Infinitivals at the End-State

Evidence for L2 Acquisition of English Non-finite Complementation

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THESIS

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### Abbreviations

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<th>Description</th>
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<tbody>
<tr>
<td>BNC</td>
<td>British National Corpus</td>
</tr>
<tr>
<td>COCA</td>
<td>Corpus of Contemporary American English</td>
</tr>
<tr>
<td>CP</td>
<td>Complementizer Phrase</td>
</tr>
<tr>
<td>DDL</td>
<td>Data-Driven Learning</td>
</tr>
<tr>
<td>DELE</td>
<td>Diploma de Español como Lengua Extranjera (Diploma of Spanish as a Second Language)</td>
</tr>
<tr>
<td>DO</td>
<td>Direct Object</td>
</tr>
<tr>
<td>DP</td>
<td>Determiner Phrase</td>
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<tr>
<td>ECM</td>
<td>Exceptional Case Marking</td>
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<tr>
<td>EPP</td>
<td>Extended Projection Principle</td>
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<tr>
<td>ESL</td>
<td>English as a Second Language</td>
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<td>IO</td>
<td>Indirect Object</td>
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<tr>
<td>L1</td>
<td>First Language</td>
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<td>L2</td>
<td>Second Language</td>
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<tr>
<td>ObjC</td>
<td>Object Control</td>
</tr>
<tr>
<td>PCFG</td>
<td>Probabilistic Context-Free Grammar</td>
</tr>
<tr>
<td>RDH</td>
<td>Representational Deficit Hypothesis</td>
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<tr>
<td>RtoO</td>
<td>Raising to Object</td>
</tr>
<tr>
<td>TP</td>
<td>Tense Phrase</td>
</tr>
<tr>
<td>T_{defP}</td>
<td>Deficient Tense Phrase</td>
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<tr>
<td>UCM</td>
<td>Unified Competition Model</td>
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<tr>
<td>vP</td>
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SUMMARY

This dissertation investigated the knowledge of English non-finite complementation by near-native Spanish-speaking (L1) learners of English (L2). In particular, this study concerned Object Control(i), Raising to Object(ii), and for-type constructions(iii).

(i) I persuaded John to be honest.  Object Control (Copular)
(ii) I believed John to be honest.  Raising to Object (Copular)
(iii) I wanted (for) John to be honest.  For-type (Copular)

Although the three constructions look identical on the surface, they have distinct syntactic configurations. The different configurations result from differences in selectional properties, which can be detected using various tests. First, only Object Control(iv) disallows expletives.

(iv) * I persuaded there to be a chance for peace.  Object Control(Expletive)
(v)  I believed there to be a chance for peace.  Raising to Object(Expletive)
(vi) I wanted (for) there to be a chance for peace.  For-type(Expletive)

Second, they differ with regard to the type of verbs in their complements (vii-ix).

(vii) I persuaded John to run a mile.  Object Control(Non-stative)
(viii)* I believed John to run a mile.  Raising to Object(Non-stative)
(ix) I wanted (for) John to run a mile.  For-type(Non-stative)

Whereas Raising to Object has no expletive restriction (v), it is the only type that disallows bare non-stative complements (viii). Finally, for-type constructions have no restrictions but allow an optional overt complementizer (iii,vi,ix). Examples (iv-ix) demonstrate that the three types are distinct.

This dissertation studied the L2 acquisition of these constructions because they are not commonly taught in the classroom; instead, their acquisition relies on input and L1 knowledge. Further, a subset—Raising to Object—is highly infrequent. Because Raising to Object is
acquired by L1 speakers, their infrequency does not block L1 attainment. Evidence of L2 acquisition of Raising to Object would suggest that L1 and L2 acquisition are qualitatively similar because L2 acquisition can also be achieved for structures that are extremely infrequent. This dissertation provides exactly this type of evidence: 19 near-native L1 Spanish L2 English learners exhibit sensitivity to subtle, highly infrequent restrictions in non-finite complementation. This finding runs counter to proposals that predict that the mechanisms used in L1 and L2 acquisition are different (e.g., Bley-Vroman, 1989, 1990, 2009).
1. Introduction

The process of adult second language (L2) acquisition has a widely differential outcome, in many cases resulting in L2 grammars highly divergent from native speakers’. Importantly, select cases are attested of near-native grammars (e.g., Birdsong, 1992, Lardiere, 2007) or functionally native-like grammars (e.g., Hyltenstam & Abrahamsson, 2003, 2009). A variety of explanations for this variance have been proposed, including those that cite biological factors (e.g., Bolinger, 1968; Johnson & Newport, 1989, 1991; Flege et al., 1999; DeKeyser, 2000), environmental factors (e.g., Lantolf, 2000, et seq), the effect of the first language (L1) on the L2 (e.g., Slabakova, 2000), individual differences (e.g., Dörnyei, 2005; Arabski & Wojtaszek, 2011), and processing difficulty (e.g., Prévost & White, 2000). At their most basic level, all of these explanations take a stance on one underlying issue: Do L1 and L2 acquisition share a common mechanism?

The strongest supporter of the position that there is a difference is Bley-Vroman (1989, 1990, 2009). Bley-Vroman observed that, whereas the outcome of L1 acquisition is almost always successful, L2 acquisition is affected by both internal and external factors. For this reason, Bley-Vroman proposed the Fundamental Difference Hypothesis: L1 and L2 acquisition are fundamentally different because they rely on different mechanisms. The Fundamental Difference Hypothesis has been tested indirectly as part of research on a critical, or sensitive, period in language acquisition (e.g., Birdsong, 1992; Coppieters, 1987; DeKeyser, 2000, 2013; DeKeyser, Alfi-Shabtay, & Ravid, 2010; Ioup, Boustagui, El Tigi, & Moselle, 1994; Johnson & Newport, 1989, 1991; Lenneberg, 1967; Muñoz & Singleton, 2011; Oyama, 1976; Rothman & Guijarro-Fuentes, 2010; Schachter, 1990; White & Genesee, 1996;), but such research has largely focused on the outcome of L2 acquisition rather than attempt to study factors that reflect on the
mechanism directly. The goal of this dissertation is to present a novel approach to this problem by manipulating availability in L2 input can shed light on whether L1 and L2 acquisition share a common mechanism.

To test whether a fundamental difference exists, one must first investigate the learning mechanism used in L1 acquisition. One potential factor of interest is frequency. Adult native speakers have intuitions regarding (un)acceptability of sentences in their language, even for infrequent sentence types. The lack of effect for frequency calls into question whether frequency itself does not constrain the outcome of L1 acquisition. If an effect for frequency is found in L2 acquisition, this would suggest that the mechanism of L1 and L2 acquisition are distinct. For this reason, evidence of L2 knowledge of highly infrequent forms would be informative on this issue.

Another important factor is the role of the L1 in L2 acquisition. Consider that the L1 is typically learned in a monolingual environment\(^1\), but sequential L2 acquisition occurs after an L1 is either partially or fully acquired. Adult L2 learners in particular have a fully acquired native language before L2 acquisition begins, which makes understanding the effect of the L1 on the L2 essential. To study the mechanism of L2 acquisition, it is important to isolate how much of the outcome of acquisition is due to having a fully-formed L1 in place. Because knowledge of the L1 is one inherent difference between L1 and L2 acquisition, comparison of forms that exist in both languages (structurally similar forms) to those that are different in the two languages (structurally dissimilar forms) is also highly informative on this issue (see e.g., Lardiere, 2009).

The respective potential roles of frequency and similarity make the selection of participants and linguistic forms essential in comparing the mechanism(s) of L1 and L2 acquisition. This dissertation studies the intuitions of near-native L1 Spanish/L2 English

\(^1\) The obvious exception to this is simultaneous bilingualism, which is beyond the scope of this dissertation.
learners that acquired English in adulthood. Importantly, near-native learners were chosen in order to increase the chance of acquisition. Despite the fact that studying the end-state itself is not the goal of this dissertation, the question of whether the L1 mechanism differs from the L2 mechanism necessitates the investigation of the linguistic system of learners that are as close to native-like as possible.

As for the linguistic forms of investigation, this study focuses on a subset of English non-finite complementation. English non-finite complementation was chosen for two reasons. First, non-finite complementation differs among languages, including between English and Spanish. Evidence of native-like knowledge of L2 English structures that differ from the learner’s L1 Spanish cannot be due to positive transfer. Second, certain types of English non-finite complementation are both infrequent and uninstructed—i.e., have low salience—which predicts that they will be difficult to learn (Bardovi-Harlig, 1987). The same infrequent and uninstructed forms are consistently acquired in L1 acquisition. In the case that such forms are not acquired in the L2, this would suggest that the mechanism of L2 acquisition is unlike that of L1 acquisition.

To disentangle these factors, this dissertation investigates L2 English knowledge of four types of non-finite complementation that differ in regard to the factors of frequency and similarity with the learners’ L1 Spanish: Object Control (1), those with optional complementizer for (2), Raising to Object verbs with bare non-stative complements (3), and Raising to Object verbs with perfective non-stative complements (4).

(1) Mary persuaded John to paint a portrait. Object Control
(2) Mary wanted for John to paint a portrait. For-type Constructions
(3) * Mary believed John to paint a portrait. Raising to Object (Bare)
(4) Mary believed John to have painted a portrait. Raising to Object (Perfective)
Of these four types, two are frequent: Object Control and for-type constructions. Spanish differs from English in that it has one of these sentence types (Object Control) but not the other (for-type). As a result, Object Control is both frequent and similar, and for-type constructions are frequent but dissimilar.

Raising to Object constructions include all those cases in which a verb like believe takes a non-finite complement. In addition to perfective non-stative complements as in (4) above, Raising to Object also takes progressive non-statives (5), copular complements (6) and certain stative ones (e.g, 7).

(5) Mary believed John to be painting a portrait. Raising to Object (Progressive)
(6) Mary believed John to be honest. Raising to Object (Copular)
(7) Mary believed John to know the answer. Raising to Object (Stative)

The restriction on bare non-statives (3) distinguishes Raising to Object from both Object Control and for-type constructions. Spanish does not have Raising to Object at all, so examples like (3) are disallowed in both English and Spanish, making Raising to Object (Bare) a “similar” construction because it is illicit across the two languages. The unavailability of any type of Raising to Object in Spanish therefore entails that Raising to Object with perfective complements (4) differs between English and Spanish due to being licit in English and illicit in Spanish. Because Raising to Object in all its forms is highly infrequent (see Chapter 4 for further discussion), Raising to Object (Bare) is infrequent but similar, and Raising to Object (Perfective) is both infrequent and dissimilar. The arrangements of the features [+/- similar] and [+/- frequent] with respect to the forms in (1)-(4) appear in Table 1.
Table 1. Forms of Interest by Similarity and Frequency

<table>
<thead>
<tr>
<th>Similarity</th>
<th>+frequent</th>
<th>-frequent</th>
</tr>
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</table>
| +similar   | Object Control | *Raising to Object (Bare)
| -similar   | For-type constructions | Raising to Object (Perfective)

The asterisk indicates that this form is illicit in both languages.

Given the four forms in Table 1, the following research questions are investigated in this dissertation: Do L2 learners differ from L1 speakers with regard to (i) [+ similar, + frequent] non-finite complementation, (ii) [+ similar, - frequent] non-finite complementation, (iii) [- similar, + frequent] non-finite complementation, and (iv) [- similar, - frequent] non-finite complementation.

If only the frequent and similar type is acquired (i), this suggests that frequency and similarity are necessary but neither alone is sufficient. If only the two frequent types acquired (i, iii), irrespective of similarity, then this suggests that frequency is both necessary and sufficient. If only the two similar forms are acquired (i-ii), then this suggests that similarity is both necessary and sufficient. Finally, if the infrequent and dissimilar type of non-finite complementation is acquired (iv), then neither frequency nor similarity is necessary. It is this last case that would present evidence that L1 and L2 acquisition share the same mechanism. The other three outcomes would suggest ways in which the two mechanisms differ.

This dissertation is broken into 8 chapters, including the introduction. First, I present an analysis of non-finite complementation in both English and Spanish in Chapter 2, especially as it pertains to the four structures represented in Table 1. Second, chapter 3 discusses the role of similarity between languages. Chapter 4, which concludes the review of literature, discusses frequency in L2 acquisition and the frequency of each of the four structures as found in corpus data. Chapters 5-7 encompass the experimental portion of this dissertation, presenting the hypotheses, the methods, and the results, respectively. Finally, I present the discussion in
Chapter 8 along and some conclusions in Chapter 9 with implications for the L2 acquisition of non-finite complementation more generally.
2. English Non-finite Complementation

In this chapter, I discuss the structure of non-finite complementation. First, I introduce some assumptions necessary for the analysis of non-finite complementation. In section 2.2, I then present an analysis using these assumptions for the types of non-finite complementation that will be investigated in the remainder of this dissertation, supporting a three-way distinction among the types. Next, I compare Spanish non-finite complementation to English non-finite complementation in section 2.3, highlighting the differences between the two languages in regard to the forms of interest. Finally, I conclude this chapter with an account of what a native Spanish speaker learning English must learn to fully acquire English non-finite complementation given the analyses of English and Spanish in sections 2.2-2.3.

2.1 Assumptions

In this dissertation, I follow the general architecture for narrow syntax laid out in Adger (2003) following the Minimalist Program (Chomsky, 1995 et seq). A few particular assumptions are central to my analysis of non-finite complementation, and I discuss them in this section. Of these assumptions, the most relevant are those regarding determiner phrases (DPs): all argument DPs require both a θ-role and structural Case. The first requirement, a θ-role, is part of the θ-Criterion: all arguments must bear one and only one θ-role, and all θ-roles must be assigned to an argument (Chomsky, 1981, 1995).\(^2\) As is clear in the definition, the θ-Criterion gives particular importance to arguments, and therefore a θ-role must be assigned in configurations where arguments exist. Consider, for example (1) below.

---

\(^2\) The assumption that a DP can only have one θ-role has been challenged (Hornstein, 1999, et seq; López, 2001) on the grounds that only allowing one θ-role is a stipulation that reduces the economy of the combinatorial system. In fact, the assumption that one DP cannot take two θ-roles has given rise, in part, to a piece of syntactic machinery unique to Control constructions, which is the null subject of a non-finite verb called PRO. While the introduction of PRO may be on the surface stipulative, it is crucial for an array of phenomena (Landau, 2001), so I adopt it here along with the θ-Criterion in its original form.
(1) Mary called John.

In (1), there are two DPs in need of a θ-role, Mary and John. The verb call, in fact, has two θ-roles, agent and theme, which are assigned to Mary and John, respectively.

However, not only can DPs receive a θ-role, but they also must receive one. Compare (1) with the case of (2).

(2) *Mary slept John.

Unlike persuade in (1), the verb sleep only assigns one θ-role: the person who sleeps, the theme. Because there is no second θ-role, John is left without one. The resulting sentence is ungrammatical because it violates the θ-Criterion.

The second assumption is that all DPs need structural case. Case in English can be detected by use of case-marked pronouns such as he for nominative case and him for accusative case. Case is assigned independently of θ-roles: agents (3), experiencers (4), and patients (5) can all be assigned nominative case.

(3) a. John ran a mile.
   b. He ran a mile.

(4) a. John loved Mary.
   b. He loved Mary.

(5) a. John was persuaded to come.
   b. He was persuaded to come.

The assignment of nominative case occurs via agreement between a DP and a finite Tense head (T). I will assume, following Petesky and Torrego (2001, 2004, 2006, 2007) and Chomsky (2000), that the unvalued, uninterpretable Case feature of DP is valued upon agreement with a
functional head, wherein nominative pertains to T. In (6) below, I illustrate this agreement where

\( u \text{case} \) indicates uninterpretable case either valued \([u \text{case}: \text{nom}]\) or unvalued \([u \text{case}: \text{ }]\).

(6) a. \( T[u \text{case}: \text{nom}] \ldots DP[u \text{case}: \text{ }] \)

   b. \( T[u \text{case}: \text{nom}] \ldots DP[u \text{case}: \text{nom}] \)

   c. \( T[u \text{case}: \text{nom}] \ldots DP[u \text{case}: \text{nom}] \)

In (6a), T and DP appear with the case features they bore upon external merge from the lexicon, either valued as is the case with T or unvalued as with DP. T then values \( u \text{case} \) on DP (6b), and the feature is checked on both T and DP (6c). The checked feature arises morphologically as nominative case on the DP, visible in (3b), (4b), and (5b) as \( He \). I will refer to the DP bearing nominative case as the subject for the purposes of this dissertation.

A similar process gives rise to accusative case. Accusative (acc) is a feature valued on little v \([u \text{case}: \text{acc}]\) that agrees with a DP. The derivation of this agreement is shown in (7) as parallel to (6).

(7) a. \( v[u \text{case}: \text{acc}] \ldots DP[u \text{case}: \text{ }] \)

   b. \( v[u \text{case}: \text{acc}] \ldots DP[u \text{case}: \text{acc}] \)

   c. \( v[u \text{case}: \text{acc}] \ldots DP[u \text{case}: \text{acc}] \)

The checked case feature in (7c) arises as accusative case on the DP. For convenience, I will refer to the DP bearing accusative case as the object from this point forward.

A final consideration regarding subjects and objects regards movement. Certain accounts of case assignment (e.g., Chomsky, 1989) assume that Case is assigned locally in a Spec-head configuration, an assumption that requires movement from a base position to a case-checking position. As is consistent with Adger (2003), I will not assume that case assignment must occur in Spec-head configurations. In fact, I will assume that movement is free as proposed in
Chomsky (2004), and those cases of movement that arise in the following section are optional or driven by other syntactic requirements. This assumption affects the Extended Projection Principle (EPP) in English. The EPP states that English requires that an element be merged into the left edge of the tense phrase (TP), which we will call the specifier (Spec) position. Generally, this position is filled by the subject, but expletives can also appear in [Spec,TP] such as in (8) below.

(8) There was a man in the garden.

Because Case is not assigned locally, an in-situ subject, here a man, can receive nominative case in agreement with T, and the expletive there can satisfy the EPP.

2.2 English Non-finite Complementation

2.2.1 Raising and Control

Case and θ-roles interact in non-finite complementation, leading to dual clausal relationships (Raising to Subject (9), Raising to Object (10)) or the necessity of a null argument called PRO (Subject Control (11), Object Control (12)).

(9) John seems to be honest.

(10) Mary believes John to be honest.

(11) John tried to be honest.

(12) Mary persuaded John to be honest.

For this discussion, recall that I assumed that finite T assigns nominative case. As the term ‘non-finite complementation’ suggests, all types of non-finite complement constructions feature an untensed verb in the complement clause. Examples (9)-(12) all feature the complement to be honest. The verb to be is non-finite, and the associated T of the complement cannot assign nominative case.
I begin with dual clausal relationships because of the relevance of Case in these examples. Consider Raising to Subject constructions (13).

(13) John seems to be honest.

The DP John receives nominative Case as the subject via agreement with matrix T, but the verb seem has no θ-role to assign to its subject. Seem has only one θ-role, which it assigns to the proposition to be honest. In addition to being the subject of the matrix clause, John is also the theme of the non-finite predicate to be honest. Despite the fact that John receives a θ-role in the complement, it cannot receive Case there: T of the complement cannot assign nominative case to the DP because T is non-finite. As a result, John is in a dual clausal relation, receiving a θ-role in the complement and Case in the matrix clause.

The dual clausal relation in Raising to Subject is generally analyzed as occurring via movement of the DP, here John, from the complement to the matrix clause. This movement is represented in (14) where the trace, t, indicates a previous location of the DP within the complement, which in turn is delineated by the use of square brackets.

(14) John\textsubscript{[case:nom]} T\textsubscript{[case:nom]} seems [t; to be honest]

The analysis in (14) illustrates the origin of the term ‘Raising to Subject’: the subject begins in the complement where it receives a θ-role and raises to matrix [Spec,TP] to satisfy the EPP where it happens to check its ucase feature on T. Recall, however, that the ucase feature could be checked from an in-situ position, and that the EPP need not be satisfied via movement.

Where the subject is an indefinite DP (15), merging an expletive is also possible (16).

---

3 The placement of the trace in (14) suggests that the base position for the subject is in [Spec,TP] or [Spec,vP]. In reality, the base position for the subject is a lower position as part of a small clause (see e.g., (16)). The movement of the DPs inside of the complement is tangential to the present discussion, so for the sake of simplicity, I only include one instantiation of a trace at the left edge of the TP to indicate that the DP was previously in the complement. This notation is used throughout.
(15) A man seems to be in the garden.

(16) There seems to be a man in the garden.

With regard to non-finite complementation, the use of an expletive to satisfy the EPP is restricted to when a verb does not assign an external θ-role to an argument, such as the subject of *seem*. In short, DPs can satisfy their requirements in different clauses, receiving a θ-role in the complement and Case in the matrix clause.

Raising to Object (RtoO) constructions also result from dual clause relationships (17).

(17) Mary believes John to be honest.

The matrix verb in example (17) is *believe*, which has two θ-roles: experiencer, *Mary*, and proposition, *to be honest*. As in (14), the DP *John* is the theme of the predicate *to be honest*, but with regard to the matrix clause, *John* is the object. Due to the θ-Criterion, *John* can only receive one θ-role. Given that *John* receives one in the complement, the analysis that *believe* assigns it a θ-role as well incorrectly predicts that (17) would be ungrammatical. Further evidence that *John* does not receive a θ-role from *believe* results from use of an expletive (18).

(18) Mary believes there to be cookies on the table.

As noted above, expletives can only be used where there are no arguments to be assigned a θ-role. Therefore *believe* only has two arguments, and *John* in (17) is not one of them. The dual clausal relationship in (17) is analyzed as (19), where v is occupied by the inflected verb *believes*.

(19) Mary believes[ucase:acc] John[ucase:acc] [t; to be honest]
John receives a θ-role in the complement and Case in the matrix clause. Given the assumption that movement is free, John is able to leave the complement and merge into the matrix clause.\(^4\) For reasons laid out in Lasnik and Saito (1991) and Hong and Lasnik (2010), I will assume that movement is at least possible in RtoO. Note that the name RtoO infers this movement. Alternate accounts that do not involve movement call sentences like (17) exceptional case marking (ECM), which I mention here because of its relevance to section 3.2.2.

The second major type of configuration in non-finite complementation, Control, involves an apparent surplus of θ-roles. Let us begin with Subject Control in example (20) below.

(20) John tried to be honest.

Example (20) has only one DP, and it is logically both the theme of the predicate to be honest and the agent of the matrix verb try. Assignment of both θ-roles to a single DP would violate the θ-Criterion, so another solution is needed. Compare (20) to (21).

(21) [To be honest] is difficult.

In (21), the complementizer phrase (CP) To be honest functions as the subject of the predicate is difficult, and it receives the theme θ-role. However, no DP is present to receive the theme θ-role assigned by the predicate To be honest itself.

The proposal of a silent constituent, called PRO (e.g., Chomsky, 1981; Landau, 2003), can resolve the difficulties encountered in (20) and (21). PRO is a null constituent that receives a θ-role in a non-finite clause. The assignment of θ-roles in (20) and (21) with PRO are (22) and (23), respectively.

(22) John\(_i\) tried [PRO\(_i\) to be honest]

\(^4\) For reasons related to Phase Theory (Chomsky, 2000, et seq), here I assume that the non-finite complement of RtoO does not have the phase head C (complementizer), which subsequently precludes the complementizer phrase. Though less important for the purposes of this study, this assumption also extends to Raising to Subject.
In (22), PRO receives the theme θ-role in the complement, and John receives the agent θ-role in the matrix clause. In (23), PRO receives the theme θ-role of to be honest, and the entire constituent [PRO To be honest] receives the theme θ-role of the predicate is difficult.

Note that PRO in (22) and (23) bear different indices. Typically, PRO is controlled by a higher DP, such as John in (22), but it can be uncontrolled, such as in arbitrary PRO (23). A structure in which the matrix subject controls PRO is called Subject Control (22).

A parallel type of structure is Object Control (ObjC). In ObjC (24), the object of the matrix clause controls PRO.

(24) Mary persuaded John, [PRO to paint a portrait]

In (24), the DP John appears to have two logical functions: patient of persuade and agent of paint. As in Subject Control, the assignment of two θ-roles is avoided by assignment of one θ-role to a co-indexed PRO (25).

(25) Mary persuaded John, [PRO to paint a portrait]

By controlling PRO, John is associated with both θ-roles without violating the θ-Criterion.

The difference between RtoO and ObjC verbs with respect to the θ-roles they assign additionally affects the types of finite complements they can take. Because ObjC verbs assign a θ-role to both a theme and a proposition (John and PRO to paint a portrait in (25)), an ObjC verb cannot select a finite complement (26) without a theme. In the presence of a theme, ObjC can assign a proposition θ-role to a finite complement (27).

(26) *Mary persuaded [that John painted a portrait]

(27) Mary persuaded [John] [that he needed a portrait]
RtoO verbs, on the other hand, assign a proposition θ-role only, so a finite complement is licit without a theme (28) and illicit with one (29).

(28) Mary believed [that John painted a portrait]

(29) Mary believed [John] [that he needed a portrait]

2.2.2 Complement Restrictions and Diagnostics

For the present study, the two main structures of interest are RtoO and ObjC in the linguistic systems of native Spanish speakers who have learned English in adulthood. ObjC exists in both languages, allowing it to be a baseline condition for comparison to RtoO. RtoO, in turn, is absent in Spanish and infrequent in English, so evidence of the acquisition or non-acquisition of RtoO is relevant to the relationship between frequency and second language acquisition.

An additional reason that RtoO is a valuable structure to study is that there are subtle restrictions on the complement of RtoO. The complement of RtoO is restricted in regard to morphological and non-morphological aspect on the non-finite verb. Compare (30) and (31).

(30) Mary believes John to be honest.

(31) *Mary believes John to paint a portrait.

The verbs of the complements differ in regard to stativity, where to be (30) is a stative verb and to paint (31) is a non-stative verb. As the term ‘stative’ suggests, a stative verb is one that does not entail activity, such as to know or to seem. Any verb that cannot be classified as stative is restricted in the complement of RtoO. Because the aspect expressed in regard to stativity is lexical, I will refer to this as non-morphological aspect.
RtoO’s complement does, however, allow non-stative verbs that bear morphological aspect. Morphological aspect is expressed in English with overt morphology and includes perfective (32) and progressive (33).

(32) Mary believes John to have painted a portrait (this morning).
(33) Mary believes John to be painting a portrait (right now).

In comparing (30)-(33), it becomes apparent that the restriction on the complement of RtoO is only on bare non-statives (31); statives (30) and non-statives with perfective (32) or progressive (33) aspect are allowed. For the purposes of this dissertation, I assume that learners who accept (32) and (33) but correctly reject (31) have acquired the restriction on the non-finite complement of RtoO.

Let us further assume that RtoO is not taught in the classroom, as I will demonstrate in Chapter 4. Then the restrictions on the complement of RtoO are also not taught. I will show in Chapter 4 that RtoO is highly infrequent, and examples with perfective and progressive aspect even less so. Any evidence that the restrictions have been acquired supports the stance that second language acquisition can proceed without the aid of frequency information or instruction, much in the way that first language acquisition does.

Complement restriction, such as (30)-(33) above, serve as a useful diagnostic tool. The complement of ObjC does not have a restriction on bare non-statives as can be seen in (35), contrasting with RtoO (34).

(34) *Mary believes John to paint a portrait.
(35) Mary persuades John to paint a portrait.

ObjC verbs can take bare non-statives in their non-finite complements (35), indicating that the two types of verbs are empirically different.
Additionally, recall that expletives were used in section 2.2.1 to illustrate configurations in which a verb did not assign a θ-role. Whereas RtoO can take an expletive in its complement (36), ObjC cannot (37).

(36) Mary believes there to be cookies on the table.

(37) *Mary persuades there to be cookies on the table.

This difference is due to the fact that ObjC verbs like persuade have an additional θ-role that cannot be assigned to the expletive. Therefore expletives provide another diagnostic for distinguishing between RtoO and ObjC.

2.2.3 For-type Verbs

In addition to RtoO and ObjC, a third type of structure will be studied in this dissertation: verbs that pattern with want and need. The matrix verbs want and need can select a non-finite complement, and that complement can feature a verb with any non-morphological aspect, both stative (38) and non-stative (39).

(38) a. Mary wants John to be honest.

b. Mary needs John to be honest.

(39) a. Mary wants John to paint a portrait.

b. Mary needs John to paint a portrait

Our first diagnostic suggests that want and need are ObjC verbs because they allow bare non-stative complements. This predicts that they will not allow expletives in their complements, as is the case with ObjC (40). This prediction is not borne out (41).

(40) *Mary persuades there to be cookies on the table.

(41) a. Mary wants there to be cookies on the table.

b. Mary needs there to be cookies on the table.
The second diagnostic, use of an expletive, leads to a contradictory conclusion, suggesting that *want* and *need* are RtoO verbs. ObjC does not allow an expletive in the non-finite complement because it has a patient θ-role that it needs to assign. The allowance of an expletive in (41) demonstrates that *want* and *need* do not have a patient θ-role, which is consistent with RtoO verbs.

I propose that the contradicting evidence in (39)-(40) supports a third category of verbs. In fact, this third category of verbs has an additional behavior that is not observed with RtoO or ObjC: *want* and *need* can optionally take a non-finite complement with an overt complementizer (42), namely *for*, has the head of the CP complement.

(42) a. Mary wants [\text{CP (for) John to be honest}]
   b. Mary needs [\text{CP (for) John to be honest}]

The examples in (42) serve two purposes. First, (42) supports the analysis that verbs like *want* and *need* are neither RtoO nor ObjC because neither can take an overt complementizer (43)-(44).

(43) *Mary believes for John to be honest.
(44) *Mary persuades for John to be honest.

The second purpose is to illustrate that use of a complementizer is a third diagnostic, and for obvious reasons, I will use the term *for*-type for those verbs that allow the complementizer.

The summary of the three verb categories according to the diagnostics appears in Table 2.

<table>
<thead>
<tr>
<th>Verb Category</th>
<th>Diagnostic 1 Bare non-stative</th>
<th>Diagnostic 2 Expletive</th>
<th>Diagnostic 3 Overt Comp (<em>for</em>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RtoO</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>ObjC</td>
<td>√</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>For-type</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>
Using these diagnostics, three lists were generated consisting of verbs in each category. These lists appear in Appendix A along with their frequencies. I will return to frequency in Chapter 4.

2.3  *Spanish Non-finite Complementation*

L2 English learners who are native speakers of Spanish have the task of learning the three-way distinction (RtoO, ObjC, *For*-type) discussed in section 2.2. This task may be affected by similarity between English and Spanish in regard to these structures. Evidence for and against the role of similarity will be discussed in Chapter 3, but it is first necessary to establish the ways in which English and Spanish differ in non-finite complementation.

Like English, Spanish also has non-finite complementation, including Raising to Subject, as in (45), and Subject Control, as in (46).

(45) Juan, parece [ti estar contento].

Juan seems to be happy

(46) Juan, intentó [PROi mantenerse calmado].

Juan tried PRO to stay calm

Spanish Raising to Subject, just like English Raising to Subject, is a construction composed of a matrix verb which selects a non-finite complement where one DP, here Juan, receives a θ-role in the complement and Case as the subject of the matrix clause. Spanish Subject Control, again like English, is a construction composed of a matrix verb which selects a non-finite complement, but its subject originates in the matrix clause where it receives both a θ-role and Case. Because the DP Juan agrees with matrix T, it receives nominative Case (47)-(48).

(47) Él, parece [ti estar contento].

He seems to be happy

(48) Él, intentó [PROi mantenerse calmado].
He tried PRO to stay calm

Spanish also has ObjC as seen in (49).

(49) María convenció a Juan a [PRO; construir un castillo de arena].

María convinced ACC Juan PRO to build a sandcastle

Like in the English examples, ObjC verbs such as convencer ‘to convince’ take a DP complement and a non-finite complement. PRO receives an agent θ-role from the verb in the complement, here construir ‘to build’, and the DP complement of the matrix clause receives a patient θ-role from the matrix verb. Case is also assigned by the matrix verb to the DP in complement position, resulting in accusative Case, visible as the a personal in (49).

Evidence that Spanish ObjC is analogous to English ObjC comes from finite complements. Consider that ObjC verbs like convince cannot take finite complements in either Spanish (50) or English (51) without also taking a DP complement in the matrix clause ((52) and (53), respectively).

(50) *Convencí que Juan pinta un retrato.

(51) *I convinced that John paint a portrait.

(52) Convencí a Juan de necesitaba un retrato de sí mismo.

(53) I convinced John that he needed a portrait of himself.

Unlike non-finite complements (49), finite complements are illicit when selected by ObjC verbs. The ungrammaticality of (50) and (51) is due to θ-roles: the T of the finite complement cannot assign a θ-role to PRO, and instead it assigns its θ-role to the DP Juan/John. Once the DP receives the patient θ-role from pintar/paint, it cannot receive one from convencer/convinced. As a result, one θ-role remains unassigned, which violates the θ-Criterion and renders the sentence
ungrammatical. Because English and Spanish ObjC verbs both select for the same type of complements—non-finite only—this is evidence that they are the same construction.

The remaining two types of non-finite complement constructions, RtoO and for-type constructions, are absent in Spanish: both Spanish RtoO (54) and for-type constructions, with (55) and without (56) the overt complementizer, are ungrammatical.

(54) *Creo a Juan ser inteligente.
I believe ACC Juan to be intelligent

(55) *Quiero para Juan correr un maratón.
I want for Juan to run a marathon

(56) *Quiero a Juan correr un maratón.
I want ACC Juan to run a marathon

Recall that in English, RtoO is restricted: RtoO with a bare non-stative complement (57) is illicit in English. Compare English RtoO with bare non-stative (57) to Spanish RtoO with non-stative (58).

(57) *I believe John to run a marathon.

(58) *Creo a Juan correr un maratón.
I believe ACC Juan to run a marathon

Instead, both English and Spanish RtoO verbs accept finite complements with non-stative verbs (59)-(60).

(59) I believe that John ran a marathon.

(60) Creo que Juan corrió un maratón.
I believe that Juan ran a marathon
Examples (57)-(60) illustrate that, with respect to bare non-statives, English and Spanish are similar: non-finite complements are illicit and finite complements are licit.

Importantly, (57) in English is repairable by changing the non-stative to a perfective non-stative (61), but Spanish RtoO non-stative is not subject to repair (62).

(61) I believe John to have run a marathon.

(62) *Creo a Juan haber corrido un maratón.

I believeACC Juan to have run a marathon

Spanish has no RtoO at all, so RtoO with perfective aspect in Spanish (62) is illicit. The contrast in (61) and (62) shows that, with respect to RtoO with perfective aspect, English and Spanish differ.

It is relevant at this point to mention that some authors (Hernanz & Brucart, 1987; Hernanz, 1999; Pérez-Tattam, 2007) claim that Spanish has RtoO. In what follows, I provide evidence that Spanish “RtoO” is not RtoO at all. To begin, those constructions that have been labeled “RtoO” in Spanish involve perceptual verbs like ver ‘to see’ (63) and oír ‘to hear’ (64).

(63) Vi al ciclista [subir una montaña]

I sawACC.DEF cyclist go up a mountain

‘I saw the cyclist go up a mountain.’

(64) Oí al músico [tocar el piano]

I heardACC.DEF musician play the piano

‘I heard the musician play the piano.’

Instead of RtoO, examples (63) and (64) are reduced clause constructions like causative constructions. Evidence that causative verbs are reduced clause constructions comes from López (2001), wherein he shows that the argument structure of the embedded verb may play a role in its
licensing: For causatives, unaccusative verbs are not licensed in the complement (65) unless their subject is overt (66), though this is not true for unergative (67) or transitive (68) verbs.

(65) *La jefa hizo venir el día de año nuevo.

the boss made come the day of year new
‘The boss had (someone or other) come on New Year’s.’

(66) La jefa hizo venir a María el día de año nuevo.

the boss made come \textit{ACC} Maria the day of year new
‘The boss had Maria come on New Year’s.’

(67) La jefa hizo trabajar demasiado el día de año nuevo.

the boss made work too much the day of year new
‘The boss had (someone or other) work too much on New Year’s.’

(68) Napoleón hizo comprar muchos muebles.

Napoleon made buy many furnitures
‘Napoleon had (someone or other) buy many pieces of furniture.’

[\text{López, 2001 (33a-d): 708-709}]

One explanation of the data in (65)-(68) is presented in López (2001). López proposes that causative constructions have reduced complements that can be composed a constituent lacking a TP, such as a verb phrase VP. For clarity, (69)-(72) exemplify the structure of (65)-(68), respectively.

(69) *La jefa hizo [VP venir el día de año nuevo]

the boss made come the day of year new
‘The boss had (someone or other) come on New Year’s.’

(70) La jefa hizo [VP venir a María el día de año nuevo]
the boss made come\textsubscript{ACC} Maria the day of year new

‘The boss had Maria come on New Year’s.’

(71) La jefa hizo [\textsc{vp} trabajar demasiado el día de año nuevo]

the boss made work too much the day of year new

‘The boss had (someone or other) work too hard on New Year’s.’

(72) Napoleón hizo [\textsc{vp} comprar muchos muebles]

Napoleon made buy many furnitures

‘Napoleon had (someone or other) buy many pieces of furniture.’

Where unaccusative verbs lack an overt subject (69), this gives rise to unacceptability because the subject of unaccusative verbs is generated within the VP. Importantly, when the overt subject is absent in unergative (71) and transitive (72) complements of causative constructions, this is unproblematic because the subject of unergative and transitive verbs is generated outside of the VP. In those cases where the optional external argument is present, one more functional projection is required above the VP in the reduced clausal complement in order for the argument to be external to the VP. Under the Minimalist Program (Chomsky, 1995, et seq), it is commonly assumed that external arguments in transitive predicates are generated in a specifier position of the functional projection \textsc{vp} [\textsc{spec,vp}].

\textsc{rtoO}, unlike causative verbs, requires that the external argument of the non-finite complement always be overt, which suggests that \textsc{rtoO} necessarily has more functional projections than just the VP. In particular, \textsc{rtoO} requires an external argument for its non-finite complement. Because the external argument is generated in [\textsc{spec,vp}], English \textsc{rtoO} must have more structure than the VP found in Spanish causatives (69)-(72), which suggests that the two structures must be distinct. Here I adopt the analysis that the non-finite complement of \textsc{rtoO} is a
deficient TP (T_{det}P) due to reasons argued for in the work of Chomsky (2000): if the non-finite complement of a Raising verb were a normal TP or a full complementizer phrase (CP) complement, no DP would be able to move out of the complement unless it were to be merged in a specifier position of the CP. Though the precise nature of the non-finite complement is tangential to their ability to be acquired, suffice to say that it is different from the complement in causative constructions. Because RtoO, like ObjC and for-type constructions, obligatorily realize the external argument in its complements, causative constructions belong to none of these categories.

If perceptual verb constructions take reduced clausal complements (only a vP or a VP) like causatives, then the distinctions in (65)-(68) should also be borne out with a perceptual matrix verb. Indeed, this is the case: For perceptual verb constructions, it is also the case that unaccusative verbs are not licensed in the complement (73) unless their subject is overt (74), though this is not true for unergative (75) or transitive (76) verbs.

(73) *La jefa vio [VP venir el día de año nuevo]
the boss saw come the day of year new
‘The boss saw (someone or other) come on New Year’s.’

(74) La jefa vio [VP venir a María el día de año nuevo]
the boss saw come_{ACC} Maria the day of year new
‘The boss saw Maria come on New Year’s.’

(75) La jefa vio trabajar el día de año nuevo.
the boss saw work the day of year new
‘The boss saw (someone or other) work on New Year’s.’

(76) Napoleón vio comprar muchos muebles.
Napoleon saw buy many furnitures

‘Napoleon saw (someone or other) buy many pieces of furniture.’

These data support the assertion that perceptual verbs are not RtoO verbs because they can appear without overt subjects in the complement (75)-(76). This is a direct counter-argument to claims that Spanish has RtoO verbs, which is relevant from an acquisition stance. If perceptual verb constructions were RtoO, this would raise questions as to whether transfer were available from Spanish to English. The fact that Spanish does not have RtoO instead predicts that RtoO must be acquired in its entirety.

In summary, Spanish differs from English in its non-finite complementation because it lacks RtoO and for-type constructions. This means that any L1 Spanish speaker learning L2 English would have to acquire these constructions, including the aspectual distinctions on non-stative complements in RtoO and the optionality of the complementizer in for-type constructions. As for ObjC constructions, their availability in Spanish suggests that L1 Spanish/L2 English learners may be able to employ knowledge of ObjC from their L1 in their L2, predicting that ObjC would be easier to learn than the unattested types RtoO and for-type.

I argued in section 2.2.2 that the aspect restrictions on the complement of RtoO may present a uniquely difficult challenge in L2 acquisition. L1 Spanish speakers must learn that English RtoO verbs (i) allow non-finite complements, but (ii) the non-finite complement must not be non-stative (iii) unless it bears perfective or progressive morphology. For this reason, Table 3 includes separate lines for Bare and Perfective aspect, distinguishing RtoO from for-type constructions.
Table 3. Non-morphological Aspect Non-stative Complements in English and Spanish for ObjC, RtoO, and for-type Constructions

<table>
<thead>
<tr>
<th></th>
<th>ObjC English</th>
<th>ObjC Spanish</th>
<th>RtoO English</th>
<th>RtoO Spanish</th>
<th>for-type English</th>
<th>for-type Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare aspect</td>
<td>√</td>
<td>√</td>
<td>X</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Perfective aspect</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
</tbody>
</table>

English and Spanish differ with respect to RtoO and for-type constructions, though not ObjC. In this study, I focus on the acquisition of all three constructions, including the aspectual restrictions on non-statives in RtoO.

2.4 Conclusions

In this chapter I have presented an analysis of non-finite complementation in both English and Spanish. I have argued that English has an array of types of non-finite complementation that includes the documented types Raising to Subject, Subject Control, Raising to Object (RtoO), and Object Control (ObjC), as well as another type that I have referred to as for-type constructions. I have also argued that Spanish has a subset of these types of non-finite complementation, specifically Raising to Subject, Subject Control, and ObjC.

As will be discussed in the following chapter, this dissertation concerns types of non-finite complementation that are not learned in the classroom—RtoO, ObjC, and for-type constructions—because of apparent surface similarity. The fact that Spanish and English have a partial overlap in regard to these types of non-finite complementation is the root of one of the main issues of this study, specifically the role of similarity between the L1 and the L2. The following chapter critically synthesizes what is known about similarity in L2 acquisition and makes specific predictions regarding the acquisition of English non-finite complementation by L1 Spanish speakers.
3. **Similarity**

The impetus of this dissertation is to better understand how the mechanism of adult second language (L2) acquisition differs from the mechanism of first language (L1) acquisition. A confound in this question is the role of the L1: Because adult L2 learners have a fully-formed linguistic system at the onset of L2 acquisition, the L1 is a potential source of linguistic information. In this chapter, I discuss the relationship between a learner’s L1 and their L2.

To do this, I employ the property theory/transition theory dichotomy (Gregg, 1993, 1996). Gregg (1993) proposed that any model of second language acquisition must include two components. The first component is a theory of what must be learned, which he refers to as a property theory of second language acquisition. The second is a theory of how that knowledge is learned, which Gregg terms a transition theory. Note that certain models often put greater emphasis on one or the other. Generative models of second language acquisition (e.g., White, 2003), for example, invest a great deal of their effort in property theory whereas cognitive models (e.g., MacWhinney, 2005) dedicate the same level of effort to refining transition theories.

The distinction between property theory and transition theory is pertinent to the discussion of similarity because there is conflict between structural overlap (‘actual’ similarity) and how L2 learners interact with that overlap. The typology of structural overlap is fairly straightforward in the context of a developed syntactic analysis such as what was presented in Chapter 2. The way that learners interact with that similarity is subject to various factors, including the necessity that learners correctly identify similarity regardless of whether this occurs consciously or subconsciously. Even in the case of detected similarity, a learner must then put that similarity to use. In light of these issues, the interaction between structural overlap and
surface similarity must be understood in order to make predictions (see also Kellerman, 1977, 1978 for objective vs. subjective similarity and Kellerman, 1983, 1986 for psychotypology).

Section 3.1 presents similarity in light of the overlap between the learner’s L1 Spanish and their L2 English (i.e., a property theory account). This comparison gives rise to the typology \([+/-\) similar\] that will be used as an independent variable in the experimental portion of this dissertation. Section 3.2 presents a synthesis of ways in which linguistic knowledge from the L1 affects linguistic knowledge in the L2 (i.e., transfer theories), which lead to predictions for the typology in section 3.1. Section 3.3 presents experimental evidence regarding the acquisition of similar and dissimilar non-finite complementation from Pérez-Tattam (2007). Pérez-Tattam investigated the knowledge of L1 English L2 Spanish regarding Spanish non-finite complementation, which results in a typology somewhat distinct from that presented in section 3.1. Though Pérez-Tattam’s study is the inverse of this dissertation, the predictions made in section 3.2 hold: Her learners do not employ L1 English linguistic information regarding non-finite complementation in the early stages of L2 Spanish acquisition, suggesting that this information is unavailable at early stages of development. Conversely, her more advanced learners show evidence of more native-like knowledge of Spanish non-finite complementation without converging on native intuitions. Because her cross-sectional study did not include learners at near-native proficiency, it remains open to question whether convergence on native-like intuitions would occur at near-native proficiency. Given this gap, predictions and conclusions for the present study in light of the Fundamental Difference Hypothesis (Bley-Vroman, 1989, 1990, 2009) appear in section 3.4.
3.1 Overlap and Similarity

3.1.1 Concepts

Chapter 2 presented a contrastive analysis of the grammars of English and Spanish, and the degree to which their grammars overlapped was highlighted. As was suggested at that point, overlap in grammar is a type of similarity between the two languages. In this section, I discuss how similarity relates to the concept of property theory (Gregg, 1993, 1996). Grammars are inherently the subject of a property theory: The L1, the L2, and the learner’s interlanguage all contain some subset of the possible elements of human language. Contrasting the L1 and the L2 allows for insights of what was present in the learner’s linguistic system before L2 acquisition and what needs to be acquired in the target language. The addition of the interlanguage—the state of the learner’s grammar at any given point in time during L2 acquisition (Selinker, 1972)—gives some insight into the process of L2 acquisition. Further discussion of the role of similarity during the process of L2 acquisition will be the topic of section of 3.2 on transition theory (Gregg, 1993, 1996).

A particular property theory of the L1 and L2 presented in the previous chapter was developed using the assumptions of the Minimalist Program (Chomsky, 1995, et seq). In the Minimalist Program, the elements that comprise languages include features, functional heads, and selectional properties, among others. The verb convince/convencer, for example, selects a non-finite complement and a DP complement in both languages. The verb need/necesitar, however, selects a non-finite clausal complement in English and a finite one in Spanish. The composition of English and Spanish overlap in regard to the selectional properties of convince/convencer but not need/necesitar. For need/necesitar, this non-overlap entails that
successful acquisition of L2 English by L1 Spanish speakers involves acquiring a property in the L2 not available in the L1. A similar claim can be made for any case of non-overlap.

The relative amount of overlap between two languages is captured by terms such as typological distance or language distance (Wode, 1976; Kellerman, 1977, 1979; Ringbom, 1978, 1987; Odlin, 1989, 2003). Some authors (e.g., Odlin, 1989, 2003) cite greater distance between languages as causing increased difficulty in language acquisition, including some (e.g., Bialystok & Hakuta, 1999) that propose a positive correlation between the amount of overlap and the likelihood of native-like attainment. Imagine for a moment that the task of the second language learner can be equated to a checklist of properties in the L2 that must be acquired. An L2 learner of a language that is typologically similar to the L1 (e.g., L1 Spanish/L2 English) would have a much shorter list than an L2 learner of a language that is less typologically similar (e.g., L1 Spanish/L2 Korean). Note that the metaphor of a checklist in L2 acquisition is, unfortunately, an oversimplification. I will discuss further how this is an oversimplification in section 3.2 on transition theories. However, the observation that difficulty is greater or lesser depending on the relationship between the L1 and the L2 remains valid (see Bialystok & Miller, 1999; Elo, 1993; Hulk & Müller, 2000; Odlin, 1989, 2003; and Ringbom, 1987; for examples).

3.1.2 Application to Non-Finite Complementation

The potential advantages and disadvantages of overlap in grammars naturally extend to the L2 acquisition of English non-finite complementation by L1 Spanish speakers. Given the partial overlap between English and Spanish non-finite complementation, the acquisition of some types of non-finite complementation but not others may be due in part to similarity. The role of similarity in acquisition is itself conditioned by factors that pertain to transition theory, but
before moving on to transition theory, let us begin by summarizing the relationship between English and Spanish non-finite complementation.

First, recall that Spanish does not have RtoO or for-type constructions. Though they cannot select for non-finite complements, the verbs that form English RtoO (1) and for-type constructions (2) do exist in Spanish, except that they select for finite complements: (1b) and (2b), respectively.

(1) a. *Creo a Juan pintar un retrato. (non-finite, RtoO verb)
    I believe ACC Juan to paint a portrait.
   
b. Creo que Juan pinta un retrato. (finite, RtoO verb)
    I believe that Juan paints a portrait.

(2) a. *Quiero a Juan pintar un retrato. (non-finite, for-type verb)
    I want ACC Juan to paint a portrait.
   
b. Quiero que Juan pinte un retrato. (finite, for-type verb)
    I want that Juan paints a portrait.

The opposite is true for ObjC verbs. Because ObjC exists in Spanish, Spanish ObjC verbs can select for non-finite complements (3a) as they do in English. In both languages, ObjC verbs cannot select directly for finite complements without another DP in the matrix clause (3b) due to θ-role restrictions.

(3) a. Convencí a Juan a pintar un retrato. (non-finite, ObjC verb)
    I convinced ACC Juan to paint a portrait.
   
b. *Convencí que Juan pintara un retrato. (finite, ObjC verb)
    I convinced that Juan paints a portrait.
In summary, RtoO and *for*-type verbs select finite complements in Spanish, and ObjC verbs select non-finite complements in Spanish.

As discussed in the non-finite complementation section in Chapter 2, all three types of verbs select non-finite complements in English. For finite complements, consider (4)-(6), exemplifying finite complements with RtoO verbs (4), *for*-type verbs (5), and ObjC verbs (6), respectively.

(4) I believe that John painted a portrait.

(5) *I want that John painted a portrait.

(6) *I persuade that John painted a portrait.

Of the three types, only English RtoO verbs (4) can select for a finite complement as its only complement, including a non-stative verb under past, future, or habitual readings.

The comparison of Spanish and English complementation in terms of (non)finiteness is summarized in Table 4 below.

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th></th>
<th>Spanish</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-finite</td>
<td>Finite</td>
<td>Non-finite</td>
<td>Finite</td>
</tr>
<tr>
<td>ObjC</td>
<td>√</td>
<td>X</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>RtoO</td>
<td>√↓</td>
<td>√↑</td>
<td>X</td>
<td>√↓</td>
</tr>
<tr>
<td><em>For</em>-type</td>
<td>√↓</td>
<td>X</td>
<td>X</td>
<td>√</td>
</tr>
</tbody>
</table>

¹Does not include bare non-stative complements.

As can be seen in Table 4, English and Spanish converge on the finiteness of the ObjC verb complements allowing only non-finite in both languages. *For*-type verbs conflict because Spanish (2b) allows finite complements but English does not (5), allowing instead non-finite complements (7).

(7) I want (for) John to paint a portrait
Table 4 notes that RtoO verbs allow both non-finite and finite complements. Where bare non-stative complements are concerned, this generalization does not hold: English RtoO verbs cannot take bare non-stative non-finite complements. This results in a case where the selectional properties of English and Spanish converge, allowing finite (8) but not non-finite (9) bare non-stative complements.

(8) a. I believe that John painted a portrait.
    b. Creo que Juan pintó un retrato. (finite, RtoO verb)
       I believe that Juan painted a portrait.

(9) a. *I believe John to paint a portrait.
    b. *Creo a Juan pintar un retrato. (non-finite, RtoO verb)
       I believe ACC Juan to paint a portrait.

The parallel between English and Spanish in (8)-(9) is not due to the same reasons: English RtoO has a restriction on bare non-stative verbs, and Spanish has no RtoO. The fact that Spanish does not have RtoO also entails that the allowance of perfective non-stative complements in English (10) is not found in Spanish (11).

(10) I believe John to have painted a portrait.
(11) *Creo a Juan haber pintado un retrato.
       I believe ACC Juan to have painted a portrait.

Therefore in terms of the variable [+/- similar], the typology of the target forms is as appears in

Table 5.

Table 5. Similarity by Non-finite Complementation Type
3.2 Transition Theories and Similarity

Predictions regarding the role of similarity in L2 acquisition necessarily require discussion of transition theories. A transition theory (Gregg, 1993, 1996) is the inherent companion of a property theory in the following way: a property theory pertains to what needs to be acquired and a transition theory pertains to how that knowledge is acquired. Any particular theory of how knowledge is acquired is an instance of a transition theory, and in fact, a great deal of the literature on second language acquisition as a whole concerns various transition theories.

The notion of a transition theory is relevant to the discussion at hand because an understanding of how similarity affects acquisition is relevant to developing informed hypotheses. Whereas the typology of similar/dissimilar is the domain of property theory, effects on acquisition by similarity/dissimilarity are the domain of transition theory. Specifically, a transition theory is needed to explain (a) availability of the L1 at the initial state, (b) facilitation/inhibition effects due to overlap, and (c) effects of surface similarity, i.e., cases where two languages only appear to be the same on the surface. These elements are discussed in the following subsections, respectively.

3.2.1 The Initial state

The initial state of second language acquisition is relevant to transition theory in that it is the learner’s first “transition” or transfer of knowledge from the L1 to the L2. Because the initial state precedes the process of L2 acquisition, it forms the baseline of the L1’s influence on the L2. A principled, cross-linguistic account of what is available from the L1 at the initial state predicts

<table>
<thead>
<tr>
<th>Type</th>
<th>Similar</th>
</tr>
</thead>
<tbody>
<tr>
<td>ObjC</td>
<td>+</td>
</tr>
<tr>
<td>For-type</td>
<td>-</td>
</tr>
<tr>
<td>RtoO (Bare Non-statives)</td>
<td>+</td>
</tr>
<tr>
<td>RtoO (Perfective Non-statives)</td>
<td>-</td>
</tr>
</tbody>
</table>
that certain L1-related knowledge comes for free. Whether that knowledge facilitates or inhibits the second language acquisition process is external to the content of the initial state.

Various proposals have been made as to the initial state of second language acquisition (Kaplan, 1993; Eubank, 1993/94, 1996; Lakshmanan & Selinker, 1994; Schwartz & Sprouse, 1994, 1996; Epstein, Flynn, & Martohardjono, 1996; Grondin & White, 1996; White, 1996; Vainikka & Young-Scholten, 1996a, 1996b; Hawkins & Chan, 1997; Prévost, 1997; Paradis, Le Corre, & Genesee, 1998; Slabakova, 2000; Yuan, 2001; Bhatt & Hancin-Bhatt, 2002), all of which propose that at least some of the L1 is present at the initial state of L2 acquisition. These proposals fall into two categories, one in which all of the L1 is available at the initial state (i.e., full transfer approaches) and one in which only part of the L1 is available at the initial state (i.e., partial transfer approaches).

However, all evidence in favor of full transfer fails to examine the grammar as a whole (see White, 2003; and Meisel, 2001; for relevant argumentation). Any evidence that a part of the L1 is unattested in the early stages of the L2 would fail to support full transfer accounts (Schwartz & Sprouse, 1994, 1996). Evidence of L1 knowledge being unattested in the early stages of the L2 is found in Yuan (2001). Yuan studied the L2 acquisition of verb raising in Chinese by L1 speakers of French, German, and English at three stages in their study of Chinese: 4-6 months, 1.5-2.5 years, and 3-4.5 years. Verb raising is a clause-bounded phenomenon in which the main clause verb raises to a higher position. Languages with verb raising allow adverbs to intercede between the verb and its object (13), whereas those without do not (12).

(12) *John eats often apples.

(13) Jean mange souvent des pommes.

Jean eats often\textsubscript{ADV} apples
The L1s of the learners varied in regard to having verb raising or not: French and German, like Chinese, allow verb raising, whereas English does not.

The participant groups were administered an oral production and a judgment task in which they had to produce or judge structures that required verb raising in Chinese. In the oral production task, learners were asked to produce full sentences based on information in a table using one of the following adverbs: *often, sometimes, rarely, or seldom*. Learners were told that the activity was testing their interpretation of the adverbs. This was done to divert attention away from adverb placement in the sentence. In the judgment task, learners were presented with pairs of sentences and asked to mark which sentence was correct or whether both were correct. An example item from the task appears in (14) below.

(14) a. Wo gege he pinching Deguo jiu. □
    My brother drink usually German wine
    ‘My brother drinks usually German wine.’

b. Wo gege pinching he Deguo jiu. □
    My brother usually drink German wine
    ‘My brother usually drinks German wine.’

c. I don’t know. □                  [Yuan, 2001: 261 (11)]

In (14), (14a) was verb raising, which is the licit word order in the target language. (14b) is non-verb raising, which is not licit in Chinese. Regardless of whether there was verb raising in their L1, all but one of the learner groups had over 90% accuracy on the Chinese word order for both tasks\(^5\). More importantly, learners at the earliest stages had at least 91% accuracy for both tasks, including an accuracy of 100% for the early English group (with an average study of 4 months)

\(^5\) The L1 French group at 1.5 years of study had an accuracy of 88% on the oral production task.
on a total of 140 tokens in the oral task. If the English learners had transferred their knowledge of verb raising at the initial state, the author argues, such a high accuracy at 4 months of study is highly unlikely.

In light of the lack of evidence of full transfer of the L1 as a whole, I assume one of the various partial transfer accounts (Bhatt & Hancin-Bhatt, 2002; Eubank, 1993/94, 1996; Hawkins & Chan, 1997; Vainikka & Young-Scholten, 1996a, 1996b). All partial transfer accounts are concerned with what part of the L1 does not transfer at the initial state, and in all cases, some portion of the L1 functional elements are not available at the L2 initial state. Both Eubank (1993/94, 1996) and Hawkins and Chan (1997) propose that, though functional categories are available at the initial state, the strength of the features on those functional categories is not. Non-finite complementation is not reliant on feature strength, so neither proposal is relevant to the study at hand.

Two other hypotheses about the nature of the initial state both predict that L1 Spanish knowledge of non-finite complementation is unavailable at the initial state of L2 English acquisition. In their Minimal Trees Hypothesis (MTH), Vainikka and Young-Scholten (1996a, 1996b), for example, propose that only lexical categories from the L1 are available at the initial state. Because non-finite complementation relies on functional categories (i.e., CP and TP), the MTH predicts that the functional categories necessary for non-finite complementation are not available.

The primary evidence presented for the MTH concerns head-directionality. Vainikka and Young-Scholten (1996a, 1996b) predict that by virtue of the presence of lexical items (e.g. VP), L1 properties that are associated with those lexical items will transfer at the initial state. One
such property is head directionality, including the difference between noun-adjective word orders in English and languages such as Spanish: whereas English adjectives precede the noun (e.g., *red car*), Spanish adjectives typically follow the noun (e.g., *coche rojo*, or ‘car red’). Because noun phrases’ heads are nouns, English is head-final and Spanish is head-initial. Another example of head directionality, verbs and their complements (i.e., VPs), is cited as primary evidence by Vainikka and Young-Scholten (1996a, 199b) for the MTH. The authors observe that early L2 speech is characterized by VPs whose order (head initial vs. head-final) matches that of their first language, and adoption of the L2 VP word order represents resetting a parameter related to word order. A critique of this logic appears in Meisel (2011). Meisel argues that presence of a transferred parameter from the L1 indicates transferred functional material. Although Meisel’s argument is based on a pre-minimalism account (Ouhalla, 1991), the MTH bears the burden of proof that head-directionality is solely lexical in nature, including compatibility with feature-based accounts (e.g., Embick & Noyer, 2007; Halle & Marantz, 1994; Harley & Noyer, 1999).

By comparison, Bhatt and Hancin-Bhatt (2002) present a more conservative approach. The authors hypothesize that some functional categories are available at the initial state. Importantly, they argue that the CP layer in particular is not available. Evidence that the initial state lacks a CP layer comes from phenomena such as question-formation in Bhatt and Hancin-Bhatt (2002). Because question formation relies on the availability of CP, problems with question formation at the initial stages of L1 Hindi L2 English acquisition lead the authors to propose that there is no CP at the initial state. Instead, they propose Structural Minimality: at the initial state, all clauses are Inflection Phrases (IPs), which for the purposes of the present discussion are analogous to TPs. If this is the case, then all types of non-finite complementation
are analyzed the same way at the initial state. Indeed, this makes the strong prediction that superficial similarity may play a strong role in L2 acquisition. Discussion of superficial similarity appears in section 3.2.3, and evaluation of this prediction and its relation to the near-native speakers in this dissertation will be presented in section 3.3.

In summary, the initial state of L2 acquisition with regard to transfer is described as involving either full transfer from the L1 (Schwartz & Sprouse, 1994, 1996) or some form of partial transfer (Bhatt & Hancin-Bhatt, 2002; Eubank, 1993/94, 1996; Hawkins & Chan, 1997; Vainikka & Young-Scholten, 1996a, 1996b). Because the role of the L1 in the L2 is under study in this dissertation, I assume a conservative approach where the functional category that is related to the potentially transferrable sentence types (CP) is not available at initial state. The study of highly proficient learners is not informative about the initial state itself; however, if a role for similarity between the L1 and the L2 is found, the possibility that CP was transferred must be entertained.

3.2.2 Facilitation and Inhibition via Similarity

One factor that inherently separates L1 acquisition from adult L2 acquisition is the fact that L2 acquisition occurs in the presence of a fully acquired L1. The coexistence of the L1 and the L2 gives rise to the possibility of cross-linguistic influence, which is also sometimes called transfer. Odlin (1989) defines transfer as “the influence resulting from the similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired” (p. 27). Because this influence is the result of (dis)similarity, transfer is a central transition theory in making predictions regarding [+/- similar] forms.

In regard to the role of transfer, a few salient findings emerge in the vast body of literature on the topic (e.g., Gass & Selinker, 1983; Kellerman & Sharwood-Smith, 1986; Odlin,
<table>
<thead>
<tr>
<th>Linguistic Object</th>
<th>Paper</th>
<th>L1(s)</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causative Constructions</td>
<td>Helms-Park (2001)</td>
<td>Hindi, Urdu, Vietnamese</td>
<td>English</td>
</tr>
<tr>
<td>Existential Constructions</td>
<td>Schachter &amp; Rutherford (1979)</td>
<td>Chinese, Japanese</td>
<td>English</td>
</tr>
<tr>
<td>Gender</td>
<td>Bialystok (1997)</td>
<td>English, German</td>
<td>French</td>
</tr>
<tr>
<td>Nominal Case Prefixation</td>
<td>Orr (1987)</td>
<td>Gujarati, Chingoni</td>
<td>Chichewa</td>
</tr>
<tr>
<td>Pronouns</td>
<td>White (1985)</td>
<td>Spanish</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>Gundel &amp; Tarone (1992)</td>
<td>Spanish, Chinese</td>
<td>English</td>
</tr>
<tr>
<td>Relativization</td>
<td>Gass (1979)</td>
<td>Arabic, Chinese, French, Italian, Korean, Persian, Portuguese, Japanese, Thai</td>
<td>English</td>
</tr>
<tr>
<td>Spatial Expressions</td>
<td>Schumann (1986)</td>
<td>Spanish, Japanese, Chinese</td>
<td>English</td>
</tr>
<tr>
<td>Tense/Aspect Morphology</td>
<td>Cranshaw (1997)</td>
<td>French, Chinese</td>
<td>English</td>
</tr>
<tr>
<td>Gender, Number, and Aspect</td>
<td>Bialystok &amp; Miller (1999)</td>
<td>Spanish, Chinese</td>
<td>English</td>
</tr>
<tr>
<td>Morphology</td>
<td>Jansen, Lalleman &amp; Muysken (1981)</td>
<td>Turkish, Moroccan</td>
<td>Dutch</td>
</tr>
<tr>
<td>Perception of Lexical Tones</td>
<td>Gandour &amp; Harshman (1986)</td>
<td>Thai, Yoruba, English</td>
<td>n/a</td>
</tr>
<tr>
<td>Phonology</td>
<td>Bongaerts (1999)</td>
<td>Dutch</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>Flege et al. (1999)</td>
<td>Korean</td>
<td>English</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Ringbom (1987)</td>
<td>Spanish, Swedish</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>Ard &amp; Homburg (1993)</td>
<td>Spanish, Arabic</td>
<td>English</td>
</tr>
</tbody>
</table>
1989, 2003). Transfer is more strongly attested in some linguistic subsystems (e.g., phonology) than others (e.g., morphosyntax). There is both positive transfer—facilitation—and negative transfer—interference or inhibition—and authors disagree as to whether one is more influential than the other (see e.g., Weinreich, 1953 for the primacy of interference and Ringbom, 1987, 1992 for claims that facilitation is more prevalent). Finally, predicted difficulties in acquisition based on a property theory analysis do not always materialize (e.g., Gass & Selinker, 1983; Odlin, 1989). Further discussion of this last point will be the topic of section 3.2.3.

Despite the disagreement among scholars of cross-linguistic influence in regard to the degree of transfer and when it will occur, a great deal of studies have found a facilitation effect for similarity between the L1 and the L2. Table 6 features 20 studies in which the presence or absence of a form in the L1 correlated with successful L2 acquisition. This effect was found across a range of L1s including Hindi-Urdu, Spanish, Finnish, Moroccan, and Korean, although only a few L2s were empirically tested: English, Chichewa, French, and Dutch. The wide range of phenomena in Table 6 suggest that the existence of some role for similarity is undeniable.

In most cases, the studies in Table 6 included two L1 groups, and the group with similar use of the target form had more native-like performance. One study of this type is Bialystok and Miller (1999), which I will discuss here for two reasons: First, it is a clear example of comparison of two L1 groups, and second, it also includes two types of dissimilarity, a point which will become relevant in this dissertation. Bialystok and Miller investigated the interlanguage of L1 Chinese and L1 Spanish/L2 English learners across a range of morphosyntactic elements. The forms tested include plural markers, determiners, future morphology, and progressive morphology. An additional category was included that the authors labeled ‘collocations’, consisting of comparisons such as (12) and (13) below.
(12)  a. Mary fainted and collapsed [on the floor].
     b. *Mary fainted and collapsed [the floor].

(13)  a. My parents arrived [at the airport] already.

As compared to (12a) and (13a), sentences (12b) and (13b) are missing a preposition, resulting in ungrammatical structures. The problem lies in the complement to the verb, indicated by square brackets: the unaccusative verbs collapse and arrive take prepositional phrase (PP) complements (e.g., on the floor or at the airport) but not DP complements (e.g., the floor or the airport).

Bialystok and Miller observe that Chinese shares some of these subcategorization properties, though not others. In the case of (12) and (13), Chinese is similar to English in the case of (12) and dissimilar in the case of (13). Spanish is in line with English for both examples, though subcategorization of this type is not systematically similar between Spanish and English.

The authors assigned the 5 categories the values ‘similar’ and ‘dissimilar’ in regard to comparison of Chinese and English or Spanish and English. The criteria for ‘dissimilarity’ differed by form. For plural and determiners, ‘dissimilar’ was attributed to lacking the category in the learner’s L1. For future and progressive, ‘dissimilar’ was attributed to optionality of realization in the L1 where there was only one realization in the L2. In particular, Spanish has both a periphrastic and simple future tense, and both the present tense and a gerund can be used to expressive progressive. I summarize this categorization in Table 7.

Table 7. Categorization of Similarity in Bialystok & Miller (1999)

<table>
<thead>
<tr>
<th></th>
<th>Plural</th>
<th>Determiners</th>
<th>Future</th>
<th>Progressive</th>
<th>Collocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese &amp; English</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Spanish &amp; English</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+/-</td>
</tr>
</tbody>
</table>
On a grammaticality judgment task, L1 Chinese L2 English learners were more accurate on those structures that were similar in Chinese and English. However, there was no relationship between similarity and accuracy for the L1 Spanish/L2 English learner group. The authors attribute the differential effect of similarity between the two learner groups to typological similarity between English and Spanish: Because there is less for L1 Spanish learners to learn in English, learners are able to hone in on particular structures. L1 Chinese learners, however, are faced with a multitude of differences to acquire, resulting in overall greater difficulty. Another potential explanation, of course, could be that there is a qualitative difference between dissimilarity due to lacking a category, as is the case with Chinese, and optionality of realization, as is the case with Spanish.

The results of Bialystok and Miller (1999) suggest that it is more difficult to acquire a category that is absent in the L1 (Chinese determiners) than acquiring a form that is optionally realized in the L1 (Spanish future and progressive morphology). This finding is relevant to the current dissertation because the two [-similar] forms of study also differ in a qualitative way, as is represented in Table 8.

Table 8. Type of Dissimilarity in Bialystok and Miller (1999) and Current Study

<table>
<thead>
<tr>
<th>Type of dissimilarity</th>
<th>What</th>
<th>Languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent → Overtly Realized</td>
<td>Determiners</td>
<td>L1 Chinese/L2 English</td>
</tr>
<tr>
<td>Restriction (Superset → Subset)</td>
<td>Future &amp; Progressive</td>
<td>L1 Spanish/L2 English</td>
</tr>
<tr>
<td>Expansion (Subset → Superset)</td>
<td>Believe-type Perfective Complements</td>
<td>L1 Spanish/L2 English</td>
</tr>
<tr>
<td>Contrastive (Finite → Non-finite)</td>
<td>For-type verbs + (non)finite</td>
<td>L1 Spanish/L2 English</td>
</tr>
</tbody>
</table>

Whereas the acquisition of determiners for L1 Chinese L2 English learners is the acquisition of something absent in the L1, the acquisition of future and progressive for L1 Spanish/L2 English
learners is a restriction: Learners must restrict the set of possible ways to express future and progressive, going from a superset to a subset of options.

The relationship between subsets and supersets has been observed to affect learning (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987, White, 1989). The Subset Principle (Berwick, 1985) proposes that certain pairs of languages have relationships with regard to linguistic phenomena that meet the Subset Condition: All of the possible configurations of language X are possible in language Y, and language Y has additional configurations that are not possible in language X. The task of the language learner is to choose between compatible hypotheses that account for the input based on positive evidence. If a learner adopts a hypothesis that is consistent with the data for language Y, the hypothesis would overgenerate for language X. Therefore, given all the possible hypotheses that account for at least language X, the learner always chooses the hypothesis that accounts for the smallest amount of data for economy reasons, i.e., language X and only language X. This predicts that going from a superset to a subset is aided by learning strategies natural to the learner (Manzini & Wexler, 1987; Wexler & Manzini, 1987).

In the case of L1 Spanish/L2 English acquisition of perfective complements for believe-type verbs (i.e., those that can form Raising to Object with non-finite complements), the learner must learn that there are more ways to realize the same proposition in English than in Spanish. Spanish epistemic verbs (believe-type verbs) take finite complements, including when that complement has perfective aspect (14). English epistemic verbs can take finite complements (15) in addition to non-finite complements (16).

(14) Creo que Juan ha pintado un retrato.
(15) I believe that John has painted a portrait.
(16) I believe John to have painted a portrait.

All three examples (14)-(16) express the same proposition. It is simply the case that English has two ways to express it (Finite, Non-finite) and Spanish has only one (Finite). The task of the L1 Spanish learner of English, therefore, is to acquire the additional way (16).

With regard to the Subset Principle, White (1989) argues that the most economical choice at the early stages of L2 acquisition will be for the learner to initially adopt a hypothesis that is consistent with their L1 data (i.e., a subset hypothesis). This fact alone suggests that acquiring an L2 phenomenon that has a superset of configurations is a more difficult task than the reverse. However, recall that the Subset Principle is a theory of learning based on positive evidence. The primacy of positive evidence under the Subset Principle suggests that superset can be acquired: Though learners do not start with the correct hypothesis, sufficient occurrences of configurations outside of their current hypothesized subset would trigger reanalysis.

The final case of dissimilarity, for-type verbs, differs contrastively. A for-type verb such as want and need selects only one type of clausal complement in both Spanish and English, but it selects a different type in each: Spanish want and need take finite clauses whereas English want and need take non-finite complements. As a result, the L1 Spanish/L2 English learner must both acquire a new type of complement for these verbs and suppress the type of complement that was selected for in their L1. Notice that contrastive dissimilarity does not meet the Subset Condition, and ergo the Subset Principle does not apply.

Instead, the process of acquisition relies on restriction via negative evidence and acquisition via positive evidence. Restricting options has been proposed to cause difficulty due to the fact that ungrammaticality would be inferred via negative evidence only (Hyams, 2000; White, 1989). If this generalization holds for the study at hand, this predicts that the for-type
contrastive dissimilarity will be more difficult to acquire than the RtoO Perfective, which does not involve restriction.

3.2.3 Surface Similarity

In contrast with the similarity typology presented in section 3.1, there is an additional confound: surface similarity. Surface similarity contrasts with structural overlap in that the former is a superficial similarity in which disparate sentence structures share a linear order. The superficial nature of surface similarity has been linked to similarity as perceived by the learner, which in turn has been linked to cross-linguistic influence (e.g., Bialystok, 1997; Eckman, 2004; Kellerman, 1977, 1978; Ringbom, 2007; Ringbom & Jarvis, 2009). The effects of surface similarity appear to be widespread because evidence for a role of surface similarity has been found for an array of language phenomena including specific language impairment (e.g., Leonard, Sabbadini, Volterra, & Leonard, 1988; Leonard, 1989), aphasia (e.g., Leonard, McGregor, & Allen, 1992), early stages of L1 acquisition (e.g., Corder, 1967; White, 1981) and also L2 acquisition (Kellerman, 1978; Odlin, 1989). The widespread nature of this effect suggests that it is a natural pitfall of learning based on input, so effects of surface or perceived similarity in L2 acquisition should not be surprising.

With regard to any particular linguistic property, Ringbom and Jarvis (2009) propose that the distance between actual and perceived similarity results from three factors: (i) learners’ failure to notice similarities, (ii) learners’ misconception about what similarities they do notice, and (iii) learners’ assumptions that certain similarities exist despite no evidence for them. Importantly, those authors that employ the term ‘perceived’ similarity typically do so in a post-hoc manner. Studies of perceived similarity typically do not include off-line or on-line measures
of awareness. Instead, proposals regarding the role of perceived similarity analyze their results and draw conclusions parallel to factors (i)-(iii) from Ringbom and Jarvis (2009).

Although the terms perceived similarity and surface similarity are sometimes used interchangeably, they are conceptually distinct. Ostensibly, a superficial similarity—a surface similarity—would provide an opportunity for misanalysis by affecting how the learner perceives a particular L2 distinction. This may result in either misconception about noticed similarities (ii) or belief that a similarity exists that does not (iii). Here I employ the term surface similarity with the understanding that it may affect the learner’s perception of similarity.

The issue of surface similarity is relevant to non-finite complementation for two reasons. As stated in section 3.2.1 on the initial state of L2 acquisition, I adopt the conservative analysis that all clauses are IPs at the initial state (Bhatt & Hancin-Bhatt, 2002). This analysis will be revisited upon evidence of an effect for similarity, but as it stands, it predicts that learners may have a mental representation of the various types of non-finite complementation that is superficially similar, meaning that they are all composed of main verbs and IP complements. The second reason is that the types of non-finite complementation in the current study are identical on the surface: Raising to Object (RtoO: 17), Object Control (ObjC: 18), and for-type constructions (19).

(17) Mary believes John to be honest.

(18) Mary persuades John to be honest.

(19) Mary needs (for) John to be honest.

It is only with further analysis (see the diagnostics laid out in section 2.2) that they can be distinguished. This presents a special challenge to an L1 Spanish/L2 English learner. Spanish has only ObjC (18), so a learner may be able to use knowledge of ObjC in Spanish in acquiring it
in English. The same learner does not have RtoO (17) or for-type constructions (19) in their native language. It is possible that some L2 learners will assume that all three types are instantiations of the one type that exists in their L1, specifically Object Control. Note that misanalysis of a verb like believe (i.e., RtoO verbs) as an ObjC verb would involve over-riding the learner’s knowledge of the argument structure: believe in Spanish—as well as English—has no θ-role for an internal DP argument. Although the necessity of over-riding RtoO verbs’ argument structure makes the misanalysis less likely, it is difficult to predict what learners will perceive to be similar and subsequently transfer. If a misanalysis of RtoO or for-type were to occur, such an analysis makes incorrect predictions regarding the other types, including the prediction that neither RtoO nor for-type would allow expletives, though both do (20)-(21).

(20) Mary believes there to be cookies on the table.
(21) Mary needs (for) there to be cookies on the table.

Misanalysis of RtoO and for-type constructions as ObjC predicts added difficulty for acquiring RtoO and for-type constructions.

An important final note regarding surface similarity relates to proficiency. Kellerman (1979, 1983, 1986) observed a relationship between learner proficiency and perception of similarity. This relationship indicated that learners’ judgments regarding similarity were more accurate at higher levels of proficiency. The author cites that this is largely due to a better understanding of the target language, implicit or otherwise. If this relation holds for the L1 Spanish/L2 English acquisition of non-finite complementation, the study of near-native learners in this dissertation predicts that learners will exhibit minimal errors due to perceived similarity that does not reflect actual structural overlap.
3.3 *Experimental Evidence: Pérez-Tattam (2007)*

To my knowledge, there is no study that investigates the L2 acquisition of English non-finite complementation, particularly of RtoO, *for*-type constructions, and ObjC. However, study of the L2 acquisition of Spanish non-finite complement constructions by L1 English speakers is found in Pérez-Tattam (2007). The learners in Pérez-Tattam’s dissertation were of intermediate and advanced proficiency, and comparison of the two groups may allow for some insight into the development of non-finite complementation in L2 acquisition generally. Also, Pérez-Tattam studied types of complementation that are relevant to this dissertation, including ObjC, and *want* and *need* (*for*-type verbs) with both non-finite and finite complements.

In Chapter 2 of this dissertation, I presented evidence that Spanish lacks RtoO and *for*-type constructions. Pérez-Tattam (2007) investigates the remaining form of non-finite complementation studied in this dissertation, ObjC, as well as *for*-type verbs (*want* and *need*) with finite complements. Both ObjC and finite complements of *want* and *need* rely on the availability of a CP. Returning to the transition theory discussed in section 3.2, I adopted the conservative analysis that CP is not available at the initial state (Bhatt & Hancin-Bhatt, 2002). The unavailability of CP predicts that L1 English speakers will have non-native-like representations of non-finite complementation in their L2 Spanish at the initial state. If this is the case, remnants of non-native-like representations may still be present at intermediate proficiency, which would corroborate the premise that there is no CP at initial state.

Further, the comparison of the advanced group to the intermediate group in Pérez-Tattam’s study will give insight into the ability of L2 learners to use similarity at subsequent stages of reanalysis. Let us use as an example ObjC, which is similar in English and Spanish (22), and *for*-type constructions, which are dissimilar in English and Spanish (23).
(22) a. We forced the politicians to make a decision.

b. Les obligamos a los políticos a tomar una decisión.

[Them,CL (we) forced ACC the politicians to make a decision]

[Pérez-Tattam, 2007 (150)]

(23) a. The boss wanted the employees to work on the report.

b.* La jefa quería a los empleados trabajar en el informe.

[The boss wanted ACC the employees to work on the report]

[Pérez-Tattam, 2007 (152)]

c. La jefa quería que los empleados trabajaran en el informe.

[The boss wanted that the employees worked on the report]

Recall that those verbs that elicit for-type constructions in English (23a) require finite complements in Spanish (23c). If intermediate learners have non-native-like knowledge of both ObjC (similar) and for-type constructions (dissimilar), then evidence of native-like knowledge of either of these forms by advanced learners suggests that non-finite complementation can be acquired despite not being available at the initial state. Importantly, if native-like knowledge of (22) but not (23) is found at advanced proficiency, then similarity plays a role in spite of the initial state.

In her dissertation, Pérez-Tattam employed two tasks to ascertain the groups’ knowledge regarding Spanish ObjC, for-type verbs (want and need), and perceptual verb constructions. The first task was a grammaticality judgment task, for which the author found that both proficiency level learner groups had ratings of ObjC and for-type verb constructions that were significantly different from the native speakers. In particular, learners gave the for-type grammatical
exemplars lower ratings than native speakers and the ungrammatical exemplars higher ratings than native speakers.

She also investigated ratings of perceptual verb constructions, claiming that they are exceptional case marking (ECM) constructions. As discussed in section 2.3, ECM is an analysis of RtoO constructions, and I argued there that RtoO does not exist in Spanish. Rather, perceptual verb constructions have reduced clausal complements that are not analogous to English. For these constructions, Pérez-Tattam also found that both advanced and intermediate L2 learners of Spanish had ratings that were significantly different from L1 Spanish speakers as measured by the grammaticality judgment task; however we will set this finding aside because reduced clausal complements are outside of the purview of the current study.

In her interpretation of the results, the author observes that the L1 English L2 Spanish learners accepted grammatical ObjC with overt DPs significantly more than native speakers which she attributes to the prevalence of this construction in English. Because this construction is infrequent but not ungrammatical in Spanish, this suggests that similarity between English and Spanish aids acquisition despite the overall infrequency of the construction. The advanced learners, however, did not statistically differ from the native speakers, despite having a higher acceptance rate. For ungrammatical items, both participant groups accepted ungrammatical for-type constructions (want and need with non-finite complements) in Spanish significantly more than native speakers. Because for-type constructions are grammatical in English, the structural dissimilarity between English and Spanish may have caused interference.

Her second task was an interpretation task in which participants had to interpret the controller of the PRO of ObjC. The PRO was either controlled by a direct object (DO) or by an

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6 Pérez-Tattam also had participants perform the interpretation task on perceptual verb constructions, but because perceptual verb constructions are not of interest to the current study, I do not discuss those results here.
indirect object (IO), and both DO and IO appeared half of the time as DPs and half of the time as clitics. The resulting conditions were DP DO, DP IO, clitic DO (e.g., locla), and clitic IO (e.g., le). A context was given that ended in the critical stimulus, followed by a question as in the full DP IO example in (24).

(24) Isabel estaba harta de que María estuviera al teléfono a todas horas. Un buen día, habló con ella muy seriamente y no permitió a María usarlo nunca más.

¿Quién o quiénes no lo usará(n) nunca más?

(“Isabel was sick of Maria using the phone all the time. One day, she had a serious talk with her and did not let Maria use it anymore.

Who will not use the phone anymore?”)

For the context and question above, the possible answers were Isabel, María, Las dos (‘Both of them’), and No sé (‘I don’t know’). Pérez-Tattam found that the intermediate proficiency group was significantly less accurate than the L1 Spanish group in correctly responding to questions that featured DO and IO clitics as well as those that featured full DP IOs. The advanced group was only significantly different from the L1 speakers on DO clitics.

The finding that L2 Spanish learners show difficulty in interpreting the clitic controller is unsurprising. English has no clitics, so there is no opportunity for facilitation due to overlap of the L1 and the L2. Clitics also have low salience due to being short and not having word stress.

Salience Both of these factors correctly predict that clitics would be more challenging to learners than full DPs. However, the fact that intermediate learners had difficulty interpreting the full DP IO controller is suggestive with regard to the issue of similarity and the initial state: ObjC is

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7 Low perceptual salience due to phonological reasons such being unstressed, contracted, or bound has been found to be predictive of learning difficulty for L1 child (Slobin, 1985) and L2 adult (e.g., Henrichsen, 1984; Schmidt & Frota, 1986) learners.
present in both English and Spanish, including IO controllers such as (24) above, reproduced in English as (25).

(25) She didn’t permit María to use the phone anymore.

The availability of IO controllers in English predicts acquisition, but at lower levels of proficiency, learners failed to employ their knowledge of IO controllers from their L1.

Comparing the findings of the first task to the second task, a clearer picture emerges. In the first task, the author found that both intermediate and advanced proficiency had non-native-like knowledge of the dissimilar form, and only the advanced learners converged on native speakers for similar forms. In the second task, she found that advanced, but not intermediate, proficiency learners had native-like interpretation of the similar form, ObjC. Under the analysis that (i) ObjC relies on CP and that (ii) CP is unavailable at the initial state (Bhatt & Hancin-Bhatt, 2002; Vainikka & Young-Scholten, 1996a, 1996b), the composite result of these two tasks suggests that similarity plays a role in L2 acquisition of non-finite complementation independent of the initial state.

Pérez-Tattam’s results are applicable to the current study in terms of the predictions based on similarity, but the design of the current study makes some noteworthy changes. First, the current study reverses the L1-L2 relation: whereas Pérez-Tattam investigated the L1 English L2 acquisition of Spanish non-finite complementation, I investigate the L1 Spanish/L2 acquisition of English non-finite complementation. The study of English non-finite complementation is of particular interest because English has a larger array of types of non-finite complementation. Because Spanish has a subset of these types, the task of the L1 Spanish/L2 English learner is to acquire the remaining types. Further, these types differ in terms of their frequency, allowing both similarity and frequency to be manipulated.
Second, in Pérez-Tattam’s study, she excluded participants that scored at near-native proficiency (above 90%) on her proficiency measure. In this dissertation, I test near-native learners to have the greatest chance of finding learners who have acquired English non-finite complementation. Study of near-native learners simulates study of a successful “end state” learner, and evidence of these forms at a near-end state entails that their acquisition is indeed possible.

Finally, Pérez-Tattam also was unable to test the acquisition of RtoO because RtoO is not present in Spanish, and the current study will look for knowledge of RtoO. She was further unable to test aspectual distinctions in non-finite complementation because aspectual distinctions are part of RtoO, one of the types of non-finite complementation absent in Spanish. Part of the goal of the current study is to fill in these gaps.

3.4 Conclusions: Similarity and the Fundamental Difference Hypothesis

In this chapter, I presented proposals that similarity between the L1 and the L2 is generally predictive of native-like attainment. Independently, I have assumed that the relevant functional category for non-finite complementation, CP, is unavailable at the initial state on the basis of findings from two independent studies: Bhatt and Hancin-Bhatt (2002) and Pérez-Tattam (2007). As a result, learners initially analyze all types of non-finite complementation as IPs, which may allow for misanalysis due to surface or perceived similarity.

If the goal of this study were to simply show that adult L2 acquisition of non-finite complementation can be successful, the unavailability of CP transfer would be potentially problematic, as it inherently makes the task of the L2 learner more complex: not only do learners have to acquire those types of non-finite complementation that are absent in their L1, but
they have to acquire those types of non-finite complementation that are present in their L1. Further, learners have to do so in spite of conflicting evidence.

However, the purpose of this study is to better understand the differences between the mechanisms of L1 and L2 acquisition. The Fundamental Difference Hypothesis predicts that the mechanism is different due to maturational constraints that prevent the learner from employing linguistic universals. In this dissertation, the goal is to test whether forms that are infrequent and uninstructed are learnable in the L2 as they are in L1. Whereas positive transfer is facilitative of L2 acquisition (see e.g., section 3.2.2), it is, instead, useful for our present purposes that transfer is an unlikely source of L2 knowledge of English non-finite complementation: L2 knowledge of English non-finite complementation found in this dissertation is the consequence of some mechanism after L2 input has begun.

Because the mechanisms of interest in this study must interact with L2 input, it is very important to understand the role of frequency in L2 acquisition. Additionally, any potential role for frequency can be tested only once the frequency of the various types of non-finite complementation in the learners’ English input is quantified and compared. I address both of these issues in Chapter 4.
4. Frequency

In the discussion on similarity, evidence was presented suggesting that the L2 acquisition of non-finite complementation is reliant on information not available at the initial state. Instead, acquisition is posited to take place at subsequent stages of learning, during which time the learner is exposed to large amounts of input. Understanding the composition of the input is essential because of a potential role for both content and frequency. One example of a claim to this effect was discussed in Chapter 3: Pérez-Tattam (2007) concluded that her L2 learners’ greater proclivity for full DP complements in ObjC over clitic complements was due to the former’s greater frequency in English. Claims of this sort necessitate further investigation of the role of frequency in L2 acquisition.

This chapter presents a critical summary of the role of frequency in L2 acquisition and makes predictions regarding the (in)frequency of the target forms in this dissertation. In the same way that frequency may affect how learning occurs, frequency accounts are also transition theories. The transition theories associated with frequency often link availability in the input with success in L2 acquisition, with frequency differences being ascribed partial causation in an array of differential outcomes (see e.g., Boyd & Goldberg, 2009; and Ellis & Collins, 2009 for relevant meta-analyses). Because the acquisition of infrequent forms is consistently successful in L1 acquisition, frequency effects may present evidence of a difference in learning mechanism employed in L1 and L2 acquisition.

To better understand the role of frequency in L2 acquisition, this chapter is divided into three main parts followed by conclusions. In section 4.1, I begin with evidence that L1 acquisition cannot be the product of solely statistical learning, i.e., that frequency does not have an effect on the end-state of L1 acquisition. I then examine the role of frequency in L2
acquisition in section 4.2, including two highly influential models. Section 4.3 examines the frequency of the three types of non-finite complementation of interest in this dissertation—RtoO, ObjC, and for-type constructions—using corpus data and frequency counts. Conclusions regarding the relative frequency of these forms, L2 acquisition, and the Fundamental Difference Hypothesis are presented in section 4.4.

4.1 The Role of Frequency in L1 Acquisition

Most modern proposals that tout the role of frequency fall under the general umbrella of emergentist learning. Emergence, in the Aristotelian sense, is the creation of complex patterns via the interaction of simple processes. An emergentist approach to language, therefore, is one that assumes that the complex, multi-faceted phenomenon of language is the result of simple processes applied in repetition. Importantly, emergentist models claim that language acquisition is data-driven (Clark & Eyraud, 2007; Clark & Lappin, 2011; Cowie, 1997, 1999, 2003; Perfors, Tenenbaum, & Regier, 2011), meaning that frequency is the central factor in learning. According to such claims, L1 acquisition is data-driven because it is the product of domain-general learning mechanisms. The term ‘domain-general’ refers to knowledge and learning mechanisms that are not allocated to a particular faculty of the mind, including the ability to regularize input and extract intuitions regarding grammaticality and ungrammaticality.

In contrast with domain-general language acquisition models are domain-specific acquisition models. Any knowledge or learning mechanisms that are allocated to a particular faculty of the mind are domain-specific. Chomsky (1965) first noted that L1 acquisition proceeds in spite of what he observed to be deficiencies in the input, including the infrequency of specific constructions, misleading data, and a lack of negative evidence in regard to ungrammaticality. Because L1 acquisition is consistently successful despite such issues, he
proposed that acquisition must be facilitated by an innate, domain-specific language capacity unique to humans. This line of argumentation is referred to as the Poverty of Stimulus argument, an argument which has been the subject of much discussion in the field (e.g., Baker & McCarthy, 1981; Hornstein & Lightfoot, 1981; Cowie, 1997, 1999, 2003; Crain & Petroski, 2001, 2002; Pullum & Sholz, 2002). Those that challenge emergentism in L1 acquisition are those that argue that domain-specific mechanisms are responsible for language acquisition.

Proponents of emergentism in L1 argue that domain general learning mechanisms are used in language acquisition, even if the subsequent knowledge is domain specific. Cowie (1997), for example, argues that the knowledge that a learner acquires about the language is domain-specific if domain-specific knowledge can be characterized as “knowledge (or at least informed speculation) about the nature of language,” (p.18). Although she claims that this definition of domain-specific knowledge is compatible with both UG and emergentism, she contends that the mechanism used to acquire such knowledge need not be domain-specific. Under such an approach, the learner must rely on domain-general learning mechanisms, and the presence of domain-specific knowledge is not evidence of an innate faculty of language acquisition.

If Cowie’s position is to be evaluated, a larger issue arises that concerns the nature of the proposed domain-general learning mechanisms and their relationship with the input. Cowie characterizes these mechanisms as such experience-driven statements as “Look for similarities;” “Prefer simpler hypotheses to more complex ones;” and “Seek out underlying regularities,” (p. 25) but makes no definite claims as to what the actual mechanisms are (see also Slobin’s (1972) operational principles). Further, even if she were to present specific mechanisms, she offers no way to test whether the mechanisms are indeed sufficient.
In response to such issues, some authors (Clark & Eyraud, 2007; Clark et al, 2008; Clark, 2010; Clark & Lappin, 2011; Perfors et al., 2011) have employed data-driven learning (DDL) algorithms in an attempt to show what knowledge is acquired through the interaction of a subset of primary linguistic data and domain-general learning mechanisms. Such algorithms are designed to learn particular grammatical phenomena such as yes/no questions (1).

(1)  a. John has seen the show.
    b. Has John seen the show?

The goal of designing DDL algorithms is to simulate human language learning. For a learning mechanism to arrive at a correct representation of yes/no question formation, it must be able to generate (3), but not (4), derived from (2).

(2)  The man [who is hungry] is ordering dinner.
(3)  Is the man [who is hungry] __ ordering dinner?  [Clark & Lappin, 2011 (15a)]
(4)  *Is the man [who __ hungry] is ordering dinner?  [Clark & Lappin, 2011 (15b)]

Examples (3) and (4) illustrate that simply fronting the first auxiliary in (2) is insufficient: if the first auxiliary is part of a relative clause, as in (2), fronting of the first auxiliary renders the construction ungrammatical (4).

To test whether the distinction between (3) and (4) can be learned via a DDL mechanism, Clark and Eyraud (2007) tested a string substitution algorithm based on weak substitutability (Harris, 1954). Weak substitutability claims that two strings $u$, $v$ are of the same category if they can be substituted for one another in a “significant set of linguistic contexts,” (Clark & Lappin, 2011: 41). Clark and Eyraud (2007) found that by using a string substitution algorithm based on
weak substitutability, example (3) and not (4), can be correctly produced using data such as in (5).  

(5)  

a. The man who is hungry died.  
b. The man ordered dinner.  
c. The man died.  
d. The man is hungry.  
e. Is the man hungry?  
f. The man is ordering dinner.  

[Clark & Lappin, 2011 (14), p. 42]  

Given (5), the algorithm can deduce that [the man] and [the man who is hungry] are of the same category based on (5a) and (5c). Further, (5d) and (5e) allow the algorithm to deduce that question formation, in the presence of an auxiliary, requires the fronting of the auxiliary immediately following an element of the category represented by [the man]. Given the latter of these two deductions, the algorithm would predict that a question based on (5f) would be (6) below.  

(6) Is [the man] ordering dinner?  

Finally, because [the man] can be substituted for any element in its category, (3) is predicted to be generated, reproduced as (7) below.  

(7) Is [the man who is hungry] ordering dinner?  

One challenge for theories that rely on string substitution types of DDL is the fact that such algorithms over-generate (Berwick & Chomsky, 2008; Berwick, Pietroski, Yankama, & Chomsky, 2011). Consider the verb phrases (VPs) in (8) and (9), demarcated using square brackets.  

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8 Clark and Eyraud’s (2007) examples are nearly identical to (5), but Clark and Lappin (2011) present them in a more concise format.
(8) a. Eagles [eat].  
   b. The men who are hungry [eat].  
   c. Small children [eat].  

(9) a. Eagles [eat apples].  
   b. The men who are hungry [eat apples].  
   c. Small children [eat apples].  

Given (8) and (9), weak substitutability predicts that [eat] and [eat apples] are of the same category. If string substitution applies blindly, then [eat apples] should be possible to substitute for [eat] in examples like (9a), yielding (10), which is ungrammatical.

(10) *Eagles [eat apples] apples.  

Examples such as (10) illustrate that string substitution in its pure form over-generates to form illicit configurations.

A different DDL approach comes from Perfors, Tenenbaum, and Regier (2011). Perfors et al. (2011) assigned a series of Bayesian models to a set of data from the CHILDES database (MacWhinney, 1993) to test whether domain-general learning could deduce domain-specific knowledge as predicted by Cowie (1997). The domain-specific knowledge tested by Perfors et al. was the knowledge that language is hierarchical. The most successful algorithm that the authors employed was a probabilistic context-free grammar (PCFG) that was equipped with a prior probability bias for simpler hypotheses. Once the best fit PCFG was found, the authors tested the grammar’s ability to predict hierarchical representations such as the auxiliary fronting exemplified in (3).

Perfors et al. found that the PCFG was able to parse the yes/no questions with auxiliaries (3) despite never having previously encountered exemplars of that form in the input. The authors
observe that correct parsing of (3) is dependent on a hierarchical representation. They conclude that the PCFG is evidence against a domain-specific mechanism for language acquisition: Domain-general learning as evidenced by the PCFG can learn domain-specific knowledge such as hierarchy in language.

Berwick et al. (2011) subsequently challenged Perfor et al.’s conclusion that the PCFG provides evidence against a domain-specific mechanism. Critically, Berwick et al. highlight an assumption by Perlors et al. regarding knowledge of hierarchy: The development of hierarchical representation affords the learner the ability to learn structure-dependent rules. This assumption can be represented as (11).

(11) If hierarchy is present in the grammar of the learner, then the grammar is composed of structure-dependent rules.

A structure-dependent rule is a grammatical rule that applies only to a subset of all structures. It prevents a given structure from appearing in an infelicitous context, which in turn constrains ambiguity both syntactically and in terms of interpretation. As an example, consider (12) below.

(12) Can eagles that fly eat? [Berwick et al., 2011 (5a): 1210]

In (12), the auxiliary can could arguably modify either eat (13) or fly (14).

(13) [Eagles that fly] can eat.

(14) [Eagles that can fly] eat. [Berwick et al., 2011 (5b-c): 1210]

But while interpretation (15) of (12) is acceptable, interpretation (16) is considered infelicitous, indicated by (#).

(15) Is it the case that [eagles that fly] can eat?

(16) #Is it the case that [eagles that can fly] eat?
Examples like (16) provide a potential confound for context-free grammars. The parsing of exemplars like (12) implies no specific number of interpretations, which in the case of (12) is just one: (15). Contrast this with ambiguous examples such as (17) and its two interpretations, (18) and (19).

(17) The senator called the donor from Texas. [Berwick et al., 2011 (13): 1212]

(18) The senator called the donor while the senator was in Texas.

(19) The senator called the donor who was from Texas.

The presence of hierarchy in a grammar does not inherently predict that multiple representations of a linear structure will be allowed for some exemplars (17) but not others (12). Because hierarchy itself does not provide this type of structure-specific information, the implicature in (11) does not hold.

In summary, domain-general mechanisms, as represented by DDL algorithms, both over-generate and fail to account for constrained ambiguity in representation. In the absence of compelling evidence of a domain-general learning algorithm, I adopt an account of the language learning mechanism in L1 acquisition that is not data-driven but rather domain-specific. A domain-specific learning mechanism is also consistent with the observation that L1 acquisition is robustly successful, including of infrequent forms: if L1 acquisition is not data-driven, then a lack of frequency in the input is not problematic.

Returning to the predictions made in the introduction to this chapter, adopting an account of L1 acquisition that is not constrained by frequency entails nothing about L2 acquisition, meaning that L2 acquisition might or might not be constrained by frequency. The adoption of an L1 mechanism that is not constrained by frequency, however, makes predictions that can be used to compare the mechanisms of L1 and L2 acquisition. In the case that L1 and L2 share a
common learning mechanism, no effect for frequency should be found for L2 acquisition. Finding an effect for frequency in L2 acquisition, on the other hand, would suggest that the mechanisms of L1 and L2 acquisition are distinct. To this end, I discuss the role of frequency in L2 acquisition in the following section, especially as concerns morphosyntax.

4.2 The Role of Frequency in L2 Acquisition

Frequency has been attributed a role as a partial predictor in a range of facets of second language use and acquisition (see e.g., Ellis, 2003 for discussion). Importantly, all frequency-based accounts are concerned with the formation of form-meaning connections, and like L1 models that rely on DDL, L2 models of frequency-based learning are emergentist. Of these, two influential models are connectionism (McClelland & Rumelhart, 1986) and the Competition Model (Bates & MacWhinney, 1989).

The connectionism approach (Elman et al., 1996; McClelland & Rumelhart, 1986; McLeod, Plunkett, & Rolls, 1998; Plunkett, 1998; Plunkett & Elman 1997; Redington & Chater, 1998; Seidenberg, 1997), for example, is an emergentist approach that uses DDL in conjunction with prototypical learning. Connectionists typically assume that L1 and L2 acquisition both occur in the same way: Simple learning mechanisms are able to regularize over massive amounts of data, resulting in a fine-grained neural network of associations. The same criticism of DDL in L1 acquisition, however, applies to connectionism. DDL models over-generate, thus failing to account for knowledge of constrained ambiguity in L2 learners. Recall examples (12), (15), and (16) from section 4.1, reproduced below.

(12) Can eagles that fly eat? [Berwick et al., 2011 (5a): 1210]

(15) Is it the case that [eagles that fly] can eat?

(16) #Is it the case that [eagles that can fly] eat?
In the same way that strict DDL in L1 acquisition incorrectly predicts that L1 speakers would accept (16) as an interpretation of (12), DDL in L2 acquisition incorrectly predicts that L2 learners would accept (16).

The other influential L2 emergentist approach is the Competition Model (Bates & MacWhinney, 1989; MacWhinney, 2001, 2005, 2006; MacWhinney & Bates, 1989; MacWhinney, Bates & Kliegl, 1984; MacWhinney, Leinbach, Taraban & McDonald, 1989). The emphasis of the Competition Model is on cues in language acquisition, where cues consist of lexical items that entail information to be used in an interpretation of the sentences in which they appear. The Competition Model differs from connectionism in two major ways. First, it is concerned with interpretation, which relies on the interaction of syntactic information with morphological, semantic, pragmatic, and phonological information. The focus on interaction of such distinct modules of language means that the Competition Model is not inherently limited by the predictions of DDL. Whereas the weak substitutability of DDL is blind to word category, the semantic and pragmatic modules are not, which may allow for a more complex linguistic system to develop, including one that distinguishes between (15) and (16).

Second, it places emphasis on both availability of the cue as well as on its reliability. The Competition Model is concerned with linguistic tasks which themselves have a frequency. The availability of a given cue, then, is whether it is present or absent in a particular linguistic task. More specifically, contrastive availability refers to those cases in which a cue’s availability is linked to a particular interpretation (MacWhinney, 2002). As a result, availability is a function of contrastive availability and task frequency. Reliability, on the other hand, is defined as “the conditional probability that an interpretation X should be selected given the presence of a cue
Y,” (MacWhinney, 2002: 4). Reliability is a statistical measure, and it predicts that acquisition will occur for those cues and forms that are highly reliable.

The combination of availability and reliability suggests that frequency alone is not sufficient for predicting L2 acquisition. Instead, co-occurring forms that are (a) similar on the surface only, (b) equally frequent, and (c) interpreted differently would be difficult to learn under the Competition Model. This difficulty is not adequately captured under strictly DDL models, including connectionism.

Importantly, predictions regarding the acquisition of forms that are superficially similar are relevant to the study at hand. Recall that part of the impetus of investigating the L2 acquisition of English non-finite complementation is the fact that, with certain embedded verbs, the various types of complementation can appear to belong to one homogenous category. For clarity, consider (20)-(22) where ObjC, RtoO, and for-type verbs appear with the same embedded predicate, to be honest.

(20) John persuaded Mary to be honest.
(21) John believed Mary to be honest.
(22) John wanted (for) Mary to be honest.

As discussed in Chapter 2, the sentences in (20)-(22) have distinct syntactic structures despite surface similarity. In fact, Spanish only has one of these types of non-finite complementation, ObjC (20).

Given the importance of lexical information in the Competition Model, the relevant cue reliability concerns the matrix verb in predicting the particular structure in which it occurs. This suggests that ObjC verbs are the most reliable cues because in all of the cases that an ObjC verb appears with a non-finite complement, the ObjC verb is in an ObjC construction. The next most
reliable would be for-type verbs because, although they can appear in either for-type or Subject Control constructions, for-type verbs have no further restrictions on their configurations. Finally, RtoO verbs would be the least reliable because they can appear both with finite and non-finite complements, and those non-finite complements that are licit with RtoO verbs are constrained in terms of aspect. RtoO verbs, in comparison with ObjC and for-type verbs, are arguably qualitatively less reliable in this sense. In what follows, I show that the frequency of ObjC, RtoO, and for-type verbs mirror their reliability, suggesting that ObjC and for-type verbs are frequent and reliable cues whereas RtoO verbs are infrequent and unreliable cues.

4.3 Non-finite Complementation in the Primary Linguistic Data

4.3.1 Corpus Frequency

In this section, I argue that non-finite complement constructions differ in terms of frequency and that some of the types (i.e. RtoO) are in fact highly infrequent. Most non-finite complement constructions appear sparingly in corpus data of the English language. In their analysis of the British National Corpus (BNC), Noël and Colleman (2009, 2010, 2012) cite that RtoO, for example, is a very infrequent form, especially in the active voice. In a sub portion of the Corpus of Late Modern English Texts (CLMET) compiled at the University of Leuven by Hendrik De Smet, Noël and Colleman (2010) found only 900 instances of RtoO among the over 6 million words collected between 1850 and 1920. The authors then performed a diachronic analysis using a normalization to instances per million words and compared four time periods: 1640-1710, 1710-1780, 1780-1850, and 1850-1920. The analysis showed that the use of RtoO has dropped across the four time periods: 335.7/million, 266.44/million, 210.49/million, and

---

9 Noël and Colleman actually cite 1108 tokens of RtoO, but their count includes 208 tokens of expect, which is a for-type verb.
181.59/million, respectively.\(^{10}\) This pattern indicates that not only is RtoO infrequent, but its use is diminishing.

Analysis of child speech and child-directed speech was conducted by Goro (2004) using the CHILDES database. She found no exemplars of RtoO type constructions using the verb believe, but she did find examples of non-finite complementation with the verbs want and need. Because Goro analyzed want and need as RtoO, she investigated no other RtoO verbs.

In the corpus portion of her study on child acquisition of RtoO and ObjC, Kirby (2009) cites evidence of RtoO in child speech, but as with Goro (2004), the verbs Kirby cites as exemplars of RtoO were want and need. The author chose want and need because they were both more likely to be found in the input and patterned with believe-type verbs in all of the constructions that she tested. Kirby’s frequency table for for-type constructions using want and need, as well as ObjC with ask and tell, is reproduced in Table 9 below.

Table 9. Frequency of for-type Constructions (want, need) and ObjC (ask, tell) in Select Corpus Data as Reported by Kirby (2009)

<table>
<thead>
<tr>
<th>Speaker</th>
<th>want</th>
<th>need</th>
<th>ask</th>
<th>tell</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>297</td>
<td>60</td>
<td>128</td>
<td>304</td>
<td>789</td>
</tr>
<tr>
<td>Child</td>
<td>689</td>
<td>19</td>
<td>9</td>
<td>70</td>
<td>787</td>
</tr>
</tbody>
</table>

Kirby found that want and need appeared in both child speech as well as child-directed speech, including a handful of examples with embedded expletives in the child speech. In particular, the verb want was highly prevalent \((N_{\text{ADULT}} = 297; N_{\text{CHILD}} = 689)\) for both child and adult speakers whereas need was not \((N_{\text{ADULT}} = 60; N_{\text{CHILD}} = 19)\).

Finally, Kirby (2009) also analyzed the CHILDES database for exemplars of ObjC using the verbs ask and tell, also due to their higher frequency in child speech. Of the two verbs, ask

\(^{10}\) For context, a similar type of analysis for the structure “going to” found 30,000 instances per million (Berglund, 2000).
was less prevalent overall ($N_{\text{ADULT}} = 128; N_{\text{CHILD}} = 9$), but was particularly infrequent among child speakers. The verb *tell* was more frequent, but there was still less prevalence in child speech as compared to adult speech ($N_{\text{ADULT}} = 304; N_{\text{CHILD}} = 70$).

In summary, RtoO is infrequent both in adult corpus data as well as child corpus data, with attested cases of RtoO actually being instantiations of *for*-type constructions. *For*-type constructions are largely represented by the verb *want*, but do appear in child speech. ObjC constructions are also attested in child speech, but the overall frequency of its appearance is less than *for*-type constructions.

4.3.2 *Instruction of English Non-finite Complementation*

Given that the present study concerns the adult L2 acquisition of these forms, it is necessary to consider the ways that input provided to the adult learner may be distinct from that of the child L1 learner. In addition to overall frequency, adult L2 learners have another common source of input, instruction. Instruction forms part of the L2 learner’s input, but it also provides explicit information, implicit information, or both explicit and implicit information as part of the input. In their meta-analysis of learning studies, Norris and Ortega (2000) found that type of instruction had a differential effect on learning, with the greatest evidence of learning found in those conditions that Norris and Ortega classify as “focus on form,” where form-meaning connection was emphasized. Because they found that instruction is beneficial, this suggests that evidence for the acquisition of a form can be found in instruction even if it is represented by impoverished input in L1 acquisition. That is, those learners who receive instruction are receiving supplementary structured input. Because this dissertation examines whether learning takes place in L2 acquisition despite impoverished input, it is important to determine whether
structured input regarding English non-finite complementation is provided by instruction in the classroom.

Importantly, the differences between the types of non-finite complementation of interest are either rarely taught or not taught at all. After examination of several of the most commonly used English as a Second Language (ESL) textbook series\textsuperscript{11}, a clear picture emerges. The frequency of the instruction of non-finite complementation bears a close relationship with the frequency of the appearance of the forms in corpus data. \textit{For}-type construction, for example, receives focus not only on its RtoO-analogous structure (23) but also in its Subject Control-analogous structure (24).

(23) I want John to run a mile.

(24) I want to run a mile.

The ESL literature often points out that \textit{want} takes a non-finite complement rather than a finite complement, but the same features of \textit{for}-type constructions that are absent in corpus data are also absent in instruction: Only one book (Grammar Dimensions, Cengage) included examples with the optional overt complementizer (pp. 326-329). An example of the optional complementizer presented in Grammar Dimensions appears in (25) with its explanation in (26).

(25) Juan \textbf{hates} (for) Isabel to worry.

(26) Some verbs from List A\textsuperscript{12} (\textit{desire, hate, like, love, and prefer}) may optionally include \textit{for} with the infinitive complement when the infinitive has an explicit subject.

\textsuperscript{11} Grammar Sense, Oxford; Grammar Dimensions, Cengage; Grammar in Context, Cengage; Focus on Grammar, Pearson; Clear Grammar, University of Michigan; English Grammar, Pearson; Grammar and Beyond, Cambridge

\textsuperscript{12} List A contains verbs of emotion (e.g., care, desire), verbs of initiation, completion, and incompletion (e.g., begin, cease), verbs of mental activity (e.g., forget, learn), verbs of choice and intention (e.g., agree, choose), verbs of requests and demands (e.g., demand, swear), and intransitive verbs (e.g., appear, seem)
The instruction of the overt complementizer is both infrequent and, as is evident in (26), is formulaic. Further, none of the ESL books mentions that for-type verbs can be followed by an expletive, meaning that what little instruction of for-type constructions that exists fails to capture the full spectrum of the phenomena.

ObjC, like for-type constructions, appears in the most advanced level ESL books, in which the literature points out that ObjC verbs are followed by a DP and a non-finite complement rather than a finite complement. Because for-type constructions and ObjC are not listed as separate types, the two are often conflated in the literature, wherein they co-occur in long lists of verbs that can all take a DP and any non-finite complement. Given this lack of separate instruction, it is unclear whether learners can distinguish between ObjC and for-type constructions even if they were to receive instruction, but to even receive instruction on ObjC, the learner would have to progress to the highest level ESL classes.

Finally, RtoO is all but absent in the ESL instructional literature. The RtoO verbs often appear with finite complements, but only in one case (Grammar Dimensions, Cengage) did examples of an RtoO verb appear with a non-finite complement. The one case of RtoO that appeared was within a section entitled “Complex Passives” (p. 67). The examples presented and their explanation appears as in (27) and (28), respectively.

(27) a. The topic of today’s lecture is early primates. Primates are believed to have appeared on the earth about sixty-nine million years ago.

b. Many numbers are associated with superstitious beliefs. For example, thirteen is said to be an unlucky number.

c. A hijacker took over a jumbo jet flying to New York this morning. The hijacker was reported to have been demanding that the plane fly to South America.
Form: Subject (other than introductory it\textsuperscript{13}) + passive verb + to infinitive

Use: This form could also be used to introduce topics, but it is especially appropriate after a topic has been introduced because the topic can then be put in the subject position.

As can be observed in (27), the only cases of RtoO are presented in the passive, and as seen in (28), the learner is provided both with a formula for passive RtoO and an explanation of its use based on its relationship with the discourse. No comment was made as to the restrictions on its complement in terms of aspect or stativity/non-stativity.

In summary, L2 input is similar to L1 input except that some cases of passivized RtoO appear in formal contexts. Instruction of ObjC, RtoO, and for-type constructions is either sparse or completely absent, so that the role of instruction in the acquisition of these forms is arguably negligible. For structures that are not commonly instructed, their frequency is particularly important. If, as suggested by Bley-Vroman (1989, 1990), the mechanisms are different between L1 acquisition and L2 acquisition, then the infrequency of non-finite complementation predicts that L2 acquisition of non-finite complementation will not be native-like.

4.3.3 Corpus Study Using the COCA Database

For the present study, I conducted a corpus analysis based on 20\textsuperscript{th} and 21\textsuperscript{st} century English using the Corpus of Contemporary American English (COCA)\textsuperscript{14}, in part to reproduce Noël and Colleman’s results for 19\textsuperscript{th} century and early 20\textsuperscript{th} century corpora (2009, 2010, 2012). First, I chose 10 verbs of each type (RtoO, ObjC, for-type) that were balanced for raw frequency,

\textsuperscript{13} Before the presentation of passive RtoO, there are examples using an expletive such as “It is believed that…” The explanation of the complex passive RtoO exemplars are predicated on the observation that phrases using “It is believed that” often serve to introduce a topic, “since the new information comes at the end of the sentence,” (67).

i.e., the overall frequency of a lexical item in all contexts. I then entered those verbs into the COCA database with one of two searches dependent on verb type, finite context for RtoO verbs (29) and non-finite context for ObjC and for-type verbs (30).

(29) Query syntax for Finite Contexts (RtoO):
\[ \text{[believe].[v*] that [n*] [v*]} \]

Example: *believe*

(30) Query syntax for Non-finite Contexts (ObjC and for-type):
\[ \text{[persuade].[v*] [n*] to [v*]} \]

Example: *persuade*

The brackets around a lexical item in the COCA syntax indicates all forms based on the lexeme that appears in the bracket, meaning that the search *believe* elicits the verbal forms *believe*, *believing*, *believed*, and *believes*, as well as forms belonging to other word categories, such as *belief*. The bracketed letters marked with an asterisk specify word categories, including verb *[v*] and noun *[n*], and putting a period between a lexical item and a word category limits results based on that lexeme to a particular word category. In the case of (29), the query syntax elicits tokens in which a verbal form of the word *believe* is followed by three words in sequence: the complementizer *that*, a noun, and a verb. Importantly, *[v*] does not elicit non-finite verbs, so to elicit a non-finite complement, the query syntax of (30) elicits a verbal form of *persuade* is followed in sequence by a noun, the word *to*, and a verb.

For each query, a maximum of 100 entries were returned, with a minimum of one token per entry (no maximum number of tokens). For each entry, I checked whether the token(s) represented the target form and calculated a total number and percentage of target tokens among all of the entries. The average raw frequency and average number of target tokens in correct context appear in Table 10 below.\textsuperscript{15}

\textsuperscript{15} See Appendix A for the full table of frequency by verb.
Table 10. Raw Frequency and Contextual Frequency of ObjC, RtoO, and For-type Constructions

<table>
<thead>
<tr>
<th>Construction Type</th>
<th>Raw Frequency</th>
<th>Contextual Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>ObjC (Non-finite)</td>
<td>32850.1 (20863.7)</td>
<td>163.6 (92.3)</td>
</tr>
<tr>
<td>RtoO (Finite)</td>
<td>41517.9 (39297.0)</td>
<td>62.2 (41.5)</td>
</tr>
<tr>
<td>For-type (Non-finite)</td>
<td>142993.4 (88207.5)</td>
<td>421.1 (495.9)</td>
</tr>
</tbody>
</table>

The verbs that elicit for-type constructions have almost three times the contextual frequency of ObjC verbs, and they are seven times as frequent as the contextual frequency of RtoO verbs. However, ObjC verbs are almost three times as frequent in context as RtoO verbs, which elicits the frequency hierarchy in (31).

(31) Contextual Frequency by Construction

\[ \text{for-type} \succ \text{ObjC} \succ \text{RtoO} \]

In addition to its finite non-stative complements, recall that RtoO can also take non-stative complements if they have perfective aspect. For this reason, I also ran a search in the COCA database for RtoO verbs in the context of non-finite perfective complements. The query syntax appears in (32) below.

(32) Query syntax for Perfective Contexts (RtoO):

Example believe

\[[\text{believe}]\cdot [v^*] \cdot [n^*] \text{ to have } [v^*]\]

Using the query syntax in (32), only 3 tokens were found across all 10 verbs in Appendix B, all of which appeared with the matrix verb understand.

To determine whether these structures were significantly different in terms of contextual frequency, I entered the contextual frequency of all of the verbs in a one-way repeated measures ANOVA with the independent variable Type (ObjC Non-finite, RtoO Finite, for-type Non-finite, RtoO Perfective). A main effect for Type was found \((F_{1.063.9.563} = 5.546; p = 0.040)\), and the output of the post-hoc pairwise comparison appears in Table 11.
Table 11. Pairwise Comparison of Contextual Frequency by Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Compared to</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ObjC Non-finite</td>
<td>RtoO Finite</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>( for )-type Non-finite</td>
<td>0.140</td>
</tr>
<tr>
<td></td>
<td>RtoO Perfective</td>
<td>0.000</td>
</tr>
<tr>
<td>RtoO Finite</td>
<td>ObjC Non-finite</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>( for )-type Non-finite</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>RtoO Perfective</td>
<td>0.001</td>
</tr>
<tr>
<td>( for )-type Non-finite</td>
<td>ObjC Non-finite</td>
<td>0.140</td>
</tr>
<tr>
<td></td>
<td>RtoO Finite</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>RtoO Perfective</td>
<td>0.025</td>
</tr>
<tr>
<td>RtoO Perfective</td>
<td>ObjC Non-finite</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>RtoO Finite</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>( for )-type Non-finite</td>
<td>0.025</td>
</tr>
</tbody>
</table>

As can be seen in Table 11, all pairwise comparisons were significant, with the exception of ObjC and \( for \)-type. This means that ObjC and \( for \)-type constructions were both statistically more frequent than RtoO Finite and RtoO Perfective, and RtoO Finite was statistically more frequent than RtoO Perfective.

One important caveat regarding the frequency analysis must be considered regarding \( for \)-type verbs. \( For \)-type verbs have two possible surface forms with non-finite complements. Note that for this analysis, I have searched for the version without the overt complementizer \( for \).

Consider that Spanish and English differ in regards to the finiteness of the licit clausal complements of \textit{want}, \textit{need}, and other such \( for \)-type verbs: When the complement of \textit{want} (\textit{querer}) and \textit{need} (\textit{necesitar}) has an external argument, Spanish requires that the complement be finite, and English requires that the complement be non-finite. What L1 Spanish/L2 English learners need to acquire is the fact that \( for \)-type verbs select non-finite complements in English rather than finite complements, as in Spanish. It is the frequency of this distinction that is relevant, which is why I have classified \( for \)-type verbs as frequent on the basis of their frequency
with non-finite complements as a whole and not specifically with the complementizer. With this in mind, there are four possible outcomes (i-iv).

(i) Learners accept both finite and non-finite complements with for-type verbs.

(ii) Learners accept finite complements and reject non-finite complements with for-type verbs.

(iii) Learners reject both finite and non-finite complements with for-type verbs.

(iv) Learners reject finite complements and accept non-finite complements with for-type verbs.

Outcomes (i) and (ii) both state that learners accept finite complements with for-type verbs. These outcomes would support the conclusion that learners have not acquired English’s selectional properties of for-type verbs. Outcomes (iii) and (iv) would be evidence that learners have acquired the selectional properties of English’s for-type verbs insofar as the fact that such verbs cannot take a finite complement. The difference between outcomes (iii) and (iv) is regarding non-finite complements wherein they are rejected in outcome (iii) and accepted in outcome (iv). In outcome (iii), the rejection of non-finite complements would suggest that the L2 learners have acquired selectional properties of these verbs that do not include the possibility of the overt complementizer. This result would be consistent with at least some native English speakers, but it may be argued that learners have not completely acquired the selectional properties of for-type English verbs. The acceptance of non-finite complements in outcome (iv), therefore, would suggest that the L2 learners have converged on a monolingual-type grammar that both allows overt complementizers and disallows finite complements.

Using the results of the pairwise comparison, I categorize the four types as either [+frequent] or [-frequent]. Considering that ObjC and for-type were both more frequent the
RtoO types as well as not statistically different from each other, I will classify ObjC and \textit{for}-type as \([+\text{frequent}].\) Even though RtoO Finite is more frequent than RtoO Perfective, RtoO is less frequent than both ObjC and \textit{for}-type constructions. For this reason, I classify RtoO Finite as well as RtoO Perfective as \([-\text{frequent}].\)

4.4 \textit{Conclusions: Frequency and the Fundamental Difference Hypothesis}

This chapter showed that the types of non-finite complementation of interest differ in regard to frequency. The Competition Model was adopted in section 4.2, and it predicts that frequency will play a role in the L2 acquisition of non-finite complementation. Both ObjC and \textit{for}-type constructions are frequent in the input, which is expected to result in L2 acquisition. Input reflecting RtoO and RtoO’s restrictions on aspect are composed of unreliable, infrequent cues; therefore RtoO and RtoO’s aspectual restrictions are not expected to be found in L2 learners’ linguistic system.

Let us return to the aims of the present study, in which the goal is to evaluate whether the mechanism of L2 acquisition is the same as the mechanism of L1 acquisition. In addition to the differential frequency of the target forms, this chapter also presented evidence that the frequency-based accounts are not sufficient to explain L1 acquisition. Finding that frequency plays a central role in the outcome of L2 acquisition would support the Fundamental Difference Hypothesis’ conclusion that the mechanisms of L1 and L2 acquisition are distinct. Finding that frequency does not play a role in the outcome of L2 acquisition would instead support the conclusion that the mechanisms are the same. In the following chapter, these predictions are combined with those regarding similarity in order to present the hypotheses of this dissertation.
5. **Hypotheses**

5.1 **Interim Summary**

This chapter presents a brief synthesis of the review of literature followed by the research questions and hypotheses for the current study. Let us begin with an interim summary regarding the role of similarity and frequency in L2 acquisition. In Chapter 3, I argued that similarity plays a limited role in L2 acquisition (e.g., Kellerman, 1977, 1978; Odlin, 2003; Pérez-Tattam, 2007), and this effect may not be attributable to initial transfer due to the unavailability of the CP at the initial state (Vainikka & Young-Scholten, 1996a, 1996b; Bhatt & Hancin-Bhatt, 2002). Instead, evidence of facilitation and inhibition due to structural overlap or surface similarity is attested at later stages. Monolingual L1 acquisition cannot rely on another language for facilitation, so the study of L2 acquisition of forms that are different between the L1 and the L2 is informative to the issue of similarity.

I also showed that frequency-based (i.e., data-driven) learning mechanisms cannot explain the outcome of L1 acquisition because they over-generalize and fail to produce constrained ambiguity (Berwick & Chomsky, 2008; Berwick et al., 2011). Pure frequency-based accounts in L2 acquisition suggest that L2 acquisition is data-driven (e.g., McClelland & Rumelhart, 1986), which suffers from the same critiques as those in L1 acquisition. Emergentist accounts (e.g., Bates & MacWhinney, 1989) instead posit a role for frequency that interacts with other factors such as the consistency with which a particular form is associated with a particular meaning. A role for frequency in L2 acquisition would suggest that the mechanisms of L1 and L2 acquisition are distinct.
A striking parallelism in Chapters 3 and 4 is the observation of the difficulty of learning forms that appear to be the same on the surface. Let us return to the examples cited in both of these chapters: RtoO (1), ObjC (2), and for-type (3).

(1) John believes Mary to be honest.
(2) John persuades Mary to be honest.
(3) John needs (for) Mary to be honest.

On the surface, (1)-(3) seem to be the same structure. As discussed in section 3.2.3, it might be expected that a naïve learning mechanism would not be able to distinguish among them. Overlap in grammar between the L1 and the L2 predicts that learners will use their knowledge of ObjC in Spanish to facilitate learning ObjC in English (2). However, shared surface similarity among (1)-(3) suggests that (1) and (3), which in fact are not the same as Spanish, might be more difficult to acquire.

A similar observation was made by the Competition Model (Bates & MacWhinney, 1989, et seq) in Chapter 4. The Competition Model posits that contrastive availability—a link between a cue and a particular interpretation—is necessary for acquisition. The fact that the surface structure in (1)-(3) is non-distinctive suggests that learners would have difficulty distinguishing between them, ultimately making learning all three types of non-finite complementation challenging.

Given the common prediction of difficulty due to surface similarity, a result where learners do not distinguish between the forms could have two interpretations: non-acquisition due to perceived similarity or non-acquisition due to lack of contrastivity. As we will see in Chapter 7, the highly proficient L2 learners do distinguish among the various types of non-finite complementation. The fact that different approaches link apparent similarity with added
challenge is a striking parallelism that merits further study, but this issue is beyond the scope of the current study.

5.2 Research Questions and Hypotheses

The research questions concern the binary features [+/- frequent] and [+/- similar]. In the same way that [+/- frequent] was used to classify the constructions of interest in Chapter 4, [+/- similar] can be applied in the same way according to the differences between Spanish and English presented in Chapters 2, recapitulated here: ObjC verbs select non-finite non-stative complements in Spanish (4) and English (5); whereas RtoO verbs select finite non-stative complements in Spanish (6) and English (7).

(4) Convencí a Juan a pintar un retrato.
I convinced ACC Juan to paint a portrait.

(5) I convinced John to paint a portrait.

(6) Creo que Juan pinta un retrato.
I believe that Juan paints a portrait.

(7) I believe that John paints a portrait.

Because Spanish and English do not differ as to the finiteness of non-stative complements with these verbs, I classify these structures as [+similar].

In the case of for-type verbs, Spanish and English have distinct restrictions on finiteness. Spanish for-type verbs select for a finite complement (8), and English for-type verbs select for a non-finite complement (9).

(8) Quiero que Juan pinte un retrato.
I want that Juan paints a portrait.

(9) I want (for) John to paint a portrait.
Because Spanish and English differ in regard to for-type verbs, I classify for-type constructions as [-similar].

Finally, English RtoO has aspectual restrictions on non-stative verb complements: bare complements are illicit (10) and perfective (11) or progressive complements are licit.

(10) *I believe John to run a mile.

(11) I believe John to have run a mile.

Spanish does not have RtoO, so it also does not have RtoO’s aspectual restrictions. For this reason, RtoO Perfective is also [-similar].

When combined, the two binary features [+/- frequent] and [+/- similar] create a different feature set for each of the four structures, as seen in Table 12.

Table 12. Non-finite Complementation in Terms of Frequency and Similarity

<table>
<thead>
<tr>
<th></th>
<th>Frequent</th>
<th>Similar</th>
</tr>
</thead>
<tbody>
<tr>
<td>ObjC</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>*RtoO (Bare)</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>For-type</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>RtoO (Perfective)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Observation of the feature sets in Table 12 allows for predictions to be made regarding the L2 acquisition of the four types of non-finite complementation. More specifically, different predictions are made in regard to whether frequency and similarity are sufficient or whether they are simply necessary.

Either predictor is necessary if all the forms that lack this feature—those forms that are [-frequent] or [-similar]—are not acquired. Frequency is necessary in the case that the infrequent types, specifically the RtoO constructions with either bare aspect or perfective aspect, are not acquired. Similarity is necessary in the case that dissimilar types, for-types and RtoO verbs with perfective aspect, are not acquired. In the case that either factor is necessary, this predicts that
RtoO with perfective aspect will not be acquired because it is both [-frequent] and [-similar]; therefore evidence of L2 acquisition of RtoO with perfective aspect suggests that neither frequency nor similarity are necessary. These predictions are summarized in Table 13 below.

### Table 13. Predictions by Necessity and Sufficiency of Form

<table>
<thead>
<tr>
<th></th>
<th>ObjC</th>
<th>RtoO Bare</th>
<th>For-type</th>
<th>RtoO Perfective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent Necessary</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Similar Necessary</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Both Necessary</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Neither Necessary</td>
<td>+?</td>
<td>+?</td>
<td>+?</td>
<td>+?</td>
</tr>
<tr>
<td>Either Sufficient</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Note that Table 13 includes an additional prediction regarding sufficiency. Acquisition of all forms that are either frequent or similar—everything except RtoO with perfective aspect—would be suggestive that being either frequent or similar is sufficient for acquisition.

The issue of necessity and sufficiency is of upmost importance in addressing the goal of this dissertation, which is to determine whether the mechanisms of L2 acquisition are like those of L1 acquisition. Frequency is neither necessary nor sufficient in L1 acquisition because adult L1 speakers know even the infrequent forms in their native language. Similarity, for monolingual speakers, it is neither necessary nor sufficient due to being irrelevant: the L1 acquisition of a monolingual speaker is necessarily the only language that has been learned. Finding that frequency and similarity are not necessary in L2 acquisition would suggest that the mechanisms of L1 and L2 acquisition are shared. Practically speaking, this would be suggested by evidence of L2 knowledge of RtoO with perfective aspect.

Evidence that frequency is necessary or sufficient would suggest the opposite: the mechanisms of L1 and L2 acquisition are distinct. Finding that frequency alone is necessary would suggest that L2 acquisition is data-driven, though L1 acquisition is not (Berwick & Chomsky, 2008; Berwick et al., 2011). Such a finding would be partially consistent with L2
accounts of connectionism (McClelland & Rumelhart, 1986). Finding that either frequency or similarity is sufficient instead would support the Competition Model (Bates & MacWhinney, 1989) because frequency is used in L2 acquisition in conjunction with other factors such as cue reliability.

The interpretation of evidence of a role for similarity is less clear. It is true that similarity is neither necessary nor sufficient in L1 acquisition because monolingual L1 acquisition has no other language to compare itself to. This does not imply that finding an effect for similarity implies that L1 and L2 acquisition proceed via different mechanisms because the situations are incomparable: the mechanism of L2 acquisition may be the same as L1 acquisition but with an extra source of linguistic information that is not available in L1 acquisition.

In order to tease apart the role of frequency and similarity, this study employs four research questions. Research Question 1 investigates the [+frequent, +similar] form ObjC.

(12) Research Question 1
Do highly proficient L1 Spanish/L2 English learners show native-like knowledge of a frequent and similar form, i.e. ObjC verb constructions, in regard to finiteness?

For Research Question 2, I investigate RtoO with bare, non-stative complements, which has the feature set [-frequent, +similar]

(13) Research Question 2
Do highly proficient L1 Spanish/L2 English learners show native-like knowledge of an infrequent but similar form, i.e. RtoO verb constructions with bare non-stative complements (RtoO Bare), in regard to finiteness?

The third research question investigates the [+frequent, -similar] form for-type constructions.
(14) Research Question 3

Do highly proficient L1 Spanish/L2 English learners show native-like knowledge of a frequent but dissimilar form, i.e. *for*-type verb constructions, in regard to finiteness?

Finally, Research Question 4 investigates forms that are both [-frequent] and [-similar], namely RtoO with perfective non-stative complements.

(15) Research Question 4

Do highly proficient L1 Spanish/L2 English learners show native-like knowledge of an infrequent and dissimilar form, i.e. RtoO Perfective, in regard to finiteness?

For each research questions, this study poses a hypothesis. Previous research on L2 acquisition has suggested a role for frequency (McClelland & Rumelhart, 1986; Bates & MacWhinney, 1989) as well as for similarity (e.g., Weinreich, 1953; Ringbom, 1987, 1992) which predicts that forms that are either frequent, similar between the L1 and the L2, or both, will be acquired. Because Research Question 1 investigates ObjC verb constructions, which are both frequent and similar, this predicts that ObjC verb constructions will be acquired, as can be seen in Hypothesis 1 (16) below.

(16) Hypothesis 1

Highly proficient L1 Spanish/L2 English learners will show native-like knowledge of a frequent and similar form, i.e. ObjC verb constructions, in regard to finiteness.

Although RtoO verb constructions with bare aspect and *for*-type constructions are not both frequent and similar, the former is similar and the latter is frequent. In light of this observation, the hypotheses for Research Questions 2 and 3 appear in (17) and (18), respectively.
(17) Hypothesis 2
Highly proficient L1 Spanish/L2 English learners will not show native-like knowledge of an infrequent but similar form, i.e. RtoO verb constructions with bare non-stative complements (RtoO Bare), in regard to finiteness.

(18) Hypothesis 3
Highly proficient L1 Spanish/L2 English learners will show native-like knowledge of a frequent but dissimilar form, i.e. *for*-type verb constructions, in regard to finiteness.

Finally, RtoO verbs with perfective complements are neither frequent nor similar; so, as suggested by previous research, such constructions should not be acquired. This prediction is reflected in the hypothesis for Research Question 4 in (19).

(19) Hypothesis 4
Highly proficient L1 Spanish/L2 English learners will not show native-like knowledge of an infrequent and dissimilar form, i.e. RtoO Perfective, in regard to finiteness.

In summary, it is expected that those forms that are either frequent or similar between the L1 and the L2 will be acquired.
6. **Methods**

6.1 **Participants**

For this study, one experimental group consisting of L1 Spanish/L2 English speakers was compared to a control group of monolingual English speakers. Both groups were recruited via Amazon’s Mechanical Turk due to the large participant base. This recruitment method was also chosen because previous research supports the validity of crowd-sourcing recruitment via services such as Mechanical Turk (e.g., Gibson et al., 2011; Laleko & Polinsky, 2013; Sprouse, 2011). For example, acceptability judgments of monolingual speakers using Mechanical Turk have been previously found to not differ significantly from those elicited using traditional laboratory methods (Sprouse, 2011; Gibson et al, 2011). The biggest difficulty in using a crowd-sourcing type of data collection lies in targeting the experimental group of interest, here highly proficient L1 Spanish/L2 English speakers. However, Laleko and Polinsky (2013) successfully recruited and tested both heritage and L2 speakers via Mechanical Turk using the methods laid out in Sprouse (2011) and Gibson et al. (2011), including gathering thorough background information from participants that allowed for precise participant selection. In addition to gathering background information to this degree, further considerations regarding use of Mechanical Turk appear below where relevant.

During the data collection for the control group, data were gathered from 25 participants who had completed at least some college studies and self-identified as native English speakers. Three participants were removed from the control group for being bilinguals of English and another language, and two were removed for being L2 learners of another language (Spanish). The resulting control group consisted of 20 monolingual L1 English speakers recruited using Amazon’s Mechanical Turk. The mean age of the control group was 30.8, and the group
consisted of 11 women and 9 men. None of the remaining L1 speakers reported having learned any languages besides English, and none had lived outside of the United States. As a result, all of the L1 speakers had completed high school in the United States.

A subsequent round of data collection was used to recruit the experimental group. Mechanical Turk allows the researcher to impose qualification tests in order to complete the online survey, acting as a web-based screening. The qualification test removed learners who did not meet three particular criteria. The first criterion was that participants needed to have an age of acquisition for Spanish that was no later than birth. The second self-report criterion was that participants had to report speaking both Spanish and English on a daily basis. The third criterion was a self-report of proficiency in which participants had to rate their proficiency in both languages as 3 or higher on a 5-point Likert scale. Higher scores on the self-report were not required due to the subjective nature of self-report data, such as L2 learners’ underestimation of their own proficiency (see e.g., MacIntyre, Noels, & Clement, 1997).

65 participants passed the qualification test and participated in the experiment. The research questions investigated whether native-like knowledge of non-finite complementation is possible, and for this reason, the participant selection was designed in such a way as to treat the linguistic background variables as control variables to ensure that the experimental group was as homogeneous as possible. For this reason, 26 participants were removed from the data set for being early bilinguals or heritage speakers, meaning that a language besides Spanish was spoken in their family during early childhood. All the remaining learners were native speakers of only one language (i.e., Spanish) and had completed at least some college studies.

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16 The other languages of the removed participants were English (N = 20), Arabic (N = 1), Basque (N = 1), Chinese (N = 1), Korean (N = 2), and Portuguese (N = 1).
Because this study investigates adult L2 acquisition, participant selection also controlled for age effects and length of residency. In particular, a relationship has been observed between L2 performance and age of arrival, rather than reported age of acquisition (Johnson & Newport, 1989; Birdsong, 1992); for this reason, age of arrival was used as the age of exposure, and participants who arrived before the age of 17 were removed from the data set due to not being adult L2 learners ($N = 13$). No effect for length of residency has been observed after at least 5 years of residency (Oyama, 1978; Johnson & Newport, 1989), so any learner with less than 5 years of continuous residency was removed ($N = 1$). The number of participants that met all the language background criteria was 25.

For the remaining participants, proficiency was then controlled so that only highly proficient participants were included in the data. As will be discussed in the materials in section 6.2, two written proficiency measures were used to be highly selective (Ionin & Montrul, 2009; White, Genesee, & Steinhauer, 2012). As with the background variables, proficiency is treated as a control variable: Learners who did not perform in the native English speaker range of proficiency$^{17}$ on both measures were removed from the data set ($N = 6$). This was done in order to ensure the closest approximation to the end-state and maximal convergence on native speakers. Table 14 summarizes both the control and experimental groups’ proficiency as measured by the two proficiency measures.

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$^{17}$ The range of proficiency for the native speakers was defined by the minimum and maximum score for each measure. For Proficiency Measure 1 (Ionin & Montrul, 2009), this was 34/40 and for Proficiency Measure 2 (White et al., 2012), this was 20/30.
Table 14. Proficiency Scores by Group and Measure

<table>
<thead>
<tr>
<th>Measure</th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Proficiency Measure 1 (40)†</td>
<td>38.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Proficiency Measures 2 (30)ii</td>
<td>26.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Total (70)</td>
<td>64.8</td>
<td>2.4</td>
</tr>
</tbody>
</table>

† Ionin & Montrul (2009)  ii White et al. (2012)

An independent t-test showed that, despite controlling for the range of proficiency, the distribution of scores within that range resulted in a statistical effect for group for both Proficiency Measure 1 ($t_{29.412} = 4.814, p = 0.000$) and Proficiency Measure 2 ($t_{33.108} = 3.122, p = 0.004$). However, the two measures were highly correlated ($r = 0.723, p = 0.000$), indicating that the measures themselves have external validity, meaning that they are representative of proficiency in the written modality. As a result, though group differences were found, the similarity between the groups’ scores (a difference of 2.4 and 2.2 for the two measures, respectively) is suggestive of similarity between the overall English proficiency of the groups.

Due to the selectivity of the background variables, the dialect of Spanish of the participants in the experimental group was not controlled. Of the 19 participants, 4 were from North America, 6 were from the Caribbean, 5 were from South America, and 3 were from Spain. The biggest risk in regard to not controlling dialect of Spanish is differing intuitions regarding non-finite complementation in Spanish. To control for this confound, participants were asked to rate isolated examples of Spanish non-finite complement constructions using verbs from the three categories of matrix verbs (ObjC verbs, RtoO verbs, For-type verbs) and a non-finite complement with a bare aspect non-stative verb (e.g., to paint a portrait, etc). Participants rated

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18 The participants from North America were from Guatemala ($N = 1$) and Mexico ($N = 3$). The Caribbean participants were from Cuba ($N = 1$), the Dominican Republic ($N = 3$), and Puerto Rico ($N = 2$). The South American participants were from Argentina ($N = 1$), Chile ($N = 1$), Colombia ($N = 1$), Peru ($N = 2$), and Venezuela ($N = 1$). Of the participants from Spain ($N = 3$), only one reported their region of origin, which was Zaragoza.
two exemplars of each type. The average ratings on a 1-5 Likert scale for these three types by dialect region appears in Table 15.

Table 15. Average Ratings by Dialect and Spanish Sentence Type

<table>
<thead>
<tr>
<th>Region</th>
<th>ObjC Non-finite</th>
<th>*RtoO Bare Non-finite</th>
<th>*For-type Non-finite</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America (4)</td>
<td>3.5</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Caribbean (6)</td>
<td>4.3</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>South America (5)</td>
<td>4.8</td>
<td>1.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Spain (3)</td>
<td>4.7</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>All (19)</td>
<td>4.4</td>
<td>1.2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Because the expected overall pattern in Spanish was found, further effects on non-finite complementation due to dialect were not expected, and participants were treated as a cohesive group.

Although the Spanish proficiency of the L1 Spanish/L2 English group is tangential to this study, it is important to establish that the participants gathered online were indeed Spanish speakers as they reported themselves to be. Rather than adding a complete Spanish proficiency measure that would lengthen the experiment significantly, a selection from the Diploma de Español como Lengua Extranjera (DELE; e.g., Montrul & Slabakova, 2003) was used to ensure that the participants were also highly proficient Spanish speakers. Because the DELE increases in difficulty throughout the 30 item multiple choice section, it was expected that native speakers of Spanish would perform at ceiling in the middle subset \((N = 10)\) of these items. This is precisely what was found: 18 of the participants scored a 10 of 10, and 1 participant scored a 9 of 10.\(^\text{19}\) Further discussion of the DELE itself appears in the materials below.

\(^{19}\) As a comparison, consider the case of 4 native English speakers who accidentally took the learner group version of the experiment that included the selection from the DELE. Three of the learners reported starting to learn Spanish at 12, and the fourth reported starting Spanish at 14. Despite having self-reported a Spanish proficiency of at least 3 out of 5, their average score on the selection of the DELE was 3.75 out of 10 with a standard deviation of 2.63.
The final experimental group consisted of 19 late L1 Spanish/L2 English speakers at near-native proficiency. The mean age of the experimental group was 42.6, and the group consisted of 15 women and 4 men. The participants’ average age of arrival was 25.1, with an average length of residency in the United States of 17.6 years.

6.2 Materials

The critical items were constructed from 10 verbs of each construction type (Raising to Object, Object Control, for-type) that were balanced for raw frequency using the COCA Corpus (Davies, 2008). First, lists of verbs of each type were generated using the diagnostics from Chapter 2: Raising to Object disallows bare non-stative verbs in the non-finite complement; Object Control disallows expletives in the non-finite complement; for-type constructions are those that have no complement restrictions and can optionally take the overt complementizer for. A total of 18, 12, and 12 verbs fit the criteria for inclusion in each category, respectively.

The raw frequency for each verb was found using the COCA Corpus. The raw frequency included all verbal forms and tenses, and as such, the query syntax appeared as in (1) below using believe as an example.

(1) [believe].v*

[ ] = All instances of believe; .v* = that are verbs

A minimum and maximum cutoff point for frequency was then established (minimum = 4000; maximum = 150000), and 10 verbs were selected from each list so that the lists were not statistically different for raw frequency ($F_{1.150,10.354} = 2.766$, $p = 0.124$, $\eta^2 = 0.235$). These 30 verbs were then used to develop critical stimuli for each research question in a violation paradigm.
In addition to the 30 matrix verbs, a set of 60 embedded verbs was developed consisting of non-stative verbs. The 60 verbs were separated into three lists by matrix verb type and balanced for frequency using their raw frequency as found in the COCA corpus. One list each was used for each set of matrix verbs, wherein a lexicalization for each embedded verb was created. Due to the difficulty of balancing the lists of non-stative verbs, each lexicalization consisted of the non-stative verb and either a definite DP or a PP including a definite DP, depending on the verb’s argument structure. Finally, every lexicalization featured only animate DPs in the matrix clause and as the external argument of the complement.

For Research Questions 1 and 3, a correct and a violation condition were created: for ObjC, the correct condition is the Non-finite condition (1) and the violation is the Finite condition (2).

(1) ObjC Non-finite

Mary persuaded John to run the marathon.

(2) ObjC Finite

* Mary persuaded that John ran the marathon.

For the for-type verbs, Non-finite is also the correct item (3) and Finite is the violation (4).

(3) For-type Non-finite

Mary needed for John to run the marathon.

(4) For-type Finite

* Mary needed that John ran the marathon.

In total, participants saw each ObjC and for-type verb twice and each embedded verb once.
For Research Questions 2 and 4, the violation condition is the same: RtoO Bare Non-finite (5). However, for Research Question 2, the correct condition is Finite (6), and for Research Question 4, the correct condition is RtoO Perfective (7).

(5) RtoO Bare Non-finite

* Mary believed John to run the marathon.

(6) RtoO Finite

Mary believed that John ran the marathon.

(7) RtoO Perfective Non-finite

Mary believed John to have run the marathon.

For each lexicalization based on the remaining 20 embedded verb list, a version of each condition (5)-(7) was made. Each participant will see one version of each lexicalization, resulting in 10 tokens of each condition, and each RtoO matrix verb will be seen 3 times each ($M = 2.1$).

To balance for the fact that the RtoO verbs were seen 3 times each, a filler condition was created for both the ObjC verbs and the for-type verbs so that the matrix verbs of all three types were seen 3 times each. The filler condition was designed to mirror the critical items by incorporating expletives in lieu of one of the DPs. The use of expletives resulted in an additional violation/correct condition pairing: a violation condition with ObjC verbs (8) and a correct condition with for-type verbs (19).

(8) ObjC Expletive

* Mary persuaded there to be agreement.

(9) For-type Expletive

Mary needed for there to be agreement.
The results of analysis of the filler items is outside of the purview of this dissertation but will be analyzed in future work.

In total, participants saw 20 critical stimuli each from Research Questions 1 and 3, 30 critical stimuli from Research Questions 2 and 4, and 20 filler items. Critical items were distributed among three lists as part of a Latin Square design. See Appendix B for the full list of stimuli.

A total of 56 additional distracters were also used: The first type of distractor, perception verbs with reduced clauses and causatives, was chosen to mirror the word order of the critical items. Perception verbs like hear and see, as well as causative verbs like make, select for a reduced clausal complement (10), but not a full clausal complement (11).

(10) Yolanda saw Chris wash his hands.

(11) *Yolanda saw Chris to wash his hands.

Employing a parallel but distinct distractor has the benefit of drawing attention away from the relevant distinctions in the critical items. To this end, 20 lexicalizations were written with a correct (10) and violation condition (11). Each participant saw half of the lexicalizations as the correct condition and half as the violation condition.

The other type of distractor was wh-questions with long-distance dependencies. Questions with long-distance dependencies were chosen to increase the number of dual clausal structures with finite complements. For each of 36 lexicalizations derived from a base sentence (12), 4 versions were created that varied in regard to the type of question (subject question, object question) as well as whether the complementizer was overt or covert. The 4 versions were subject question, overt complementizer (13); subject question, covert complementizer (14); object question, overt complementizer (15); and object question, covert complementizer (16).
(12) Base sentence

You said that John bought a book.

(13) Subject Question, Overt Complementizer

*Who did you say that bought the book?

(14) Subject Question, Covert Complementizer

Who did you say bought the book?

(15) Object Question, Overt Complementizer

What did you say that John bought?

(16) Object Question, Covert Complementizer

What did you say that John bought?

Participants saw 9 lexicalizations of each question type, resulting in 36 total question distracters per participant.

Additional materials included a background questionnaire, two written proficiency measures for English, a proficiency measure for Spanish, and a debriefing questionnaire. The background questionnaire is based on the LEAP-Q (Marian et al, 2007), and the debriefing questionnaire was designed by the investigator. The LEAP-Q was chosen as a basis for the background questionnaire both because of its wide use in the field (e.g., Reichle, 2010; Jegerski, VanPatten, & Keating, 2011) as well as the type of information it elicits. The background questionnaire ascertained the age of acquisition of both English and Spanish, years of education, length of residency in both their home Spanish-speaking country and the United States, as well as questions that do not appear on the LEAP-Q, including age of arrival to the United States and birthplace. The debriefing questionnaire was used to control for the participants’ awareness of the study’s target form, including asking for an example, if applicable. In the case that a
participant was able to provide an example of a critical item in the study, they were removed. No participants were removed according to this criterion. The final background questionnaire and a sample of the debriefing questionnaire appear in Appendices C and D.

The proficiency measures were two different cloze tests designed and used in previous studies (Ionin & Montrul, 2009; White et al., 2013). Task validity and modality were considered in choosing these measures. The issue of task validity relates to ensuring that a task actually measures what it is intended to measure. Task validity was ensured by using two different proficiency measures. A strong correlation between the two measures across participants ($r = 0.721, p = 0.000$) demonstrated that they measured the same factor, which is taken to be proficiency in English.

The written modality was chosen for measuring proficiency both for logistical reasons and conceptual reasons. Logistically, written proficiency can be easily collected using an online medium such as the one being employed in this dissertation. Conceptually, the use of the written modality for the task as well as for measuring proficiency removes potential confounds due to imbalances among the various language skills in participants (e.g., reading vs. listening). Among the possible written proficiency measures, the cloze test, or gap-filling test, was chosen because it combines vocabulary, syntax, semantics, and discourse knowledge (Hulstijn, 2010), and these same modules of language are relevant for the experimental task as well.

A reduced version of the DELE proficiency measure was also employed to confirm that participants gathered via Mechanical Turk were indeed speakers of Spanish (Montrul & Slabakova, 2003). The DELE was chosen because it is an official measure of Spanish proficiency used for international certification that, like the LEAP-Q, is widely employed in the

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field of linguistics (e.g., VanPatten, 2010; Sagarra & Herschensohn, 2011; Potowski & Bolyanatz, 2012).

6.3 Procedure

The procedure was composed of a pre-experimental phase, an experimental phase and a post-experimental phase. In the pre-experimental phase, participants completed the background questionnaire. During the experimental phase itself, the critical items and distracters were presented as a timed written acceptability judgment task using the presentation software Ibex. Untimed judgment tasks allow participants to employ explicit knowledge, which for L2 learners includes metalinguistic knowledge and other knowledge gained from language instruction. A timed task was chosen to better access implicit knowledge, which is more representative of online use of language and linguistic competence. Judgment tasks more generally are useful in those cases where knowledge of ungrammaticality is of interest because it allows participants to respond negatively to critical items. As evidenced by corpus data, sheer absence or infrequency in production does not entail ungrammaticality, so a production task in which a participant does not produce a given form is not sufficient evidence that the form in question is considered ungrammatical by the speaker (see Schütze, 1996 for related argumentation).

Some research has found that processing tasks can provide evidence regarding ungrammaticality as measured by increase in processing load (e.g., Juffs, 2005), which suggests that processing may be an alternative to judgment tasks. For the study at hand, processing is insufficient to make claims about ungrammaticality: Because processing is sensitive to frequency effects (e.g., Clifton et al., 1984; Dussias & Cramer Scaltz, 2008), the statistical differences in contextual frequency of the forms investigated in this study predict processing

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21 See Ellis (2005) for evidence of these two types of knowledge and further discussion of their use in judgment tasks.
differences due to frequency. Until the role of frequency in the L2 acquisition of non-finite complementation is better understood, frequency remains a confound in the study of the processing of non-finite complement forms.

As for the judgment scale itself, this dissertation employed a Likert scale on a 1-5 scale. A Likert scale was chosen to allow participants to distinguish between forms that are less natural due to being infrequent and forms that are altogether unacceptable. Importantly, there is evidence that type of rating scale may be independent of results: studies that have compared Likert scales to binary judgments and magnitude estimation have found comparable $p$ values and effect sizes for all three scale types (Weskott & Fanselow, 2008; Fukuda et al., 2010). In regard to the length of the Likert scale, a 5 point scale was chosen in principle because a 3 point scale functions essentially as a binary scale with a third option for unclear judgments. Having larger than the 3 point scale makes it more likely for the cited differences between unnaturalness due to infrequency and unacceptability to be observable. A scale beyond 5 points was not chosen because previous research has found that the results of judgment tasks do not vary statistically by the size of the scale (Matell & Jacoby, 1971; Sprouse, 2007; Dawes, 2008).

The participant first received instructions in which they were told that they would rate how acceptable each sentence sounded on a 1-5 Likert scale. The instructions included descriptions of the endpoints of the scale, with 5 described as “completely natural” and 1 described as “completely strange, meaning neither you nor anyone you know would say it.” After the instructions, participants did a series of practice items ($N = 7$) before moving on to the experimental items. The presentation of the practice and experimental items followed the recommendations outlined in Han and Ellis (1998). Participants were presented with a sentence for 2200 ms and then were asked to judge the sentence. If no judgment was given by 3500 ms,
the scale disappeared. Both judgment rating and reaction time were recorded. After the experimental phase, the post-experimental phase began: participants completed the English proficiency measures and the Spanish proficiency measure, followed by the Spanish ratings discussed in section 6.1 and then the debriefing questionnaire.

6.4 Data Analysis

Data analysis consisted first of a participant analysis and an item analysis. Then, for each of the research questions, I propose a separate statistical analysis, all with the dependent variable Rating. For Research Questions 1-3, a two-way 2x2 repeated measures ANOVA was run with the between-subjects variable Group (Native, Non-native) and the within-subjects variable Complement (Finite, Non-finite). Finally, for Research Question 4, a two-way 2x2 repeated measures ANOVA was run with the between-subjects variable Group (Native, Non-native) and within-subjects variable Aspect (Bare, Perfective).
7. Results

7.1 Overall Descriptives

Before formal data analysis, the data were first cleaned to conform to assumptions of inferential statistics. An item analysis was performed using the monolingual group to identify exemplars that were outliers within their sub-types (i.e., ObjC finite, ObjC non-finite, RtoO finite, RtoO non-finite, for-type finite, for-type, non-finite, RtoO perfective). A total of two items were removed due to being outliers at 2.5 standard deviations. The remaining items were used to calculate the averages on a 1-5 Likert scale, which are listed in Table 16.

Table 16. Ratings by Group, Matrix Type, and Embedded Type

<table>
<thead>
<tr>
<th>Group</th>
<th>Type</th>
<th>Finite</th>
<th></th>
<th></th>
<th></th>
<th>Non-finite</th>
<th></th>
<th></th>
<th>Perfective</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>C/V</td>
<td>M</td>
<td>SD</td>
<td>C/V</td>
<td>M</td>
<td>SD</td>
<td>C/V</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Native</td>
<td>ObjC</td>
<td>V</td>
<td>1.92</td>
<td>1.04</td>
<td>C</td>
<td>4.39</td>
<td>0.98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RtoO</td>
<td>C</td>
<td>4.32</td>
<td>0.93</td>
<td>V</td>
<td>2.16</td>
<td>1.10</td>
<td>C</td>
<td>3.26</td>
<td>1.26</td>
</tr>
<tr>
<td></td>
<td>For-type</td>
<td>V</td>
<td>1.88</td>
<td>1.05</td>
<td>C</td>
<td>3.94</td>
<td>1.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Near-native</td>
<td>ObjC</td>
<td>V</td>
<td>2.79</td>
<td>1.61</td>
<td>C</td>
<td>4.22</td>
<td>1.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RtoO</td>
<td>C</td>
<td>4.05</td>
<td>1.26</td>
<td>V</td>
<td>2.54</td>
<td>1.52</td>
<td>C</td>
<td>3.38</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>For-type</td>
<td>V</td>
<td>2.88</td>
<td>1.60</td>
<td>C</td>
<td>3.64</td>
<td>1.38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*C/V indicates whether the subtype was a Correct or Violation condition for the statistical analysis.

Initial visual inspection of the data revealed that the near-native group accepted more items overall, resulting in elevated ratings as compared to the native group, especially as concerned the items that the natives typically rated low. As an example, the native group gave a high average rating to ObjC verbs with non-finite complements ($M = 4.39$) as opposed to finite complements ($M = 1.92$). The near-native group rated ObjC verbs with non-finite complements similarly high.

---

22 The two items that were removed used the verb *demand*. In both cases, the item was 2.5 $SD$ above the mean (4.89 for (i) and 4.36 for (ii)) despite the fact that one (i) was a correct condition and the other (ii) was a violation condition. The acceptance of (ii) may be due to a subjunctive reading of the verb *read* which is identical between the past tense and the subjunctive, and the correct condition (i) was an outlier because such sentences are less accepted overall.

(i) Brian demanded for Sonia to climb the tree.
(ii) Brian demanded that Betty read the newspaper.
(M = 4.22), but they rated ObjC verbs with finite complements higher than the native group (M = 2.79). This pattern was consistent across the dataset.

7.2 Research Questions

This dissertation tested four research questions, each in regard to one of the four target types. The first research question (7) and hypothesis (8) concerned ObjC verbs.

(7) Research Question 1

Do highly proficient L1 Spanish/L2 English learners show native-like competence for a frequent and similar form, i.e. ObjC verb constructions, in regard to finiteness?

(8) Hypothesis 1

Highly proficient L1 Spanish/L2 English learners will show native-like competence for a frequent and similar form, i.e. ObjC verb constructions, in regard to finiteness.

The average ratings for the monolinguals and near-native L2 learners appear in Figure 1 below.

![Figure 1. Rating of Object Control by Group and Complement](image-url)
Observation of Figure 1 reveals that both groups prefer non-finite complements with ObjC verbs over finite complements. The difference between the correct and violation conditions was greater for the monolingual speakers.

For inferential analysis, a repeated measures ANOVA was performed with the between-subjects variable Complement (Finite, Non-finite) and the within-subjects variable Group (Monolingual, Near-native). The ANOVA revealed an overall effect for Complement ($F_{1,37} = 162.978, p = 0.000, \eta^2 = 0.815$), indicating that ObjC was overall more highly rated with non-finite complements than with finite complements. Though no effect for Group was found, there was an interaction between Group and Complement ($F_{1,37} = 8.158, p = 0.007, \eta^2 = 0.181$). These results suggest that both monolingual speakers and L2 learners prefer ObjC verbs with non-finite complements. The interaction was further analyzed using independent $t$-tests to compare the groups within each Complement type and paired-samples $t$-tests to compare Complement types within each group. The post-hoc analysis revealed that the interaction was due to a higher rate of acceptance of the violation condition in the near-native group: Though the groups differed in regard to Finite ($t_{29.068} = -2.818, p = 0.009$), they both distinguished between Finite and Non-finite (Native: $t_{19} = -15.840, p = 0.000$; Near-native: $t_{18} = -5.596, p = 0.000$). Because the groups did not treat the two types of complements differently, Hypothesis 1 was accepted.

The second research question (9) and hypothesis (10) investigated RtoO verbs with bare aspect non-stative complements.
(9) Research Question 2

Do highly proficient L1 Spanish/L2 English learners show native-like competence for an infrequent but similar form, i.e. RtoO verb constructions with bare non-stative complements (RtoO Bare), in regard to finiteness?

(10) Hypothesis 2

Highly proficient L1 Spanish/L2 English learners will not show native-like competence for an infrequent but similar form, i.e. RtoO verb constructions with bare non-stative complements (RtoO Bare), in regard to finiteness.

As can be seen in Figure 2, both groups preferred finite bare aspect non-stative complements with RtoO verbs to non-finite complements. The L2 group had a higher acceptance of the violation condition, echoing the pattern seen in Figure 1.

![Figure 2. Rating of Raising to Object (Bare Aspect) by Group and Complement](image)

As with the ObjC verbs, a repeated measures ANOVA with the between-subjects variable Complement and the within-subjects variable Group was performed. The ANOVA showed an
effect for Complement ($F_{1,37} = 122.298$, $p = 0.000$, $\eta^2 = 0.768$) for the RtoO verbs with bare aspect. In the case of RtoO verbs, the groups rated RtoO Bare with finite complements more highly than with non-finite complements. Neither an effect for Group$^{23}$ nor an interaction was found. There was, however, a trend toward significance in the interaction ($F_{1,37} = 3.420$, $p = 0.072$, $\eta^2 = 0.085$). Exploratory post-hoc $t$-tests confirmed that both groups distinguished between Finite and Non-finite, and no difference was found between the groups for either type of Complement.

Hypothesis 2 (10) predicted that the L2 group would differ from the monolingual group because RtoO constructions are infrequent overall. Though there was a trend toward significance in the interaction between Group and Complement, this trend had a negligible effect size ($\eta^2 = 0.085$) that resulted in no differences between groups in the post-hoc. Because the groups treated the two types the same, Hypothesis 2 was rejected.

Research Question 3 (11) investigated the for-type verbs. Due to the high frequency of for-type verbs with non-finite complements, Hypothesis 3 (12) predicted that the L2 group would converge on the monolingual target for for-type verb constructions.

(11) Research Question 3
Do highly proficient L1 Spanish/L2 English learners show native-like competence for a frequent but dissimilar form, i.e. for-type verb constructions, in regard to finiteness?

(12) Hypothesis 3
Highly proficient L1 Spanish/L2 English learners will show native-like competence for a frequent but dissimilar form, i.e. for-type verb constructions, in regard to finiteness.

---

$^{23}$ RtoO Group: ($F_{1,37} = 0.151$, $p = 0.700$, $\eta^2 = 0.004$)
Figure 3 presents the average ratings for the two complement types (Finite, Non-finite) in both groups. Both the monolinguals and the near-native L2 learners preferred the non-finite complement to the finite complement with for-type verbs. Note that the near-natives had a much higher acceptance of the finite complement, which is licit in their L1 Spanish.

![Figure 3. Rating of For-type by Group and Complement](image)

A third repeated measures ANOVA was performed with the between-subjects variable Complement and the within-subjects variable Group. The analysis revealed an effect for Complement ($F_{1,37} = 126.883, p = 0.000, \eta^2 = 0.774$) but no effect for Group$^{24}$. The groups rated for-type verbs more highly overall with non-finite complements than with finite complements. However, the L2 group neither rejected nor accepted for-type verbs with finite complements consistently; as a result, there was an interaction between Complement and Group ($F_{1,37} = 24.395, p = 0.000, \eta^2 = 0.397$) indicating that the native group and the near-native group differed in how they rated the two types of complements.

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$^{24}$ For-type Group: ($F_{1,37} = 1.391, p = 0.245, \eta^2 = 0.036$)
Follow-up analysis of the interaction showed that the interaction was driven by the violation condition because learners differed from natives with regard to the finite complements only ($t_{28.437} = -3.096, p = 0.004$). Both groups did statistically differentiate between the two types of Complements (Native: $t_{19} = -14.586, p = 0.000$; Near-native: $t_{18} = -3.753, p = 0.001$). Though the interaction is of a more substantial effect size ($\eta^2 = 0.397$) than the one found for RtoO Bare ($\eta^2 = 0.085$) or even ObjC ($\eta^2 = 0.181$), the fact that both groups do distinguish between the violation and the correct conditions necessitates the acceptance of Hypothesis 3.

The final research question (13) and its hypothesis (14) were posed for RtoO verbs with non-finite complements that had either bare aspect or perfective aspect (RtoO Perfective).

(13) Research Question 4

Do highly proficient L1 Spanish/L2 English learners show native-like competence for an infrequent and dissimilar form, i.e. RtoO Perfective, in regard to finiteness?

(14) Hypothesis 4

Highly proficient L1 Spanish/L2 English learners will not show native-like competence for an infrequent and dissimilar form, i.e. RtoO Perfective, in regard to finiteness.
Figure 4. Rating of Raising to Object (Perfective) by Group and Aspect

The average ratings of Raising to Object with Bare Non-finite (Violation condition) and Perfective aspect (Correct condition) for the two groups appears in Figure 4. Both groups prefer the Perfective complement to the Bare Non-finite complement, but the correct condition is somewhat degraded for both groups (around 3.25).

The final ANOVA was a repeated measures ANOVA with the between-subjects variable Aspect (Bare, Perfective) and the within-subjects variable Group. An effect was found for Aspect ($F_{1,37} = 95.052, p = 0.000, \eta^2 = 0.720$) that indicated that perfective non-stative complements were more widely accepted than bare aspect non-stative complements across groups. No effect for Group was found, and there was no interaction. The lack of an interaction suggests that, contrary to Hypothesis 4, the monolinguals and the L2 learners did not treat the aspect distinction differently. For this reason, Hypothesis 4 was also rejected.

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25 RtO Perfective Group: ($F_{1,37} = 0.960, p = 0.333, \eta^2 = 0.025$); RtO Perfective Complement*Group: ($F_{1,37} = 1.471, p = 0.233, \eta^2 = 0.038$)
8. Discussion

I begin the discussion with section 8.1, which discusses the research questions in light of the results found in Chapter 7. A brief detour regarding the degradation of RtoO Perfective appears in section 8.2, and then a synthesis of the research questions is presented in section 8.3. Extensions and implications for other theories are presented in section 8.4.

For the interpretation of the results, Table 13 from Chapter 5 is reprinted below as Table 17. Table 17 summarizes predictions regarding the status of frequency and similarity, specifically indicating which of the four forms would be learned if frequency, similarity, or both were necessary or sufficient. I refer to this table throughout this chapter, and in doing so, I demonstrate that the results indicate that neither frequency nor similarity are necessary for L2 acquisition, which does not support the Fundamental Difference Hypothesis (Bley-Vroman, 1989, 1990, 2009).

<table>
<thead>
<tr>
<th></th>
<th>ObjC</th>
<th>RtoO Bare</th>
<th>For-type</th>
<th>RtoO Perfective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent Necessary</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Similar Necessary</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Both Necessary</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Neither Necessary</td>
<td>+?</td>
<td>+?</td>
<td>+?</td>
<td>+?</td>
</tr>
<tr>
<td>Either Sufficient</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

8.1 Discussion of Research Questions

The first research question investigated the acquisition of ObjC, which is both similar between English and Spanish and frequent in the input. In regard to the predictions in Table 17, ObjC is predicted to be acquired regardless of whether frequency or similarity are necessary or sufficient. For this reason, the finding that L2 learners acquired ObjC was not informative to the objectives of this dissertation but rather present a strong baseline of comparison.
Research Questions 2 and 3 investigated whether similarity or frequency were necessary for L2 acquisition. In the case where either RtoO Bare or for-type constructions were acquired but not the other, this would allow for conclusions based on necessity because the features [+/- similar] and [+/- frequent] are in an inverse relation with respect to RtoO Bare and for-type. Acquiring RtoO Bare but not for-type would suggest that similarity was necessary. Acquiring for-type but not RtoO Bare would have suggested that frequency was necessary. Because both types were indeed acquired, this suggests that neither similarity nor frequency is necessary.

Finally, Research Question 4 was informative as to whether similarity or frequency were sufficient for language acquisition. In the case where a learner did not acquire RtoO Perfective—but did acquire the remaining types—then the only unacquired type would be both dissimilar and infrequent. This would suggest that either a form must be similar or frequent to be learned. The fact that RtoO Perfective was acquired is a highly informative result. In fact, neither similarity nor frequency is necessary for L2 acquisition.

8.2 Degradation of RtoO Perfective

It merits mention that the correct condition for Research Question 4, RtoO Perfective, was degraded. Both natives and near-natives rated RtoO with perfective aspect just above 3 with a reasonably high standard deviation, but both groups preferred perfective aspect to bare aspect (‘Non-finite’). The fact that ratings of perfective are degraded requires some consideration. Why would it be that native speakers would distinguish between RtoO with bare aspect and perfective aspect but not give the latter ratings higher than 3.26? One potential reason may be the extreme infrequency of these examples. Note that the statistical difference in contextual frequency between the four target structures is reported in section 4.3.3, but the contextual frequency of RtoO Perfective is not reported in Appendix A. This is due to the fact that a total of
three examples of perfective non-finite complements were found for all of the RtoO verbs tested in this study. Regardless, native speakers do prefer them to the illicit RtoO Bare examples.

Another potential reason relates to the materials. Piloting of the materials revealed that some native speakers rate the target forms differently based on the tense of the matrix verb. First, it was found that they had difficulty accepting for-type verbs with an overt complementizer if the matrix verb is in present tense (1) rather than past tense (2).

(1) John needs for Mary to paint a portrait.
(2) John needed for Mary to paint a portrait.

To maintain the distinction between (2) and the finite condition, the past tense was used for the matrix verbs of for-type. Additionally, ObjC was accepted more robustly with past tense (4) than with present tense (3) as well.

(3) John persuades Mary to paint a portrait.
(4) John persuaded Mary to paint a portrait.

The preference for past tense with ObjC is likely due to felicity: English present tense expresses states or habitual events, and it is less felicitous for John to habitually persuade Mary to paint portraits (3) than for him to have persuaded her at some point in the past (4).

In the case of for-type verbs, the difference in tense indicates a state (1) or a past event (2). The results of piloting the materials suggest that some native speakers cannot get the state reading (1) with for-type verbs in the presence of the overt complementizer. Instead, native speakers were more willing to accept the past event reading, which is supported by the average for examples like (2) in Table 16 ($M = 3.94$).
The past tense was therefore used with ObjC and for-type verbs. Because predictions were made on the basis of surface similarity, the past tense was used consistently across the items, including using the past tense with RtoO Perfective (6) instead of present tense (5).

(5) John believes Mary to have painted a portrait.

(6) John believed Mary to have painted a portrait.

RtoO verbs are epistemic—meaning that they express beliefs—and as a result are compatible with the semantics of English present tense. The interpretation of (6) is not of a past event but of a past state of belief.

The use of past tense with RtoO had the opposite effect from past tense with the other verb types: natives slightly preferred present tense (5) to past tense (6). This may be due to the fact that the complements of epistemic verbs are concurrent with the matrix verb.\(^{26}\) Perfective aspect, such as in the complement predicate to have painted a portrait, indicates that the event occurred at some point before the point of reference. The resulting interpretation in (6) is that there was some point in the past in which John held the belief that Mary had already painted a portrait. The preference for present tense that arose in the piloting of the materials suggests that a past belief about a previous event (6) is less felicitous than a present belief about a previous event (5). As a result, the average for the perfective condition in Table 1 reflects degraded ratings due to infelicity, not ungrammaticality. Importantly, the degraded ratings are still better than the ungrammatical RtoO Bare condition (\(M = 2.16\)), which serves the purposes of the current study.

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\(^{26}\) In contrast to RtoO verbs, the predicate of ObjC and for-type verbs is interpreted as occurring subsequent to the matrix verb. This difference may be due to the fact that ObjC and for-type verbs have full CP complements and RtoO does not. For further discussion, refer to Mensching (2000).
8.3 Synthesis

The findings from Chapter 7 are summarized in Table 18 below by the features of each type. Table 18 also lists whether L2 learners had native-like knowledge of each form in the final column labeled “L2 Acquired?”.

Table 18. Forms by Frequency, Similarity, and Results

<table>
<thead>
<tr>
<th></th>
<th>[+/- frequent]</th>
<th>[+/- similar]</th>
<th>L2 Acquired?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ObjC</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>RtoO (Bare)</td>
<td>-</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>For-type</td>
<td>+</td>
<td>-</td>
<td>Yes?</td>
</tr>
<tr>
<td>RtoO (Perfective)</td>
<td>-</td>
<td>-</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Statistical analysis of the data found that only learner knowledge of the violation conditions of the [+frequent] types (ObjC, for-type) diverged from native speakers. This suggests that the locus of difficulty for L2 acquisition is ungrammaticality, but that acquiring new, grammatical mappings is uninhibited by infrequency and dissimilarity at near-native proficiency.

Notably, the effect of ungrammaticality was different by form: The effect size of the interaction for Group*Type in the [+frequent, -similar] type (for-type) was unique in that it was a medium effect ($\eta^2 = 0.397$). All other interactions and trends towards interactions were either small, as in the case of [+frequent, +similar] (ObjC: $\eta^2 = 0.181$), or arguably negligible, as in the case of the trend toward significance in the [-frequent, +similar] form (RtoO Bare: $\eta^2 = 0.085$). In the case of the negligible effect size, post-hoc analysis revealed no difference between groups, neither for the correct nor the violation conditions.

Of the three types, the only one with a medium effect size was the [-similar] type (for-type), suggesting that the greatest difficulty was found where the L1 and the L2 conflicted. Unlike the [-frequent,-similar] form (RtoO Perfective), which has no Spanish analogue, the [+frequent,-similar] form is opposite or conflicting in Spanish: English want and need typically
take non-finite complements whereas in Spanish they usually take finite complements. The fact that learners diverged the most from native speakers in regard to the violation condition in the *for*-type suggests that absence of negative evidence resulted in residual optionality (e.g., Sorace, 2005) with regard to *for*-type with finite complements. Note that the optionality is due to having a conflicting option in the L1 still available; therefore optionality does not arise for RtO Perfective.

Importantly, the results in Table 18 are useful in eliminating either frequency or similarity as the central predictive factor for L2 acquisition of grammatical forms. If either frequency or similarity were to be necessary for L2 acquisition, then the [-frequent, -similar] form, RtO Perfective, would not have been acquired. This is what was predicted in Hypothesis 4 based on claims in the literature, but Hypothesis 4 was ultimately rejected because no evidence was found that learners had residual deviance from native speakers in regard to RtO Perfective. The acquisition of RtO Perfective entails that near absence from the input is not inherently problematic for L1 acquisition, even if it fails to exclude certain options that are available in the L1.

With regard to types of dissimilarity, Section 3.2.2 predicted that learning the [-similar] RtO Perfective would be harder to acquire than the [-similar] *for*-type. This is because the acquisition of RtO Perfective can appeal the Subset Principle (Berwick, 1985) and *for*-type

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27 The *for*-type verbs do allow for other configurations, but the design of the current study disallows these options. For some speakers, English *for*-type verbs do not exclusively take non-finite complements and instead can allow subjunctive. Because none of the target stimuli involve subjunctive, this issue is not resolved by the current study. Additionally, *for*-type verbs can form Subject Control in both English and Spanish, meaning that the external argument of the matrix clause is coindexed with a null subject of a non-finite complement such as in (i).

(i) John, wanted PRO, to visit.

The fact that none of the *for*-type items in this dissertation had null subjects like in (i), this possibility is also not addressed here. Because English and Spanish both have Subject Control, the same predictions would be made as those for Object Control.
cannot. This prediction was corroborated: there was an interaction between Group and Complement for *for*-type but not for RtoO Perfective.

The results of this dissertation are partially consistent with Pérez-Tattam (2007). Pérez-Tattam found that advanced, but not intermediate, learners had native-like judgments and interpretation of similar forms between the L1 and the L2. The dissimilar items, however, were judged and interpreted differently from native speakers at both proficiency levels. If one were to view Pérez-Tattam’s groups together with the participants of this dissertation cross-sectionally, the comparison would show an effect for similarity that manifests at higher levels of proficiency but not intermediate proficiency. Dissimilarity, on the other hand, continues to cause some difficulty at all proficiency levels.

Let us return briefly to the caveat regarding *for*-type verb constructions in section 4.3.3. It was proposed that the presence of the highly infrequent overt complementizer *for* in these constructions would not be problematic for learners due to the overall high frequency of the larger category of *for*-type verbs with non-finite complements. For this reason, Hypothesis 3 predicted that the distinction regarding *for*-type verbs would be acquired. Although the learners rejected the violation condition significantly less than the native speakers, this is unrelated to frequency. The correct condition, despite the infrequency of the presence of the complementizer, was accepted by learners at a rate that was not significantly different from native speakers. Hypothesis 3 was confirmed due to a statistical difference between the violation and correct conditions in both groups.

I demonstrate that the results indicate that neither frequency nor similarity is necessary for L2 acquisition. I have argued that frequency is insufficient to predict the outcome of L1 acquisition. Further, similarity is irrelevant in monolingual L1 acquisition because there is no
other language of comparison. An effect for frequency would have supported the Fundamental Difference Hypothesis (Bley-Vroman, 1989, 1990, 2009), and an effect for similarity would have fit with the hypothesis even if it didn’t provide direct evidence. Instead, the finding that neither frequency nor similarity is necessary for L2 acquisition runs counter to the Fundamental Difference Hypothesis: it failed to show that the mechanism of L2 acquisition is susceptible to factors that are present but not effective in L1 acquisition.

8.4 Implications for Other Theories

In addition to informing the research questions, the findings of this dissertation have implications for other theories, such as the Unified Competition Model (MacWhinney, 2005), the Bottleneck Hypothesis (Slabakova, 2008), and the Representational Deficit Hypothesis (Hawkins, 2003). This is because studying learners at high, arguably native-like proficiency is a unique opportunity to comment on what is ultimately possible in L2 acquisition. Implications for these three theories are presented in 8.2.1, 8.2.2, and 8.2.3, respectively.

8.4.1 The Unified Competition Model (MacWhinney, 2005)

The results discussed in section 8.1 test predictions made by the Unified Competition Model (MacWhinney, 2005). As discussed in Chapter 4, the Unified Competition Model (UCM) draws parallelisms between L1 and L2 acquisition, including the observation of a relationship between acquisition and two factors, availability and reliability. Availability is related to the frequency of the cue needed for acquisition, and the reliability of a cue is the consistency with which that cue leads to the same interpretation.

Additionally, however, the UCM makes specific predictions for L2 acquisition due to the presence of the learner’s L1. Of these, the most interesting prediction is the claim that “whatever
can transfer will,” (MacWhinney, 2005: 18). This prediction is compatible with a full transfer model such as those presented in 3.1.2 and is subject to some degree to the same criticisms.

However, a full transfer model can partially explain the results of the present study. Full transfer makes two predictions. First, the [-similar] form that contradicts the L1 would be harder to acquire than the [-similar] form that is absent from the L1 because the former is negative transfer that must be overcome from the learner’s standpoint. Support for this prediction is evidenced by the presence of an interaction in the For-type condition (Research Question 3) as compared to no interaction in the RtoO Perfective condition (Research Question 4).

The second prediction is that the [+similar] forms should be easier to learn than the [-similar] forms. This prediction is somewhat supported in that the greatest effect size for an interaction was found for the For-type [-similar] form as compared to the [+similar] forms ObjC and RtoO Bare. However, post-hoc analysis found a difference between natives and near-natives for the ungrammatical items in ObjC but not RtoO Bare. Based on the predictions of the UCM, it is unclear why this would happen: Both forms are [+similar] and should transfer.

The UCM also does not predict difficulty for acquiring sensitivities to ungrammaticality in general. In fairness, the UCM is not designed to account for ungrammaticality, so deriving predictions in regard to ungrammaticality from the UCM is pure speculation. The claim of full transfer, on the other hand, should entail transfer of this sort. Consider the case of a speaker of an obligatory subject language like English learning French as an L2, which is also an obligatory subject language. Such a learner would likely have the intuition that a French sentence lacking a subject is a bad one. In the same sense, it is unclear why speakers of an ObjC language such as Spanish would not transfer the following corollary intuition to English: An ObjC verb with a
finite complement is ungrammatical in a language with ObjC. These results suggest a needed extension of the Competition Model that better models negative transfer.

8.4.2 The Bottleneck Hypothesis (Slabakova, 2008)

The Bottleneck Hypothesis (Slabakova, 2008) observes that there is a mismatch between learners’ syntactic knowledge and their production of or sensitivity to inflection that are associated with a singular functional head. One example is the $T^0$ head in English. English $T^0$ has been proposed to play a role in the Extended Projection Principle (EPP), which essentially results in all English sentences having subjects. $T^0$ is also predicted to play a role in the lack of verb raising in English. For convenience, the difference between verb raising and non-verb raising languages is detectable by the position of an adverb. Verb raising languages like French allow an adverb to be placed between a verb and its complement (1), whereas non-verb raising languages like English do not allow adverbs between verbs and their complements as in the translational equivalent of (1) that appears in (2).

(1) Jean mange souvent des pommes. [French with verb raising]
(2)* John eats often apples. [English with verb raising]
(3) John often eats apples. [English without verb raising]
(4)* Jean souvent mange des pommes. [French without verb raising]

Languages like English instead allow adverb placement preverbally (3), which is disallowed in verb raising languages (4). As observed in Slabakova (2008) and White (2003), various studies have found that L2 learners of English can master the EPP and acquire the restriction on verb raising (Lardiere, 1998a, 1998b; Ionin & Wexler, 2002). However, the learners from these studies fail to master the inflectional morphology associated with $T^0$, with particular difficulty being associated with the 3rd person singular morpheme [-s] and the past tense morpheme [-ed].
Slabakova (2008 et seq) hypothesized that this mismatch is due to the difficulty of feature mapping to forms as is observed in the work of Lardiere (2005, 2007, 2008, 2009). Consider that a particular form (e.g., auxiliary or bound morpheme) can map several meanings such as the morpheme [-ing]. Typically [-ing] forms part of progressive tenses both in the present (5) and the past (6).

(5) John is eating.
(6) John was eating.

However, [-ing] in the presence of a verb inflected with past tense can also be used to express [-past, +polite] as in (7).

(7) I was wondering if you were available.

Finally, past tense inflection, in addition to being able to mark [-past, +polite] can be ambiguous in regard to whether an action is ongoing or not, such as the embedded verb was in (8).

(8) Jane said that Joyce was pregnant.

In (8), it is unclear whether Joyce is still pregnant or not. The various mappings of [-ing] and past tense inflection suggest that these forms would be difficult to acquire.

Notably, this claim echoes the predictions of the UCM in that form mapping is the locus of difficulty. However, the Bottleneck Hypothesis differs from the UCM in that it (i) does not make any claims in regard to the extent of transfer but (ii) does predict insensitivity to ungrammaticality if it relies on morphology. The latter prediction is testable using the results of this dissertation. The findings do not corroborate the prediction that ungrammaticality centers on morphology: Learners had no difficulty with morphologically encoded aspect, but they did have difficulty with a violation condition that relied on selection, which is arguably syntactic, rather than morphological (i.e., for-type with finite complements). Therefore, the Bottleneck
Hypothesis does not find support with highly proficient learners and may be limited instead to earlier stages of learning.

8.4.3 The Representational Deficit Hypothesis (Hawkins, 2003)

The Representational Deficit Hypothesis (RDH; Hawkins, 2003, et seq) also makes predictions in regard to the present study. The RDH predicts that uninterpretable syntactic features are the locus of difficulty in L2 acquisition. Uninterpretable features bear no unique meaning because they are paired with interpretable features that are visible at the conceptual-intentional interface. The RDH predicts that uninterpretable features are unavailable in L2 if and only if they are not present in the learner’s L1. Residual non-native-likeness is predicted to be found where the L1 and the L2 have a mismatch in regard to uninterpretable features.

One case of mismatch of uninterpretable features that is found in non-finite complementation is the uninterpretable inflection feature proposed by Déchaine and Manfredi (2000) and applied to L2 data by Hawkins et al. (2008). Under Dechaine and Manfredi’s analysis, the uninterpretable inflection feature \([u\text{Infl}]\) differs in strength cross-linguistically, with the strong version \([u\text{Infl}:*]\) responsible for verb raising in languages such as Spanish and the weak version \([u\text{Infl}:]\) responsible for a lack of verb raising in languages such as English.28 Additionally, aspectual heads, such as Perfective (Perf) and Progressive (Prog), are present both in Spanish and English, and the authors analyze Perf and Prog as containing a strong inflectional feature \([u\text{Infl}:*]\). As a result, English has both weak and strong \([u\text{Infl}]\) whereas Spanish has only strong \([u\text{Infl}]\).

Consider the application of this analysis to the RtoO Bare and RtoO Perfective constructions in this study. English RtoO Bare and RtoO Perfective differ in terms of aspect.

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28 See section 8.2.2 for an example of verb raising.
Non-morphological aspect such as non-stative aspect reflected in the RtoO Bare condition is reliant on a weak inflectional feature \([uInfl:\ ]\). Morphological aspect such as perfective aspect in RtoO Perfective is reliant on a strong inflectional feature \([uInfl:*]\). L1 speakers of Spanish that are acquiring L2 English have only one of these features, the strong one \([uInfl:*]\), in their L1 detectable by virtue of the presence of verb raising. To fully acquire English, they must acquire the weak inflectional feature as well. The RDH predicts that the weak inflectional feature is unavailable to L1 Spanish speakers because it is not part of their L1. Therefore, L1 Spanish/L2 English learners should not be able to acquire the restrictions on RtoO Bare due to being reliant on an uninterpretable feature that they cannot acquire. Instead, learners acquired RtoO Bare and RtoO Perfective indiscriminately. This directly contradicts the RDH, and it instead suggests that the RDH requires refinement, corroborating previous work (e.g., Ahn & Herschensohn, 2013; Campos-Dintrans, Pires, & Rothman, 2014; Cuza, Guijarro-Fuentes, Judy, & Rothman, 2008; Cuza, Guijarro-Fuentes, Pires, & Rothman, 2012; Garcia Mayo & Villareal Olaizola, 2011; Ionin & Montrul, 2010; Ionin, Montrul, & Crivos, 2009; Wen & Schwartz, 2014).
9. Conclusions and Outlook

In this dissertation, I have investigated the question of whether L1 and L2 acquisition share a common mechanism in the hopes of better understanding age effects on language acquisition. A timed acceptability judgment task revealed that L1 Spanish speakers had knowledge of forms in their L2 English that were (i) not instructed in English classrooms, (ii) highly infrequent, and (iii) different or absent from their L1, Spanish. This suggests that learners can acquire forms based on minimal evidence from the input, even when they cannot draw generalizations between their L1 and the L2. Despite having acquired these forms, learners retained some difficulty in correctly rejecting violation sentences that are grammatical in their L1, suggesting that more evidence is needed to overcome the L1 selectional bias.

These results were found to be informative in regard to three different proposals in the field: the Unified Competition Model (MacWhinney, 2005), the Bottleneck Hypothesis (Slabakova, 2008), and the Representational Deficit Hypothesis (Hawkins, 2003). None of these proposals fully account for the patterns of acquisition described above, suggesting that they do not describe the upper bounds of L2 acquisition. For this reason, research on the linguistic knowledge of highly proficient or near-native L2 learners is essential to distinguish between what is unacquirable in an L2 in practice versus what is unacquirable in an L2 in principle (e.g., Lardiere, 2014).

Two future trajectories result from this project. The first trajectory is related to replicating the results with different linguistic structures. In this dissertation, learners had greater difficulty with structures that had conflicting selectional properties in their L1 (English for-type verbs take non-finite complements whereas Spanish for-type verbs take finite complements) than those structures that were simply absent in their L1 (infrequent restrictions on RtoO, i.e., RtoO...
Perfective vs. Non-finite/Bare). If this difference is due to the relation between the L1 and the L2, this result should be replicable.

The second trajectory is related to disentangling the effect of bilingualism from age effects. The experimental group in this study was composed of L2 learners who differ from the monolingual control group in two ways. The L2 learners both have two languages in their linguistic system, and they learned the target language—the one of interest in this study—at a later age. The results suggest that contrast between the L1 and the L2 presents difficulty, but it is unclear whether this difficulty results only from a lack of structural overlap between the two languages or whether the lack of structural overlap is problematic due to having learned the second language in adulthood. Therefore, to truly understand this result, further study with early bilinguals using the same materials is needed, and comparative study with L1 English/L2 Spanish bilinguals would be informative.

Finally, the results of this dissertation run counter to the Fundamental Difference Hypothesis (FDH). Bley-Vroman’s FDH (1989, 1990, 2009) proposes that the mechanisms of L1 and L2 acquisition must be different because the outcome of L2 acquisition is affected by factors not relevant in L1 acquisition. One of these factors is frequency, but extreme infrequency did not result in non-native-like attainment in the present study. This result alone runs counter to the FDH. A role for dissimilarity due to conflict between L1 and L2 selectional properties was also found. This does not strictly support the FDH because monolingual L1 acquisition does not occur in the presence of another acquired language, and thus the two cases are not directly comparable. However, extension of this question to simultaneous bilinguals as suggested above may inform whether this effect is limited to L2 acquisition.
Works Cited


## Appendix A – Raw and Contextual Frequency by Verb

<table>
<thead>
<tr>
<th>Type</th>
<th>Verb</th>
<th>Raw Entries</th>
<th>Tokens</th>
<th>#Target</th>
<th>Percentage</th>
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<td>1729</td>
<td>100.00</td>
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</tbody>
</table>

\(^i\)Other tokens include constructions like *need time to study* or *need money to spend*, which are not *for-type* constructions
## Appendix B – Critical Items

<table>
<thead>
<tr>
<th>RQ</th>
<th>Lexicalization</th>
<th>Correct (Non-finite)</th>
<th>Violation (Finite)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Adam invited Emily to close the gate.</td>
<td>Adam invited that Emily closed the gate.</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>Benny ordered Heather to cut the ribbon.</td>
<td>Benny ordered that Heather cut the ribbon.</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>Bianca invited Eric to grab the cup.</td>
<td>Bianca invited that Eric grabbed the cup.</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>Billy convinced Gabrielle to cook the meal.</td>
<td>Billy convinced that Gabrielle cooked the meal.</td>
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<tr>
<td>1</td>
<td>5</td>
<td>Brandon challenged Hannah to draw the picture.</td>
<td>Brandon challenged that Hannah drew the picture.</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>Brianna ordered Greg to mend the wound.</td>
<td>Brianna ordered that Greg mended the wound.</td>
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<tr>
<td>1</td>
<td>7</td>
<td>Brittany convinced Freddie to hide the treasure.</td>
<td>Brittany convinced that Freddie hid the treasure.</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>Bruce sent Heidi to drink the lemonade.</td>
<td>Bruce sent that Heidi drank the lemonade.</td>
</tr>
<tr>
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<td>9</td>
<td>Caitlyn challenged Hugh to mix the salad.</td>
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</tr>
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<td>Carrie sent Jack to prepare the lesson.</td>
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<td>Ciara forced Chuck to eat the cookie.</td>
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<td>Darla forced Cody to watch the show.</td>
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<td>Diana reminded Danny to examine the test.</td>
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</tr>
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<td>14</td>
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<td>Elizabeth taught that Darren explored the mines.</td>
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<td>1</td>
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<td>Eva persuaded Donald to feed the birds.</td>
<td>Eva persuaded that Donald fed the birds.</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>Jacob hired Alexa to push the limit.</td>
<td>Jacob hired that Alexa pushed the limit.</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>Jeffery hired Angelina to rob the bank.</td>
<td>Jeffery hired that Angelina robbed the bank.</td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>Jimmy taught Anna to sleep in the yard.</td>
<td>Jimmy taught that Anna slept in the yard.</td>
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<tr>
<td>1</td>
<td>19</td>
<td>Joey reminded Ashley to rent the apartment.</td>
<td>Joey reminded that Ashley rented the apartment.</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>Jonathan persuaded Beth to type the essay.</td>
<td>Jonathan persuaded that Beth typed the essay.</td>
</tr>
<tr>
<td>RQ</td>
<td>Lexicalization</td>
<td>Correct (Finite)</td>
<td>Violation (Non-finite)</td>
</tr>
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<td>-------------------------------------------------</td>
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<td>Abraham suspected that Vanessa damaged the paint.</td>
<td>Abraham suspected Vanessa to damage the paint.</td>
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<td>22</td>
<td>Alfredo confirmed that Larry devised the plan.</td>
<td>Alfredo confirmed Larry to devise the plan.</td>
</tr>
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<td>2</td>
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<td>Austin understood that Gina exposed the spy.</td>
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</tr>
<tr>
<td>2</td>
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<td>Bart presumed that Albert tipped the waiter.</td>
<td>Bart presumed Albert to tip the waiter.</td>
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<td>2</td>
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<td>Drake concluded that Mary found the killer.</td>
<td>Drake concluded Mary to find the killer.</td>
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<tr>
<td>2</td>
<td>27</td>
<td>Dustin assumed that Nathan cleaned the stove.</td>
<td>Dustin assumed Nathan to clean the stove.</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>Eddie understood that Sabrina won the match.</td>
<td>Eddie understood Sabrina to win the match.</td>
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<td>2</td>
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<td>Evelyn accepted that Barbara arranged the meeting.</td>
<td>Evelyn accepted Barbara to arrange the meeting.</td>
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<td>2</td>
<td>30</td>
<td>Janet imagined that Rose hired the gardener.</td>
<td>Janet imagined Rose to hire the gardener.</td>
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<td>2</td>
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<td>Jessica guessed that Pamela set the table.</td>
<td>Jessica guessed Pamela to set the table.</td>
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<td>2</td>
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<td>Jocelyn understood that Rachel lied about the murder.</td>
<td>Jocelyn understood Rachel to lie about the murder.</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>Joseph suspected that Adrian bit the sandwich.</td>
<td>Joseph suspected Adrian to bite the sandwich.</td>
</tr>
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<td>2</td>
<td>34</td>
<td>Kara concluded that Samantha raised the bar.</td>
<td>Kara concluded Samantha to raise the bar.</td>
</tr>
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<td>2</td>
<td>35</td>
<td>Keith believed that Andy brought the camera.</td>
<td>Keith believed Andy to bring the camera.</td>
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<tr>
<td>2</td>
<td>36</td>
<td>Kelly suspected that Marie ran the mile.</td>
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</tr>
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<td>2</td>
<td>37</td>
<td>Laura believed that Nick seized the capitol.</td>
<td>Laura believed Nick to seize the capitol.</td>
</tr>
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<td>2</td>
<td>38</td>
<td>Leo concluded that Olivia baked the cake.</td>
<td>Leo concluded Olivia to bake the cake.</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>Lilly confirmed that Belinda sold the bike.</td>
<td>Lilly confirmed Belinda to sell the bike.</td>
</tr>
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<td>Logan confirmed that Marcus chose the movie.</td>
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<td>2</td>
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<td>2</td>
<td>42</td>
<td>Madeline guessed that Maggie shut the door.</td>
<td>Madeline guessed Maggie to shut the door.</td>
</tr>
<tr>
<td>2</td>
<td>43</td>
<td>Mark accepted that Polly selected the answer.</td>
<td>Mark accepted Polly to select the answer.</td>
</tr>
<tr>
<td>2</td>
<td>44</td>
<td>Martha accepted that Steven elected the governor.</td>
<td>Martha accepted Steven to elect the governor.</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>Marvin guessed that Caleb sent the letter.</td>
<td>Marvin guessed Caleb to send the letter.</td>
</tr>
<tr>
<td>2</td>
<td>46</td>
<td>Matthew presumed that Paulina finished the race.</td>
<td>Matthew presumed Paulina to finish the race.</td>
</tr>
<tr>
<td>2</td>
<td>47</td>
<td>Melinda imagined that Tommy voted for the law.</td>
<td>Melinda imagined Tommy to vote for the law.</td>
</tr>
<tr>
<td>2</td>
<td>48</td>
<td>Robert presumed that Marina broke the egg.</td>
<td>Robert presumed Marina to break the egg.</td>
</tr>
<tr>
<td>2</td>
<td>49</td>
<td>Ruth assumed that Charles tracked the deer.</td>
<td>Ruth assumed Charles to track the deer.</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>Sarah believed that Timothy developed the photo.</td>
<td>Sarah believed Timothy to develop the photo.</td>
</tr>
<tr>
<td>RQ</td>
<td>Lexicalization</td>
<td>Correct (Non-finite)</td>
<td>Violation (Finite)</td>
</tr>
<tr>
<td>----</td>
<td>----------------</td>
<td>--------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>51</td>
<td>Andrew asked for Teresa to fix the computer.</td>
<td>Andrew asked that Teresa fixed the computer.</td>
</tr>
<tr>
<td>3</td>
<td>52</td>
<td>Anthony desired for Nora to wrap the present.</td>
<td>Anthony desired that Nora wrapped the present.</td>
</tr>
<tr>
<td>3</td>
<td>53</td>
<td>Ayden wanted for Tina to buy the magazine.</td>
<td>Ayden wanted that Tina bought the magazine.</td>
</tr>
<tr>
<td>3</td>
<td>54</td>
<td>Brian demanded for Sonia to climb the tree.</td>
<td>Brian demanded that Sonia climbed the tree.</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>Cathy wanted for Peter to polish the wood.</td>
<td>Cathy wanted that Peter polished the wood.</td>
</tr>
<tr>
<td>3</td>
<td>56</td>
<td>Chad craved for Arthur to complete the task.</td>
<td>Chad craved that Arthur completed the task.</td>
</tr>
<tr>
<td>3</td>
<td>57</td>
<td>Chase called for Sharon to construct the fort.</td>
<td>Chase called that Sharon constructed the fort.</td>
</tr>
<tr>
<td>3</td>
<td>58</td>
<td>Holly needed for Oliver to write the date.</td>
<td>Holly needed that Oliver wrote the date.</td>
</tr>
<tr>
<td>3</td>
<td>59</td>
<td>Jane craved for Carmen to remove the dirt.</td>
<td>Jane craved that Carmen removed the dirt.</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>Julia allowed for Fiona to listen to the music.</td>
<td>Julia allowed that Fiona listened to the music.</td>
</tr>
<tr>
<td>3</td>
<td>61</td>
<td>Karina demanded for Betty to read the newspaper.</td>
<td>Karina demanded that Betty read the newspaper.</td>
</tr>
<tr>
<td>3</td>
<td>62</td>
<td>Lauren pushed for Jill to kill the mosquito.</td>
<td>Lauren pushed that Jill killed the mosquito.</td>
</tr>
<tr>
<td>3</td>
<td>63</td>
<td>Leah needed for Erica to scrub the floor.</td>
<td>Leah needed that Erica scrubbed the floor.</td>
</tr>
<tr>
<td>3</td>
<td>64</td>
<td>Natalie urged for Randy to grow the plant.</td>
<td>Natalie urged that Randy grew the plant.</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
<td>Ricky asked for Julian to speak the language.</td>
<td>Ricky asked that Julian spoke the language.</td>
</tr>
<tr>
<td>3</td>
<td>66</td>
<td>Roger called for Henry to slice the pizza.</td>
<td>Roger called that Henry sliced the pizza.</td>
</tr>
<tr>
<td>3</td>
<td>67</td>
<td>Shannon pushed for Noah to stir the soup.</td>
<td>Shannon pushed that Noah stirred the soup.</td>
</tr>
<tr>
<td>3</td>
<td>68</td>
<td>Tony desired for Max to steal the coin.</td>
<td>Tony desired that Max stole the coin.</td>
</tr>
<tr>
<td>3</td>
<td>69</td>
<td>Tyler urged for Lucas to stop the fight.</td>
<td>Tyler urged that Lucas stopped the fight.</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>Wendy allowed for Aaron to smash the plate.</td>
<td>Wendy allowed that Aaron smashed the plate.</td>
</tr>
<tr>
<td>RQ</td>
<td>Lexicalization</td>
<td>Correct (Perfective)</td>
<td>Violation (Bare)</td>
</tr>
<tr>
<td>----</td>
<td>----------------</td>
<td>----------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>Abraham suspected Vanessa to have damaged the paint.</td>
<td>Abraham suspected Vanessa to damage the paint.</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>Alfredo confirmed Larry to have devised the plan.</td>
<td>Alfredo confirmed Larry to devise the plan.</td>
</tr>
<tr>
<td>4</td>
<td>23</td>
<td>Amanda imagined Carlos to have grilled the steak.</td>
<td>Amanda imagined Carlos to grill the steak.</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>Austin understood Gina to have exposed the spy.</td>
<td>Austin understood Gina to expose the spy.</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>Bart presumed Albert to have tipped the waiter.</td>
<td>Bart presumed Albert to tip the waiter.</td>
</tr>
<tr>
<td>4</td>
<td>26</td>
<td>Drake concluded Mary to have found the killer.</td>
<td>Drake concluded Mary to find the killer.</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>Dustin assumed Nathan to have cleaned the stove.</td>
<td>Dustin assumed Nathan to clean the stove.</td>
</tr>
<tr>
<td>4</td>
<td>28</td>
<td>Eddie understood Sabrina to have won the match.</td>
<td>Eddie understood Sabrina to win the match.</td>
</tr>
<tr>
<td>4</td>
<td>29</td>
<td>Evelyn accepted Barbara to have arranged the meeting.</td>
<td>Evelyn accepted Barbara to arrange the meeting.</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>Janet imagined Rose to have hired the gardener.</td>
<td>Janet imagined Rose to hire the gardener.</td>
</tr>
<tr>
<td>4</td>
<td>31</td>
<td>Jessica guessed Pamela to have set the table.</td>
<td>Jessica guessed Pamela to set the table.</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>Jocelyn understood Rachel to have lied about the murder.</td>
<td>Jocelyn understood Rachel to lie about the murder.</td>
</tr>
<tr>
<td>4</td>
<td>33</td>
<td>Joseph suspected Adrian to have bitten the sandwich.</td>
<td>Joseph suspected Adrian to bite the sandwich.</td>
</tr>
<tr>
<td>4</td>
<td>34</td>
<td>Kara concluded Samantha to have raised the bar.</td>
<td>Kara concluded Samantha to raise the bar.</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>Keith believed Andy to have brought the camera.</td>
<td>Keith believed Andy to bring the camera.</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>Kelly suspected Marie to have run the mile.</td>
<td>Kelly suspected Marie to run the mile.</td>
</tr>
<tr>
<td>4</td>
<td>37</td>
<td>Laura believed Nick to have seized the capitol.</td>
<td>Laura believed Nick to seize the capitol.</td>
</tr>
<tr>
<td>4</td>
<td>38</td>
<td>Leo concluded Olivia to have baked the cake.</td>
<td>Leo concluded Olivia to bake the cake.</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
<td>Lilly confirmed Belinda to have sold the bike.</td>
<td>Lilly confirmed Belinda to sell the bike.</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>Logan confirmed Marcus to have chosen the movie.</td>
<td>Logan confirmed Marcus to choose the movie.</td>
</tr>
<tr>
<td>4</td>
<td>41</td>
<td>Lucy assumed Patrick to have confronted the bully.</td>
<td>Lucy assumed Patrick to confront the bully.</td>
</tr>
<tr>
<td>4</td>
<td>42</td>
<td>Madeline guessed Maggie to have shut the door.</td>
<td>Madeline guessed Maggie to shut the door.</td>
</tr>
<tr>
<td>4</td>
<td>43</td>
<td>Mark accepted Polly to have selected the answer.</td>
<td>Mark accepted Polly to select the answer.</td>
</tr>
<tr>
<td>4</td>
<td>44</td>
<td>Martha accepted Steven to have elected the governor.</td>
<td>Martha accepted Steven to elect the governor.</td>
</tr>
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<td>4</td>
<td>45</td>
<td>Marvin guessed Caleb to have sent the letter.</td>
<td>Marvin guessed Caleb to send the letter.</td>
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<td>46</td>
<td>Matthew presumed Paulina to have finished the race.</td>
<td>Matthew presumed Paulina to finish the race.</td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>Melinda imagined Tommy to have voted for the law.</td>
<td>Melinda imagined Tommy to vote for the law.</td>
</tr>
<tr>
<td>4</td>
<td>48</td>
<td>Robert presumed Marina to have broken the egg.</td>
<td>Robert presumed Marina to break the egg.</td>
</tr>
<tr>
<td>4</td>
<td>49</td>
<td>Ruth assumed Charles to have tracked the deer.</td>
<td>Ruth assumed Charles to track the deer.</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>Sarah believed Timothy to have developed the photo.</td>
<td>Sarah believed Timothy to develop the photo.</td>
</tr>
</tbody>
</table>
Appendix C – Sample Debriefing Questionnaire

Thank you for participating!

Please take the time to answer a couple of follow-up questions.

1. Having completed the study, what do you think it was about?

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

2. Give an example of your answer above, if applicable:

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________
**Vita**

Jeanne Heil  
University of Illinois at Chicago, M/C 315  
1702 University Hall  
601 S. Morgan St.  
Chicago, IL 60607  
jheil3@uic.edu

**EDUCATION**

2009-2015  
Ph.D., Hispanic Studies, University of Illinois at Chicago  
Concentrations: Theoretical Linguistics, Second Language Acquisition  
Advisor: Luis López  
Dissertation: *Infinitivals at the End-State: Evidence for the Second Language Acquisition of English Non-finite Complementation*  
Committee: Luis López (chair), Kara Morgan-Short, Jessica Williams, Jennifer Cabrelli Amaro, Jill Jegerski (University of Illinois at Urbana-Champaign)

2007-2009  
M.A., Hispanic Studies, University of Illinois at Chicago  
Qualifying Research Paper: *The Acquisition of ECM: In search of empirical evidence against the Movement Theory of Control*

2003-2007  
B.A., Spanish, Wittenberg University, Springfield, OH (Phi Beta Kappa), Summa Cum Laude

**RESEARCH**

Major fields  
Second Language Acquisition, Applied Morphosyntax, and Bilingualism  
Areas of Specialization  
Acquisition of syntax and morphology; sentential processing of second language learners and early bilinguals; syntactic knowledge of second language learners and early bilinguals; methodology of bilingualism

**PUBLICATIONS**

Refereed Journal Articles  

Manuscripts Under Preparation

Relative Clause Attachment in Early and Late Bilinguals, with Shane Ebert, Bryan Koronkiewicz, Sergio Ramos, Daniel Vergara, & Luis López.

Morphological Encoding in Highly Proficient Second Language Learners, with Luis López.

Code-switching of Non-finite Complement Constructions, with Luis López.

**RESEARCH EXPERIENCE**

Graduate Research Assistant – Bilingualism Research Laboratory, University of Illinois at Chicago
PIs: Kay González-Vilbazo, Luis López

Graduate Student Director Spring 2014 – Spring 2015
Director of Undergraduate Research Spring 2013 – Spring 2014
Director of Research Administration (IRB) Spring 2012 – Spring 2013
Director of Grants, Funds, and Finance Spring 2011 – Spring 2012
Director of Literature and Information Management Spring 2010 – Spring 2011
Director of Marketing and Communication Fall 2008 – Spring 2010

Graduate Research Assistant – Piloting Multisite Replication in Second Language Acquisition: Attention to Form and Meaning
PIs: Kara Morgan-Short, Emma Marsden
Funding: Language Learning Research Club at the University of Michigan

Mentorship of Undergraduate Students – Bilingualism Research Laboratory, University of Illinois at Chicago

Bill Udziela
AY 2014-2015
Project Title: *Bare-Phrase Ellipsis in Spanish/English Code Switching*
Graduate Mentor Consultant for Capstone Project

Emily Dorgan
SP 2015
Project Title: *Priming and the Bilingualism Mode Continuum*
Independent Study

Ryan Battles
FA 2013
Project Title: *Expletives in the Interlanguage: Second Language Acquisition of English Argument Structure*
Independent Study

Łukasz Adamczyk
AY 2012 - 2013
Project Title: *Intuitions in Bilingualism: Directionality Restrictions in Code-switching*
Caterpillar Award for Undergraduate Research
AY 2011 - 2012
Project Title: *Object Control and Raising to Object in L1 and L2 Processing*
LAS Undergraduate Research Award (LASURI)

Blanca Bustos
AY 2012 - 2013
Project Title: *Critical Period Hypothesis and the Acquisition of Infrequent Forms*
LAS Undergraduate Research Award (LASURI)

PRESENTATIONS

**Peer-Reviewed Professional Meetings**


Sessions Chaired


AWARDS

Travel Grants

Graduate Student Council, University of Illinois at Chicago, Fall 2010, Fall 2012, Fall 2013, Fall 2014

School of Literature, Cultural Studies, and Linguistics, University of Illinois at Chicago, Spring 2011

Department of Hispanic and Italian Studies, University of Illinois at Chicago, Spring 2011

Teaching/Coordinating Awards

Excellence in Coordination Basic Language Program, 2009 – 2010

APPOINTMENTS

2014 – Present  Research Assistant, Department of Hispanic and Italian Studies, University of Illinois at Chicago, Chicago, IL

2007 – 2014  Teaching Assistant, Department of Hispanic and Italian Studies, University of Illinois at Chicago, Chicago, IL

2009 – 2010  Coordinator of Spanish 101, Spanish Basic Language Program, University of Illinois at Chicago, Chicago, IL

2004 – 2007  Spanish Tutor, Department of Spanish, Wittenberg University, Springfield, OH
SERVICE: UNIVERSITY OF ILLINOIS AT CHICAGO

Conference Organizer

2011 – 2012
Student Advisor to the Organizing Committee, 2012 UIC Bilingualism Forum

2008 – 2012
Organizing Committee, UIC Talks in Linguistics (UICTiL)

2010 – 2011
Head Organizer, 2011 UIC Bilingualism Forum

Spring 2010
Head Organizer, UIC Generative Second Language Acquisition Symposium

Spring 2009
Organizing Committee, 2009 UIC Bilingualism Forum

Graduate Committee

2009 – 2010
Graduate Committee Student Representative for the Department of SFIP

TEACHING: UNIVERSITY OF ILLINOIS AT CHICAGO, Fall 2007 – Present

Linguistics

Introduction to Hispanic Linguistics for Spanish Majors and Minors
Span206 3 semesters (Spring 2011, Spring 2012, Spring 2014)

Spanish Blended Learning Courses

Advanced Grammar for Spanish Majors and Minors
Span202 3 semesters (Fall 2012; Spring 2013; Summer 2013)

Spanish Basic Language Program
Span104 2 semesters (Spring 2009; Fall 2011)
Span103 7 semesters (AY 2007-2008; Fall 2009; Summer 2010; Summer 2011; Summer 2012; Fall 2013)
Span102 1 semester (Fall 2010)
Span101 4 semesters (Fall 2008; Summer 2009; Fall 2009; Fall 2012, Summer 2014)

LANGUAGES

English: Native
Spanish: Near-native
French: Intermediate, Reading Knowledge
Italian: Reading Knowledge
Japanese: Beginner
Korean: Beginner
REFERENCES

Research:
Luis López (luislope@uic.edu) - Thesis Advisor, Head of the Spanish Department, Co-author
Kara Morgan-Short (karams@uic.edu) - Thesis Committee Member, Co-author
Kay González-Vilbazo (kgy@uic.edu) - Co-author

Teaching:
Justyna Makowska (jmakow1@uic.edu) - Assistant Head to the Spanish Basic Language Program
Inma Taboada (taboada@uic.edu) - Coordinator of 200-level Spanish