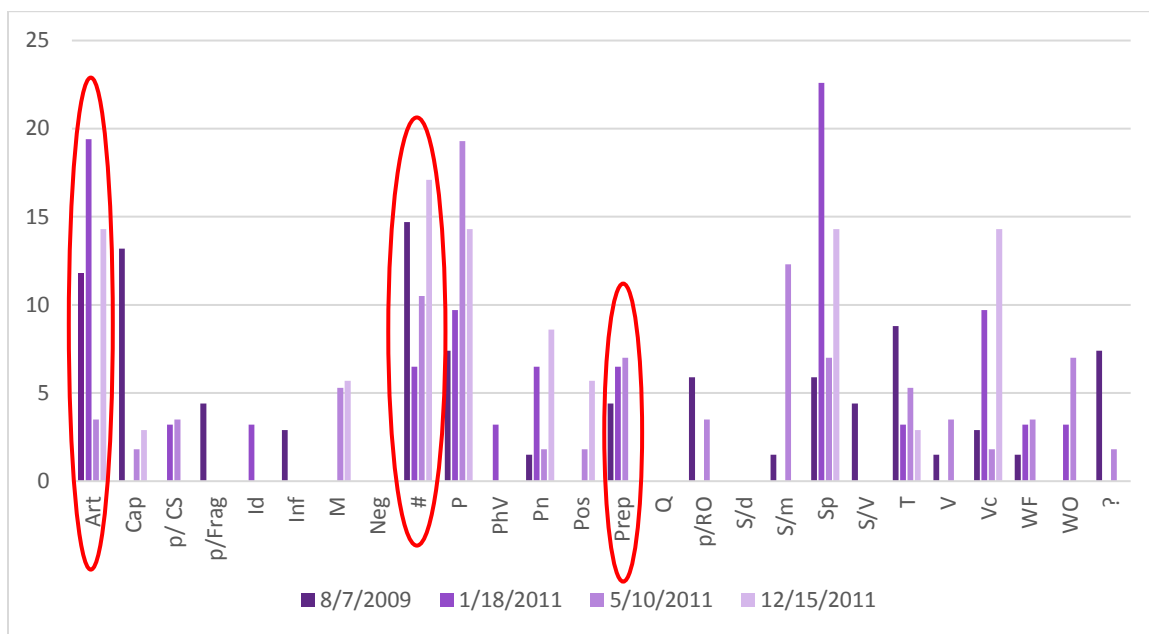
Figure 4.8. Sandy: Total Percent of Errors per Essay

Taken together, the results reported thus far suggest that the participants' overall fluency and accuracy increased as the study progressed. These results are consistent with those reported from the cross-sectional study, and will be revisited in the discussion of the research questions in Chapter V.

Descriptive statistics targeting specific learner errors are presented next. These are intended to provide answers to Research Questions 1 and 2: *Which grammatical errors persist in the participants' written output over time?* and *Do the cross-sectional data and longitudinal data on persistent errors converge?* As in the previous section, results will be presented first for Lisa, and then for Sandy.

Percent of all coded errors per essay. To answer the first and second research questions, descriptive statistics summarizing (a) the percent of errors per essay for each error type and (b) the percent of errors per essay for the three most persistent errors were computed for each of the nine essays in the corpus. As in the cross-sectional study, the longitudinal data for both Lisa and Sandy were coded for 26 discrete error types to reveal which, if any, errors persisted in their later essays, with the following results.

Participant 1: "Lisa." The four essays comprising the Lisa corpus were analyzed using descriptive statistics, and the results are graphically depicted in Figure 4.9 and Table 4.3, below. The vertical bars in Figure 4.9 represent the percentage of errors per error type for each of the four writing samples collected between August 7, 2009 and December 15, 2011. The three most persistent grammatical errors are circled in red. Interestingly, these are the same errors that were found to persist in the cross-sectional data, namely, those involving English articles, number, and prepositions (cf. Figure 4.3).



Legend¹

- Art-** article
- Cap-** capitalization
- p/CS-** comma splice
- p/Frag-** fragment
- Id-** idiom
- Inf-** Infinitive
- M-** modal
- Neg-** negation
- #-** number
- P-** punctuation
- PhV-** phrasal verb
- Pn-** pronoun
- Pos-** possession
- Prep-** preposition
- Q-** question form
- p/RO-** run-on
- S/d-** double subject
- S/m-** missing subject
- Sp-** spelling
- S/V-** subject/verb agreement
- T-** Tense
- V-** verb missing
- Vc-** vocabulary
- WF-** word form
- WO-** word order
- ?-** meaning is unclear

Figure 4.9. Lisa: Percent of Errors per Essay for 26 Coded Errors

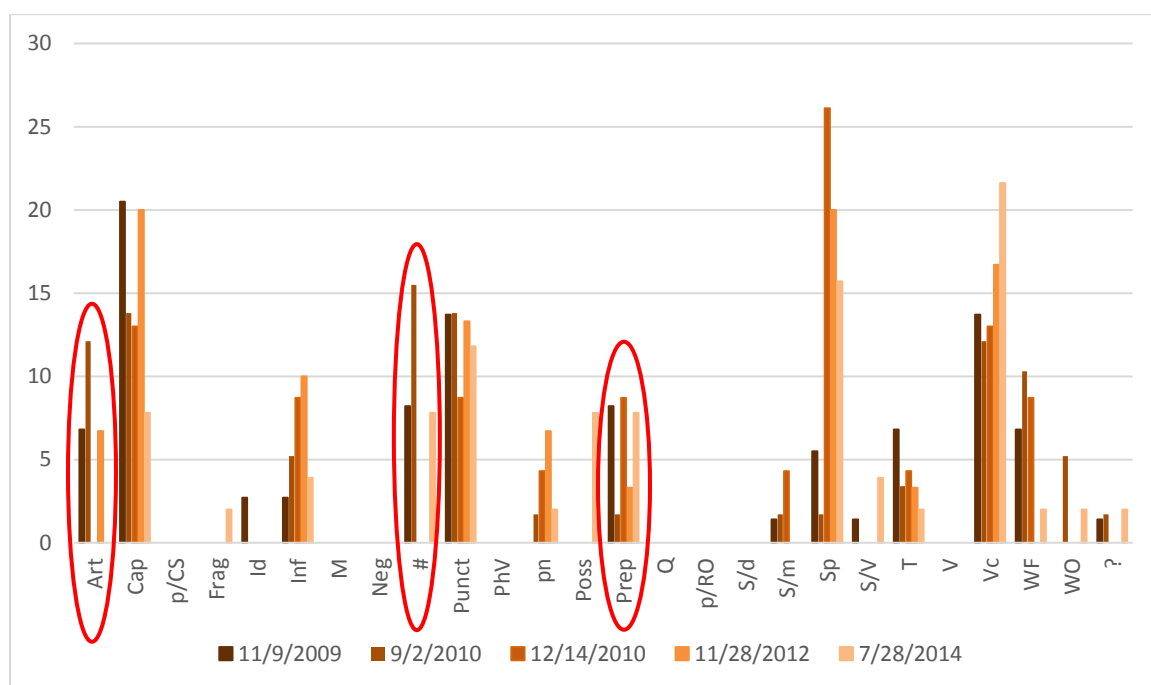
Table 4.3

Lisa: Percent of Errors per Essay for 26 Coded Errors

	Art	Cap	p/CS	p/Frag	Id	Inf	M	Neg	#	P	PhV	Pn	Pos	Prep	Q	p/RO	S/d	S/m	Sp	S/V	T	V	Vc	WF	WO	?
Aug. 7, 2009	11.8	13.2	0	4.4	0	2.9	0	0	14.7	7.4	0	1.5	0	4.4	0	5.9	0	1.5	5.9	4.4	8.8	1.5	2.9	1.5	0	7.4
Jan. 18, 2011	19.4	0	3.2	0	3.2	0	0	0	6.5	9.7	3.2	6.5	0	6.5	0	0	0	0	22.6	0	3.2	0	9.7	3.2	3.2	0
May 10, 2011	3.5	1.8	3.5	0	0	0	5.3	0	10.5	19.3	0	1.8	1.8	7	0	3.5	0	12.3	7	0	5.3	3.5	1.8	3.5	7	1.8
Dec. 15, 2011	14.3	2.9	0	0	0	0	5.7	0	17.1	14.3	0	8.6	5.7	0	0	0	0	0	14.3	0	2.9	0	14.3	0	0	0

¹ For a more detailed explanation of coded errors with examples, see Table 3.1.

Participant 2: Sandy. In the same way, descriptive statistics were used to analyze the five writing samples comprising the Sandy corpus. These are summarized in Figure 4.10 and its corresponding Table 4.4, below. The vertical bars in Figure 4.10 represent the total percentage of errors per error type for each of the five writing samples collected between November 2009 and July 2014. Circled in red are errors involving articles, number, and prepositions, the same persistent errors identified in both the Lisa and cross-sectional corpora.



Legend

Art- article	Neg- negation	Q- question form	V- verb missing
Cap- capitalization	#- number	p/RO- run-on	Vc- vocabulary
p/CS- comma splice	P- punctuation	S/d- double subject	WF- word form
p/Frag- fragment	PhV- phrasal verb	S/m- missing subject	WO- word order
Id- idiom	Pn- pronoun	Sp- spelling	?- meaning is unclear
Inf- Infinitive	Pos- possession	S/V- subject/verb agreement	
M- modal	Prep- preposition	T- Tense	

Figure 4.10. Sandy: Percent of Errors per Essay for 26 Coded Errors

Table 4.4

Sandy: Percent of Errors per Essay for 26 Coded Errors

	Art	Cap	p/CS	Frag	Id	Inf	M	Neg	#	Punct	PhV	pn	Poss	Prep	Q	p/RO	S/d	S/m	Sp	S/V	T	V	Vc	WF	WO	?	
11/9/2009	6.8	20.5	0	0	2.7	2.7	0	0	8.2	13.7	0	0	0	8.2	0	0	0	0	1.4	5.5	1.4	6.8	0	13.7	6.8	0	1.4
9/2/2010	12.1	13.8	0	0	0	5.2	0	0	15.5	13.8	0	1.7	0	1.7	0	0	0	0	1.7	1.7	0	3.4	0	12.1	10.3	5.2	1.7
12/14/2010	0	13	0	0	0	8.7	0	0	0	8.7	0	4.3	0	8.7	0	0	0	0	4.3	26.1	0	4.3	0	13	8.7	0	0
11/28/2012	6.7	20	0	0	0	10	0	0	0	13.3	0	6.7	0	3.3	0	0	0	0	20	0	3.3	0	16.7	0	0	0	0
7/28/2014	0	7.8	0	2	0	3.9	0	0	7.8	11.8	0	2	7.8	7.8	0	0	0	0	15.7	3.9	2	0	21.6	2	2	2	2

Percent of targeted errors per essay. Once the three grammatical targets of articles, prepositions, and number had been identified, descriptive statistics comparing the mean percent of error for each were reorganized into discrete bar graphs to more clearly illustrate the participants' use of the three target structures over time.

Participant 1: Lisa. Descriptive statistics summarizing Lisa's use of the three grammatical targets are graphically illustrated in Figure 4.11 and summarized in Table 4.5, below. The vertical bars in Figure 4.11 represent the percent of article, preposition, and number errors found in each of the four writing samples collected for Lisa between August 2009 and December 2011.

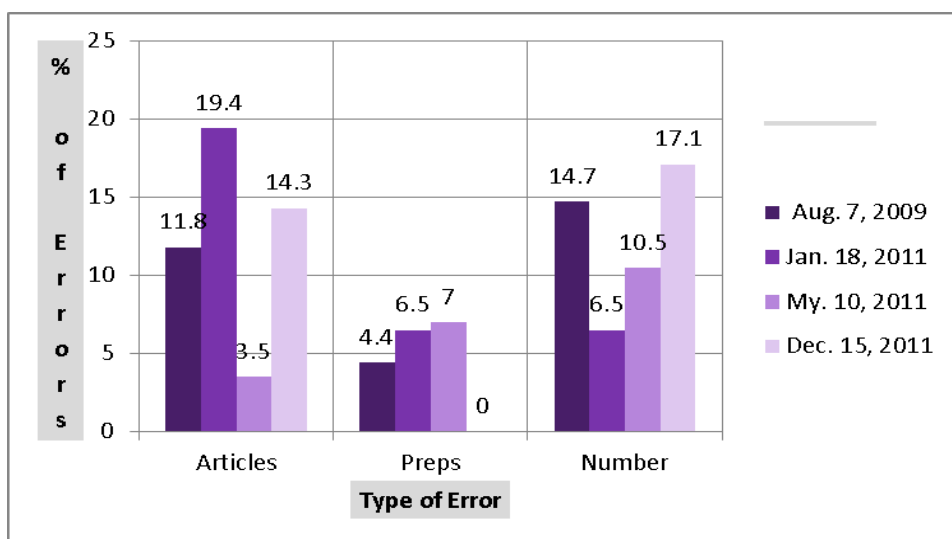


Figure 4.11. Lisa: Percent of Errors per Essay for Three Linguistic Targets

Table 4.5

Lisa: Percent of Errors per Essay for Three Linguistic Targets

Date of Composition	Articles	Prepositions	Number
Aug. 7, 2009	11.8	4.4	14.7
Jan. 18, 2011	19.4	6.5	6.5
May 10, 2011	3.5	7.0	10.5
Dec. 15, 2011	14.3	0.0	17.1

To begin, as Figure 4.11 reveals, Lisa's total percentage of article errors underwent a marked increase (i.e., 11.8 % to 19.4%) from the first writing sample to the next; then, after a temporary decrease to 3.5% in the third writing sample, increased more than fourfold to 14.3% in the last. As a result, when Lisa penned the fourth and final writing sample, her total percentage of errors for English articles was nearly 3% higher than it had been for the first. Similarly, after a temporary drop in number errors from the first writing sample to the second (i.e., 14.7% to 6.5%), the total percentage of number errors climbed steadily from the third writing sample (10.5%) to the last (17.1%), an increase of approximately 7% from Writing Sample 3 to 4, and a nearly 3% increase overall. Put simply, like her use of English articles, Lisa's use of number was *less* target-like at the end of the 28-month study than it had been at the start. Finally, her total percentage of preposition errors increased (i.e., 4.4%→6.5%→7.0%) from the first through third writing sample but dropped to zero in the fourth.

Participant 2: Sandy. Descriptive statistics summarizing Sandy's use of the three linguistic targets are presented next. As summarized in Figure 4.12 and Table 4.6, the longitudinal data for articles, number, and prepositions revealed evidence of persistence in Sandy's use of all three targeted errors, particularly the latter two.

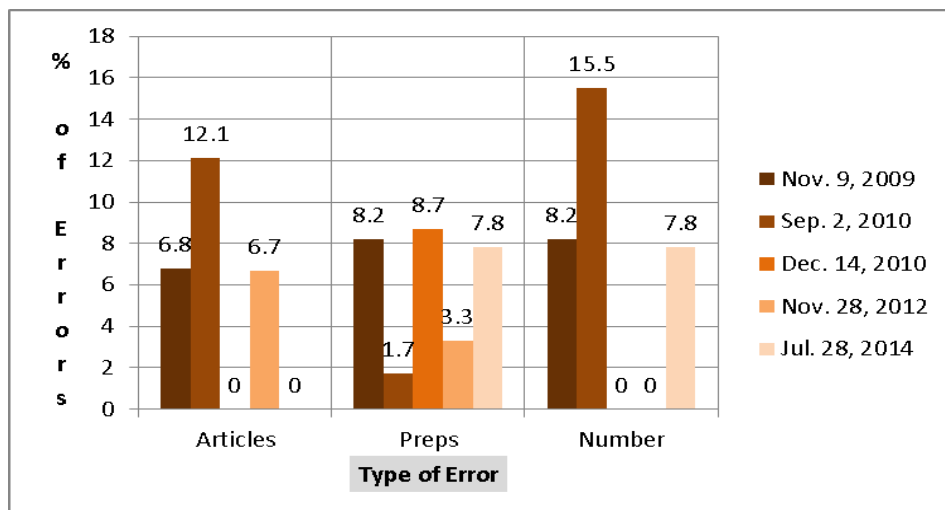


Figure 4.12. Sandy: Percent of Errors per Essay for Three Linguistic Targets

Table 4.6

Sandy: Percent of Errors per Essay for Three Linguistic Targets

Date of Composition	Articles	Prepositions	Number
Nov. 9, 2009	6.8	8.2	8.2
Sept. 2, 2010	12.1	1.7	15.5
Dec. 14, 2010	0	8.7	0
Nov. 28, 2012	6.7	3.3	0
July 28, 2014	0	7.8	7.8

Beginning with Sandy's use of prepositions and number, the descriptive data revealed an inverted U-shaped pattern² that has been attributed to L2 learners' overgeneralizations of rule-based representations to new linguistic input (Carlucci et al., 2006; Jain & Stephan, 2006) – a possible consequence of increased exposure to the TL. As illustrated by Figure 4.12, the total percentage of *number* errors in Sandy's writing

² A U-shaped developmental trajectory typically suggests a pattern of good performance, followed by bad performance, followed by good performance (Carlucci et al., 2006). However, here Sandy's use of prepositions and number are said to follow an *inverted* U-shaped pattern, since higher percentages are indicative of a higher percentage of errors.

rose, fell, and rose again (i.e., from 8.2% → 15.5% → 0% → 0% → 7.8%) over the 56-month course of the study. In the end, the total percentage of number errors per essay remained virtually unchanged from the first writing sample to the last.

In a similar way, Sandy's use of English *prepositions*, as measured by the total percentage of preposition errors per essay, also followed an inverted U-shaped (i.e., 8.2 → 1.7 → 8.7 → 3.3 → 7.8) pattern. Here the total percentage of preposition errors per essay rose markedly (i.e., from 1.7% to 8.7%) from Writing Sample 2 to Writing Sample 3. Then, after a temporary decrease from 8.7% to 3.3% in Writing Sample 4, it more than doubled from 3.3% to 7.8% in Writing Sample 5. Hence, at the time of the fifth and final data collection in July 2014, the total percentage of preposition errors (7.8) remained virtually the same as it was at the onset of the study nearly five years before (8.2). Finally, evidence of persistence could also be found in Sandy's use of English articles. As Figure 4.12 illustrates, the total percentage of article errors per essay remained virtually unchanged (6.8% → 6.7%) from the first essay to the fourth before dropping to 0% in the fifth.

To summarize, the results presented thus far affirm that the three most persistent grammatical errors as revealed by an analysis of the descriptive statistics were those involving English articles, prepositions, and number, the same persistent errors found in Part I. These findings, which shed light on the first and second research questions, are further corroborated in Section 4.2.2, where the results of a TLU analysis of the targeted errors provide additional evidence of their persistence and once again demonstrate convergence between the longitudinal and cross-sectional data.

4.2.2 Target-Like Use (TLU) Analysis

To answer Research Questions 3 and 4, an in-depth TLU analysis of the longitudinal data was conducted next. First, the participants' overall use of articles, prepositions, and number was analyzed to procure evidence of selective fossilization among the three linguistic targets. Next, a second round of analysis was undertaken to look for evidence of selective fossilization within the linguistic targets by examining the participants' use of (1) articles in various linguistic environments, (2) individual prepositions, and (3) number by noun type (e.g., count vs. noncount nouns). The TLU analysis was conducted by dividing the number of correct suppliance of a target structure in contexts by the number of obligatory contexts plus the number of suppliance in non-obligatory contexts and then multiplying the quotient by 100 to obtain the percent accuracy. Following that, the percent correct for each of the three linguistic targets was plotted on a line graph to illustrate developmental trends. The results are reported below.

Participant 1: Lisa. A two-part TLU analysis was conducted of the four writing samples comprising the 1,142-word Lisa corpus. The first round of analysis was undertaken to shed light on the first study participant's overall use of the three linguistic targets, and the second, to obtain a more nuanced understanding of the same.

TLU analysis, round one. This TLU analysis of the longitudinal data begins with an examination of Lisa's differential command of the three linguistic targets. To determine the percent correct per essay for the three grammatical targets, the number of target-like suppliances for each was divided by the number of non-target-like suppliances, and the results are reported below. Tables 4.7, 4.8, and 4.9 organize the data

in tabular form, and Figure 4.13 provides a linear representation with data points, arranged by date, displaying the percent correct for each.

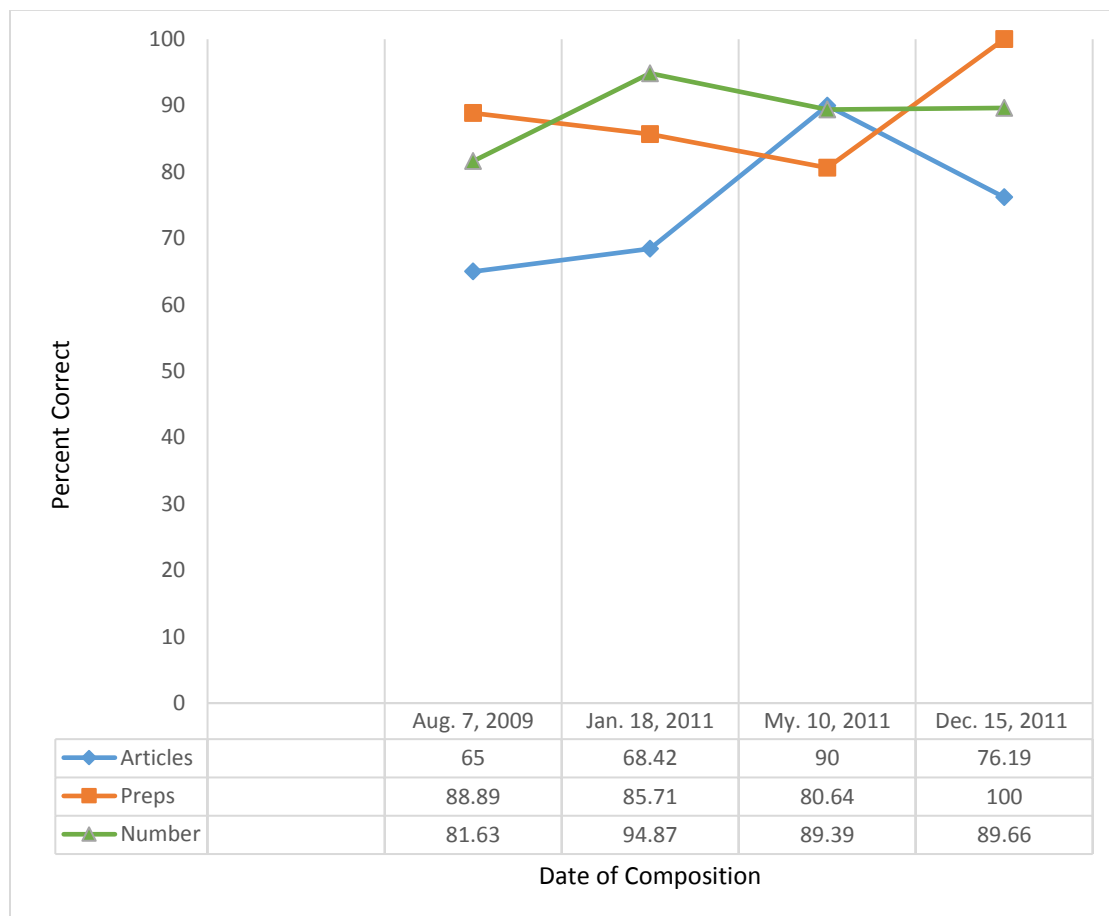


Figure 4.13. Lisa's TLU of Articles, Prepositions, and Number

Table 4.7

Lisa's Target-Like Use (TLU) of Articles

Date of Composition	# Words per Essay	Total # Occurrences: Article Use	# Correct	# Incorrect	% Correct
Aug. 7, 2009	280	20	13	7	65
Jan. 18, 2011	200	19	14	5	73.68
May 10, 2011	367	20	18	2	90
Dec. 15, 2011	295	21	16	5	76.19
	1142	80	61	19	

Table 4.8

Lisa's TLU of Prepositions

Date of Composition	# Words per Essay	Total # Occurrences: Preposition Use	# Correct	# Incorrect	% Correct
Aug. 7, 2009	280	36	32	4	88.89
Jan. 18, 2011	200	21	18	3	85.71
May 10, 2011	367	31	25	6	80.64
Dec. 15, 2011	295	27	27	0	100.00
	1142	115	102	13	

Table 4.9

Lisa's TLU of Number

Date of Composition	# Words per Essay	Total # Occurrences: Use of Number	# Correct	# Incorrect	% Correct
Aug. 7, 2009	280	49	40	9	81.63
Jan. 18, 2011	200	39	37	2	94.87
May 10, 2011	367	66	59	7	89.39
Dec. 15, 2011	295	58	52	6	89.66
	1142	212	188	24	

As illustrated by Figure 4.13, one of the most striking findings of the TLU analysis concerns Lisa's use of two of the three linguistic targets over time. Firstly, a comparison of the first and last writing samples, written 28 months apart, reveals little change in Lisa's ability to correctly supply English articles and number in contexts. Indeed, the longitudinal data reveal only a modest improvement in Lisa's target-like use of English *articles*. For example, at the outset of the study, Lisa's correct suppliance of articles was just 65%. Seventeen months later, after having successfully completed two semesters in an intensive Pre-College English Language Program, Lisa's target-like suppliance of English articles rose only slightly to 73.68%, leveling off at 76.19% when the study ended 11 months later. Moreover, Lisa's use of *number* also remained relatively

static from the first writing sample (81.63% correct) to the last (89.66% correct). More specifically, after a more than 13% increase in correct use from Writing Sample 1 to Writing Sample 2, the number of target-like suppliance decreased by more than 5% in Writing Sample 3 and remained virtually unchanged in Writing Sample 4. Finally, Lisa's correct use of *prepositions* declined steadily from the first writing sample to the third (91.67% → 85.71% → 80.64%) before reaching 100% target-like accuracy in the fourth. However, due to the relatively short duration (i.e., 28 months) of the study, it was not possible to determine whether the nearly 20% increase in target-like use that occurred from the penultimate writing sample to the last should be interpreted as possible evidence of acquisition, or whether it could more accurately be construed as a temporary stage of IL restructuring.

To summarize, the results of the TLU analysis thus far reveal marked differences in the first study participant's acquisition of English articles, prepositions, and number. A second round of analysis was conducted next to provide a more nuanced interpretation of the longitudinal data by examining inter- and intra-learner differential failure and success within the grammatical targets. By examining Lisa's use of articles in a variety of linguistic environments, individual prepositions in contexts, and number by noun type, this second pass at the data endeavored to uncover additional evidence of selective fossilization and so answer the third and fourth research questions: *Do the persistent errors identified in the longitudinal corpus provide evidence of selective fossilization?* and *Are the persistent grammatical errors identified in the longitudinal corpus consistent with the predictions of the SFH?*

TLU analysis, round two. This section presents the results of a more detailed TLU analysis of Lisa's use of English articles, prepositions, and number. Representative examples from the four writing samples comprising the Lisa corpus are provided for each. These examples are numbered, set off in quotation marks, and marked with an asterisk to denote their ungrammaticality, with errors bolded and italicized for emphasis. The number of the writing sample (WS) from which the excerpt was taken can be found in parentheses, and the correct usage is printed directly below.

Article use by type. As noted in the Review of the Literature, current research suggests that the successful acquisition of a second language involves more than just the acquisition of target-like forms. Even more challenging is the acquisition of target-like conceptualization of experience, which includes the ability to map form-meaning-function relations in real-time extemporaneous communication (Han, 2013). This is particularly true of English articles: definite *the*; indefinite *a/an*; and the *null* or *zero* article (i.e., the use no article at all, represented by the symbol \emptyset). For those in the process of acquiring English, then, it is not enough to know the forms of English articles and their meanings, but also to understand their appropriate use in different discourse conditions. For this reason, and to provide a more nuanced analysis of the participants' acquisition of articles, the data were subjected to another round of analysis based on an adaptation of Huebner's (1983) dynamic paradigm, summarized in Table 4.10, below.

A summary of results for Lisa's use of articles by type may be found in Table 4.11 and Figure 4.14. To determine the percent correct per essay for each type of article use, the number of target-like supplants for each was divided by the number of non-target-like supplants and graphically illustrated for ease of interpretation. In Table 4.11,

the data are presented in tabular form, with the four data elicitation points listed chronologically across the top row, and the five types of article use listed in the far-left column directly below it. Figure 4.14 provides a linear representation with data points, arranged by date, displaying the percent correct for each. Representative examples are

Table 4.10

Environments for the Appearance of English Articles a/an, the, and Ø

Type	Features	Environment	Articles	Examples
Type 1	[-SR, +RK]	Generic nouns	<i>a/an, the, Ø</i>	<i>A</i> dog is a faithful animal. <i>The</i> washing machine is another creation of modern technology. Ø Amnesty is a good solution...
Type 2	[+SR, +RK]	Referential definites previous mention	<i>the</i>	<i>The</i> Pope; <i>The</i> President; <i>The</i> sun; Residents of the US say ...I agree with <i>the</i> residents...
Type 3	[+SR, -RK]	Referential indefinites first mention	<i>a/an, Ø</i>	Evelyn was brought up in <i>an</i> environment....This environment...; Evelyne falls in love with <i>a</i> sailor....The sailor...
Type 4	[-SR, -RK]	Nonreferential nouns	<i>a/an, Ø</i>	Her role as <i>a</i> sister and <i>a</i> daughter...; People with Ø college degrees can find <i>a</i> job.
Type 5		Idioms; Other conventional uses	<i>a/an, the, Ø</i>	As <i>a</i> matter of fact; On <i>the</i> one hand; In <i>the</i> 1800s; Going to Ø work

Note: Adapted from Ekiert (2004), Butler (2002), Huebner (1983), and Thomas (1989)

numbered, set off in quotation marks, and marked with an asterisk to indicate their ungrammaticality. Article errors have been bolded and italicized for emphasis. The number of the writing sample (WS) from which the excerpt was extracted is written in parentheses, and the correct usage is printed directly below.

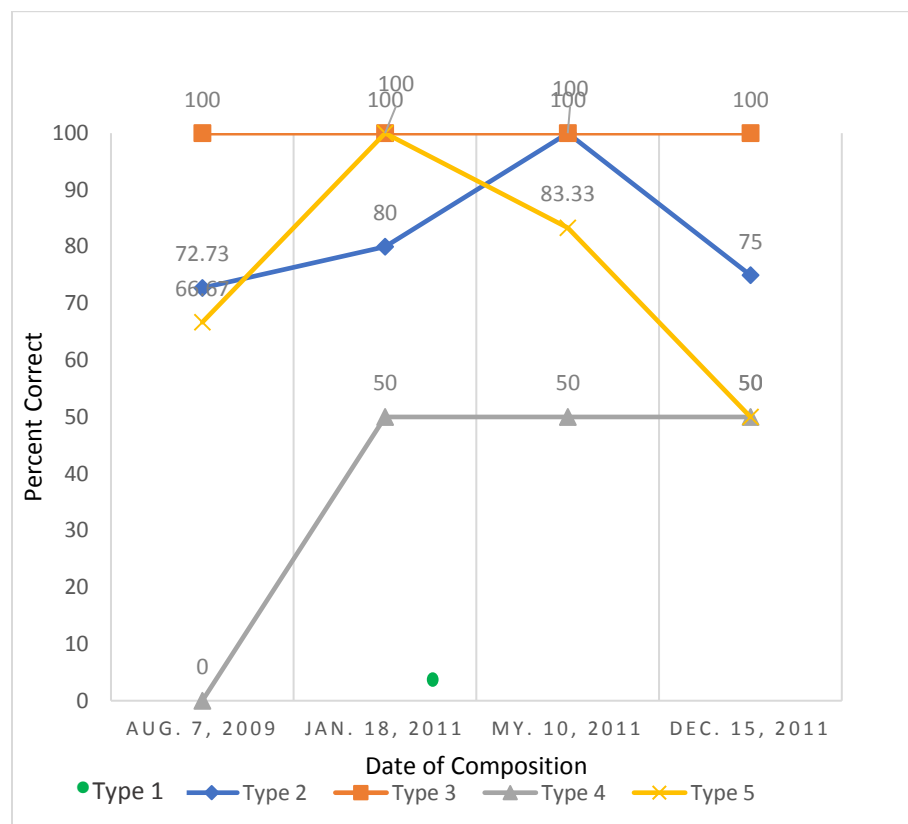


Figure 4.14. Lisa's TLU of Articles (by Type)

Table 4.11

Lisa's TLU of Articles (by Type)

	Aug. 7, 2009	Jan. 18, 2011	May 10, 2011	Dec. 15, 2011	Total # Correct Total % Correct
Type 1	--	(0/1) 0.00	--	--	(0/1) 0.00
Type 2	(8/11) 72.73	(8/10) 80.00	(9/9) 100.00	(9/12) 75.00	(34/42) 80.95
Type 3	(1/1) 100.00	(1/1) 100.00	(3/3) 100.00	(5/5) 100.00	(10/10) 100.00
Type 4	(0/2) 0.00	(2/4) 50.00	(1/2) 50.00	(1/2) 50.00	(4/10) 40.00
Type 5	(4/6) 66.67	(3/3) 100.00	(5/6) 83.33	(1/2) 50.00	(13/17) 76.47

As Figure 4.14 illustrates, pronounced differences in suppliance rates were found for all five types of article use, from total success (i.e., 100% suppliance) for Type 3 to complete failure (i.e., 0% suppliance) for Type 1.

Type 1 errors: Generic nouns [-SR, +RK]. Lisa's TLU of articles in Type 1 (i.e., generic) NPs was examined first. These involve NPs in which the head noun has no specific referent (e.g., *dogs*), but is nonetheless assumed known to the reader (e.g., *Dogs are faithful animals*). For ease of reference, a recap of the features, environment, articles, and examples of Type 1 nouns is reprinted below.

Type	Features	Environment	Articles	Examples
Type 1	[-SR, +RK]	Generic nouns	<i>a/an, the, Ø</i>	<i>A dog is a faithful animal. The washing machine is another creation of modern technology. Ø Amnesty is a good solution...</i>

To begin, only one occasion of Type 1 (Generic Noun) article use was identified in the longitudinal corpus for Lisa.

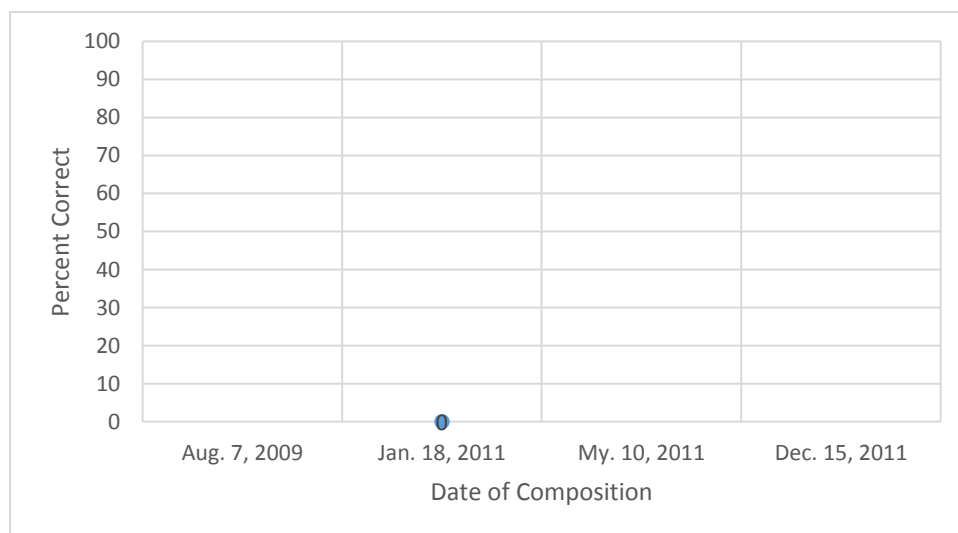


Figure 4.15. Lisa's TLU of Type 1 NPs

Table 4.12

Lisa's TLU of Type 1 NPs

Date of Composition	Total # Occurrences: Type 1 Article Use <i>Generic Noun (-SR, +RK)</i>	# Correct	# Incorrect	% Correct
Aug. 7, 2009	0	0	0	---
Jan. 18, 2011	1	0	1	0
May 10, 2011	0	0	0	---
Dec. 15, 2011	0	0	0	---
	1	0	1	

As Figure 4.15 and Table 4.12 demonstrate, Lisa missed 1 out of 1 textual uses of Type 1 nouns for the duration of the 28-month study. More specifically, in Writing Sample 2, she attempted to use the word “amnesty” generically, but fell short by adding the definite article to the NP.

1. * “Finally, *the amnesty* will be a good solution...to prevent more illegal immigration.”
 [\emptyset amnesty will be a good solution] (WS #2)

The non-target-like use of an article in a generic NP in Example 1 was considered a possible transfer error, as generic nouns in Spanish are preceded by the definite article (e.g., *la amnistía*). Interestingly, only one generic (Type 1) NP could be found in the Lisa corpus (and just four in the Sandy corpus), so it can be noted that they occurred rather infrequently in the longitudinal production data. The relevance of this finding in light of the SFH will be examined in Chapter V.

Type 2 errors: Referential definites [+SR, +RK]. The second type of article use examined involved Lisa’s TLU of referential definites, that is, articles appearing in NPs for which the head noun has a specific referent known to both the writer and reader (e.g.,

the sun, or, alternately, a previously mentioned noun). A summary of features for Type 2 NPs is reprinted below.

Type	Features	Environment	Articles	Examples
Type 2	[+SR, +RK]	Referential definites previous mention	<i>the</i>	<i>The</i> Pope; <i>The</i> president; <i>The</i> sun; Residents of the US say...I agree with <i>the</i> residents...

A total of 42 occurrences of Type 2 NP article use was found in the longitudinal corpus for Lisa, more than all the others combined. Of these 42 occurrences, 34 (or approximately two-thirds) were target-like, and 8 were non-target-like.

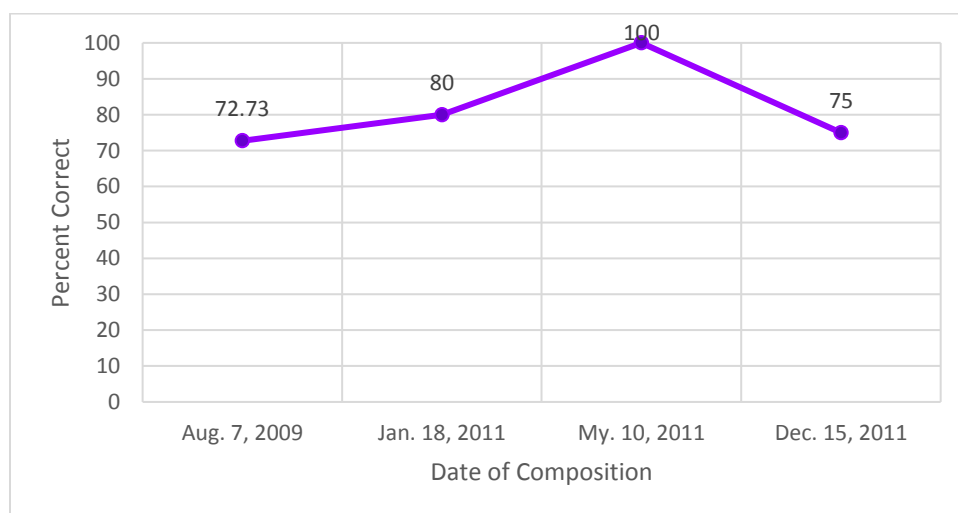


Figure 4.16. Lisa's TLU of Type 2 NPs

Table 4.13

Lisa's TLU of Type 2 NPs

Date of Composition	Total # Occurrences: Type 2 Article Use <i>Referential Definites (+SR, +RK)</i>	# Correct	# Incorrect	% Correct
Aug. 7, 2009	11	8	3	72.73
Jan. 18, 2011	10	8	2	80
May 10, 2011	9	9	0	100
Dec. 15, 2011	12	9	3	75
	42	34	8	

Type	Features	Environment	Articles	Examples
Type 3	[+SR, -RK]	Referential indefinites first mention	<i>a/an, ∅</i>	Evelyn was brought up in <i>an</i> environment....This environment...

As Figure 4.17 and Table 4.14 clearly demonstrate, Lisa's suppliance of English articles in Type 3 NPs was absolutely perfect at 100% for all four writing samples, or 10 target-like instances out of 10 occurrences.

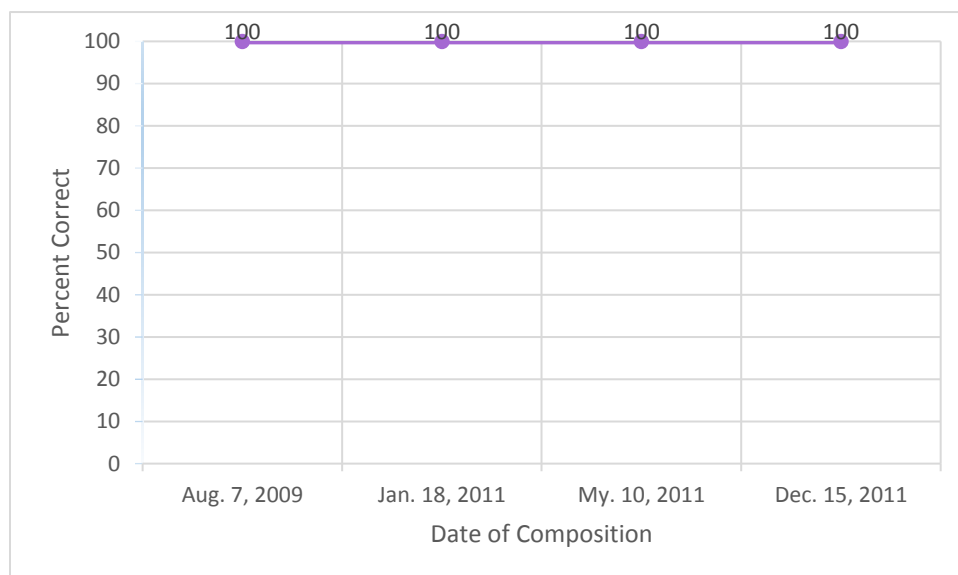


Figure 4.17. Lisa's TLU of Type 3 NPs

Table 4.14

Lisa's TLU of Type 3 NPs

Date of Composition	Total # Occurrences: Type 3 NP Article Use <i>1st Mention Nouns</i> (+SR, -HK)	# Correct	# Incorrect	% Correct
Aug. 7, 2009	1	1	0	100
Jan. 18, 2011	1	1	0	100
May 10, 2011	3	3	0	100
Dec. 15, 2011	5	5	0	100
	10	10	0	

Example 4, below, demonstrates Lisa’s proficiency with Type 3 NP article use – specifically her correct suppliance of the indefinite article + singular noun to denote first mention:

4. “Do you think *a student* who has excellent grades and is one of the most efficient students in the class should has a second opportunity to accomplish *their* goals and dreams?...the United states should help *these students*” (WS #4)

Lisa’s consistently target-like use of English articles in Type 3 NPs stands in contrast to her relatively non-target-like article use in Type 4 and Type 5 NPs, both of which show suppliance rates of only 50% at the time of the fourth/final data collection. Each, in turn, is addressed below.

Type 4 errors: Non-referential nouns [- SR, - HK]. Examined next were Lisa’s TLU of articles in Type 4 (i.e., non-referential) NPs, that is, NPs in which the head noun has neither a specific referent nor is assumed known to the reader.

Type	Features	Environment	Articles	Examples
Type 4	[-SR, -RK]	Nonreferential nouns	<i>a/an, Ø</i>	Her role as <i>a</i> sister and <i>a</i> daughter...; People with \emptyset college degrees can find <i>a</i> job.

A TLU analysis of Lisa’s writing revealed only 6 out of 10 target-like uses of articles in Type 4 NPs. After an initial increase in target-like occurrences from 0% in Writing Sample 1 to 50% in Writing Sample 2, Lisa’s TLU of articles in Type 4 NPs stabilized at 50% for the duration of the study, as illustrated in Figure 4.18 and Table 4.15, below.

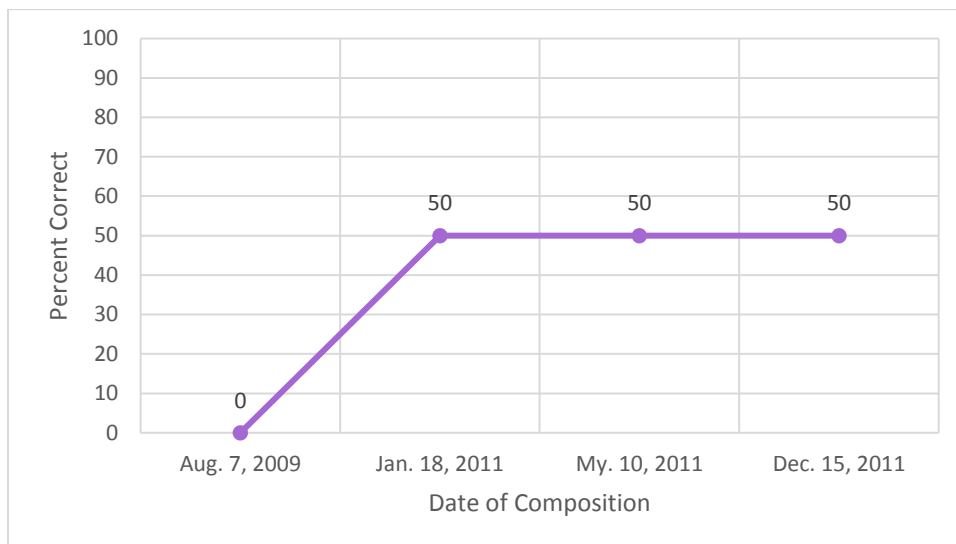


Figure 4.18. Lisa's TLU of Type 4 NPs

Table 4.15

Lisa's TLU of Type 4 NPs

Date of Composition	Total # Occurrences: Type 4 NP Article Use <i>Non-Referential (-SR, -RK)</i>	# Correct	# Incorrect	% Correct
Aug. 7, 2009	2	0	2	0
Jan. 18, 2011	4	2	2	50
May 10, 2011	2	1	1	50
Dec. 15, 2011	2	1	1	50
	10	4	6	

Two representative examples are included here. In the first, Example 5, Lisa omits the obligatory indefinite article in the final NP,

5. * "Those people come from different countries to get \emptyset better life" (WS #2)
[a better life]

while in the second, she adds the indefinite article when the null article is required:

6. * "that way they will have a better communication." (WS #3)
[\emptyset better communication]

Interestingly, Spanish non-referential NPs also allow either a null or indefinite article before the noun: for example, *Hoy Ø computadores en la biblioteca* (There are Ø computers in the library) and *Tengo un libro* (I have a book). Despite similarities between L1 and L2, however, Lisa's use of English articles with non-referential nouns was still rather non-target-like, although after only 28 months it would be premature to say that it had fossilized.

Type 5 errors: Idioms & other conventional uses. The fifth and last type of article use to be analyzed was Lisa's suppliance of articles in idioms and other conventional expressions. A summary of the features, environment, articles, and examples of Type 5 nouns is reprinted below.

Type	Features	Environment	Articles	Examples
Type 5		Idioms Other conventional uses	<i>a/an, the, Ø</i>	As <i>a</i> matter of fact; On <i>the</i> one hand; In <i>the</i> 1800s; Going to Ø work

In total, 17 occurrences of Type 5 NP article use were found in the Lisa corpus. Of these 17 occurrences, 13 were correctly supplied in obligatory contexts, and 4 were not. At the beginning of the 28-month study, Lisa's target-like suppliance of articles associated with *Type 5 nouns* was only 66.7%. However, for the second writing sample it had peaked at 100% before dropping to 83.33% for the third, and finally to only 50% by the end of the study. Lisa's suppliance rates for Type 5 NP article use are provided in Table 4.16 and visually illustrated in Figure 4.19.

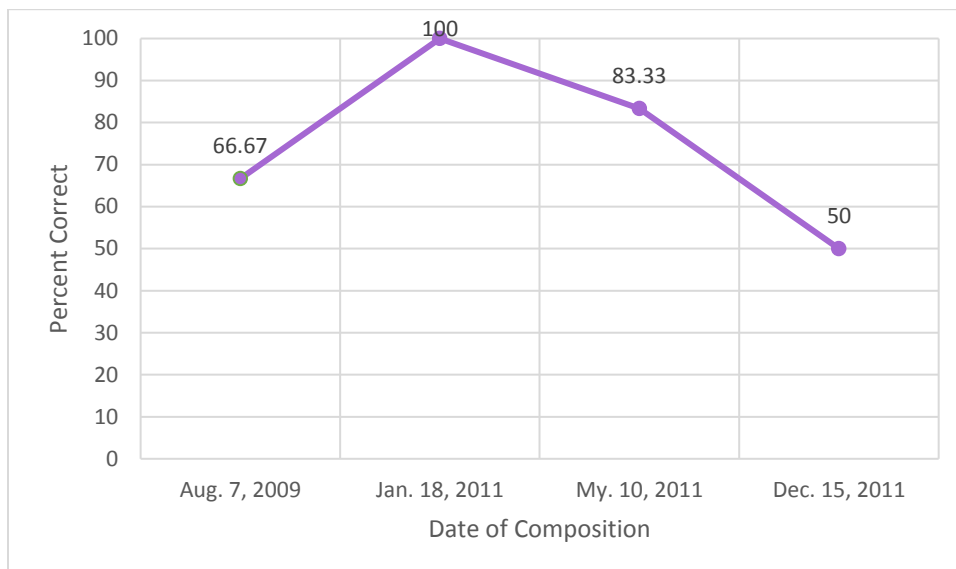


Figure 4.19. Lisa's TLU of Type 5 NPs

Table 4.16

Lisa's TLU of Type 5 NPs

Date of Composition	Total # Occurrences: Type 5 NP Article Use <i>Idioms & Other Conventional Uses</i>	# Correct	# Incorrect	% Correct
Aug. 7, 2009	6	4	2	66.67
Jan. 18, 2011	3	3	0	100
May 10, 2011	6	5	1	83.33
Dec. 15, 2011	2	1	1	50
	17	13	4	

Representative examples from the first and last writing samples underscore Lisa's variational use of articles in idiomatic expressions and other conventional uses.

7. * "in \emptyset 1800's immigrant came to the United States because they want..."
[the 1800s] (WS #1)
8. * "That way they can go to **the** college and become professional."
[go to \emptyset college] (WS #4)

In Example 7, Lisa writes *in 1800's* instead of the more idiomatic *in the 1800s*, flouting the English convention of using the definite article in NPs that refer to a time period

rather than a date. Then, in Example 8, she writes *go to the college* instead *go to college*, violating conventions regarding the use of the definite article before common nouns functioning as adverbs of place (*go to school/college, go to work, go to church* vs. *go to the hospital, go to the bank, go to the store*).

In sum, results of a more finely-grained analysis of Lisa's target-like use of English articles revealed marked differences in suppliance rates within the five linguistic environments. In contrast to this, her use of English prepositions remained comparatively stable over the course of the study, as will be demonstrated below.

Prepositions. Of the three grammatical targets, Lisa's use of prepositions was the most accurate and consistent overall, as Table 4.17 and Figure 4.20 attest.

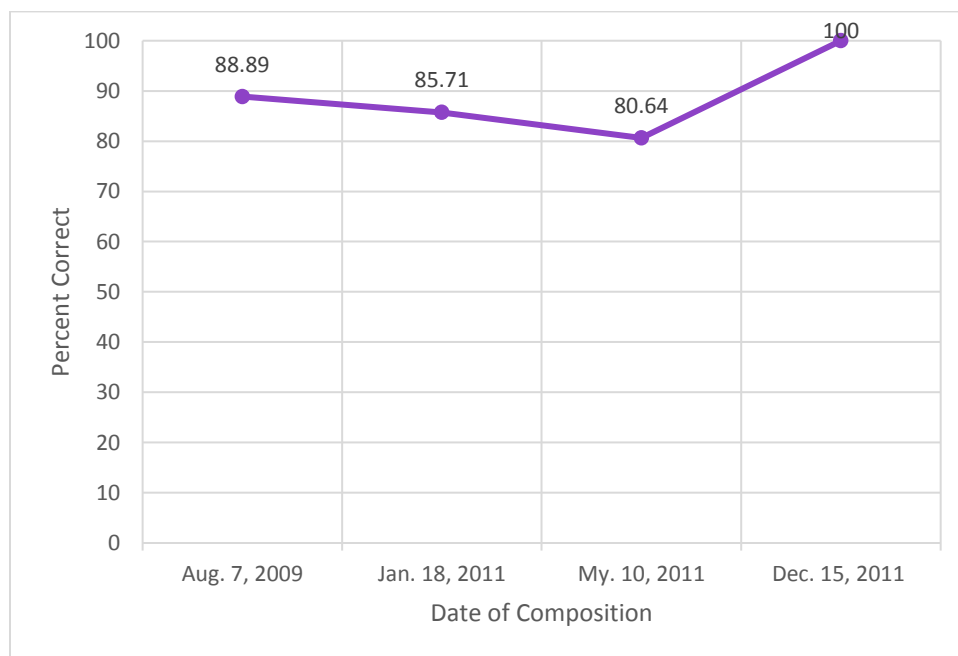


Figure 4.20. Lisa's TLU of Prepositions

Table 4.17

Lisa's TLU of Prepositions

Date of Composition	# Words per Essay	Total # Occurrences: Preposition Use	# Correct	# Incorrect	% Correct
Aug. 7, 2009	280	36	32	4	88.89
Jan. 18, 2011	200	21	18	3	85.71
May 10, 2011	367	31	25	6	80.64
Dec. 15, 2011	295	27	27	0	100.00
	1142	115	102	13	

Twelve different prepositions were identified in the longitudinal data, for a total of 115 occurrences. Table 4.18, below, lists all 12 of the prepositions found in the Lisa corpus, followed by the total number of occurrences, the number correct, the number incorrect, and the percentage correct for each.

Table 4.18

Prepositions Used in Lisa Corpus, Ranked by Total # of Occurrences

Preposition	Total # of Occurrences	# Correct	# Incorrect	% Correct
<i>to</i>	50	43	7	86.00
<i>for</i>	18	14	4	77.78
<i>in</i>	14	14	0	100
<i>of</i>	13	13	0	100
<i>on</i>	6	6	0	100
<i>with</i>	4	4	0	100
<i>by</i>	3	3	0	100
<i>from</i>	2	1	1	50
<i>as</i>	2	1	1	50
<i>about</i>	1	1	0	100
<i>after</i>	1	1	0	100
<i>up</i>	1	1	0	100
	115	102	13	88.69

As Table 4.18 affirms, over the course of the study, only 13 non-target-like instances of preposition use were identified from a total of 115. Moreover, of the 13 non-

target-like occurrences, all but 2 (i.e., 1 non-target-like use each of *from* and *as*) involved Lisa's use of two English prepositions, *to* and *for*. A detailed report of Lisa's use of the latter two follows.

All in all, a total of 50 occurrences of the preposition *to* were found in the 1,142-word longitudinal corpus for Lisa (43 target-like uses; 7 non-target-like), along with 18 occurrences of the preposition *for* (14 correct; 4 incorrect). These data are graphically represented in Figures 4.21, 4.22, and 4.23 and their corresponding Tables, 4.19, 4.20, and 4.21. Each, in turn, is reported below, and representative examples are provided for each.

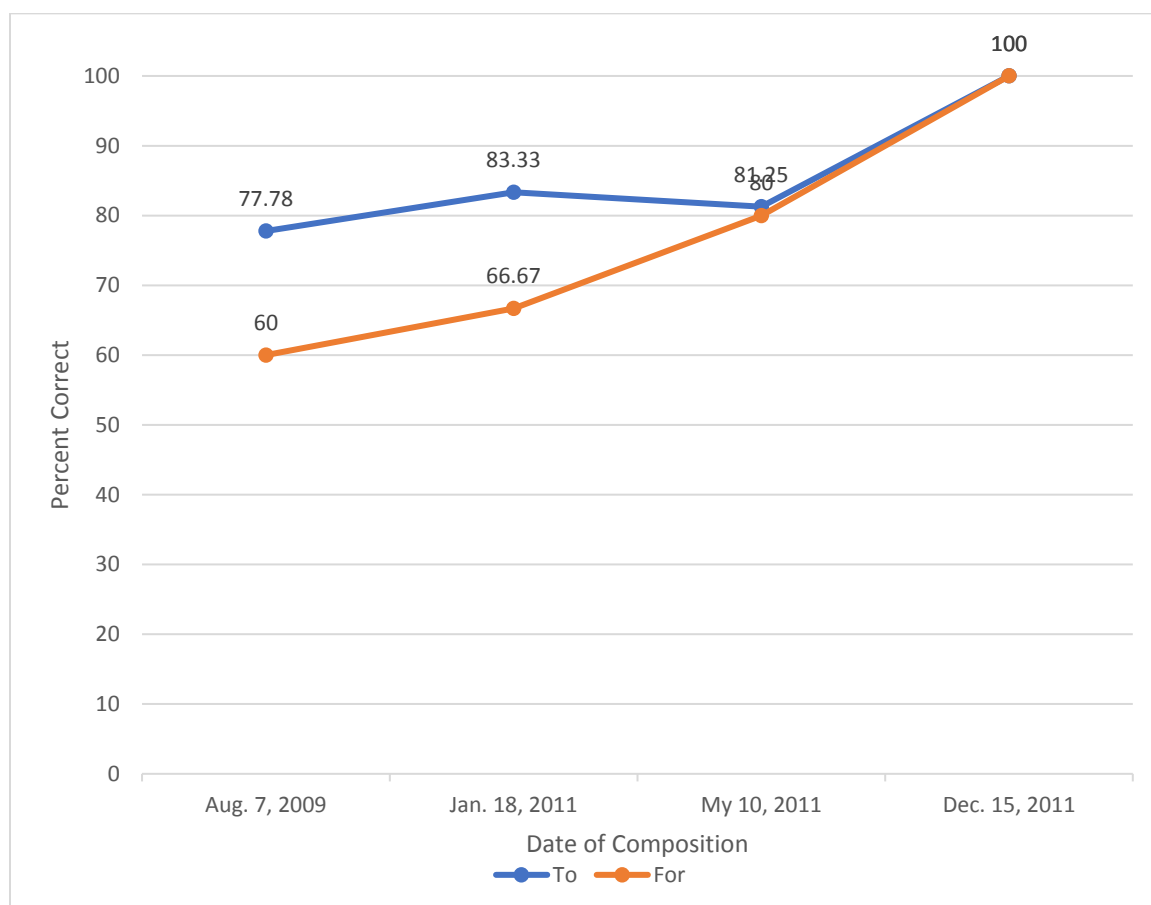


Figure 4.21. Lisa's TLU of *to* and *for*

Table 4.19

Lisa's TLU of to and for

Date of Composition	Total #	#	#	%	Total #	#	#	%
	Occurrences	Correct	Incorrect	Correct	Occurrences	Correct	Incorrect	Correct
	‘to’				‘for’			
Aug. 7, 2009	9	7	2	77.78	5	3	2	60.00
Jan. 18, 2011	12	10	2	83.33	3	2	1	66.67
May 10, 2011	16	13	3	81.25	5	4	1	80.00
Dec. 15, 2011	13	13	0	100.00	5	5	0	100.00
	50	43	7		18	14	4	

Errors involving ‘to’. Fifty occurrences of the preposition *to* were found in the longitudinal corpus for Lisa, 43 target-like, and 7, non-target-like. As can be seen in Figure 4.22 and Table 4.20, below, Lisa’s target-like use of the preposition *to* remained relatively stable through the third writing sample before reaching 100% accuracy in the fourth. Here, non-target-like uses of *to* are further distinguished as errors of commission and errors of omission, and representative examples are provided for each.

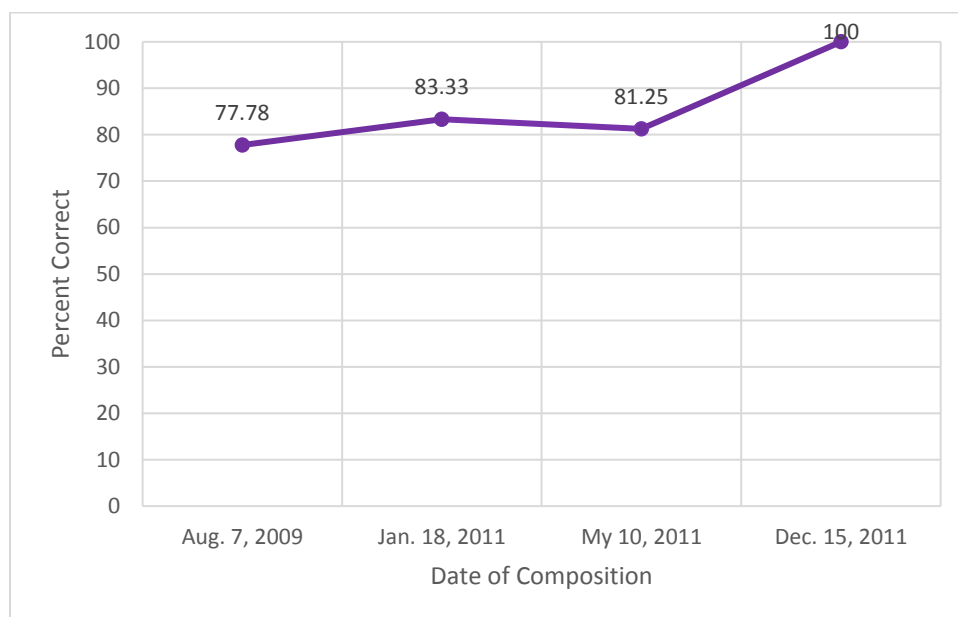
Figure 4.22. Lisa's TLU of *to*

Table 4.20

Lisa's TLU of to

Date of Composition	Total # Occurrences: 'to'	# Correct	# Incorrect	% Correct
Aug. 7, 2009	9	7	2	77.78
Jan. 18, 2011	12	10	2	83.33
May 10, 2011	16	13	3	81.25
Dec. 15, 2011	13	13	0	100.00
	50	43	7	

Examples 9-13, below, include errors of commission in which Lisa supplied the English preposition *to* in non-obligatory contexts. These outnumber errors of omission of a needed preposition four to one:

9. * "US government should give *to* all illegal students permission to study in the US." [should give \emptyset all illegal students...] (WS #2)
10. * "also immigrants will help *to* the United States government." [will help \emptyset the United States...] (WS #3)
11. * "if the English Only laws are adopted, immigrants will help *to* the United States government." [will help \emptyset the] (WS #3)
12. * "And, immigrants will help *to* the United States government" [will help \emptyset the United States...] (WS #3)

Specifically, all four errors of commission involve the English verbs *give* and *help* (translated *dar* and *ayudar*), verbs that are followed by an object NP in English. In Spanish, however, these verbs are followed by the preposition *a* (translated *to* or *at* in English) plus an object NP. As we can see, Lisa utilizes this same L1 phrase structure in Examples 9-12, above.

Lisa's one error of omission also involves the English preposition *to* and the verb *give*:

13. * "Those people...just want to give a better life \emptyset their family."
 [give a better life *to* their family] (WS #2)

In Example 13, however, which includes the ditransitive verb *give* and two object NPs, Lisa uses the correct form by placing the direct object (DO) immediately after the verb, but then omits the obligatory preposition *to* before the indirect object (IO). Lisa's use of the English preposition *to* with the verb *give* is of direct relevance to the fourth research question (i.e., the predictions of the SFH), and will be addressed in the Discussion.

Errors involving 'for'. An analysis of the longitudinal corpus for Lisa revealed 18 occurrences of the preposition *for*: 14 used correctly, and 4, incorrectly, as illustrated in Figure 4.23 and Table 4.21, below.

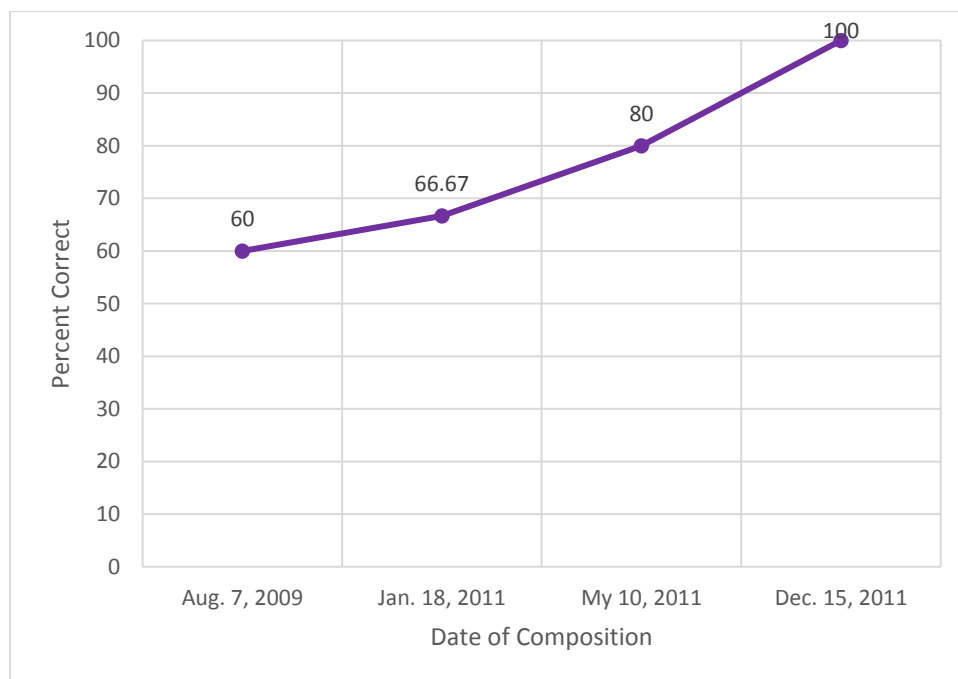


Figure 4.23. Lisa's TLU of *for*

Table 4.21

Lisa's TLU of for

Date of Composition	Total # Occurrences: <i>'for'</i>	# Correct	# Incorrect	% Correct
Aug. 7, 2009	5	3	2	60.00
Jan. 18, 2011	3	2	1	66.67
May 10, 2011	5	4	1	80.00
Dec. 15, 2011	5	5	0	100.00
	18	14	4	

As we can see from Table 4.21, Lisa's use target-like use of the preposition *for* increased steadily as the study progressed. In total, four non-target-like occurrences of *for* were found in the longitudinal data, two in the first writing sample, and one each in the second and third. Of these, one was an error of omission in which Lisa missed a situational use of the preposition *for*:

14. * “ \emptyset Many years, the United States has one of the biggest problem.”
[*For* many years] (WS #2)

The other, an error of commission, was discovered in the third writing sample. Here Lisa used *for* instead of *from* in the prepositional phrase **for this country*:

15. * “If they want something *for* this country, so they should have to give something back too.” [*from* this country] (WS #3)

Then, in Example 16, in what is clearly a language transfer error, Lisa substitutes **Durant*, a misspelling of the Spanish word *durante* (meaning *during* or *for* in this context), in place of the English preposition *for*:

16. * “*Durant* many years, immigration is one of the biggest problems in the United States.”
[*For* many years] (WS #1)

No errors involving *for* were found in the fourth/final writing sample. Indeed, while it is true that preposition errors persisted until the penultimate essay, at the time of the final data collection, Lisa's use of English prepositions was found to be completely native-like.

Number. The results of a TLU analysis of Lisa's use of number are presented next. One of the most persistent errors found in the cross-sectional data, number errors – specifically, those involving the binary choice of singular vs. plural noun to express number in English – were also found to persist in the longitudinal data. In the TLU analysis of the participant's use of number that follows, two broad classes of English nouns were examined: count vs. noncount and regular vs. irregular nouns. As defined by Celce-Murcia and Larsen-Freeman in their seminal text, *The Grammar Book* (1999), count nouns are common nouns that take a plural inflection (e.g., *cars*, *children*), whereas noncount or mass nouns (e.g., *furniture*, *courage*) do not (p. 16). Regular nouns are a subset of count nouns. With regular count nouns, the inflectional morpheme for +plural is realized as *-s* or *-es* (e.g., *toys*, *beaches*), whereas realizations of the plural morpheme of all other nouns (e.g., *men*, *wives*, *geese*, *mice*, *alumni*) are considered irregular.

For the TLU analysis of Lisa's use of number, NPs in each of the four writing samples were identified, the number of correct suppliance in contexts divided by the number of obligatory contexts plus the number of suppliance in non-obligatory contexts, and the quotient multiplied by 100 to obtain the percent correct. Next, the percent correct for each writing sample was plotted on a line graph with data points in chronological order. Finally, non-target-like uses were further analyzed in terms of noun type (i.e., count vs. noncount, regular vs. irregular) to tease apart differences in suppliance rates that

could be of use in answering the third and fourth research questions. Representative examples are provided for each.

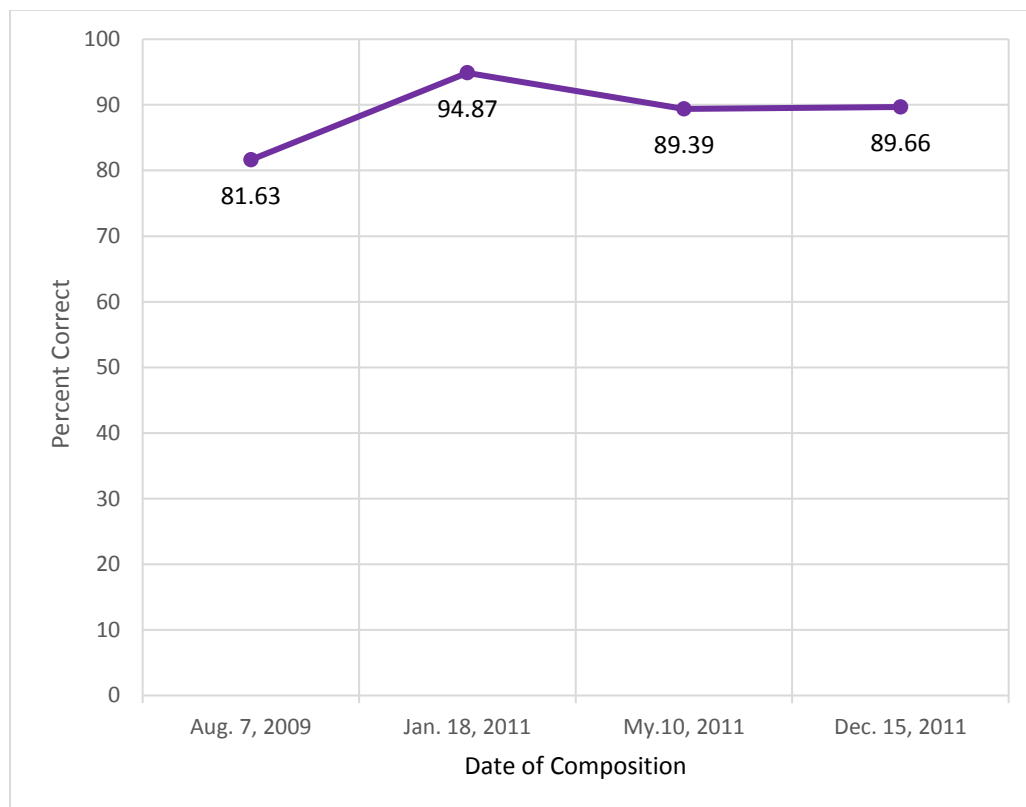


Figure 4.24. Lisa's TLU of Number

Table 4.22

Lisa's TLU of Number

Date of Composition	# Words per Essay	Total # Occurrences: Use of Number	# Correct	# Incorrect	% Correct
Aug. 7, 2009	280	49	40	9	81.63
Jan. 18, 2011	200	39	37	2	94.87
May 10, 2011	367	66	59	7	89.39
Dec. 15, 2011	295	58	52	6	89.66
	1,142	212	188	24	

Firstly, as Figure 24 and Table 4.22 illustrate, errors in number persisted throughout the course of the study. Despite nearly three years' immersion in the target

language and culture and 28 months of instruction in English writing and grammar, Lisa's target-like use of number remained relatively stable, beginning and ending with 81.63 and 89.66% accuracy, overall. However further analysis of the data revealed several salient differences in Lisa's use of number, as will be demonstrated below.

Similar to the results reported for articles and prepositions, variational use of number was also found throughout the Lisa corpus. Specifically, differences were found in Lisa's use of both count vs. noncount nouns and regular vs. irregular plural count nouns.

Count vs. noncount nouns. As illustrated in Figure 4.25 and Table 4.23, Lisa's use of both English count and noncount nouns followed a similar path, in that she missed more situational uses of each in the first writing sample, and relatively fewer in the later samples. More specifically, while she correctly supplied noncount nouns 100% of the time from the second writing sample through the last, her target-like use of count nouns fell to 89% by the end of the study. In addition to this, Figure 4.25, which provides a linear representation of the data points arranged sequentially by date, reveals not only less accuracy, but more variability in Lisa's use of count nouns.

However, Table 4.23, which in addition to displaying the percent correct for both count nouns (left column) and noncount nouns (right column) also shows the relative number of correct and incorrect occurrences of each, brings to light a more striking finding: namely, that only one of the 24 number errors in the Lisa corpus involved a noncount noun, while the remaining 23 involved count nouns.

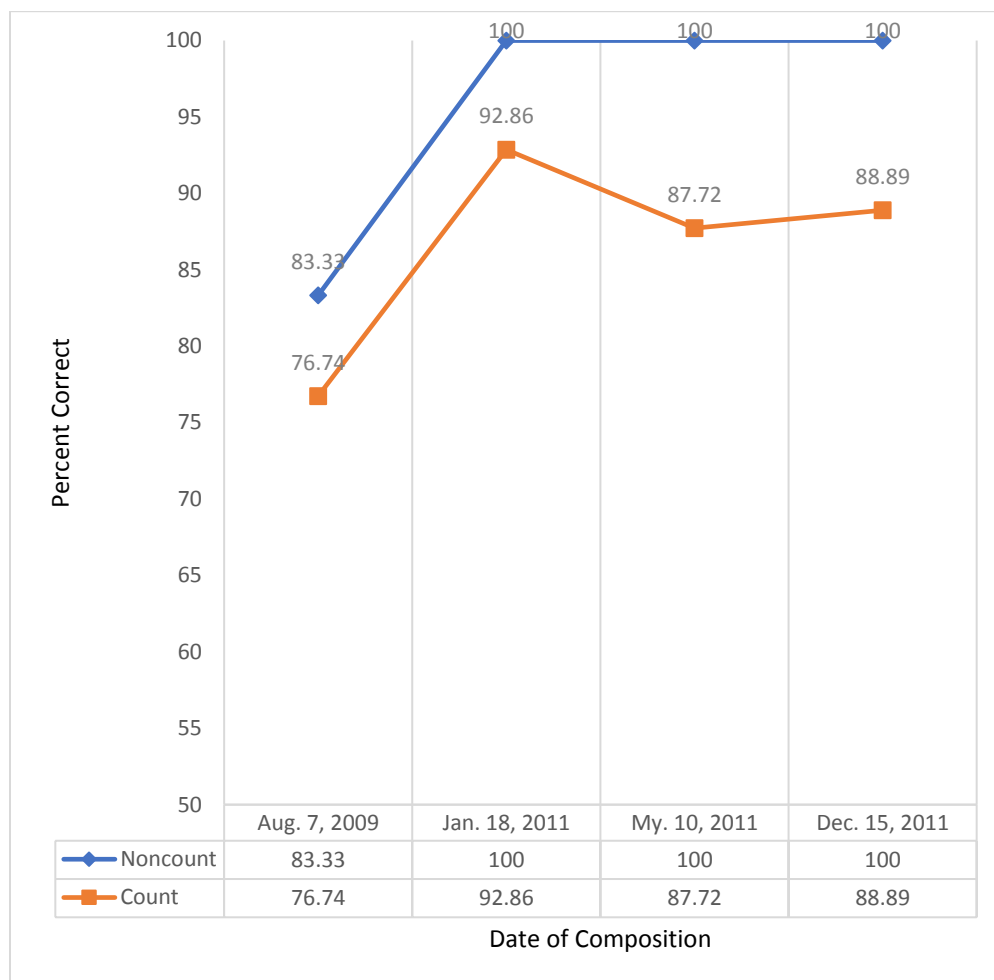


Figure 4.25. Lisa's TLU of Count vs. Noncount Nouns

Table 4.23

Lisa's TLU of Count vs. Noncount Nouns

Date of Composition	Total # Occurrences	# Correct	# Incorrect	% Correct				
					Total # Occurrences	# Correct	# Incorrect	% Correct
	/count nouns/				/noncount nouns/			
Aug. 7, 2009	43	35	8	76.74	6	5	1	83.33
Jan. 18, 2011	28	26	2	92.86	11	11	0	100.00
May 10, 2011	57	50	7	87.72	9	9	0	100.00
Dec. 15, 2011	54	48	6	88.89	4	4	0	100.00
	182	159	23		30	29	1	

Lisa's one non-target-like use of a noncount English noun, *immigrations, is reproduced in Example 17, below:

17. * "As we can see **Immigrations** is a biggest problems of the United States."
 [Immigration] (WS #1)

Here, Lisa pluralizes an uncountable noun by adding *-s*. As noted above, this is the only non-target-like occurrence involving a noncount noun in the Lisa corpus. In fact, it is 1 of only 2 non-target-like uses of noncount nouns (out of a total of 112 occurrences) in the entire longitudinal corpus for Lisa and Sandy.

Regular vs. irregular plural count nouns. A more granular analysis of Lisa's use of count nouns was conducted next and is reported below. Table 4.24 summarizes the data in tabular form, with the left column reporting the total number of occurrences, the relative number of correct and incorrect occurrences, and the percentage correct per essay for *regular* plural count nouns, and the right, for *irregular* plural count nouns. A linear representation of the data points arranged by date is provided in Figure 4.26. Both reveal additional micro-level evidence of intra-learner differential success: for instance, of the 23 number errors with count nouns, *all* involved regular nouns. As illustrated by Figure 4.26 and its corresponding Table 4.24, below, Lisa's use of irregular plural count nouns was 100% target-like for the duration of the study (i.e., from the first data collection to the last. On the other hand, her suppliance of regular count nouns followed a more variable path (78.95→88.89 →82.50→85.71 percent accuracy), never quite reaching target-like proficiency.

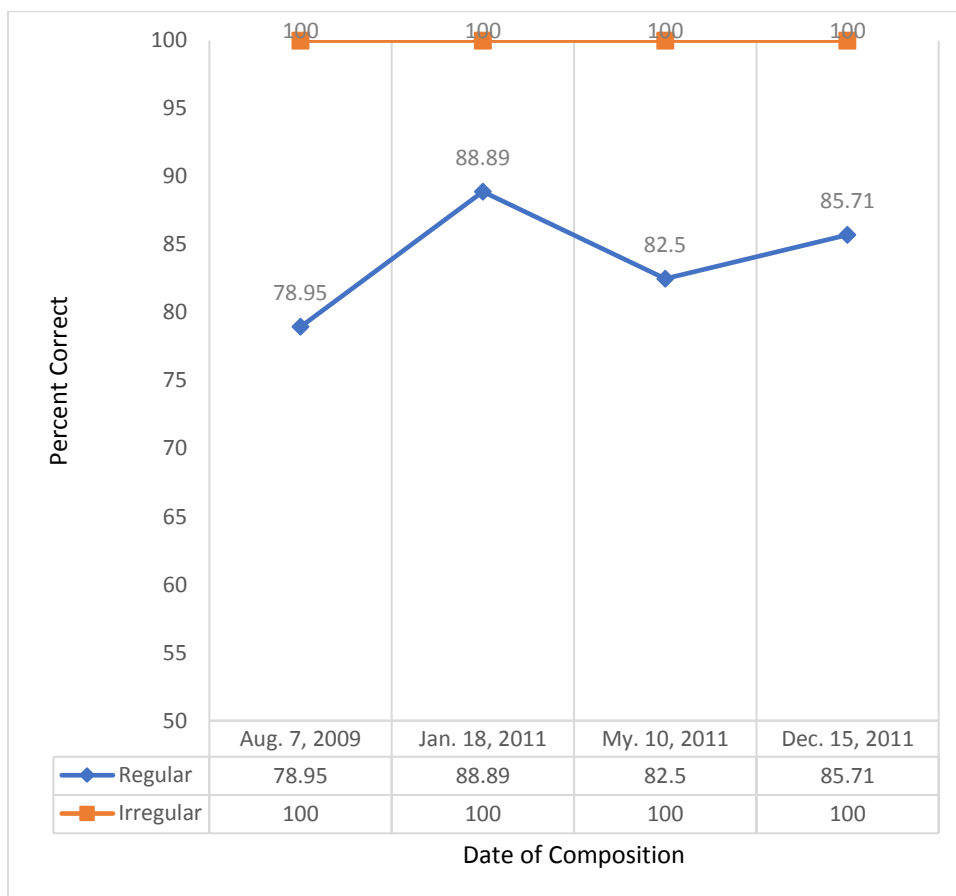


Figure 4.26. Lisa's TLU of Regular vs. Irregular Plural Count Nouns

Table 4.24

Lisa's TLU of Regular vs. Irregular Plural Count Nouns

Date of Composition	Total # Occurrences	# Correct	# Incorrect	% Correct	Total # Occurrences	# Correct	# Incorrect	% Correct
Aug. 7, 2009	38	30	8	78.95	5	5	0	100.00
Jan. 18, 2011	18	16	2	88.89	10	10	0	100.00
May 10, 2011	40	33	7	82.50	17	17	0	100.00
Dec. 15, 2011	42	36	6	85.71	12	12	0	100.00
	138	115	23		44	44	0	

What is more, errors of omission with regular count nouns, for example:

18. * "they know that those *worker* are..."
[those workers]

(WS #1)

19. * “he can’t go to college because he doesn’t have *paper_*.” (WS #2)
[he doesn’t have papers]
20. * “if *immigrant_* know the language, they can vote” (WS #3)
[immigrants]
21. * “a second opportunity to accomplish their goals and *dream_*” (WS #4)
[their goals and dreams]

outnumbered errors of commission:

22. * “the Latinos doing a better jobs than them” (WS #1)
[a better job]

by a ratio of 20 to 3 and can be found in each of the four writing samples. Of the latter, errors of commission, one was likely a transfer error involving a NP with a pluralized adjective immediately following the noun it modified:

23. * “This...will help *parent immigrants* to get closer to their American children.” [immigrant parents] (WS #3)

In sum, the results of a TLU analysis of Lisa’s writing provided robust micro-level evidence of intra-learner differential success and failure both within and among the grammatical targets. Differential use of the grammatical targets was also found in the second participant’s writing, providing evidence not only of *intra*-learner variation, but *inter*-learner variation as well.

Participant 2: Sandy. This section reports the results of a two-part TLU analysis of the four writing samples comprising the 1949-word Sandy corpus. The first round of analysis focused on Sandy’s overall use of the three linguistic targets. In the second, the focus was narrowed to obtain a more nuanced interpretation of her use of the grammatical targets. and, ultimately, to elicit answers to the third and fourth research questions.

TLU analysis, round one. To provide a general picture of Sandy’s command of the grammatical targets, the percent accuracy of her use of articles, prepositions, and number was calculated for each essay and then plotted chronologically on a line graph for ease of interpretation (see Figure 4.27 and corresponding Tables 4.25, 4.26, and 4.27, below).

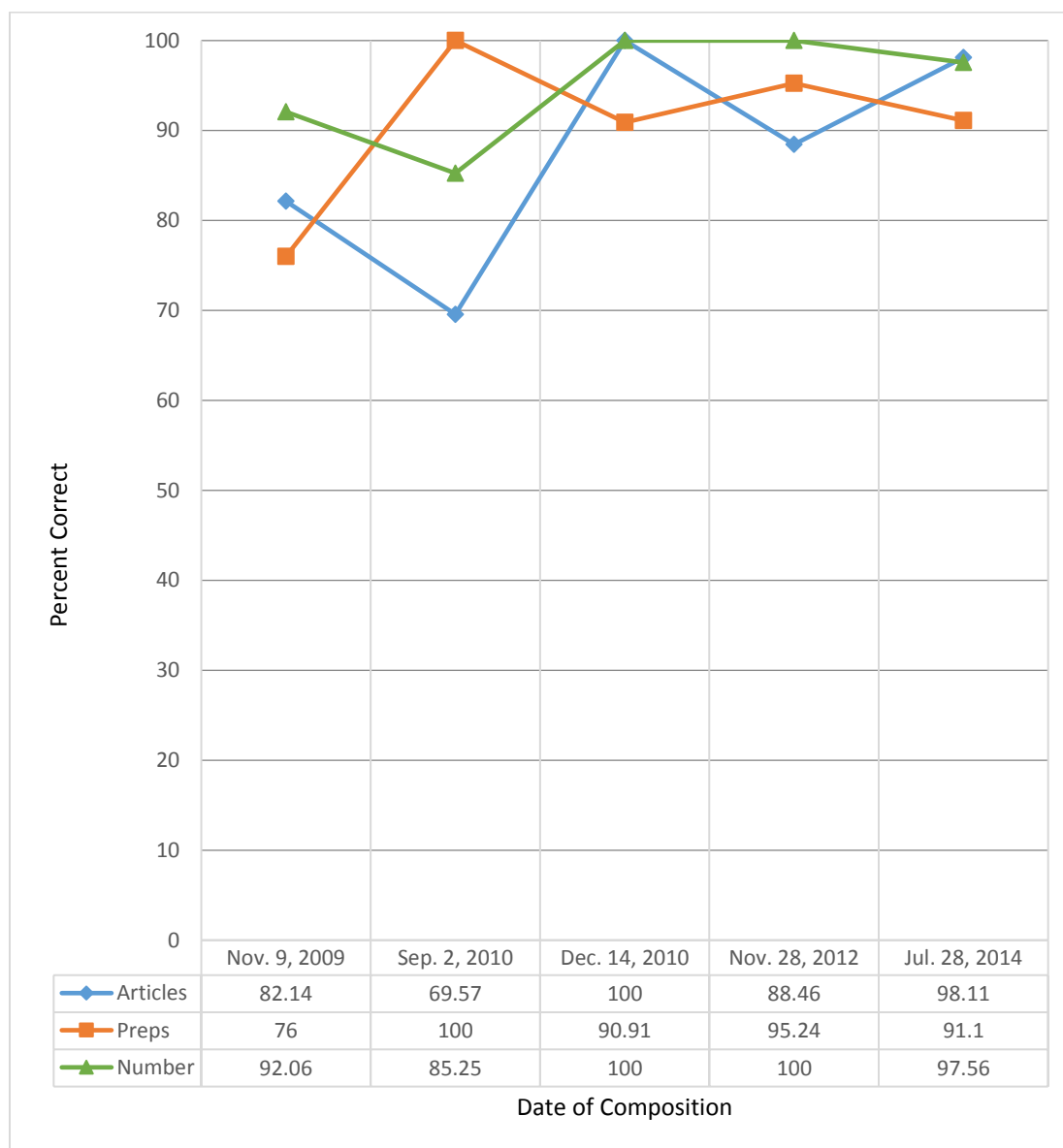


Figure 4.27. Sandy’s TLU of Articles, Prepositions, and Number

Table 4.25

Sandy's TLU of Articles

Date of Composition	# Words per Essay	Total # Occurrences: Article Use	# Correct	# Incorrect	% Correct
Nov. 9, 2009	397	28	23	5	82.14
Sept. 2, 2010	289	23	16	7	69.57
Dec. 14, 2010	189	9	9	0	100
Nov. 28, 2012	309	26	23	3	88.46
July 28, 2014	756	53	52	1	98.11
	1949	139	123	16	

Table 4.26

Sandy's TLU of Prepositions

Date of Composition	# Words per Essay	Total # Occurrences: Preposition Use	# Correct	# Incorrect	% Correct
Nov. 9, 2009	397	25	19	6	76.00
Sept. 2, 2010	289	32	32	0	100.00
Dec. 14, 2010	189	22	20	2	90.91
Nov. 28, 2012	309	21	20	1	95.24
July 28, 2014	765	58	54	4	91.10
	1949	158	145	13	

Table 4.27

Sandy's TLU of Number

Date of Composition	# Words per Essay	Total # Occurrences: Use of Number	# Correct	# Incorrect	% Correct
Nov. 9, 2009	397	63	58	6	92.06
Sept. 2, 2010	289	61	52	9	85.25
Dec. 14, 2010	189	50	50	0	100.00
Nov. 28, 2012	309	62	62	0	100.00
July 28, 2014	765	164	160	4	97.56
	1949	400	382	19	

As illustrated in Figure 4.27, Sandy's use of the three grammatical targets had become increasingly target-like (i.e., 98% for articles and number, and 91% for

prepositions) by the end of the study. Nevertheless, variational use among the three linguistic subsystems could be found. For example, unlike Lisa, whose suppliance of English prepositions was 100% accurate by the end of the study, Sandy's use of English prepositions was least target-like of all, beginning and ending with 76% and 91.1%, respectively. On the other hand, her correct suppliance of articles (82.14%) and number (92.06%) was comparatively stronger at the beginning of the study, and could easily be described as native-like (98.11% and 97.56%, in turn) at the end. On the whole, however, Sandy's differential use of the three grammatical targets was similar to Lisa's – and indeed to all adult L2 learners – by virtue of its characteristically non-linear and idiosyncratic nature. Moreover, like Lisa, additional evidence of Sandy's differential command of the grammatical targets was also found in the second round of analysis, as will be demonstrated below.

TLU analysis, round two. This second pass through the data analyzed Sandy's target-like use of the grammatical targets at a more granular level, as described above. The results are reported below.

Article use by type. Five different environments for the appearance of English articles were examined. As with Lisa, the longitudinal data for Sandy's article use were subjected to additional analysis based on a slightly modified version of Huebner's (1983) dynamic paradigm.

A summary of results for Sandy's use of articles by type may be found in Table 4.28 and Figure 4.28, below. To determine the percent correct per essay for each of the five identified types of article use, the number of target-like supplings for each was divided by the number of non-target-like supplings, and graphically illustrated for ease

of interpretation. Table 4.28 organizes the data in tabular form, with the data elicitation dates listed chronologically across the top row and the five types of article use listed in the left column directly below it. Figure 4.28 provides a linear representation with data points, arranged by date, displaying the percent correct for each. Representative examples are numbered, set off in quotation marks, and marked with an asterisk to indicate that they are ungrammatical. Article errors have been bolded and italicized for emphasis. The number of the writing sample (WS) from which the excerpt was extracted is written in parentheses, and the correct usage is printed directly below.

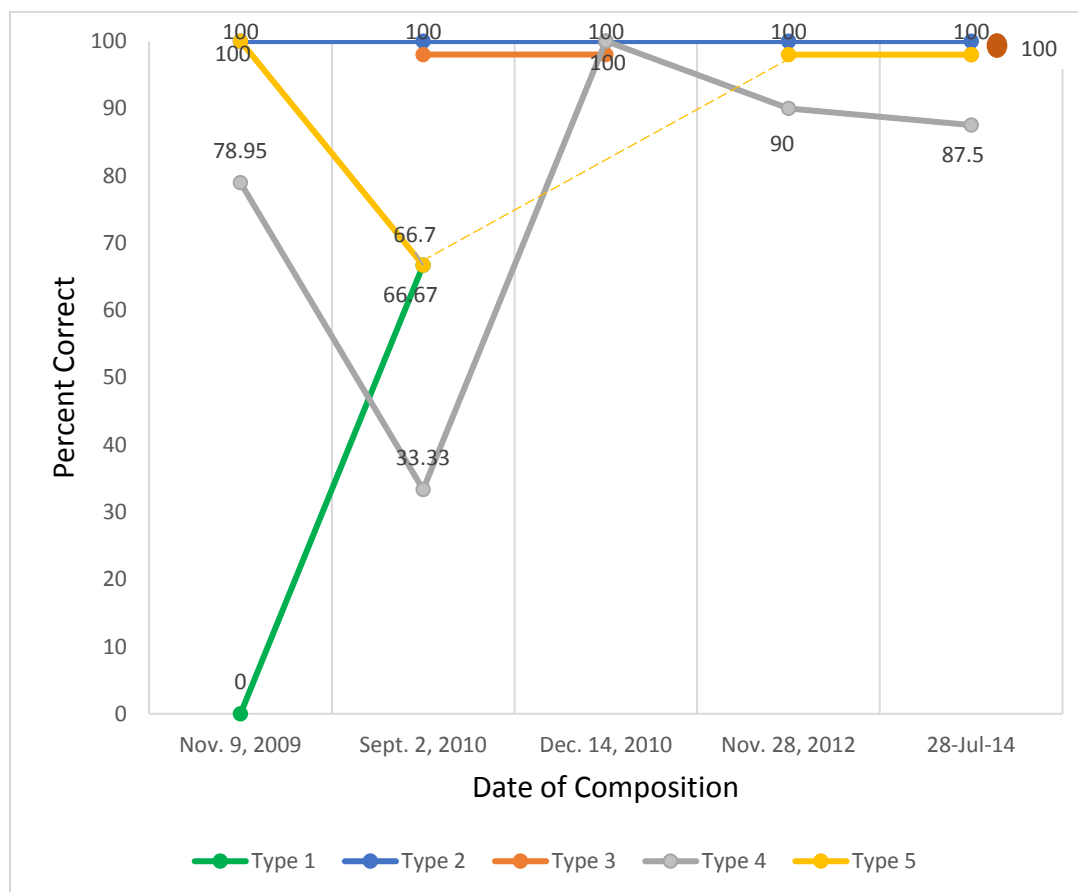


Figure 4.28. Sandy's TLU of Articles (by Type)

Table 4.28

Sandy's TLU of Articles (by Type)

	Nov. 9, 2009	Sept. 2, 2010	Dec. 14, 2010	Nov. 28, 2012	July 28, 2014
	(#correct/ #incorrect)	(#correct/ #incorrect)	(#correct/ #incorrect)	(#correct/ #incorrect)	(#correct/ #incorrect)
	% correct	% correct	% correct	% correct	% correct
Type 1	(0/1) 0	(2/3) 66.67	--	--	--
Type 2	(7/7) 100.00	(7/7) 100.00	(4/4) 100.00	(3/3) 100.00	(37/37) 100.00
Type 3	--	(1/1) 100.00	(1/1) 100.00	--	(3/3) 100.00
Type 4	(15/19) 78.95	(2/6) 33.33	(4/4) 100.00	(18/20) 0.00	(7/8) 87.50
Type 5	(1/1) 100.00	(4/6) 66.67	--	--	(5/5) 100.00

Figure 4.28 graphically illustrates the variability of Sandy's suppliance rates for each of five types of article use studied. These differences are reported below and discussed in Chapter V, where they are presented as micro-level evidence of intra-learner differential success and interpreted in light of the predictions of the SFH.

Type 1 errors: Generic nouns [-SR, +RK]. For the reader's convenience, a recap of the features, environment, articles, and examples of Type 1 noun phrases is reprinted below.

Type	Features	Environment	Articles	Examples
Type 1	[-SR, +RK]	Generic nouns	<i>a/an, the, Ø</i>	<i>A dog is a faithful animal. The washing machine is another creation of modern technology. Ø Amnesty is a good solution...</i>

To begin, as illustrated in Figure 4.29 and Table 4.29, only four occasions of Type 1 (Generic NP) article use were identified in the longitudinal data for Sandy: one in Writing Sample 1 and three in Writing Sample 2.

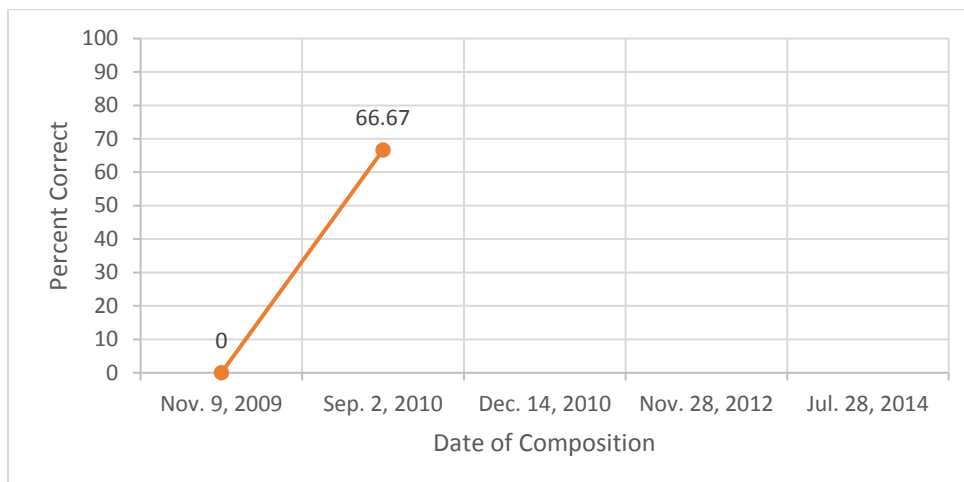


Figure 4.29. Sandy's TLU of Type 1 NPs

Table 4.29

Sandy's TLU of Type 1 NPs

Date of Composition	Total # Occurrences: Type 1 Noun Article Use <i>Generic Noun (-SR, +RK)</i>	# Correct	# Incorrect	% Correct
Nov. 9, 2009	1	0	1	0
Sept. 2, 2010	3	2	1	66.67
Dec. 14, 2010	0	---	---	---
Nov. 28, 2012	0	---	---	---
July 28, 2014	0	---	---	---
	4	2	2	

On the first occasion, Sandy used the zero article where the indefinite article was required:

24. * “ \emptyset College Education Is Important” (WS #1)
[A college education]

and in the second, she used the zero article where either the definite or indefinite article was needed:

25. * “ \emptyset Laundry machine is another creation of modern technology.” (WS #2)
[The/A washing machine]

In spite of these errors of omission, the meaning of the generic is preserved.

It bears mentioning that both Sandy and Lisa used very few generic NPs in their earlier essays and none in their later essays, and neither was able to use them reliably. Moreover, neither Sandy nor Lisa attempted to use Type 1 NPs in their later essays. Whether avoidance was to blame, or whether the rather concrete, experience-based nature of the topics played a part could not be determined, as neither participant was given the opportunity to discuss her writing. However, despite the relatively small number of occurrences, the participants' idiosyncratic use of Type 1 NPs was nonetheless found to hold relevance for the third research question and will be discussed in Chapter V.

Type 2 errors: Referential definites [+SR, +RK]. For ease of reference, a summary of features for Type 2 nouns is reprinted below.

Type	Features	Environment	Articles	Examples
Type 2	[+SR, +RK]	Referential definites previous mention	<i>the</i>	<i>The</i> Pope; <i>The</i> President; <i>The</i> sun; Residents of the US say...I agree with the residents...

To begin, 58 occurrences of Type 2 NP (e.g., previous mention) article use were found in the longitudinal corpus for Sandy, more than twice as many occurrences as Type 1, 3, and 5 NPs combined. Thirty-seven of these occurred in the last writing sample alone. Like Lisa, Sandy used more Type 2 NPs in her writing than any other. However, unlike Lisa, whose target-like use of articles in Type 2 NPs varied throughout the study and terminated with 75% accuracy, Sandy's command of articles in Type 2 NPs was 100% accurate throughout, as Figure 4.30 and Table 4.30 attest.

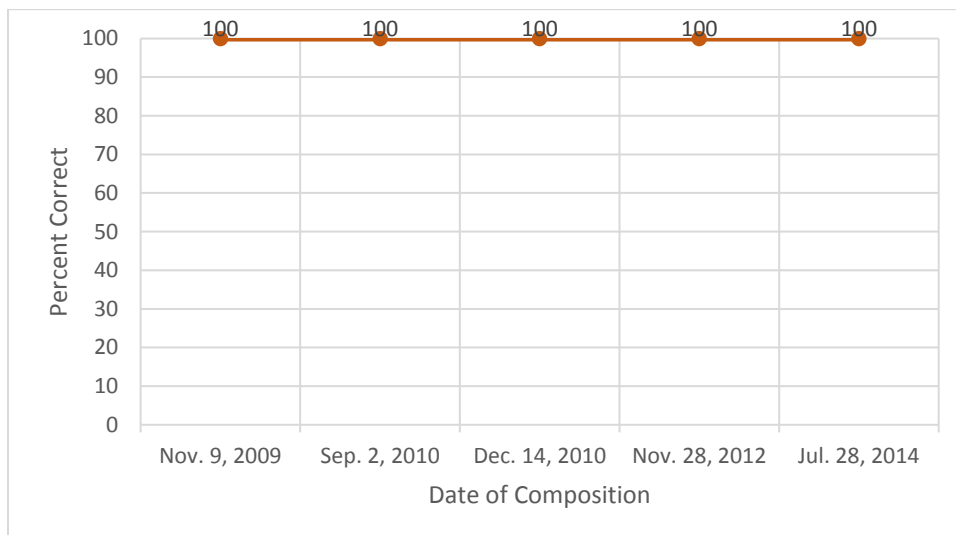


Figure 4.30. Sandy's TLU of Type 2 NPs

Table 4.30

Sandy's TLU of Type 2 NPs

Date of Composition	Total # Occurrences: Type 2 Noun Article Use <i>Referential Definites (+SR, +RK)</i>	# Correct	# Incorrect	% Correct
Nov. 9, 2009	7	7	0	100
Sept. 2, 2010	7	7	0	100
Dec. 14, 2010	4	4	0	100
Nov. 28, 2012	3	3	0	100
July 28, 2014	37	37	0	100
	58	58	0	

Sandy's perfect suppliance of English articles in Type 2 NPs was not surprising, however, as article choice for Type 2 NPs, which include referential definites (e.g., *the sun, the White House*) and previously mentioned nouns (e.g., *I see a bird; the bird is red*), is relatively transparent, straightforward, and frequently taught in ESL classes. In a similar way, Sandy's use of referential indefinites (e.g. first mention nouns) was also 100% target-like, as will be demonstrated next.

Type 3 errors: Referential indefinites [+SR, -RK]. A summary of the features, environment, articles, and examples of Type 3 NPs is reprinted below.

Type	Features	Environment	Articles	Examples
Type 3	[+SR, -RK]	Referential indefinites first mention	<i>a/an, ∅</i>	Evelyn was brought up in <i>an</i> environment....This environment...

Although only 5 occurrences of Type 3 article use were found in the Sandy corpus, all were target-like, demonstrating Sandy's absolute command of articles in Type 3 NPs over the course of the study. Figure 4.31 and Table 4.31 provide a graphic depiction of the data.

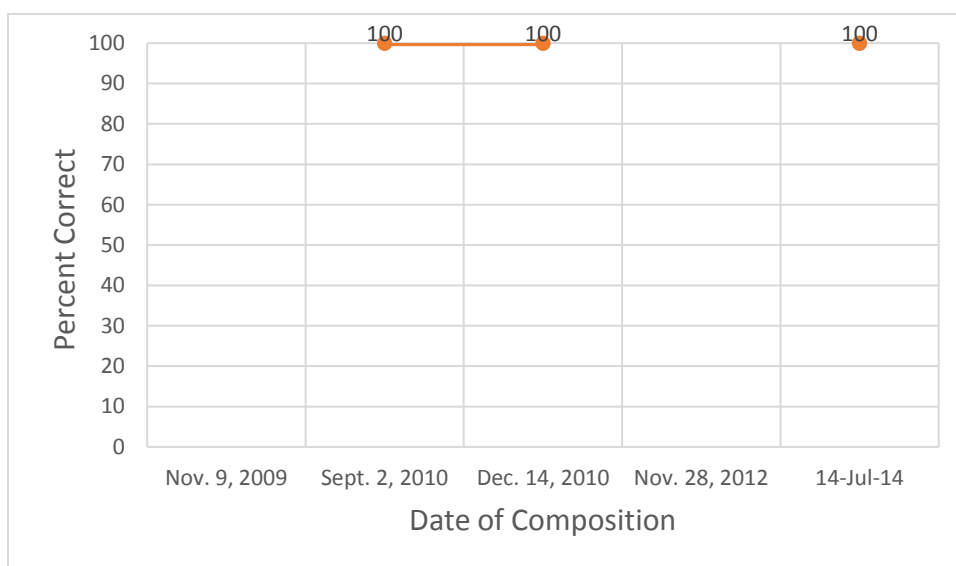


Figure 4.31. Sandy's TLU of Type 3 NPs

Table 4.31

Sandy's TLU of Type 3 NPs

Date of Composition	Total # Occurrences: Type 3 NP Article Use <i>1st Mention Nouns</i> (+SR, -RK)	# Correct	# Incorrect	% Correct
Nov. 9, 2009	0	---	---	---
Sept. 2, 2010	1	1	0	100
Dec. 14, 2010	1	1	0	100
Nov. 28, 2012	0	0	---	---
July 28, 2014	3	3	0	100
	5	5	0	

Here Sandy's performance mirrored Lisa's (cf. Figure 4.17), whose use of articles was also absolutely perfect (i.e., 10 target-like instances out of 10 occurrences) in Type 3 NPs. The combined significance of these findings will be discussed in Chapter V.

Type 4 errors: Non-referential nouns [-SR, -RK]. Type 4 errors can be summarized as follows.

Type	Features	Environment	Articles	Examples
Type 4	[-SR, -RK]	Nonreferential nouns	<i>a/an, ∅</i>	Her role as <i>a</i> sister and <i>a</i> daughter...; People with \emptyset college degrees can find <i>a</i> job.

An analysis of the longitudinal data for Sandy revealed 46 target-like instances of Type 4 NP article use out of a total of 58, as demonstrated in Figure 4.32 and Table 4.32, below.

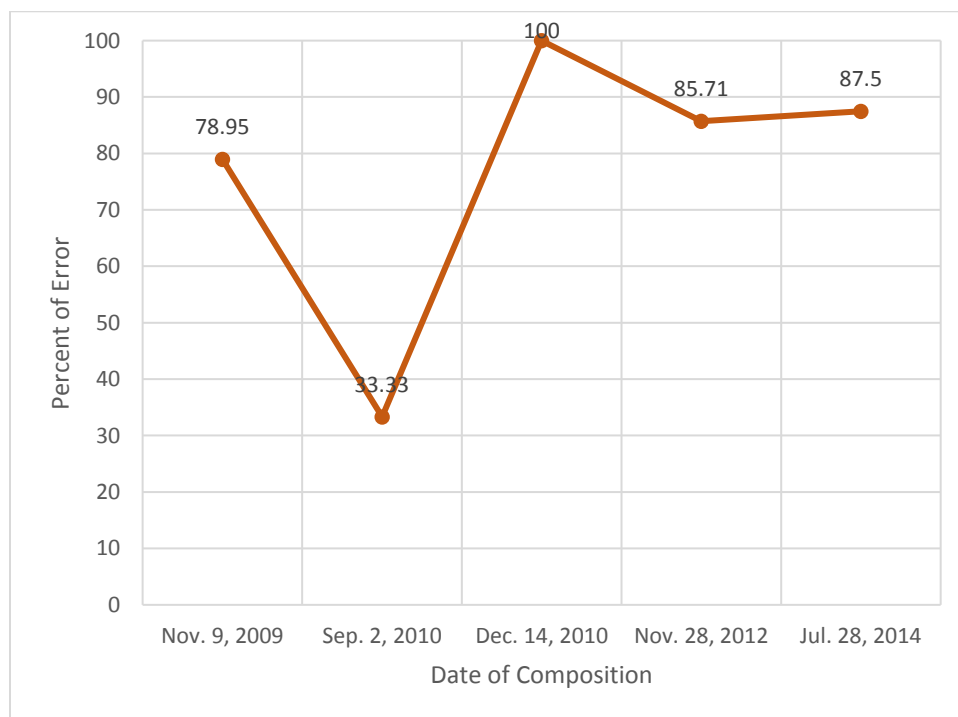


Figure 4.32. Sandy's TLU of Type 4 NPs

Table 4.32

Sandy's TLU of Type 4 NPs

Date of Composition	Total # Occurrences: Type 4 NP Article Use <i>Non-Referential (-SR, -RK)</i>	# Correct	# Incorrect	% Correct
Nov. 9, 2009	19	15	4	78.95
Sept. 2, 2010	6	2	4	33.33
Dec. 14, 2010	4	4	0	100.00
Nov. 28, 2012	21	18	3	85.71
July 28, 2014	8	7	1	87.50
	58	46	12	

Similar to Type 2 NPs (N=58), more than twice as many occurrences of Type 4 NPs were found in the corpus as Types 1, 3, and 5 NPs combined. Moreover, Sandy used Type 4 NPs in each of her essays, albeit with varying degrees of success, as demonstrated in Examples 26-29, below:

26. * “You will know things that a person with \emptyset *high school* education does not know.” (WS#1)
[*a high school education*]
27. * “thanks to *the modern technology* today we have *the cellphones*.” (WS #2)
[\emptyset modern technology] [\emptyset cellphones]
28. You will receive **a** job, expand your knowledge, and feel good about yourself. (WS #3)
29. * “ \emptyset *College* degree is **a** great investment.” (WS #3)
[A college degree]

For instance, in Example 26, Sandy uses the null article in a NP requiring an indefinite article (*“a person with \emptyset *high school* education”), and in Example 27, uses the definite article where a null article is required (*“*the modern technology*... *the cellphones*”). By contrast, Sandy’s article use is completely target-like in Example 28, where she correctly supplies the indefinite article *a* in the NP “*a* job.” Finally, examples of both target-like

and non-target-like article use can be found within the same sentence in Example 29: here Sandy fails to supply the indefinite article in the first NP (*“ \emptyset College degree”) then correctly supplies it in the second (“a great investment”). In contrast to her use of articles in non-referential (Type 4) NPs, Sandy’s article use in Type 5 NPs was less variable and more accurate overall, as will be reported next.

Type 5 errors: Idioms & other conventional uses. For ease of reference, a summary of the features, environment, articles and examples of Type 5 NPs is reprinted below.

Type	Features	Environment	Articles	Examples
Type 5		Idioms Other conventional uses	<i>a/an, the, \emptyset</i>	As <i>a</i> matter of fact; On <i>the</i> one hand; In <i>the</i> 1800s; Going to \emptyset work

Fourteen occurrences of Type 5 NP article use were found in the longitudinal corpus for Sandy, as is demonstrated in Figure 4.33 and Table 4.33, below.

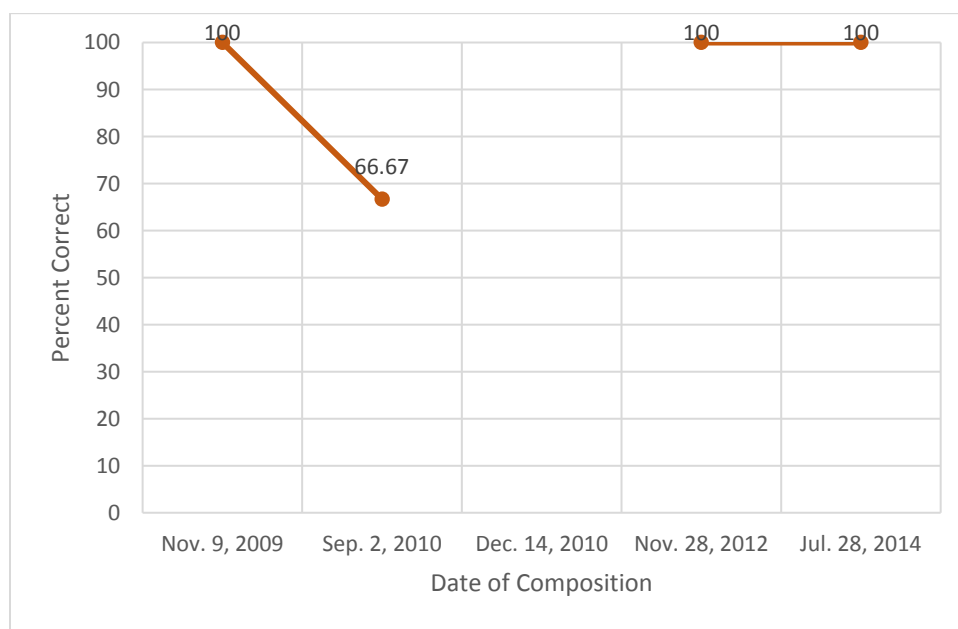


Figure 4.33. Sandy’s TLU of Type 5 NPs

Table 4.33

Sandy's TLU of Type 5 NPs

Date of Composition	Total # Occurrences: Type 5 NP Article Use <i>Idioms & Other Conventional Uses</i>	# Correct	# Incorrect	% Correct
Nov. 9, 2009	1	1	0	100
Sept. 2, 2010	6	4	2	66.67
Dec. 14, 2010	0	0	0	---
Nov. 28, 2012	2	2	0	100
July 28, 2014	5	5	0	100
	14	12	2	

Of these 14 occurrences, 12 were target-like and 2, non-target-like. Of the two non-target-like occurrences, both occurred in the second writing sample. One example can be found in Example 30, where Sandy fails to supply the indefinite article in the temporal expression *A long time ago*, possibly conflating two structurally analogous formulaic expressions: *a long time ago* and *long ago*.

30. * “ \emptyset *Long time ago*...people had to use different forms of communication.”
[*A long time ago*] (WS #1)

These two early errors notwithstanding, Sandy's use of articles in Type 5 NPs was completely target-like for the duration of the study.

To summarize, a second round of analysis revealed intra-learner variation in Sandy's use of English articles in the five linguistic environments studied. Additional evidence of intra-learner success and failure was also found in Sandy's use of English prepositions, as will be reported next.

Prepositions. A TLU analysis of the longitudinal data revealed 158 situational uses of prepositions, only 13 of which were non-target-like. As demonstrated in Table 4.34, below, a total of 18 different prepositions were identified in Sandy's essays. Her

suppliance rate was 100% accurate for 11 but varied from 97% to 33% correct for the remaining 7 (i.e., *of, for, in, by, with, into, and on*).

Table 4.34

Prepositions Used in Sandy Corpus, Ranked by Total # of Occurrences

<i>Preposition</i>	<i>Total # of Occurrences</i>	<i># Correct</i>	<i># Incorrect</i>	<i>% Correct</i>
<i>to</i>	37	37	0	100.00
<i>in</i>	33	29	4	87.88
<i>of</i>	29	28	1	96.55
<i>for</i>	16	15	1	93.75
<i>with</i>	8	5	3	62.50
<i>about</i>	6	6	0	100.00
<i>by</i>	6	5	1	83.33
<i>from</i>	5	5	0	100.00
<i>on</i>	3	1	2	33.33
<i>through</i>	3	3	0	100.00
<i>as</i>	2	2	0	100.00
<i>at</i>	2	2	0	100.00
<i>among</i>	2	2	0	100.00
<i>into</i>	2	1	1	50.00
<i>before</i>	1	1	0	100.00
<i>between</i>	1	1	0	100.00
<i>over</i>	1	1	0	100.00
<i>up</i>	1	1	0	100.00
	158	145	13	91.77

Of the 13 preposition errors found in the 1949-word Sandy corpus, roughly half (N=6) occurred in the very first writing sample. Indeed, the most marked change (i.e., 76% → 100% correct) in Sandy's use of prepositions occurred during the 10-month period between the first and second writing samples. Following that, Sandy's target-like use of English prepositions dropped to 90.91% in the third writing sample, then remained quite stable from the third writing sample through the last. Table 4.35 presents these results in tabular form, and Figure 4.34 provides a visual comparison.

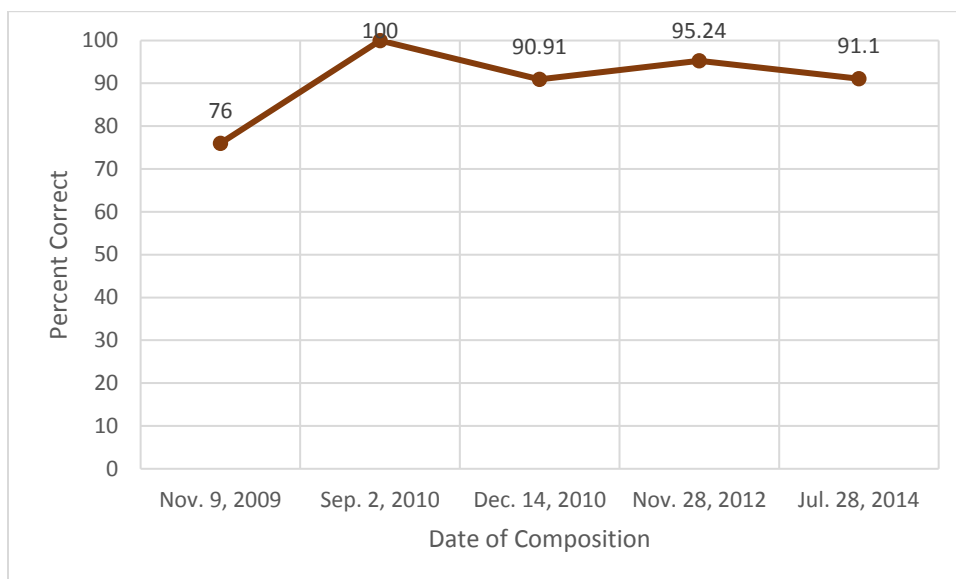


Figure 4.34. Sandy's TLU of Prepositions

Table 4.35

Sandy's TLU of Prepositions

Date of Composition	# Words per Essay	Total # Occurrences: Preposition Use	# Correct	# Incorrect	% Correct
Nov. 9, 2009	397	25	19	6	76.00
Sept. 2, 2010	289	32	32	0	100.00
Dec. 14, 2010	189	22	20	2	90.91
Nov. 28, 2012	309	21	20	1	95.24
July 28, 2014	765	58	54	4	91.10
	1949	158	145	13	

It bears mentioning that the slight regression in Sandy's accurate use of English prepositions over the 46-month period from the second writing sample through the last was accompanied by a corresponding increase in the variety and complexity of prepositions found in her later writing samples. A detailed report of Sandy's evolving use of individual prepositions follows.

As noted above, a more granular TLU analysis of Sandy's prepositions use uncovered errors with seven different English prepositions. Listed in descending order of

frequency of occurrence, they are: *in*, *of*, *for*, *with*, *by*, *on*, and *into*. Tables 4.36 through 4.42 and their corresponding Figures 4.35 through 4.42 graphically illustrate the findings. Representative examples are included for each; in some cases, Spanish translations are provided as well.³

Errors involving 'in'. The preposition with both the greatest total number of occurrences *and* the most non-target-like usages was *in*. Thirty-three occurrences of the English preposition *in* were found in the Sandy corpus: 29 target-like, and 4, non-target-like, as illustrated in Figure 4.35 and Table 4.36, below.

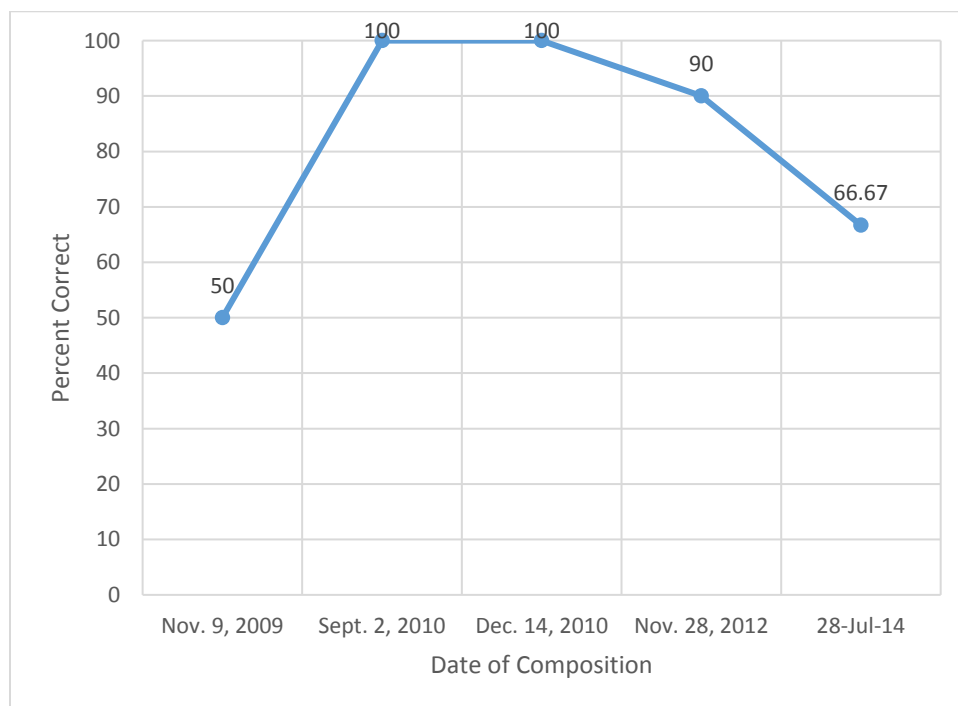


Figure 4.35. Sandy's TLU of *in*

³ The grammatical and pragmatic accuracy of all Spanish translations was confirmed by Dorotea Litvak, Ph. D., Professor of English, Applied Linguist, and native speaker of Spanish.

Table 4.36

Sandy's TLU of in

Date of Composition	Total # Occurrences: 'in'	# Correct	# Incorrect	% Correct
Nov. 9, 2009	2	1	1	50
Sept. 2, 2010	2	2	0	100
Dec. 14, 2010	13	13	0	100
Nov. 28, 2012	10	9	1	90
July 28, 2014	6	4	2	66.67
	33	29	4	

As Figure 4.35 demonstrates, Sandy's percentage of target-like use per essay for the preposition *in* followed an inverted U-shaped pattern⁴ in which it increased markedly (i.e., from 50% to 100%) from Writing Sample 1 to Writing Sample 2, remained at 100% for Writing Sample 3, then decreased to 90% in Writing Sample 4 before falling to 66.67% in Writing Sample 5. Hence, at the time of the fifth and final data collection, Sandy's total percentage of target-like supplants for the English preposition *into* was only moderately higher than it was when she penned the first essay nearly five years before.

Of the four non-target-like occurrences of the English preposition *in*, all were errors of commission. Moreover, one involved an idiomatic expression and three were likely transfer errors, as illustrated in Examples 31 through 41, below:

31. * "Here you have a lot of opportunities. the government provide (WS #1)
 help for you *in everywhere*."
 [help for you \emptyset everywhere]
el gobierno le ayuda en todas partes

⁴ Inverted U-shaped patterns have been attributed to L2 learners' overgeneralizations of rule-based representations to new linguistic input (Carlucci et al., 2006; Jain & Stephan, 2006) and are a possible consequence of increased exposure to the TL.

32. * “through education, people learn how to become good *in their profession* and prepare them for the future to come.” [good **at** their profession]
gente aprende a ser buenos en su profesión (WS #4)
33. * “When we are segregating schools’ children by their sex, we are putting limitations *in their minds*.”
 [on their minds]
estamos poniendo limitaciones en sus mentes (WS #5)
34. * “Women, *in the other hand*, were the cooks, the caretakers of the houses.”
 [on the other hand] (WS #5)

In Examples 31, 32, and 33, Sandy uses the English preposition *in* where its semantic equivalent *en* would be used in Spanish, but either \emptyset or another preposition (i.e., *at* or *on*) is required in English. For instance, in Example 31, she writes, “the government will provide help for you *in* everywhere” where no preposition (\emptyset everywhere) is required. Then, in Example 32 she uses the English preposition *in* (“good **in**”) instead of *at* (good **at**). Following that, in Example 33, she uses *in* (“we are putting limitations **in**”) where *on* (putting limitations *on*) would be the preposition of choice in English. Finally, in Example 34, Sandy writes “*in* the other hand” (as opposed to ‘*on* the other hand’). Since there is no equivalent expression in Spanish, this was likely an error in the use of an English idiom. Finally, although Sandy’s use of the English preposition *in* was completely target-like in Writing Samples 2 and 3, non-target-like occurrences appeared with increasing frequency from the fourth writing sample to the last, with 75% of these errors occurring in the Writing Samples 4 and 5.

Errors involving ‘of’. The next most frequent preposition in the corpus with at least one error in usage was *of*. Twenty-nine occurrences of the English preposition *of* were found in the Sandy corpus. Of these, 28 were target-like, and 1, non-target-like, with the single non-target-like use occurring in the first essay. From that point on, for the

duration of the study, the total percentage of accurate use for the preposition *of* was 100%, as illustrated in Figure 4.36 and Table 4.37, below.

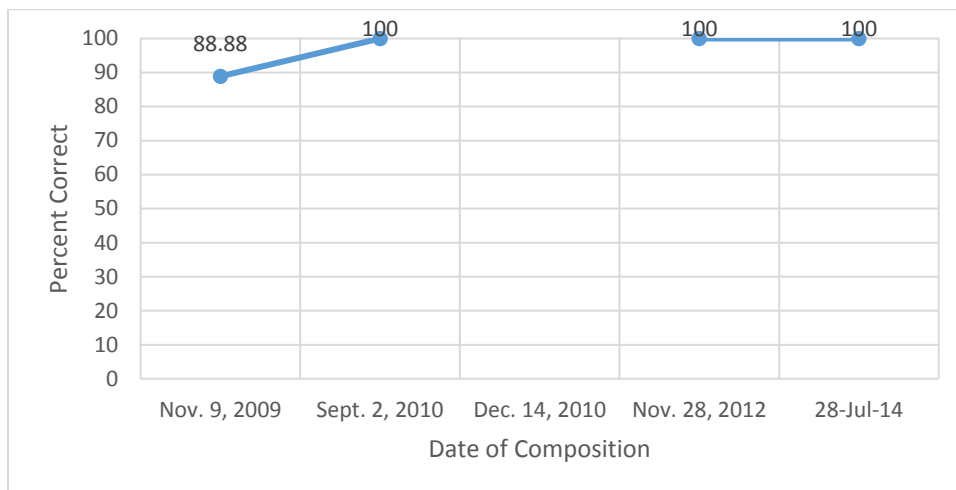


Figure 4.36. Sandy's TLU of *of*

Table 4.37

Sandy's TLU of of

Date of Composition	Total # Occurrences: 'of'	# Correct	# Incorrect	% Correct
Nov. 9, 2009	9	8	1	88.88
Sept. 2, 2010	8	8	0	100
Dec. 14, 2010	0	0	0	-----
Nov. 28, 2012	3	3	0	100
July 28, 2014	9	9	0	100
	29	28	1	93.75

Sandy's 1 non-target-like use of the English preposition *of* was an error of commission:

35. * "If you do have a college education you will have more opportunities *of job*." (WS #1)
[more job opportunities]

In what is likely a transfer error (*más oportunidades de trabajo*, translated *more opportunities of work* in English), Sandy uses Spanish word order, embedding the noun

job in a prepositional phrase (*of job*) instead of including it in the NP (*job opportunities*), where in English it functions as an adjective.

Errors involving 'for'. Results for the third most frequent preposition with at least one error in usage are presented next. Sixteen occurrences of the English preposition *for* were found in the Sandy corpus, 15 target-like, and 1, non-target-like. Over the course of the 56-month study, the total percentage of accurate use for the preposition *for* was calculated at 93.75% (see Figure 4.37 and Table 4.38, below).

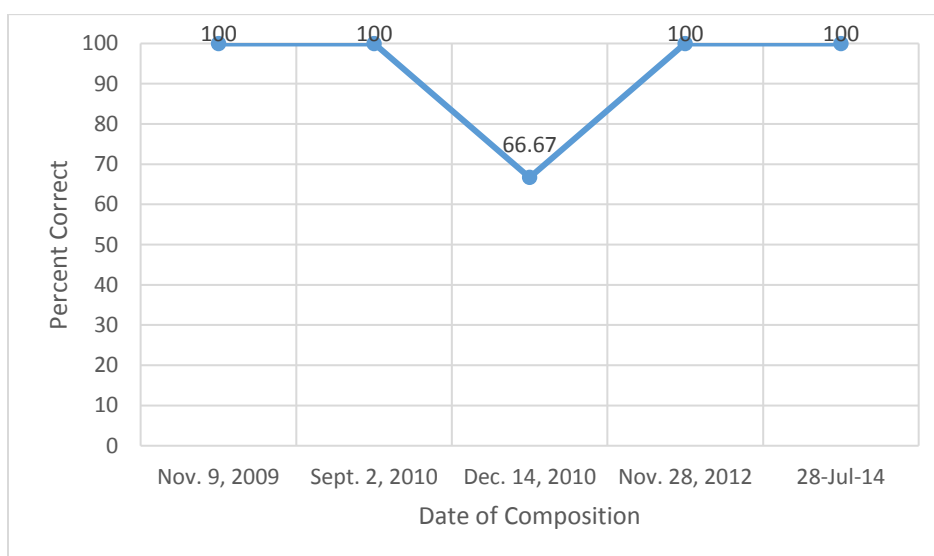


Figure 4.37. Sandy's TLU of *for*

Table 4.38

Sandy's TLU of for

Date of Composition	# Occurrences: 'for'	# Correct	# Incorrect	% Correct
Nov. 9, 2009	4	4	0	100
Sept. 2, 2010	3	3	0	100
Dec. 14, 2010	3	2	1	66.67
Nov. 28, 2012	1	1	0	100
July 28, 2014	5	5	0	100
	16	15	1	

Of the 16 occurrences of the preposition *for*, the only non-target-like use was found in Writing Sample 3:

36. * “However, Intelligence is the *key for* achieving succes and happiness in life.” [the key **to** achieving success] (WS #3)

With the exception of this one non-target-like occurrence in the third writing sample, Sandys suppliance of *for* was 100% correct for Writing Samples 1, 2, 4 and 5.

It is interesting to compare Sandy’s non-target-like use of *for* in Example 36 to her target-like uses of *for* in the same (i.e., WS #3) and other writing samples, for instance:

37. “it is important to finish or get your education here *for* a better future.” (WS #1)
38. “machines like computers...are providing a comfortable live *for* everyone.” (WS #2)
39. “these salaries pay *for* nice vacations...and a comfortable life.” (WS #3)
40. “education...prepares them *for* the future” (WS #4)
41. “men created so many obstacles *for* Virginia [Wolf]” (WS #5)

In Examples 37-41, Sandy uses the preposition *for* correctly in a variety of linguistic contexts: for instance, as part of the collocation *for* (i.e., to secure) *a better future* in Example 37; as part of the phrasal verbs *provide for*, *pay for*, *prepare for* in Examples 38, 39, and 40; and as the required preposition in the prepositional phrase *for Virginia* in Example 41.

The decision to categorize as non-target-like Sandy’s use of the English preposition *for* instead of *to* in Example 36, reprinted below, was not made without some deliberation:

36. * “However, Intelligence is the key *for* achieving succes and happiness in life.”
 [the key *to* achieving success] (WS #3)

As illustrated in Figure 4.38 below, both usages (i.e., *key for success* and *key to success*) have been documented since the year 1800.

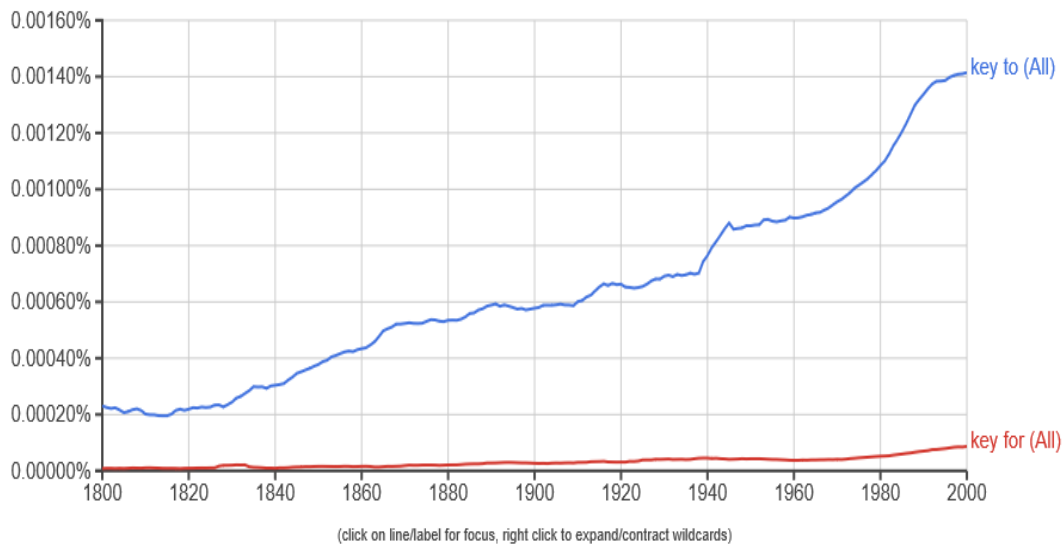


Figure 4.38. Relative Frequencies /*key to success* vs. *key for success*/ by Decade (Google Ngram Viewer, <http://bit.ly/2mSzj1G>)

However, when it was considered that for more than 200 years the former has been used only very infrequently, whereas the latter has been used with steadily increasing frequency, it seemed reasonable to mark *key to* as the more target-like form.

Errors involving 'with'. Next, 8 occurrences of the English preposition *with* were found in the Sandy corpus, 5 target-like, and 3, non-target-like, as illustrated in Table 4.39 and Figure 4.39 and by Examples 42 through 44, below.

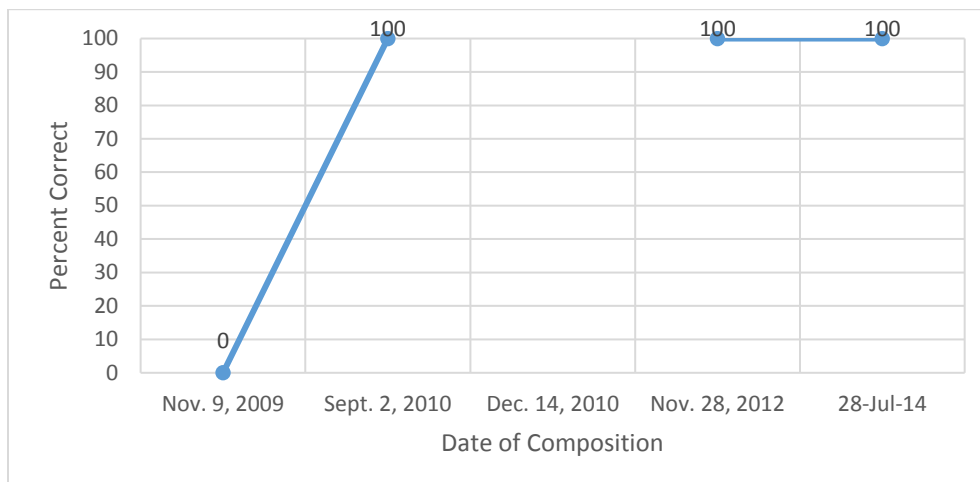


Figure 4.39. Sandy's TLU of *with*

Table 4.39

Sandy's TLU of with

Date of Composition	Total # Occurrences: 'with'	# Correct	# Incorrect	% Correct
Nov. 9, 2009	3	0	3	0
Sept. 2, 2010	2	2	0	100
Dec. 14, 2010	0	0	0	-----
Nov. 28, 2012	1	1	0	100
July 28, 2014	2	2	0	100
	8	5	3	62.50

Over the course of the 56-month study, Sandy's total percentage of accurate use for the preposition *with* was 62.50%. However, this figure is somewhat misleading, since all three errors occurred in the first writing sample and all involved the same idiomatic expression, *feel good about yourself*:

42. * "you will feel complete and *good with* yourself once when you reach the goal..." [good **about** yourself] (WS #1)
43. * "nothing feels better that *feel good with* yourself about what you had accomplished." [than feeling good **about** yourself] (WS #1)

44. * “you will *feel good with yourself*
[feel good **about** yourself]

(WS #1)

Afterwards, beginning with Writing Sample 2, Sandy’s use of the English preposition *with* was absolutely target-like for the remainder of the study.

Errors involving ‘by’. In total, 6 occurrences of the preposition *by* were found in the Sandy corpus: 5 correct, and 1, incorrect. Sandy’s use of *by* was among the most variable in the study, vacillating from 100% correct in the second writing sample, to 0% correct in the third, then finally back to 100% in the last. These data are represented in Figure 4.40 and Table 4.40, below.

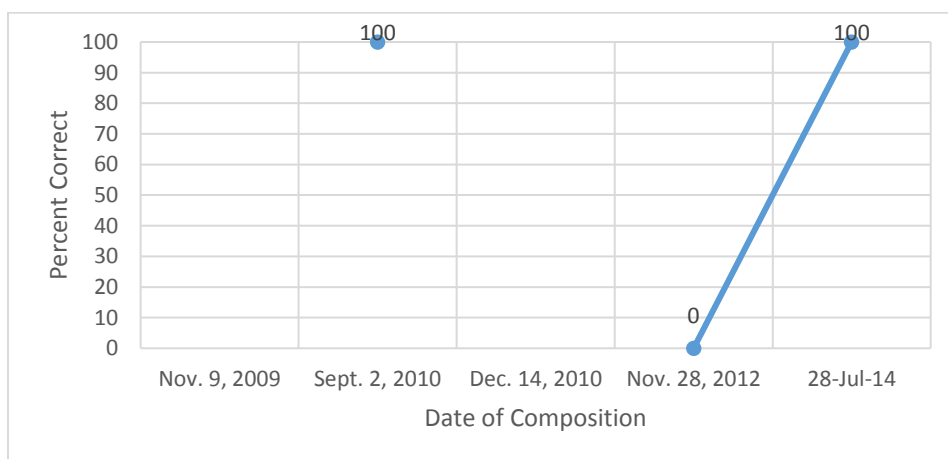


Figure 4.40. Sandy’s TLU of *by*

Table 4.40

Sandy’s TLU of by

Date of Composition	Total # Occurrences: ‘by’	# Correct	# Incorrect	% Correct
Nov. 9, 2009	0	0	0	-----
Sept. 2, 2010	1	1	0	100
Dec. 14, 2010	1	0	1	0
Nov. 28, 2012	0	0	0	-----
July 28, 2014	4	4	0	100
	6	5	1	

In Example 45, we find the only non-target-like occurrence of *by* in the longitudinal corpus:

45. * “When intelligent people become professionals they end up *by* having high salaries. [they end up \emptyset having] ...*terminan \emptyset teniendo* (WS #3)

Here Sandy uses the preposition *by* where \emptyset is required in both L1 Spanish (*terminan \emptyset teniendo salarios altos*) and L2 English (*they end up \emptyset having high salaries*), bringing to mind once again Selinker’s (1972) claim that IL is comprised not only of elements from the NL and the TL, but also elements absent from both, and underscoring the idiosyncratic nature of L2 acquisition (see also Han, 2004, 2009, 2013, 2014; Selinker, 1992).

Errors involving ‘on’. Just 3 occurrences of the English preposition *on* were found in the Sandy corpus: 1 target-like, and 2, non-target-like. These data are represented in Figure 4.41 and Table 4.41, below:

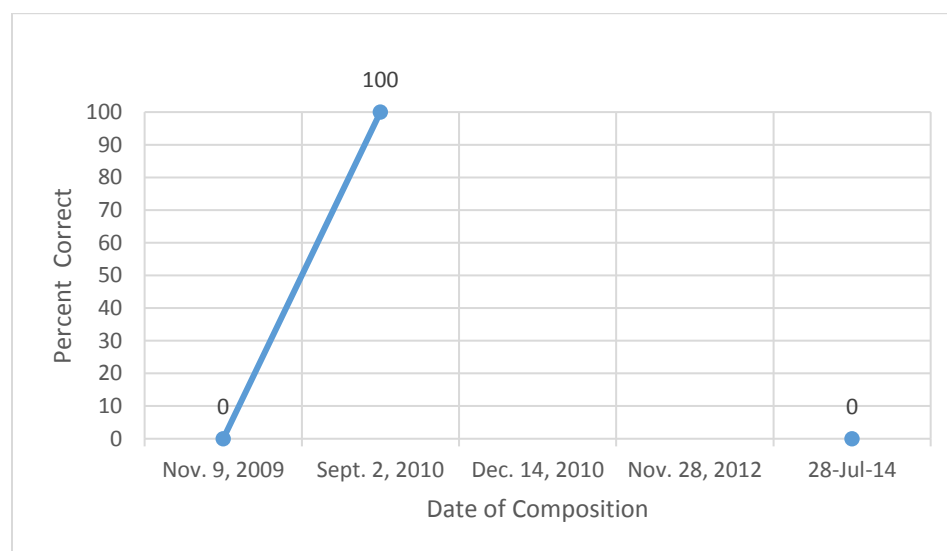


Figure 4.41. Sandy’s TLU of *on*

five years later, she uses the English preposition *on* (“at that period *on* time”) in place of the more idiomatic *of*. Here the reasons for Sandy’s deviation from native speaker norms are likely quite different, however. In Example 46, for instance, language transfer is likely at play since the English phrases ‘*in* college’ and ‘*at* college’ may both be translated ‘*en la universidad*’ in Spanish. On the other hand, Sandy’s failure to supply the correct preposition in Example 47 may be attributed to the challenges idiomatic expressions typically pose for L2 learners.

Errors involving ‘into’. Finally, of the 7 prepositions reported here, the one with the fewest total number of occurrences and the second lowest suppliance rate was the English preposition *into*. Only 2 occurrences of *into* were identified in the corpus, 1 target-like, and 1 non-target-like (see Figure 4.42 and Table 4.42, below).

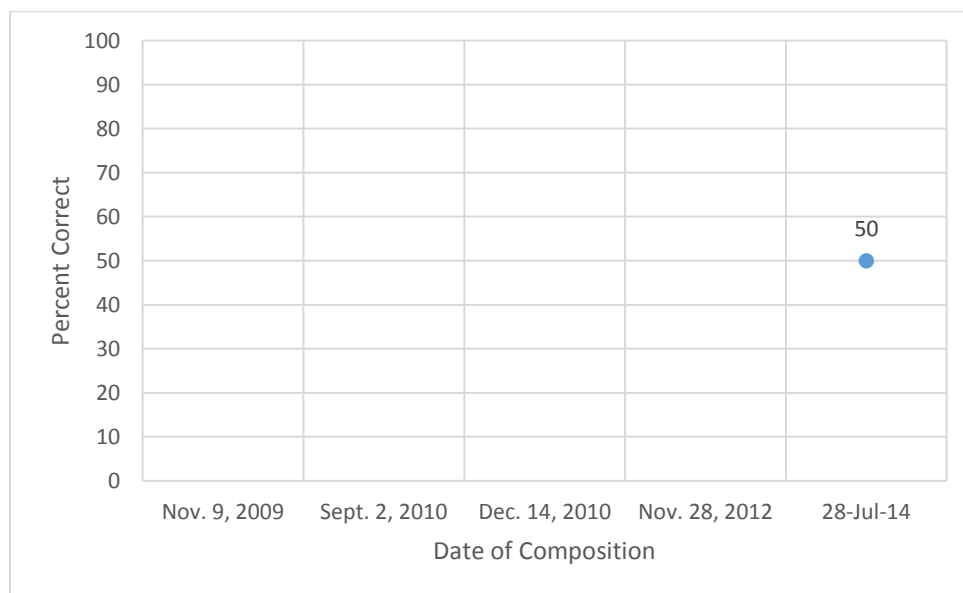


Figure 4.42. Sandy’s TLU of *into*

Table 4.42

Sandy's TLU of into

Date of Composition	Total # Occurrences: 'into'	# Correct	# Incorrect	% Correct
Nov. 9, 2009	0	0	0	-----
Sept. 2, 2010	0	0	0	-----
Dec. 14, 2010	0	0	0	-----
Nov. 28, 2012	0	0	0	-----
July 28, 2014	2	1	1	50.00
	2	1	1	

Sandy's 1 non-target-like use of *into* was an error of commission, found in the last writing sample:

48. * “We have so many examples to learn from that it would be absurd to ignore them and go back *into* time.” (WS #5)
[go back **in** time]

Here Sandy uses the preposition *into* instead of *in* for the phrase “go back in time.” Since Spanish doesn't have a similar expression (D. Litvak, Ph.D., personal communication, January 11, 2020) this is likely an error in the use of an idiomatic expression. Compare this to her one target-like suppliance of **into** from the same essay:

49. “They have to learn to respect one another, take *into* consideration one another, among many things.” (WS #5)

Here Sandy's target-like use of *into* in the idiom *take into consideration* in Example 49 stands in contrast to her non-target-like suppliance in Example 48 (“go back *into* time”). Taken together, these examples, which were found in the same paragraph of Essay 5, are clearly indicative of Sandy's differential command of English prepositions. When viewed alongside her differential success with English articles (above) and number (below), they provide robust evidence of intra-learner differential success within the same linguistic

domain (morpho-syntax), sub-system (prepositions), and, as demonstrated above, even the same word.

Number. Finally, a TLU analysis of was conducted on Sandy's use of number. As Figure 4.43 and Table 4.43 demonstrate, Sandy's use of number was generally stable and accurate throughout the course of study, beginning and ending, in turn, with 92.06% and 97.56% accuracy. After a decrease in target-like use in Writing Sample 2, Sandy's correct supplience of number was 100% for the third and fourth writing samples and 97.56% for the last. Hence, for the final 43 months of the study, Sandy's command of number could easily be described as native-like.

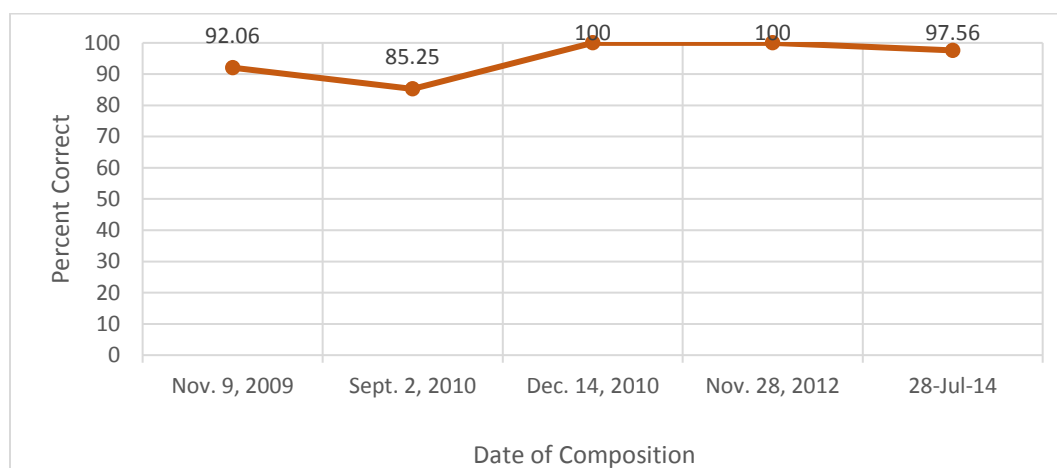


Figure 4.43. Sandy's TLU of Number

Table 4.43

Sandy's TLU of Number

Date of Composition	# Words per Essay	Total # Occurrences: Use of Number	# Correct	# Incorrect	% Correct
Nov. 9, 2009	397	63	58	6	92.06
Sept. 2, 2010	289	61	52	9	85.25
Dec. 14, 2010	189	50	50	0	100.00
Nov. 28, 2012	309	62	62	0	100.00
July 28, 2014	765	164	160	4	97.56
	1949	400	382	19	

However, when the data were further analyzed in terms of noun type, a quite different picture emerged. To provide a more nuanced interpretation of the data, two broad classes of English nouns were examined: regular (*goal*→*goals*; *way*→*ways*) vs. irregular nouns (*life*→*lives*; *child*→*children*) and count (5 *pencils*; many *students*) vs. noncount (*advice*, *valor*) nouns. This subsequent round of analysis provided additional micro-level evidence of intra-learner differential achievement, as will be reported below.

Count vs. noncount nouns. A second pass at the data compared count versus noncount nouns, revealing differences in Sandy's acquisition of each. Table 4.44 summarizes the data in tabular form: the left column reports the total number of occurrences, the relative number of correct and incorrect occurrences, and the percentage correct per essay for *count* nouns, and the right column does the same for *noncount* nouns.

A linear representation of the data points arranged by date is provided in Figure 4.44. As both Figure 4.44 and Table 4.44 demonstrate, Sandy's acquisition of both English count and noncount nouns followed different paths, though both ended just short of 100% suppliance. For example, whereas Sandy's suppliance of noncount nouns was 100% target-like from the first writing sample through the fourth and virtually target-like (i.e., 95.65% correct) for the fifth, her suppliance of count nouns revealed not only less accuracy, but also more variability. Indeed, non-target-like occurrences of English count nouns were 15 times more frequent in the Sandy corpus than those of noncount nouns (comprising 4.76% and 1.21% of these errors, in turn), and when compared with Sandy's completely target-like use of non-count nouns in Writing Samples 1 and 2, were less accurate.

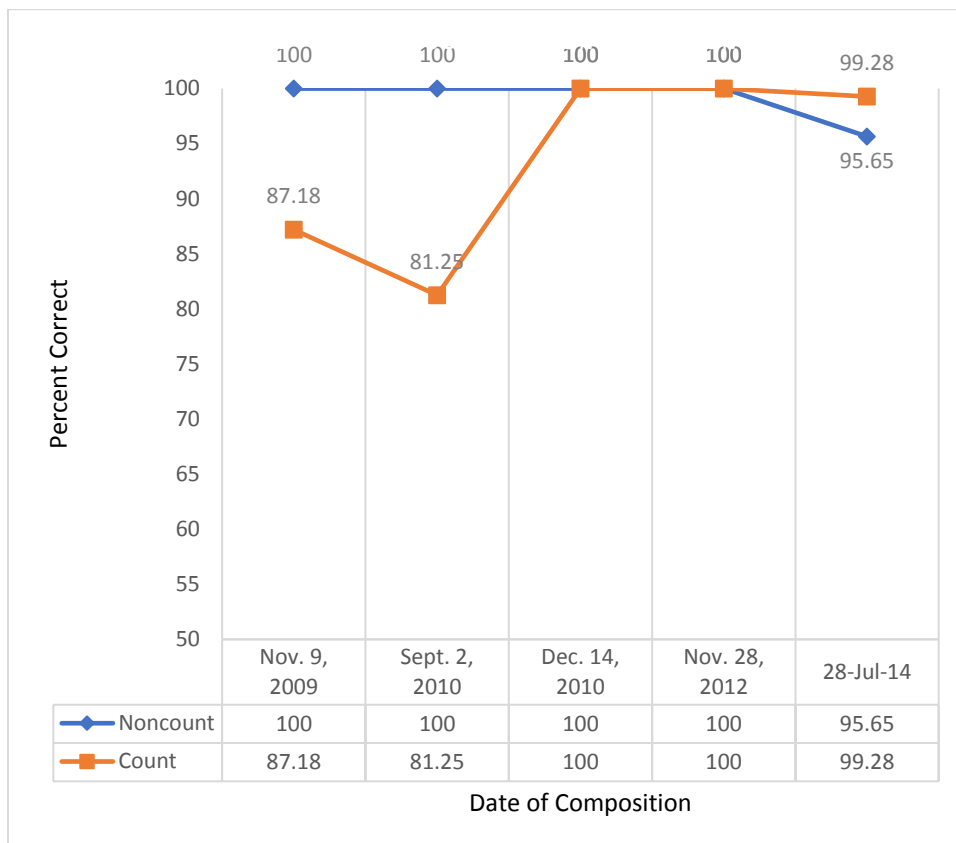


Figure 4.44. Sandy's TLU of Count vs. Noncount Nouns

Table 4.44

Sandy's TLU of Count vs. Noncount Nouns

Date of Composition	Total # Occurrences	# Correct	# Incorrect	% Correct				
					Total # Occurrences	# Correct	# Incorrect	% Correct
	/count nouns/				/noncount nouns/			
Nov. 9, 2009	39	34	5	87.18	23	23	0	100.00
Sept. 2, 2010	48	39	9	81.25	13	13	0	100.00
Dec. 14, 2010	36	36	0	100.00	14	14	0	100.00
Nov. 28, 2012	53	53	0	100.00	9	9	0	100.00
July 28, 2014	139	138	1	99.28	23	22	1	95.65
	315	300	15		82	81	1	

In the first writing sample, for example, Sandy missed 5 out of 39 situational uses of count nouns, whereas in the same essay, she used non-count nouns correctly 23 out of 23

times. Similarly, she missed 9 out of 48 textual uses of count nouns in the second writing sample, while her suppliance of noncount nouns was 100% accurate (13 out of 13 correct suppliances) throughout. Examples 50 and 51, excerpts from Writing Sample 2, demonstrate Sandy's differential command of count and noncount nouns not only in the same essay, but in the same sentence as well :

50. * “Another way of communication was through a horse-*men*, a *men* who carried the *letter*_ long *ways* in order to delivery the *message*_.”
 [Another way of communication was a horse*man*, a *man* who carried the letters a long way to deliver the messages.] (WS #2)

51. “thanks to the modern technology, today we have...cellphones, providing us an easy way to communicate.” (WS #2)

In the first example, Sandy's completely target-like use of the noncount noun “communication” stands in contrast to her non-target-like use of virtually every count noun in the sentence. Then, in the second example, Sandy uses both count and noncount nouns with complete accuracy, demonstrating yet again the co-existence of success and failure within the learner's IL. These findings mirror those of Lisa's differential use of count and noncount nouns and will be revisited in the discussion of Research Questions 3 and 4 in Chapter V. The results of a more fine-grained exploration of English count nouns immediately follow.

Regular vs. irregular plural count nouns. The last TLU analysis of Sandy's writing focused on number errors involving regular versus irregular plural count nouns. The results are presented in Figure 4.45 and Table 4.45, below.

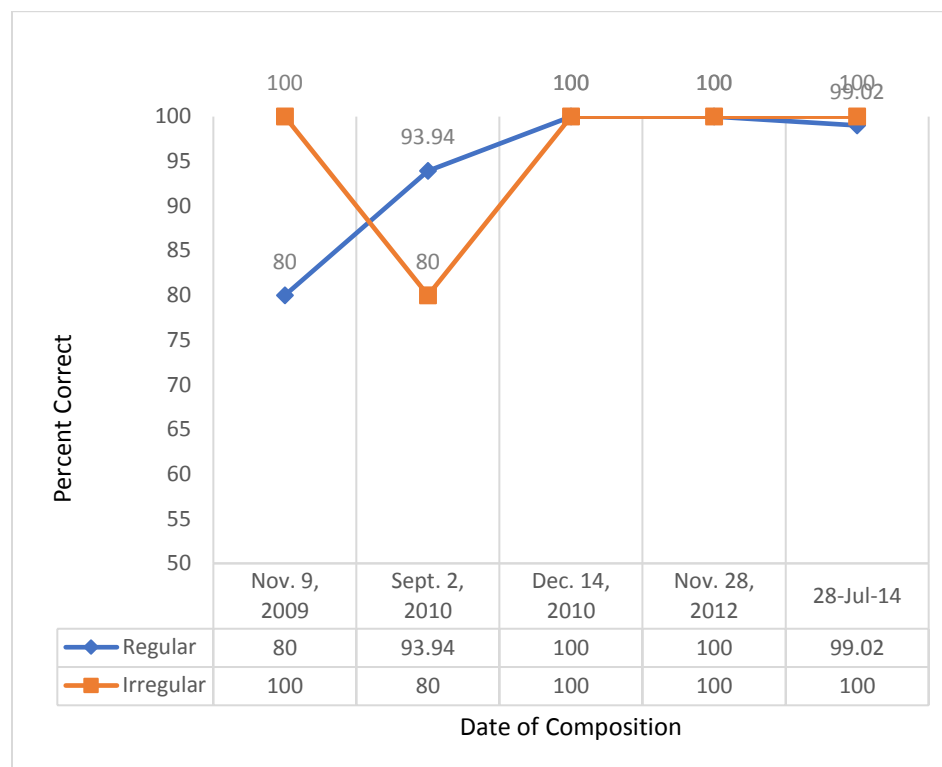


Figure 4.45. Sandy's TLU of Regular vs. Irregular Plural Count Nouns

Table 4.45

Sandy's TLU of Regular vs. Irregular Plural Count Nouns

Date of Composition	/regular plural count nouns/				/irregular plural count nouns/			
	Total # Occurrences	# Correct	# Incorrect	% Correct	Total # Occurrences	# Correct	# Incorrect	% Correct
Nov. 9, 2009	25	20	5	80.00	14	14	0	100.00
Sept. 2, 2010	33	31	2	93.94	10	8	2	80.00
Dec. 14, 2010	12	12	0	100.00	24	24	0	100.00
Nov. 28, 2012	36	36	0	100.00	17	17	0	100.00
July 28, 2014	102	101	1	99.02	37	37	0	100.00
	208	200	8		102	100	2	

A total of 310 occurrences of regular and irregular plural count nouns yielded 300 that were target-like, and 10 that were non-target-like. Of the 10 non-target-like occurrences, 8 involved regular plural count nouns, and 2, irregular. Two of the 8 errors involving regular plural count nouns included NPs in which pluralized adjectives modified the head

noun (i.e., **“others perspectives”*; **“these days things are **differents**”*). Both were likely transfer errors from L1 Spanish, where adjectives and the nouns they modify are required to agree in number (e.g., *otras perspectivas*; *cosas diferentes*). Other non-target-like uses involved the omission of the plural morpheme (-s) where the plural form of a noun was needed, as in Examples 52 and 53, below:

52. * “they used carrier *pidgeon* for sent a message from one location to another.” [pigeons] (WS #2)

53. * “we can have acces to all *kind*_ of subjects and materials.” [all kinds of] (WS #2)

In these examples we find additional evidence of Sandy’s differential command of regular count nouns, from the target-like *message*, *location*, *subjects*, and *materials*, to the non-target-like **pidgeon* and **kind*.

Finally, of the 8 errors involving regular count nouns, all but one occurred in the first two writing samples. Indeed, with the exception of the following non-target-like use in Writing Sample 5,

#54. * “It took many years for Pasteur to discover that bacteria was causing the *death* and for him to stop these killings.”⁵
[the deaths] (WS #5)

regular plural count nouns were consistently and accurately supplied from the third writing sample through the last. All in all, Sandy’s command of English number, when viewed alongside her use of articles and prepositions, affirms what Han (e.g., 2006, 2009, 2014) and others (e.g., Hawkins, 2000; Lardiere, 2012; Long, 2003;) have long

⁵ Sandy was writing here about the deaths of new mothers examined by doctors who had failed to wash their hands after performing autopsies.

proposed: namely, that success and failure coexist within the learner's IL, in this case, at the level of morpho-syntax.

In sum, the results of the TLU analysis reported in Section 4.2.2 brought to light the selective, idiosyncratic nature of the participants' acquisition of the grammatical targets, and in doing so, provided answers to the third and fourth research questions of the study. It began with an analysis of Lisa and Sandy's overall use of the grammatical targets, then delved more deeply into the data by examining their use of articles in various linguistic environments, individual prepositions in contexts, and number by noun type. This allowed for a more nuanced interpretation of the data from which it was possible to obtain additional micro-level evidence of differential attainment.

To conclude, this chapter reported the descriptive statistics and results of an in-depth TLU analysis of the participants' use of the three linguistic targets. These findings provided robust and pervasive evidence of intra- and inter-differential failure and success not only within the same linguistic domains and sub-systems, but with individual linguistic items as well. In the following chapter, these results will be discussed in relation to the research questions and the SFH. The conclusion of the dissertation follows.

Chapter V

DISCUSSION

The purpose of the study presented in this dissertation was to examine, by way of the Selective Fossilization Hypothesis (SFH) (Han, 2009, 2013b), persistent errors in the writing of adult learners of academic English. Part I consisted of a cross-sectional investigation of learners at three proficiency levels, and Part II followed two individual learners over time. Once the most persistent errors in the cross-sectional and longitudinal corpora had been identified (articles, prepositions, and number, for both), the SFH was applied retroactively to each, and the results reported in Chapter IV. This chapter discusses the most salient findings from the previous chapter, as it revisits each of the research questions in turn.

5.1 Part I: Cross-Sectional Study

Part I sought to identify persistent grammatical errors in the participants' writing and then apply the SFH retroactively to test its explanatory potential. To that end, two research questions (RQs) were posed, namely: *(1) Which grammatical errors persist in the participants' written output at the advanced proficiency level?* and *(2) Are the persistent grammatical errors identified in the cross-sectional corpus consistent with predictions of the SFH?*

Two caveats are worth mentioning. Firstly, the cross-sectional study was limited by virtue of its design to identifying potential candidates for fossilization, since a true claim of fossilization can only be made on the basis of longitudinal evidence. Secondly,

any inferences about learner behavior were predicated on the assumption that the pooled data “would yield results similar to what would be found if we looked at a single individual over time” (Gass et al., 2013, p. 37). Despite these limitations, the cross-sectional study uncovered some important findings about persistent errors, selective fossilization, and the SFH. These findings, which were subsequently confirmed in the longitudinal investigation, are discussed below.

5.1.1 RQ1: Persistent Errors

As noted throughout this dissertation, assumptions concerning the potential fossilizability of a structure cannot be made without first establishing its persistence. Hence, the purpose of the first research question was to identify which, if any, grammatical errors persisted in the participants’ writing at the advanced proficiency level.

To begin, it came as no surprise that errors in the use of articles, prepositions, and number were most persistent in the essays of the advanced learners. Anecdotal evidence from L2 writing instructors notwithstanding, converging evidence from multiple research perspectives affirms that grammatical functors such as nominal inflections, prepositions, and articles “constitute a prime area of fossilization” (Han, 2013a, p. 2). One example would be English articles, which require learners to know not only their form and canonical meanings, but also their appropriate use in a variety of discourse conditions. Another would be nominal inflection, which requires learners to know what to pluralize, how to pluralize, and when (Han, 2013a). What makes these structures especially vulnerable to fossilization is that they require the learner to be able to map morphosyntactic form, meaning (semantic), and function (pragmatic) relations, and to do so in real time (Han, 2014). Nowhere is this more of a challenge than when a “nervous”

(p. 59) learner is attempting meaningful, spontaneous communication – as, presumably, was the case for the 60 participants in the current study, whose academic standing was determined by their performance on the high-stakes placement, diagnostic, and final essays that comprised the learner data.

Although one must be careful when drawing conclusions about individual learners on the basis of pooled data, such data can nonetheless be useful in identifying developmental trends. Some unexpected findings from the current study involved the participants' target language use of English punctuation, vocabulary, and spelling. As noted in the previous chapter, in addition to the three grammatical targets of articles, prepositions, and number, errors involving punctuation, spelling, and vocabulary were also found to persist in the writing of the advanced learners. Interestingly, punctuation and vocabulary errors were found to *increase* as the learners gained in proficiency, and the mean percentage of spelling errors was nearly as high for the advanced learners as it was for at their low-intermediate peers. One possible explanation for this rather counterintuitive finding is that advanced learners are apt to make more errors as they experiment with complex sentence structure and sophisticated vocabulary. Another is that with each successive level of proficiency, the learner has to deal with words that are less frequent and hence more challenging to acquire (Z.-H. Han, personal communication, February 5, 2012). This may also account for the persistence of spelling errors at the advanced level, as learners incorporate more advanced vocabulary into their writing. Moreover, since Spanish – unlike English – is a language with a high grapheme-phoneme correspondence, it is possible that the inconsistencies of English spelling posed a continuing challenge to learners, even those at the more advanced levels.

Additionally, descriptive statistics for two of the three grammatical targets revealed U-shaped patterns in the mean percentage of article and preposition errors. As noted by Carlucci and Case (2013), a “U-shaped curve in a cognitive-developmental trajectory refers to a three-step process: good performance followed by bad performance followed by good performance once again. U-shaped curves have been observed in a wide variety of cognitive-developmental and learning contexts...including language learning” (para 1). Hence, assuming that the cross-sectional data would yield results similar to those obtained by tracking an individual learner over time, these results may be indicative of IL destabilization and restructuring as learners move “from exemplar-based learning to a stage in which representations are more rule-based” (Gass et al., 2013, p. 261). Nevertheless, it needs to be recognized that this sort of ‘pooled’ analysis can only paint a simplistic picture of the data: of articles, because their use is informed, *inter alia*, by a variety of discourse conditions, and of prepositions, because each is arguably different from the next, both in an intralingual and interlingual sense.

5.1.2 RQ2: Predictions of the SFH

As noted throughout this dissertation, the SFH seeks to capture the interaction between L1 markedness and L2 input robustness, its aim being to predict and explain intra- (and to a lesser extent, inter-) learner differential success (Han, 2014, p. 61). Thus, to answer the second research question, *Are the persistent grammatical errors identified in the cross-sectional corpus consistent with predictions of the SFH?*, it was necessary to determine the relative degree of L1 markedness and L2 input robustness of the persistent errors identified in the cross-sectional data and to interpret the results in light of the existing data and the SFH. Recall that in Han’s (2009) model, L1 markedness is

determined by the intersection of two axes – frequency and variability – to create four possible outcomes: (I) quite unmarked, (II) unmarked, (III) quite marked, and (IV) marked. According to Han (2009), unmarked forms are frequent and *invariable* in the L1, whereas marked forms are *infrequent* and variable. Similarly, the intersection of two axes – frequency and variability – gives rise to four possible outcomes for L2 input robustness: (I) quite robust, (II) robust, (III) quite non-robust, and (IV) non-robust, wherein robust forms are frequent and *invariable* in the L2, and non-robust forms, *infrequent* and variable.

To make a prognosis of selective fossilization for a particular L2 structure, it was first necessary to examine the interaction between L1 and L2 input conditions. As Han (2009) explains, “[A]ll things being equal, a given L2 element may fall in the acquisition zone *if* the NL counterpart is marked and *only if* the TL input is robust..., and conversely in the fossilization zone...*if* the NL counterpart is unmarked and *only if* the TL input is non-robust” (p. 6). This is schematized in Figure 5.1.

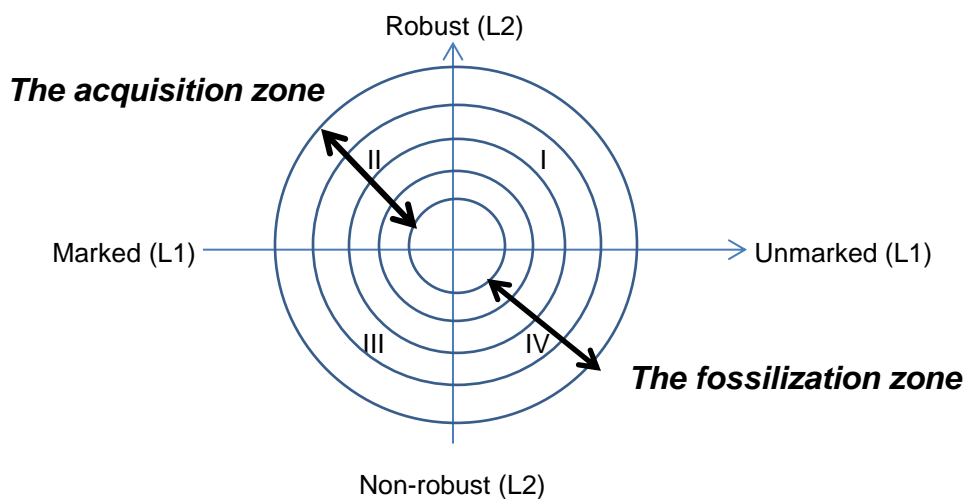


Figure 5.1. Prognoses about Acquisition and Fossilization
Reprinted from Han, 2009.

Next, the SFH was applied retroactively to the three types of persistent errors identified in the cross-sectional data (i.e., errors in the use of English articles, prepositions, and number) to assess its explanatory potential. Recall that the SFH aims to “capture the interaction between input and L1,” both of which Han considers “driving factors” in SLA (2014, p. 60). Hence, to identify potential candidates for selective fossilization, it was first necessary to establish whether the target structures were (1) marked or unmarked in L1 Spanish, and (2) robust or non-robust in L2 English, as follows.

Articles. To determine whether Spanish articles were marked or unmarked, it was necessary to know their relative frequency and variability. With regard to their frequency, a corpus of the most frequently occurring Spanish words in a sample of contemporary news and magazine articles (Davies & Davies, 2018) was consulted, confirming what anyone with even a cursory understanding of Spanish already knows: namely, that Spanish articles, like their English counterparts, are ubiquitous in the input. Indeed, 7 of the 20 most frequently occurring words in the Spanish corpus (*el, la, los, un, las, una*) were classified as articles. Moreover, it may be argued that Spanish articles are relatively consistent across contexts, given that in any given NP, not only nouns, but also articles (and all other determiners), adjectives, and possessives, are all marked for gender and number (Comrie, 1983; Sofer & Raimés, 2002). This “fully explicit concord system” (Comrie, 1983, p. 213) creates a built-in redundancy that facilitates article choice, as demonstrated in the following example, taken from Marrero and Aguirre (2003):

Unos	perros	saltan	contentos
Indef art , masc, pl	noun, masc, pl	verb, 3p, pl	adj, masc, pl
<i>Some dogs jump happy(ly).</i>			

Spanish articles are also less variable than English when it comes to expressing generic reference (Butt & Benjamin, 2013; Ionin & Montrul, 2010; Montrul & Ionin, 2010; Snape, Leung & Ting, 2006). Whereas English has different ways to express specific and generic meanings – namely *definite article + plural noun* (‘the lions’) for specific references and *bare NP + plural noun* (‘lions’) or *indefinite article + singular noun* (‘a lion’) for generic references – Spanish has only one, *definite article + plural noun* (‘los leones’) (Comrie, 1983). Nevertheless, it would be a mistake to say that Spanish articles are invariable. For example, both the definite and indefinite article have multiple forms (*el, la, los, and las* for the former, and *un, una, unos* and *unas* for the latter), the definite article *el* can be combined with prepositions *a* and *de* to form the contractions *al* and *del*, and all are constrained by various restrictions regarding their use. Hence, considering their ubiquity and relative variability, it may be argued that articles in L1 Spanish are *quite unmarked* (i.e., frequent and variable) in Han’s (2009) model.

Next, a determination of L2 input robustness was made by examining the relative frequency and variability of English articles. With regard to frequency, English articles, like their Spanish counterparts, are pervasive in the input. In a corpus of the 100 most frequently used English words (Fry, Kress & Fountoukidis, 2000), the definite article *the* holds the number one position, with the indefinite articles *a* and *an* occupying the fourth and 43rd place, respectively, for all printed material in English. A similar distribution was found in a corpus of English words taken from one unit of *North Star Reading and Writing* (Barton & Sardinias, 2004), a reading and writing text used in all low-intermediate classes at CCC. Here, too, the definite article *the* placed first as the most frequently occurring word in the corpus, with the indefinite articles *a* (ranked #3) and *an*

(ranked #26) following close behind. However, while English articles may be frequent in the L2 input, they are far from invariable. Indeed, as noted above, Han (2008a) cites articles as one of the most fossilizable structures in English (p. 6), tracing their often confounding variability to the fact that they “implicate complex form-meaning-function mappings” (p. 10).

In sum, considering the relative frequency and variation of this particular grammatical structure in both L1 and L2, it was determined that articles are *quite unmarked* in the L1 (frequent and variable) and *quite robust* in the L2 (frequent and variable), situating them in Zone I of Han’s (2009) model, a neutral zone.

Prepositions. The SFH was next applied to prepositions. As was the case with articles, the Spanish corpus (Davies & Davies, 2018) also established the pervasiveness of prepositions in the L1. For example, the Spanish corpus lists 6 prepositions (*de, en, a, por, con, para*) among the 20 most frequently occurring words, with *de* ranked most frequent of all. Concerning the variability of Spanish prepositions, Corvalán (1995) provides this colorful assessment: “Prepositions are something like the weather. No one can entirely predict them from day to day, and no one seems to be able to do anything about them” (p. 196). She goes on to write that that none of the Spanish grammars, alone or in combination, can even begin to “capture the great deal of variability in [their] form and use” (p. 196). This thought is echoed by Moreno de Alba quoted in Corvalán (1995), who asserts:

Not only for the one who studies Spanish as a foreign language, but also for those who have it as a native language, the analysis of prepositions is a difficult chapter, for the complements are so abundant – of verbs, nouns, adjectives – , and there is no lack of cases in which...we doubt when we reflectively presume to select the preposition that best suits the specific complement. (p. 196)

Thus, it was established that like articles, prepositions were *quite unmarked* (i.e., frequent and variable) in the L1.

In a similar way, a determination of L2 input robustness was made by looking at the frequency and variability of English prepositions. A comprehensive English corpus (Fry, Kress, & Fountoukidis, 2000) revealed that 6 prepositions (*of, to, in, for, on, with, at, from*) were among the most frequently used English words, with *of* being the second most frequently occurring word overall. The *North Star* textbook corpus painted a similar picture, with prepositions comprising 7 of the 22 most frequently occurring English words, in descending order of frequency: *to, of, in, about, for, at, and on*. Moreover, like their Spanish counterparts, prepositions are highly variable in English. Indeed, as Catalán asserts, their “sheer number” and “high degree of polysemy make the task of systematization nearly impossible” (p. 2). Hence, it was determined that prepositions are *quite robust* in the L2 input and *quite unmarked* in the L1, placing them, too, in the neutral Zone I of Han’s (2009) model.

Number. Finally, the SFH was applied to number. Since all Spanish nouns can appear in both numbers, singular and plural (Morrero & Aguire, 2003), forms that encode number are abundant in the L1 input. Moreover, number in Spanish is quite invariable. As a result, native speakers of Spanish, may be very sensitive to number. A “very redundant” morpheme, the Spanish plural marker *-s* “appears in nouns, adjectives and verbs, in a very regular way” (Morrero & Aguire, 2003). For instance, there are no irregular plurals in Spanish (Sofer & Raimés, 2002), and “all plural substantives and determiners end in /-s/” (Comrie, 1983, p. 201).¹ Hence, Comrie notes that the Spanish

¹ cf. “*The meek shall inherit the earth*” to “*Los mansos....*”

noun and its related forms have a “very simple” and “transparent” inflectional structure (p. 201). For these reasons, it was deduced that number is *unmarked* in L1 Spanish – that is, frequent and relatively invariable.

Forms that encode number are likewise pervasive in English. However, unlike Spanish, English plurals are quite variable. For instance, English has many irregular plurals, draws a distinction between mass and count nouns, and, as mentioned above, has two plural forms to express specific (e.g., *the lions*) and generic (e.g., *lions*) meaning where Spanish has only one (Montrul & Ionin, 2010, p. 452). The relative frequency and variability of number in English would suggest that it is *quite robust* in the L2 input, placing it, as well, in the neutral Zone I of Han’s (2009) model.

To sum up, persistent errors in article, preposition, and number use were examined in light of the cross-sectional data and the SFH, yielding the following inferences:

- Articles in Spanish are frequent and variable, hence *quite unmarked* in the L1; articles in English are frequent and variable, thus *quite robust* in the L2.
- Prepositions in Spanish are frequent and variable, hence *quite unmarked* in the L1; prepositions in English are frequent and variable, thus *quite robust* in the L2.
- Number in Spanish is frequent and invariable, hence *unmarked* in the L1; number in English is frequent and variable, thus *quite robust* in the L2,

situating each of the three grammatical targets in Zone 1, a “gray area” where “either acquisition or fossilization may occur” (Han, 2008a, p. 6). According to Han (2009), structures falling in the “gray areas” are subject not only to the interaction between L1

markedness and L2 input robustness, but also to individual difference variables such as sensitivity to input² (p. 155).

On the whole, the findings above were found to be consistent with the predictions of the SFH. For one, all three of the targeted features fell within Zone I, one of two “gray areas” in Han’s model. Moreover, the SFH predicts that any given L2 element that falls into one of these two ‘neutral’ areas “can go either way” (Han & Lew, 2012, p. 203). In light of the existing data and the SFH, then, it can be argued that if any one of these three structures had fallen instead into the acquisition zone (Zone II), it would not have been quite so persistent in the writers’ output. By the same token, if any of these structures had fallen into the fossilization zone (Zone IV), we would not expect to see such a marked decline in the frequency of errors.

In sum, the findings from Part I provided some empirical support for the SFH. However, it was clear that more work needed to be done. For one, the cross-sectional design of the study, though well-suited for an exploratory investigation designed to uncover broad trends in the data, was self-limiting in that it allowed only for the identification of likely *candidates* for fossilization. Recall that a claim of fossilization can only be made when it has been established that an individual learner has failed to progress in his or her acquisition of the L2 (or some subsystem thereof) despite continuous exposure to the L2, sufficient motivation to improve, and ample opportunities for meaningful practice (Han, 2004; Selinker, 1972). Hence, to elicit more compelling evidence of selective fossilization and gain a more nuanced understanding of the

² The current study did not investigate individual difference variables, a limitation that will be discussed in the following chapter.

relationship between the data and the SFH, a longitudinal case study of two individual learners was conducted next.

5.2 Part II: Longitudinal Study

As noted in Chapter I, the purpose of the longitudinal phase of the study was to identify and explain English language learners' persistent errors via a bottom-up textual analysis motivated and informed by the SFH. In this second phase of the study, spontaneous production data consisting of 9 timed, supervised argumentative essays were collected from two adult learners of English over a period of 28 and 56 months and subjected to an in-depth TLU analysis. Four research questions motivated the study and will be discussed, in turn, below:

- (1) *Which grammatical errors persist in the participants' written output over time?*
- (2) *Do the cross-sectional data and longitudinal data on persistent errors converge?*
- (3) *Do the persistent errors identified in the longitudinal corpus provide evidence of selective fossilization?*
- (4) *Are the persistent grammatical errors identified in the longitudinal corpus consistent with the predictions of the SFH?*

5.2.1 RQ1: Persistent Errors

The first research question, *Which grammatical errors persist in the participants' written output over time?* sought to identify persistent errors, operationalized here as the remaining errors in the IL of advanced learners, in the participants' writing, since

persistence must first be established before a case for fossilization can be made. As in the cross-sectional study, the unique focus of Part II was grammatical errors. One important difference, however, was the substitution of true longitudinal data for cross-sectional data.

The advantages of using longitudinal data in studies of L2 fossilization have already been discussed in this dissertation and are well documented throughout the SLA literature. However, since most longitudinal studies tend to focus on a small number of participants (typically 1 or 2), it is not always easy to discern patterns in the data, nor is it possible to generalize findings to the larger population. Nevertheless, it was interesting to note that when compared to the cross-sectional findings, descriptive statistics for the longitudinal data revealed the same three areas of persistence – namely, errors in the use of English articles, prepositions, and number – in the writing of both the study’s participants, most notably in their later essays. For example, the descriptive statistics show that Lisa’s article and number errors actually *increased* by the end of the study, while her preposition errors rose steadily from the first essay through the third. Moreover, the percentage of errors involving prepositions and number found in Sandy’s essays remained virtually unchanged from the first essay to the last, while the percent of article errors in her first and fourth essays were nearly identical. The persistence of these errors was not entirely unexpected, however, as all three are known to be particularly vulnerable to fossilization (cf. Section 5.1.1, above).

5.2.2 RQ2: Confluence of Findings

That the same grammatical errors were found to persist in both the cross-sectional and longitudinal phases of the study leads quite naturally to a discussion of the

second research question, *Do the cross-sectional data and longitudinal data on persistent errors converge?* To allow for comparisons between the cross-sectional and longitudinal data, descriptive statistics were computed, respectively, for (1) the mean and total number of words/percent of errors per essay, (2) the mean and total percent of errors for the 26 coded errors, and (3) the mean and total percent of errors for the three grammatical targets.

As noted in the previous chapter, descriptive statistics from the cross-sectional study revealed that both fluency and accuracy increased with each successive proficiency level. This finding was not unexpected, since fluency and accuracy were closely tied to writing proficiency as delineated by the CCC Placement Rubrics (Appendix A and B). On the other hand, the findings from the longitudinal study were not as clear cut. In contrast to the steady increase in the mean number of words (N=283→346→440) per essay and decrease in the mean percent of errors (19%→10.6%→4%) observed in the cross-sectional data, the longitudinal data revealed more variability in the accuracy and fluency of the participants' writing over time. For example, Lisa's third writing sample (N=375 words) was nearly double the length of her second (N=200 words), which was considerably shorter than either her first writing sample (N=280 words) or her last (N=295 words). At the same time, the total percentage of errors in Lisa's writing showed a marked decrease from the first writing sample to the second; then, after remaining precisely the same from the second writing sample to the third, dropped to its lowest point in the last. Looking back on Lisa's performance on the second essay, one possible explanation for both the lower word count *and* percentage of errors may be that both are artifacts of literacy training: namely, the Pre-College Program's emphasis on accuracy

over fluency. Hence, it may be reasonable to assume that for Writing Sample 2, the college ESL diagnostic exam, Lisa was following her previous instructors' advice to write less and proofread more, particularly since students were told that a strong performance on the diagnostic essay would allow them to be moved up to a higher-level ESL writing class, or even credit-bearing English 101.

Similarly, Sandy's essays, though increasing rather dramatically in terms of both accuracy and fluency, actually *decreased* in length from the first through the third writing samples before more than tripling (N=765 words) in the last. On the other hand, with the exception of a slight increase from the first essay to the second, the total percent of errors in Sandy's writing steadily decreased throughout the study, from 18.4% at the beginning of the study to 6.7% at the end. It is interesting to note that for Sandy, the lowest number of words per essay (N=189) was recorded for Writing Sample 3, the departmental final exam. The most likely explanation for the brevity of this particular writing sample is a decidedly strategic one. At CCC, the final exam is a high-stakes test that comprises 100% of a student's final grade and determines whether he or she places out of developmental writing classes or spends another semester in (non-credit) ESL. Hence, students are often advised by their instructors (as Sandy was) to write shorter final essays. Doing this, they are told, will allow them more time to proofread their work, thereby improving their chances of passing the course.

It also bears mentioning that Writing Samples 4 and 5 in the Sandy corpus were low stakes 'follow-up' essays written in the researcher's office solely for inclusion in the study. Hence, Sandy knew the essays would not be "graded" in the traditional sense and would in no way impact her grade point average or class standing. This may, in part,

account for the fact that Writing Sample 4 was more than 50% longer – and Writing Sample 5 more than 300% longer – than Writing Sample 3, the high-stakes final exam that preceded them. Of course, it is also possible that Sandy's continued, intensive exposure to English in the 23 months that had elapsed between Writing Samples 3 and 4, and the 43 months that had passed between Writing Samples 3 and 5, was responsible, at least in part, for her increased fluency. For the most part, however, Lisa and Sandy's writing reflected the same general trend observed in the cross-sectional study: namely, that as their proficiency increased, so did accuracy and fluency. In this way, the above findings may be said to demonstrate confluence between the cross-sectional and longitudinal phases of the study. Further analysis of the data revealed additional similarities, as will be discussed next.

Finally, a comparison of the descriptive statistics for all 26 coded essays revealed persistence in the use of the same linguistic targets in both the cross-sectional and longitudinal corpora. However, when the mean percentage of targeted errors per proficiency level from the cross-sectional data were compared with the true percentage of targeted errors per writing sample from the longitudinal data, subtle differences emerged. For instance, for *articles* and *prepositions*, the cross-sectional data revealed clearly discernable *inverted* U-shaped patterns of learning that have been attributed by some (e.g., Carlucci et al, 2006; Jain & Stephan, 2006) to L2 learners' overgeneralizations of rule-based representations to new linguistic input precipitated, perhaps, by increased exposure to the target language, and a steadily declining mean % of errors for *number*. On the other hand, Lisa and Sandy's use of the three individual grammatical targets showed greater variability, not only when compared against the cross-sectional data, but

also when compared against each other. These differences may be attributable to the greater predictability of group tendencies over individual behavior (Han & Tarone, 2014, p. 2) and, perhaps more significantly, to the local, selective, and idiosyncratic nature of fossilization.

In sum, to answer Research Question 2, the overall findings suggest that in terms of (1) the participants' fluency and accuracy at different levels of proficiency and (2) the persistent errors identified, the cross-sectional and longitudinal data on persistent errors did indeed converge. However, this confluence was limited to the study's descriptive statistics. A more finely tuned TLU analysis of the participants' use of English articles, prepositions, and number revealed robust evidence of both inter- and intra-learner differential achievement, as will be demonstrated below.

5.2.3 RQ3: Evidence of Selective Fossilization

At the heart of the SFH is the idea that fossilization is local and selective, manifesting itself at the level of IL subsystems (e.g., morphosyntax). Hence, to answer the third research question, *Do the persistent errors identified in the longitudinal corpus provide evidence of selective fossilization?* a TLU analysis of the three linguistic targets – English articles, prepositions, and number – was conducted to look for evidence of local, or selective fossilization. Here “fossilization” was operationalized as the relative frequency of occurrence for non-target-like forms that persist in the later essays of the study participants, and “selective fossilization” as fossilization that affects, to varying degrees, only subsystems of a learner's IL.

As the previous chapter attests, the longitudinal case study uncovered pervasive evidence of selective fossilization both among and within the three grammatical targets.

For example, a TLU analysis of Lisa's overall use of articles, preposition, and number revealed pervasive evidence of intra-learner failure and success. On the one hand, Lisa's use of English *articles* at the end of the 28-month study was target-like only about 75% of the time, whereas her correct suppliance of *prepositions* was absolutely perfect at 100%. Moreover, differences were found in the developmental trends associated with each. For instance, whereas Lisa's target-like suppliance of *prepositions* followed a virtually perfect U-shaped developmental pattern of learning, unlearning, and relearning, her use of English *articles* took the opposite path – an inverted U-shaped trajectory in which target-like usage increased, then decreased, over time. Lisa's use of *number* also followed an inverted U-shaped developmental pattern, although the data points showed more variability for the former than for the latter.

There are a few possible reasons for the differences in these developmental trajectories. For example, as Gass et al. (2013) point out, U-shaped learning in L2 acquisition has been attributed to IL destabilization and restructuring and is a likely artifact of literacy training. At the same time, *inverted* U-shaped learning has been linked by some (e.g., Carlucci et al., 2006; Jain & Stephan, 2006) to learners' overgeneralizations of rule-based representations of new linguistic input occasioned by increased exposure to the target language. As noted above, both learning patterns were found in Lisa's IL data. It is argued here that as an instructed learner with 2.8 years residence in the U.S., continuous exposure to the target language, and regular opportunities to use it in a meaningful way, Lisa had drawn upon strategies gleaned both inside and outside the classroom to advance her acquisition of English.

In a similar way, Sandy's writing also revealed differential achievement in her use of the grammatical targets. Although Sandy's use of English articles, prepositions, and number had become increasingly target-like over the course of the study, evidence of differential failure and success was manifest throughout. For example, as the descriptive statistics graphically illustrate, the total percentage of *preposition and number* errors per essay remained virtually unchanged from the first writing sample to the last, despite Sandy's intense motivation to learn, 8 years' continuous exposure to the TL input, rigorous formal instruction, and sufficient opportunities for meaningful practice. On the other hand, Sandy's total percentage of *article* errors, which was as high as 12.1% early in the study, dropped to 6.7% for the fourth essay before falling to 0% for the fifth, written 20 months later. Hence, by the end of the study, after 56 months of near complete immersion in the TL at home, work, and college, Sandy's use of English articles was absolutely target-like, suggesting that her acquisition of English articles was complete.

A more granular TLU analysis of the longitudinal data revealed additional evidence of selective fossilization not only among, but also within, the three grammatical targets. Indeed, one of the most salient findings from this more focused analysis concerned the pronounced differences found in the participants' use of the articles in different linguistic environments, individual prepositions, and number by noun type. As an example, Lisa's correct suppliance of English articles ranged from total success for referential indefinites (100% accurate for the duration of the study), to complete failure (0% accurate) for articles in generic NPs. Moreover, Lisa's suppliance of 7 of the 11 different prepositions used in her essays was 100% target-like for the duration of the study, with virtually all non-target-like occurrences involving just two prepositions: *by*

and *for*. Finally, an in-depth analysis of Lisa's TLU use of number revealed marked differences in her use of count versus non-count nouns and regular versus irregular plural count nouns: namely, variable, non-target-like use of regular count nouns on the one hand, and target-like use of irregular plural count nouns (44 target-like uses out of 44 occurrences) and noncount nouns (29 target-like uses out of 30 occurrences), on the other.

Similarly, a TLU analysis of Sandy's writing also revealed both failure and success among and within the linguistic targets. For example, of the 18 different prepositions Sandy employed in her essays, 11 were used with 100% accuracy, while her suppliance of the remaining 7 ranged from 33% (*on*) to 97% (*of*). What is more, of the 13 preposition errors out of 158 total occurrences identified in the Sandy corpus, nearly all involved idiomatic expressions or direct translations from the L1.

These findings were not unexpected. For one, idiomatic expressions are “notoriously difficult” for language learners (Celce-Murcia & Larsen-Freeman, 1999, p. 39), not only because they require learners to extract the non-literal, nonobvious meaning of a phrase (e.g., *up in the air* = undecided), but also because they may be culture-specific (e.g., compare *The squeaky wheel gets the grease* with *The nail that sticks up gets hammered down*). In addition, many Spanish learners of English falsely assume a semantic equivalence between L1 and L2, resulting in errors involving a ‘mismatch’ in meaning (i.e., native language transfer). According to Lam (2018), one of the greatest challenges to learners concerns the “multiple and diverse meanings that can be expressed by a single prepositional form” (p. 1). Take the Spanish preposition *a*, for example. As Lam (p. 1) points out, 22 “senses” have been identified for the preposition *a*, which in

English can be translated, variously, as *at, for, on, to, unto, upon, and with* (*Cambridge English-Spanish Dictionary*). What is more, each of these English translations of *a* carries within it a myriad of (English) definitions and (Spanish) interpretations. Such contextual and semantic variability may help to shed light on Sandy's differential command of English prepositions in general, and, more particularly, the preponderance of transfer errors in her writing.

One additional example of intra-learner differential success could be found in Sandy's use of number. For instance, Sandy's suppliance of noncount nouns was 100% target-like from the first writing sample through the fourth, and 95.65% for the fifth. On the other hand, her suppliance of count nouns revealed not only less accuracy, but also more variability. Finally, Sandy also exhibited differential command of English articles in different linguistic environments. For example, although her suppliance of referential definites was 100% accurate for the duration of the study (i.e., 58 target-like uses out of 58 occurrences), her correct suppliance of articles in generic NPs (0% at the beginning of the study), never exceeded 66.67%. With regard to the latter, it is interesting to note that both Sandy and Lisa used very few generic NPs in their essays, and neither was able to use them reliably. What is more, neither Sandy nor Lisa attempted to use generic NPs in their later essays. Whether avoidance was to blame, or whether the rather concrete, experience-based nature of the topics played a part, remains undetermined.

5.2.4 RQ4: Predictions of the SFH

Taken together, the findings from the TLU analysis provided robust empirical evidence of intra-learner differential success and failure. Yet how can such selectivity be explained? According to Han (2013a), the consensus among SLA researchers is that L1

influence and neurobiological maturation (i.e., the “critical period” in SLA) are the two key factors driving fossilization (p. 2). Nevertheless, neither factor “alone or in combination” can account for the “selective character” of fossilization (p. 2). Hence, she contends that a viable theory of fossilization is needed to explain such selectivity, and that such a theory should “provide a concrete analytic tool” that can be applied in both “*a posteriori* analysis of learner data as well as *a priori* analysis of target constructions” (Han, 2014, p. 59).

The aim of the fourth research question, *Are the persistent grammatical errors identified in the longitudinal corpus consistent with the predictions of the SFH?* was to test the explanatory potential of the SFH. Once articles, prepositions, and number had been identified as the three most persistent grammatical errors in the learner data, the SFH was then applied in an *a posteriori* analysis of the target structures. First, persistence was determined vis-à-vis an examination of the learner data, revealing that errors in the use of the three linguistic targets continued to appear with some frequency in the participants’ writing, most notably in their later essays. Indeed, in all but two cases (i.e., Lisa’s use of prepositions and Sandy’s use of articles), the percentage of errors for all three grammatical structures remained strikingly similar from the participants’ first writing sample to their last. By the same token, however, an analysis of the learner data also uncovered evidence of improvement. For instance, descriptive statistics computed for Lisa revealed that preposition errors, while increasing in frequency from the first through third writing samples, decreased to 0% in the fourth (i.e., last) essay. Moreover, descriptive statistics for Sandy revealed a sharp decrease in the percentage of errors for article use, for example, from 12.1% in the second writing sample to 0% in the last.

Similar to the cross-sectional study, these findings were found to be consistent with predictions of the SFH. As in Part I, all three linguistic targets fell within Zone I, a “gray” area in Han’s model where individual difference variables such as memory and sensitivity can override input and L2 factors, resulting in either acquisition or fossilization of a given IL construction (Han, 2014). In the absence of information on individual differences and in view of the existing data and the SFH, it may be argued that errors in the participants’ use of articles, prepositions, and number would have situated them in Zone IV (the fossilization zone) if they had been more persistent in the writers’ later essays, or, conversely, in Zone II (the acquisition zone) had the frequency of the errors not exhibited such a noticeable decline. Hence, these initial findings were found to be consistent with the predictions made by the SFH. However, to test the hypothesis further and to potentially uncover additional insights regarding the nature of selective fossilization and the SFH, a more granular exploration of the target structures was conducted next. This more focused TLU analysis provided micro-evidence of selective fossilization and further validated the explanatory capacity of the SFH, as described below.

English articles were the first to be scrutinized. As described in the previous chapter, successful L2 acquisition involves not only the acquisition of target-like forms, but also the ability to map form-meaning-function relations in spontaneous communication. For this reason, articles, arguably one of the most frequent and pragmatically variable constructions in English, were subcategorized according to their appropriate use in different discourse conditions. Following that, prepositions were examined individually to see which, if any, proved most challenging for the participants.

Like articles, prepositions typically encode multiple meanings and assume different form-meaning-function relations in L1 and L2, making them “the source of some of the most common [and persistent] errors” among L2 learners (Lam, 2018, p. 1). Finally, two broad classes of nouns – count vs. noncount and regular vs. irregular – were distinguished to investigate the binary choice of singular vs plural noun in the expression of number. A discussion of the findings immediately follows.

To begin, empirical support for the SFH could be found in the participants’ use of articles in Type 1 (generic) NPs. Recall that in Huebner’s (1983) dynamic paradigm (described in depth in Chapter III and reprinted, in part, below), the semantic and pragmatic function of the NP determines the form of the article (*a/an, the, Ø*) used. According to Huebner, Type 1, or *generic*, nouns are marked with the definite, indefinite, or zero (*Ø*) article, as indicated below.

Type	Features	Environment	Articles	Examples
Type 1	[-SR, +RK]	Generic nouns	<i>a/an, the, Ø</i>	<i>A dog is a faithful animal. The washing machine is another creation of modern technology. Ø Amnesty is a good solution...</i>

In English, Type 1 (generic) NPs are relatively infrequent and variable, hence non-robust in Han’s model. Indeed, only 5 occurrences of article use in Type 1 NPs could be found in the entire longitudinal corpus, each requiring the participant to choose one of four article options: *a, an, the*, or *Ø*. Conversely, the counterpart of the English generic (Type 1) NP is more frequent in Spanish than it is in English (Butt & Benjamin, 2013, p. 30); moreover, it is invariable, allowing the definite article only (Comrie, 1983; Ionin & Montrul, 2010; Snape, Leung & Ting, 2006). As such, it may be considered unmarked in the L1. Therefore, in accordance with the predictions of the SFH, article use within

generic (or Type 1) NPs would fall into Zone IV, making it susceptible to fossilization in Spanish-English IL.

These predictions were borne out in the longitudinal data for both Lisa and Sandy, whose article use in Type 1 NPs was less target-like than in any other. Specifically, in a TLU analysis of article use, Lisa's correct suppliance of articles within Type 1 NPs was 0% for the duration of the study. By comparison, her suppliance of articles in Type 2, Type 3, Type 4, and Type 5 NPs ranged from 50% to 75% correct by the end of the study. Similarly, Sandy's use of Type 1 nouns in the fifth (i.e., final) writing sample was target-like only 50% of the time. This was considerably lower than her more target-like use of articles in Type 2, Type 3, Type 4, and Type 5 NPs, which ranged from 80.7% to 100%.

Support for the SFH could also be found in Sandy's use of articles in Type 2 NPs:

Type	Features	Environment	Articles	Examples
Type 2	[+SR, +RK]	Referential definites previous mention	<i>the</i>	<i>The</i> Pope; <i>The</i> President; <i>The</i> sun; Residents of the US say...I agree with <i>the</i> residents...

Recall that Sandy's suppliance of referential definites was 100% correct (i.e., 58/58 target-like occurrences) across the board, with 37 target-like uses occurring in the fifth writing sample alone. According to the SFH, referential definites would be considered robust in L2 English, as they are frequent and relatively invariable. The reason is because unlike most instances of article use in English, form-meaning-function mapping for referential definites is relatively transparent, in all cases requiring one form (*the*), with

one meaning (a specific referent known to both the speaker/writer and hearer/reader) as determined by the physical or linguistic context (i.e., previous mention).

In contrast to this, referential definites may be considered quite marked in Spanish; that is, although they are frequent in the L1, their form is quite variable. Compared to English, which has only one form for the definite article, Spanish has four (*el, la, los, las*), each of which must agree with the number and grammatical gender of its noun. Moreover, the choice of definite article in Spanish can also be influenced by its phonological environment. For instance, when the initial phoneme of a feminine singular noun is the stressed vowel /a/ or /ha/, the masculine definite article is required (e.g., *el agua*); however, when the same noun appears in the plural form, the feminine definite article is used (*las aguas*). Based on these observations, referential definites would fall into Zone II, the acquisition zone in Han's model, a projection clearly supported by Sandy's consistently target-like use of articles in Type 2 NPs.

In addition to findings related to the participants' use of English articles, support for the SFH could also be found in their differential command of English prepositions, as demonstrated by Lisa's use of the preposition *to* with the verb *give* in sentences 9 and 13, reprinted below:

9. * "US government should give **to** all *illegal students* (IO) *permission to study* (DO) in the US. [give \emptyset all illegal students...]

13. * "Those people...just want to give *a better life* (DO) \emptyset *their family* (IO)." [give a better life **to** their family]

In sentence 9, Lisa supplies an English preposition (*to*) where none is needed, a likely transfer error from L1 Spanish, which requires that the Spanish counterpart of the English verb *give* (i.e., *dar*) be followed immediately by the preposition *a* (translated here

as *to* in English) plus an object NP. In sentence 13, however, which also includes the ditransitive English verb *give* but includes *two* object NPs, Lisa uses the correct form in the first NP by placing the direct object (DO) immediately after the verb, but then omits the obligatory preposition *to* before the indirect object (IO).

This example also offers support for the SFH. For one, ditransitive verbs like *give*, which “either require or allow two object NPs to complete their argument structure (or meaning)” (Celce-Murcia & Larsen-Freeman, 1999, p. 108), are non-robust in English, that is, relatively infrequent³ and variable. As an example, *give*, which in some linguistic contexts requires only one object NP, e.g., *The candidate gave a **speech** (DO)*, can also require two, e.g., *The officer gave **him** (IO) a **ticket** (DO)*. Moreover, in sentences for which *give* allows two object NPs, the IO can be expressed in two ways based on discourse-pragmatic conditions (i.e., \pm focus): (1) it can be embedded in a prepositional phrase (PP), e.g., *John gave a gift (DO) to **Mary** (IO)*, or (2) it can immediately follow the verb, e.g., *John gave **Mary** (IO) a gift (DO)*. On the other hand, the *transitive* Spanish verb *dar* (translated *give* in English) is unmarked (i.e., frequent⁴ and invariable) in Spanish, as it requires only one object NP and allows only one option for expressing the IO – namely, by embedding it in a prepositional phrase: *John le dio un regalo (DO) a **Mary** (IO)*. Recall that according to the SFH, linguistic items that are unmarked (i.e., frequent and invariable) in the L1 and non-robust (i.e., infrequent and variable) in the L2

³ The number of English ditransitive verbs ≈ 77 , or approximately 0.002% of an estimated 36,000 English verbs as per the UNSW Website (<https://www.cse.unsw.edu.au/~billw/ditransitive.html>) and *Old English Dictionary*, 2nd Edition.

⁴ *dar* is the 10th most frequently used verb in Spanish and is ranked #39 in overall frequency (Davies & Davies, 2018).

input are prone to fossilization, situating them in Zone IV of Han's model. Hence, the SFH would predict that errors involving the preposition *to* with the ditransitive English verb *give* are susceptible to fossilization in Spanish-English IL, as appears to be the case here.

The participants' use of count and noncount nouns also supported the SFH. For example, Lisa's use of noncount nouns was 100% correct from the second through the fourth writing samples, whereas her target-like use of count nouns at the end of the study was only 88.9%. Similarly, Sandy's use of noncount nouns in English was absolutely target-like (i.e., 100% accurate) from the first writing sample to the fourth and virtually target-like (i.e., 99.65% accurate) for the fifth; on the other hand, her use of count nouns revealed more variability and less accuracy overall. This finding, too, was consistent with the predictions of the SFH. Recall that the SFH predicts that L2 elements that are infrequent and variable (i.e., marked) in the L1 but frequent and invariable (i.e., robust) in the L2 are acquirable. Given that English noncount nouns appear only in the singular, their form may be considered *invariable*. What is more, as the *COCA* and *North Star* textbook corpuses attest, noncount nouns are surprisingly frequent in the L2 input. In addition to those that have only a singular form (e.g., furniture, advice, courage), there are many English nouns that are \pm count depending on their meaning and context (e.g., the *pain* of loss, aches and *pains*; loss of *concentration*, *concentrations* in math and science, wins and *losses*). Therefore, since English non-count nouns appear only in the singular and are relatively frequent in the TL input, they may be characterized as robust in the L2 (i.e., relatively frequent and invariable).

Conversely, noncount nouns are infrequent in Spanish. Moreover, since unlike their English counterparts, “All Spanish nouns can appear in both numbers: singular and plural” (Marrero & Aguire, 2003, p. 279), their form may be regarded as more variable as well. As a result, noncount nouns may be considered relatively *marked* in the L1, situating them in Zone II of Han’s model, where acquisition is expected to prevail. Indeed, such was the case with the participants’ consistently target-like use of English noncount nouns, as the longitudinal data attests. At the same time, count nouns, which are frequent and variable (hence, *quite robust*) in L2 English and frequent and invariable (hence, *unmarked*) in L1 Spanish, would fall into Zone I, a neutral zone, where L2 input conditions and L1 influence can be superseded by individual difference variables (Han, 2013a). Here, too, the predictions of the SFH were borne out by the learner data, as evidenced by both the inter- and intra-learner selectivity found in the participants’ use of count nouns throughout the study. Taken together, these findings were consistent with the predictions of the SFH and offered further validation for the hypothesis.

There was, however, one finding that appeared to be at variance with the predictions of the SFH, namely, the participants' use of irregular plurals. In English, irregular plural count nouns (e.g., mice→mouse, man→men) are quite variable⁵ in form and relatively infrequent, thus non-robust in the L2. In contrast to this, irregular plurals in Spanish are virtually non-existent (Sofer & Raimés, 2002); therefore, their usage may be classified as marked in Han’s model. Based on these properties, irregular plural count

⁵ The ESL grammar workbook, *Grammar in Context 3* (Elbaum, 2015), classifies irregular noun plurals into 8 types: vowel change, no change, different word form, *us*→*i*, *is*→*es*, *ix*→*ices* or *ixes/ex*→*ices* or *exes*, *um*→*a* *ion*→*a/on*→*a*, and *a*→*ae* (Appendix F, p. AP10).

nouns would fall into Zone IV, the fossilization zone. Regular plural count nouns (e.g., bird→birds), however, are frequent and invariable in English (robust in L2) as well as Spanish (unmarked in L1), placing them in Zone I, also a neutral zone in Han's model, where fossilization or acquisition can result. However, the participants' use of regular and irregular plurals would seem to follow a different path. For example, Lisa's use of irregular plural count nouns was 100% correct (i.e., 44 target-like suppliance out of 44 total occurrences) throughout the 28-month study, whereas her suppliance of regular count nouns revealed considerably more variability and less accuracy, never quite reaching target-like proficiency. Similarly, Sandy's use of irregular plurals was 100% target-like in all but the second writing sample (i.e., 100 target-like suppliance out of a total of 102 occurrences). Importantly, no errors in the use of irregular plurals were found from the third writing sample to the fifth/last, a period of 3½ years. According to the predictions of the SFH, we would have expected to see persistent errors involving irregular plural count nouns in the participants' writing (particularly in their later essays) where none, in fact, were found. Nevertheless, it is important to remember that fossilization is not only construction- and language-specific, but also learner-specific (Han, 2014), which would account for not only the inter- but also the intra-learner differences found both here and throughout the study. Since individual difference variables were not taken into account in the present study, it was not possible to know for certain whether this finding was, in fact, in conflict with the predictions of the SFH, or whether it was the result of a problem with the study's design.

To conclude, taken together, these findings suggest that the persistent grammatical errors identified in the longitudinal corpus were largely consistent with

predictions of the SFH, providing empirical support for the hypothesis. Some implications of these findings, along with a discussion of the study's limitations and recommendations for further research, are presented next.

Chapter VI

CONCLUSION

As noted in Chapter 1, fossilization, a defining characteristic of second language acquisition, is an inescapable reality for virtually all L2 learners. Early conceptualizations (e.g., Selinker, 1972; Selinker and Lamendella, 1978) characterized fossilization as a global phenomenon; hence, until fairly recently, researchers “essentially neglected intra-learner success or failure,” creating a void in the literature that is only gradually being filled (Han, 2014, p. 69). The study presented in this dissertation attempted to help fill this void by providing empirical evidence of intra- and inter-learner differential achievement (and, it will be argued, selective fossilization) and interpreting it in light of SFH.

This chapter begins with a summary of the study’s key findings, then examines some theoretical, methodological, and pedagogical implications for L2 researchers and practitioners. The following section assesses the study’s limitations and offers some suggestions for future research, and the final section concludes the dissertation.

6.1 Summary of Main Findings

As noted above, this study aimed to identify persistent errors in the writing of L1 Spanish learners of academic English and interpret them by way of the SFH. The study followed a two-pronged approach consisting of a cross-sectional analysis of 60 learners from three proficiency levels and a 28- and 56-month longitudinal case study of two individual learners, yielding some key findings.

First, independent analyses of the cross-sectional and longitudinal data identified English articles, prepositions, and number as the three most persistent grammatical errors in the spontaneous written output of the study participants. Moreover, the overall fluency and accuracy of the participants' writing was found to improve with increased proficiency, revealing additional confluence between the findings.

The study also produced evidence of selective fossilization, particularly in Part II, where statistics describing the participants' overall use of articles, prepositions, and number uncovered evidence of inter- and intra-learner differential success *among* the linguistic targets. A subsequent TLU analysis of the longitudinal data resulted in similar findings, providing additional evidence of selectivity. Lastly, a more focused TLU analysis of the learner data in Part II uncovered micro-level evidence of differential achievement *within* the linguistic targets: here distinct differences in the participants' use of articles in different linguistic environments, individual prepositions, and number by noun type underscored the selective nature of fossilization, as evidenced by the coexistence of success and failure in the learners' IL.

Importantly, findings from both the cross-sectional and longitudinal phases of the study were found to be consistent with the predictions of the SFH. For one, all three target structures were found to persist in the participants' writing despite a pronounced decline in their frequency. Additionally, all were found to be quite unmarked in L1 and quite robust in L2, situating them in Zone I in Han's model, a "gray area" where either fossilization or acquisition may prevail (Han, 2014). According to the SFH, L2 features that fall into Zone II, the acquisition zone, would not be expected to persist in the

participants' written output, nor would we expect to see such a marked decline in the frequency of errors for L2 features falling into Zone IV, the fossilization zone.

Further validation for the SFH could be found in the more granular analysis of the longitudinal data conducted in Part II. An *a posteriori* analysis of noncount nouns and articles in Type 2 NPs (referential definites) situated both in Zone II (the acquisition zone) based on their respective properties (i.e. robust in L2 and marked in L1), which would account for the participants' consistently target-like use of each. On the other hand, an *a priori analysis* of article choice in Type 1 (generic) NPs (unmarked in L1 and non-robust in L2) placed them in Zone IV of Han's model – that is, susceptible to fossilization. This prediction, too, was borne out by the learner data for both study participants, whose article use within Type 1 NPs was less target-like than any other.

One unexpected finding concerned the participants' use of irregular plural count nouns, an L2 feature that is non-robust (i.e., variable in form and relatively infrequent) in the TL input and quite marked (i.e., infrequent and invariable) in the L1. Based on these properties, errors involving irregular plurals should have been more persistent in the longitudinal data, yet Lisa's use of irregular plural count nouns was consistently target-like for the duration of the study, and, apart from the second essay, Sandy's was completely target-like as well. Nevertheless, as Han (2013a) points out, fossilization is inherently contingent and idiosyncratic. Therefore, "combinations of L1 characteristics and L2 input conditions can vary from learner to learner, and, likewise, for the different domains and subsystems of an individual learner" (p. 4).

In sum, the afore-mentioned exception notwithstanding, key findings from the cross-sectional and longitudinal phases of the study were found to be largely consistent

with the predictions of the SFH, presenting robust and pervasive evidence of selective fossilization and providing empirical support for the hypothesis. Some implications for L2 research and pedagogy are presented next.

6.2 Implications of Study

A number of implications for second language theory, research, and practice may be gleaned from this research. First, as regards L2 theory, the results of the longitudinal case study, in particular, provide evidence of selective fossilization both among and within the linguistic targets, lending credence to Han's (2014) assertion that success and failure coexist within the IL of any given L2 learner (p. 54). In this way, the findings contribute to the more current literature (e.g., Han, 2004, 2009, 2013b; Lardiere, 2006, 2007, 2012; Long, 2003; and Sorace, 2005, 2011) challenging earlier claims, first proposed by Selinker (1972), that the "entire IL competences" of individual learners can fossilize (p. 217). This understanding of fossilization as a local rather than global phenomenon has implications not only for second language theory, for which fossilization is a foundational construct, but also for second language practice, as will be discussed below.

Another theoretical implication involves the SFH itself. In addition to providing robust evidence of selective fossilization, the current study also offers empirical support for the SFH. As Han (2013b) explains, validation of the hypothesis could be provided in two ways: first, by applying the SFH retroactively to a linguistic usage that has already proven fossilizable, and second, by making specific predictions about the fossilizability or acquirability of a given usage and testing them against the SFH (p. 146). With regard

to the former, Han (2013b, 2014), reports that she has already procured preliminary support for the hypothesis by applying the SFH retroactively to several reportedly fossilizable structures gleaned from current L2 research representing a number of different L1-L2 pairings (see Han, 2013b for discussion). As regards the latter, Han (2013b) asserts that researchers can elicit support for the SFH through a corpus analysis of contextualized, naturalistic production data representative of the input to which the learner has been exposed (p. 146). More specifically, she cites the need for future research, both cross-sectional and longitudinal, that examines the interaction between “the target construction[s], L2 input, and L1 influence” (p. 165). The present investigation, which used naturalistic data and both cross-sectional and longitudinal analyses to examine the interplay of input, L1, and the three target constructions of prepositions, articles and number, endeavored to satisfy these conditions.

The research findings also have some implications for L2 research and methodology. For one, with its focus on persistent errors in the academic writing of post-secondary learners, the study contributes to our understanding of a population and genre researchers have largely overlooked in the past. Moreover, the confluence of findings between the cross-sectional and longitudinal data concerning persistent errors warrants further investigation. If future research confirms that cross-sectional and longitudinal analyses of naturalistic data in specific L1-L2 pairings are equally useful for identifying persistent errors, then cross-sectional studies could prove a viable option for studying persistence.

Additionally, certain pedagogical implications may also be gleaned from the research. With its focus on native speakers of Spanish, the present study provides some

insight into the L2 development of one of the country's largest and fastest-growing populations of instructed L2 learners. Moreover, as noted above, the numerous examples of intra- and inter-learner variability in the longitudinal data contribute to a growing body of evidence refuting the existence of global fossilization. Moving forward, it is hoped that converging evidence of selective fossilization from the present and earlier studies will help to dispel the myth of the "fossilized learner" (Han, 2013a; Long, 2003) - students wrongly labeled "unteachable" by L2 practitioners on the basis of casual observation and questionable criteria.

Lastly, the research findings provide empirical support for the SFH, which has shown promise in identifying potentially fossilizable structures for a number of L1-L2 pairings (Han, 2013b, 2014). This last point has important implications for L2 practitioners, who, forearmed with an understanding of which IL features are most vulnerable to fossilization and which may be more amenable to instruction, can endeavor to set more realistic instructional goals for their students, develop more learner-centric curricula, modify learner input, and respond to learner output in more effective ways (Finneran & Lew, 2009).

6.3 Limitations and Future Directions

As noted above, the present study provides evidence of selective fossilization (i.e., the occurrence of fossilization at the level of IL subsystems) and offers empirical support for the SFH. The significance of these findings must, however, be weighed against the studies' limitations, which point, in turn, to several possibilities for future research.

One limitation concerns learner differences. In the present study, no attempt was made to examine individual difference variables such as sensitivity to TL input and working memory capacity, both of which can override input and L1 factors for IL constructions falling within Zones I and III (i.e., the two “neutral” zones) of Han’s model. For example, in the current study, two of the three target structures (i.e., prepositions and articles) are frequent and variable both in L1 and L2. As a result, prepositions and articles are considered *quite unmarked* in L1 Spanish and *quite robust* in L2 English, situating them into Zone I, where either fossilization or acquisition may prevail (Han, 2014). In a similar way, the third linguistic target, number, though frequent and variable (i.e., *quite robust*) in L2 English and frequent and *invariable* in L1 Spanish (i.e., *unmarked*), also fell into a neutral zone (Zone I), where acquisitional outcomes are less clear-cut. Had data on individual differences such as sensitivity and memory been collected from the two participants in the longitudinal study, a more informed and nuanced interpretation of their acquisitional outcomes might have been possible. Future research that examines the role of individual learner differences in the SFH would therefore be of value.

An additional limitation concerns the study’s top-down, etic approach to data analysis. It must be conceded that by using external norms (i.e., the target language grammar) to guide her analysis of the data, the researcher was guilty of the “comparative fallacy” (Bley-Vroman, 1983), “the mistake of studying the systematic character of one language [the learner’s developing system, or IL] with another [the target system, or TL]” (p. 6). Indeed, it may be argued that the researcher who adopts the TL as a reference point in her or his data analysis has failed to recognize a fundamental assumption of IL

analysis: namely, that “the learner’s system is worthy of study in its own right” and is not simply a “degenerate form” of the TL (p. 4).

Nonetheless, it would be a mistake to say that such comparisons should never be made. Indeed, some of the best studies of learner language (e.g., Han, 1998, 2000, 2006; Lardiere, 1998, 2006, 2007; Long, 2003) have used such comparisons. Lardiere (2003), for one, has defended comparisons between TL and IL, claiming that “both the external linguistic environment (which happens to reflect the output of native speaker systems) and the learner’s own internal systematicity have important roles to play,” and warning that we should not ignore one at the expense of the other (p. 140). Moreover, as James (1998) aptly notes, learners are typically targeted on TL norms anyway, and in the process of learning an L2, frequently conduct “cognitive comparisons” of their own (Ellis & Barkhuizen. p. 61).

For the current study, justification for comparing the learner data against external norms may be found in the nature of the research itself. The present study was fundamentally an error analysis: its principal aim, as reflected in the research questions, was to identify persistent errors¹ in the participants’ writing and to compare them against the predictions of the SFH.² Hence, it is argued that using external norms to guide the analysis of the data was necessary. Finally, when one considers that Selinker and Lamendella have defined fossilization as “a permanent cessation of IL learning before the

¹ Because the focus of the study was academic writing, the term “error” was defined as a linguistic usage that would not (under similar conditions of production) be produced by a native speaker using a variety (e.g., Standard Written English) of Standard American English.

² Indeed, the “goal” of the SFH, as described by Han (2014, p. 61) is “to account for and predict intra-learner (and inter-learner, to a lesser extent) differential success.”

learner *has attained TL norms at all levels of linguistic structure and in all discourse domains*” (1978, p. 187, italics added), it is hard to imagine a fossilization study that would not require such analyses.

Another limitation of the present study is the relative lack of attention paid to L2 input, one of the two “cardinal variables” of the SFH (Han, 2014, p. 62). Han, who maintains that input is not isomorphic with the TL, as is often assumed (2009, 2011, 2013; Han & Lew, 2012), points to the virtual absence of empirical investigations of TL input as a “major gap in the SLA research” (Han, 2013b, p. 165). However, despite the need for such studies, Han acknowledges the difficulties inherent in documenting learner input, which she characterizes as a “moving target” often eluding reliable and accurate description (p. 146). In the present study, the investigation of L2 input was limited to an examination of two corpora: the *Corpus of Contemporary American English (COCA)* (Davies, 2008) and a unit from the participants’ ESL textbook, *North Star Reading and Writing* (Barton & Sardinas, 2004), which was included as a representative sample of L2 input.³

Although a detailed analysis of learner input was beyond the scope of the current investigation, a closer examination would have allowed for a more thoughtful interpretation and discussion of the findings. For one, it would have been helpful in deciding whether a non-target-like usage was the result of incomplete acquisition (i.e., fossilization) or “successful” acquisition of a non-standard usage in the L2. For example, both Lisa and Sandy lived in towns where a non-standard dialect of English is natively

³ Both the *COCA* and *North Star* corpora were used to assess the relative frequency (i.e., the quantitative property) of a given linguistic usage in the written production data.

spoken. As a result, it was not always possible to determine if a non-target-like usage (e.g., **The resident have; *she don't; *two of her friend*) was evidence of fossilization, or whether it was more likely the result of continuous exposure to a non-standard dialect of the TL. Future studies of the SFH would therefore do well to delve more deeply into the nature of learner input, so they may provide more accurate interpretations of the data and more fully capture the “subtle yet significant” interaction between the L1 and the L2 (Han, 2014).

The example above points to another of the study’s limitations, namely, the lack of attention paid to socio-affective factors (e.g., the influence of the learners’ speech community on L2 acquisition). Language is a social construct, and it goes without saying that this study would have been richer, and its findings more meaningful, had the sociocultural (e.g., systemic racism, lack of acculturation, perceived status of the learners’ culture) and sociolinguistic factors impacting language learning been taken into account. Future studies that address such issues would arguably allow for more a complete and nuanced interpretation of the data.

One further limitation concerns the length of one of the longitudinal case studies. With only 28 months between the first and last elicitation events, the duration of Lisa’s case study may have been less than optimal, as it just barely met Selinker’s two- to five-year minimum for fossilization studies (Long, 2003; Selinker, 1992; Selinker & Lamendella, 1978). It is important to note that when the study ended, Lisa was still in college, still receiving implicit *and* explicit instruction in English, and still immersed in the TL culture. Therefore, it is reasonable to assume that she was still actively acquiring the language. As a result, it is not possible to know for certain whether the persistent

errors identified in Lisa's writing were truly proof of fossilization, or whether they would be more accurately understood as evidence of interlanguage stabilization. Extending longitudinal research over a longer period – for example, five years or more⁴ – would yield richer data, allowing the future researcher to make a stronger, more compelling case for fossilization.

6.4 Conclusion

The primary objective of the study presented in this dissertation was to contribute to our current understanding of fossilization by examining persistent errors in the academic writing of L1 Spanish learners of English and explaining them in light of Selective Fossilization Hypothesis (SFH) (Han, 2009, 2013b), the theoretical framework of the study. The study followed a two-pronged approach consisting of a cross-sectional analysis of 60 learners from three proficiency levels and a 28- and 56-month longitudinal case study of two individual learners. In both cases, naturalistic production data consisting of timed college essays were collected at the research site and analyzed quantitatively to identify persistent errors in the participants' writing. Following that, a more finely grained TLU analysis was conducted, revealing robust, pervasive evidence of inter-learner selectivity and intra-learner variability both among and within the linguistic targets and providing empirical support for the SFH. Several implications for second language theory, methodology, and pedagogy were discussed, and recommendations for future research were made in view of the study's limitations.

⁴ cf. Han, 1998, 2000, 2006; Lardiere, 1998, 2006, 2007; Long, 2003.

Looking back, the study may be said to contribute to our understanding of fossilization in a number of ways. First, a few characteristic features serve to distinguish the present research from earlier studies. For example, its focus on academic writing at the post-secondary level helps fill a gap in the literature, and its concentration on native speakers of Spanish adds to our understanding of one of the fastest growing populations of L2 learners. What is more, the use of naturalistic data lends ecological validity – the extent to which the findings may be generalized to real-world settings – to the research, and the inclusion of both cross-sectional and longitudinal data allows for cross-validation of the findings. In addition, by offering empirical support for selective fossilization, the study challenges earlier conceptualizations of fossilization as a global phenomenon and helps put to rest the myth of the “fossilized” (i.e., “unteachable”) learner. More importantly, the study presented in this dissertation uncovered persistent errors in the participants’ writing, particularly at the level of interlanguage subsystems, that were in many cases consistent with the predictions of the SFH, shedding light on its explanatory potential and the validity of the hypothesis itself.

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Appendix A

ESL Placement Rubric, College English Program, Levels 1-4

LEVEL 4: Writer presents a thesis with a pattern of organization to support his/her assertion, and its development is sustained by examples. Paragraphing is present and reflects the essay's organization, although subtopics may not be fully developed. The conclusion should not be a literal repetition of the introduction. Transitions are used to achieve coherence, but not consistently. Vocabulary, tone, and diction are adequate to good. **Most importantly, syntax, verb usage, word form, and sentence boundaries are fundamentally correct, although errors in prepositions, articles, and idiomatic expressions may persist.** (3 credit hours. *This essay qualifies the student for an **Advanced** English writing class, i.e., ENGLISH 101.*)

LEVEL 3: Writer presents a thesis with a pattern of organization to support his/her assertion, but the ideas may not be developed sufficiently. Although there is a sense of paragraphing with some support of relevant details, subtopics generally lack development and argumentation can be weak. Transitions may be used, although perhaps not consistently or correctly. **This essay is distinguished from a level 2 essay by the writer's fluency and control of English syntax, verb usage, and word form. However, the level 3 essay lacks the language proficiency of the level 4 essay. Most commonly noted are errors in sentence boundaries and subject-verb agreement. As in all ESL writing, errors in prepositions, articles, and idioms may persist.** (3 credit hours. *The student should be ready for English 101 with only a three-hour course. This essay qualifies the student for **Low-Advanced** English writing class.*)

LEVEL 2: Writer is able to introduce a main idea and follow through by staying on topic. Although there is a sense of organization and paragraphing, sufficient support may be lacking. Transitions may be used, although perhaps not consistently or correctly. **This essay is distinguished from a level 1 essay by the writer's control of basic English syntax and word form, by the absence of word-for-word translation, and by the writer's proficiency in the simple tenses (present, past, future), the present and past continuous, modals in the present tense, and habitual past. The present perfect, present perfect continuous, and modals in the past are used, although perhaps not proficiently. As in the level 3 essay, errors in sentence boundaries and subject-verb agreement are likely to be present; however, the level 2 essay lacks the fluency and ease of expression of a level 3 paper.** As in all ESL writing, errors in prepositions, articles, and idiomatic expressions may persist. (6 credit hours. *The student should be ready for English 101 in 15 weeks with a six hour course. This essay qualifies the student for . **High-Intermediate** English writing class.*)

LEVEL 1: Writer *may* present a main idea and follow through by staying on topic. However, while paragraphing and support can be adequate, **this essay is distinguished from a level 2 essay by the writer's use of non-English syntax, word-for-word translation, and by the frequency of errors, particularly in verb form and word form.** In some cases, the essay may be too brief to judge. (*This essay indicates that the student's ability to benefit from instruction within the English Department is in serious question; therefore, the student will be placed into **Pre-College Language Immersion Program.***)

Appendix B

Pre-College Language Immersion Program Placement Rubric, Levels 1-4

	Subject/ Verb Agreement	Verb Tense	Sentence Boundaries	Syntax	Word Forms	Compre- hensibility	Vocabulary
LEVEL 1 BASIC	little to no correct subject/verb agreement	little or no use of proper verb tense	little or no use of correct sentence boundaries	little or no use of correct syntax	little or no use of proper word forms	low comprehensibility	little or no correct use of advanced vocabulary
LEVEL 2 LOW	limited use of correct subject/verb agreement	limited use of proper verb tense	limited use of correct sentence boundaries	limited use of correct syntax	limited use of proper word forms	variable comprehensibility	correct but infrequent use of advanced vocabulary
LEVEL 3 MID* *[low-intermed. in study]	variable use of correct subject/verb agreement	variable use of proper verb tense	variable use of correct sentence boundaries	variable use of correct syntax	variable use of proper word forms	general comprehensibility	correct and occasional use of advanced vocabulary
LEVEL 4 UPPER	consistent use of correct subject/verb agreement	consistent use of proper verb tense	consistent use of correct sentence boundaries	consistent use of correct syntax	consistent use of proper word forms	superior comprehensibility	correct and frequent use of advanced vocabulary

Appendix C

Adaptation of Swan & Smith's (2001) Coding Rubric

SYMBOL	Meaning	Domain
Art	<i>Error in article use</i>	G
Cap	<i>Error in use of capital letter</i>	O & P
p/CS	<i>Punctuation error: Comma Splice</i>	O & P
p/Fr	<i>Punctuation error: Sentence Fragment</i>	O & P
Id	<i>Error in use of idiomatic expression</i>	[V]
Inf	<i>Error in use of infinitive</i>	G
M	<i>Modal error</i>	G
Neg	<i>Negation error</i>	G
#	<i>Error in number</i>	G
P	<i>Punctuation error</i>	G
PhV	<i>Error in use of phrasal (2- and 3-part) verbs</i>	G
pn	<i>Pronoun error</i>	G
Poss	<i>Possession error</i>	G
Prep	<i>Preposition error</i>	G
Q	<i>Error in question formation</i>	G
p/RO	<i>Punctuation error: Run-On sentence</i>	G
S/d	<i>(Double subject)</i>	G
S/m	<i>(Missing subject)</i>	G
Sp	<i>Spelling error</i>	O & P
S/V	<i>(Error in agreement of subject and verb, 3ps)</i>	G
T	<i>Error in verb tense/aspect</i>	G
V	<i>(Verb missing)</i>	G
Vc	<i>Vocabulary error</i>	V
WF	<i>(Word form error)</i>	G
WO	<i>Word order error</i>	G
?	<i>Meaning is unclear</i>	G, V, O & P

Domain Key (Swan & Smith, 2001):

G = Grammar**O & P** = Orthography and punctuation**V** - Vocabulary

Appendix D

Error Tally Sheet

Subject: L3-10a ('Lisa')		Level: LNC 013 (Chile)	
Total # Words	Total # Errors	Total % Errors	
280	54 errors	19.3%	
ERROR	TALLY	# TARGETED ERROR	% TARGETED ERROR
Art		6	11.1
Cap		2	3.7
p/CS			
p/Fr		3	5.5
Idiom			
Inf		3	5.5
M			
Neg			
#		9	16.7
P		3	5.5
PhV			
pn		1	1.9
Poss			
Prep		2	3.7
Q			
p/RO		5	9.3
S/d			
S/m		1	1.9
Sp		2	3.7
S/V		3	5.5
T		5	9.3
V		1	1.9
Vc		2	3.7
WF		2	3.7
WO			
?		4	7.4
		54	100%

placement Exam 8/7/09