Abstract

It has been argued that extended exposure to naturalistic input provides L2 learners with more of an opportunity to converge of target morphosyntactic competence as compared to classroom-only environments, given that the former provide more positive evidence of less salient linguistic properties than the latter (e.g., Isabelli 2004). Implicitly, the claim is that such exposure is needed to fully reset parameters. However, such a position conflicts with the notion of parameterization (cf. Rothman and Iverson 2007). In light of two types of competing generative theories of adult L2 acquisition – the No Impairment Hypothesis (e.g., Duffield and White 1999) and so-called Failed Features approaches (e.g., Beck 1998; Franceschina 2001; Hawkins and Chan 1997), we investigate the verifiability of such a claim. Thirty intermediate L2 Spanish learners were tested in regards to properties of the Null-Subject Parameter before and after study-abroad. The data suggest that (i) parameter resetting is possible and (ii) exposure to naturalistic input is not privileged.

1. Introduction

For over two decades, a central question of generative second language (L2) acquisition has been whether parameter resetting is possible for adult language learners. Corroborating or invalidating parameter resetting would provide unsurpassable evidence concerning the role of Universal Grammar (UG) in the process of adult second language learning. However, the opposing facts of normal childhood first language (L1) acquisition and typical adult second language (L2) acquisition coupled with mutually exclusive theoretical assumptions (e.g., morphology-before-syntax vs. syntax-before-morphology) have added to the opaque nature of the question. Normal L1 acquisition is typified by uniform success, a remarkably similar developmental pattern with predictable milestones and a linear correlation between morphological production and syntactic accomplishment (Guasti 2002; Lust 2006). In contrast, adults learning a non-
primary language after puberty typically have difficulty and they rarely achieve steady-state grammars that are quantitatively and qualitatively native-like. In addition, they often vary from other L2 learners in terms of ultimate attainment despite comparable exposure to input, training and motivation.

These facts have prompted some researchers to hypothesize that the processes of child and adult language acquisition are fundamentally different (Bley-Vroman 1989, 1990). In generative terms, this fundamental difference lies in L2 learners’ purported inaccessibility, in part or in its entirety, to UG’s inventory. Strictly interpreted, this so-called fundamental difference is understood as domain-general linguistic learning in the case of adults as opposed to domain-specific learning in the case of children. Although it is clear that L1 and L2 grammars are different and that the process of linguistic learning takes a different route for adult learners, it is not at all clear that the two processes are fundamentally different.

Recently, parameter values are assumed to be located within the lexicon of a particular grammar (Chomsky 1995, 2000). Because language-specific lexicons vary in terms of which functional categories, features and strengths they instantiate, parametric differences arise cross-linguistically; that is, the acquisition of the functional lexicon has a number of syntactic consequences, which explains cross-linguistic surface variation. If one assumes L1 transfer, as we do (but see Epstein et al. 1996, 1998), the L2 initial state is the L2 steady-state and, therefore, adults use their L1 grammars to make initial hypotheses about the target L2. To restructure their transferred grammars, adult learners must acquire crucial features of the L2 that are not specified in their L1. In other words, if parameter resetting is possible, adult learners must have direct access to UG. Whether the inaccessibility to UG cited by some approaches to SLA is understood in terms of localized or global impairments, both types make the same prediction for parameter resetting: that it should be a priori impossible. For example, if one assumes local impairment, as is the case in Failed Features approaches (e.g., Beck 1998; Franceschina 2001; Hawkins 2005; Hawkins and Franceschina 2004; Hawkins and Chan 1997), then parameter resetting is unachievable because there is a post-critical period failure to acquire new L2 features. Although localized restructuring (e.g., L1 values mapped onto L2 morpho-phonological forms) is hypothesized to result in fairly sophisticated L2 grammars, Failed Features approaches take the position that, to the extent a L1 and a target L2 grammar are morphosyntactically distinctive, adult L2 grammars remain fundamentally different in terms of their underlying mental representations.

Full Access approaches to adult L2 acquisition, such as the No Impairment Hypothesis (Duffield and White 1999), assume that adults continue to have access to UG’s complete inventory. Despite possible interference from the transferred L1 grammar, parameter resetting is possible and, in most cases,
expected. Proponents of Full Access approaches maintain that new L2 features can be acquired from exposure to target input. Acknowledging the observable differences in L1 and L2 grammars and performances, especially in the domain of overt morphological use, they assume a syntax-before-morphology position (see Lardiere 1998, 2006; Prévost and White 2000; Schwartz 2003) which claims that despite surface differences in performance, advanced L2 grammars are fundamentally native-like in their underlying syntactic representations. They cite L2 poverty-of-the-stimulus (POS) knowledge in adult grammars as evidence of full accessibility to UG in adulthood (e.g., Dekydsporter et al. 1997; Dekydsporter and Sprouse 2001; Pérez-Leroux and Glass 1999; Slabakova 2006a, b; Slabakova and Montrul 2003; White 2003). Given that POS effects in linguistic systems provide incontrovertible evidence for the existence of UG, it is assumed that demonstrating POS effects in L2 grammars implies a direct role for UG in adult language learning, despite any differences that may arise.2

The present study weighs in on the aforementioned debate. We seek to investigate whether parameter resetting is possible by investigating the resetting of the Null-Subject Parameter (NSP) in 30 English adult learners of L2 Spanish at the intermediate level. If Failed Feature approaches are correct, none of the L2 learners – at this or any level of proficiency – should demonstrate parameter resetting. If Full Access approaches are correct, it should be possible for some, many, or all of the L2 learners at the intermediate level to demonstrate parameter resetting.

However, investigating the possibility of parameter resetting is only one of the goals of the present study. Because naturalistic input provides more positive evidence of low-frequency linguistic properties than does classroom input alone, it has been argued that extended exposure to naturalistic input provides L2 learners with a greater opportunity to converge on target morphosyntactic competence (Isabelli 2002, 2004 inter alia). The claim is that such exposure is needed to fully reset parameters. However, as we discuss below, such a position conflicts with the notion of parameterization (cf. Rothman and Iverson 2007). We investigate this claim by testing intermediate L2 learners just prior to and immediately following five months of exposure to naturalistic input in a study-abroad context. To examine their knowledge that Spanish, unlike their L1 English, is a null-subject language, we test their knowledge of associated constraints on what counts as a bound variable (null subjects do, but overt pronominal subjects do not) and how this knowledge interacts with the Overt Pronoun Constraint (OPC) (Montalbetti 1984) in Romance languages. The OPC disallows bound variable interpretations between quantified DP/wh-matrix subjects and embedded overt pronominal subjects (see Section 3). With others (Kanno 1998; Pérez-Leroux and Glass 1997, 1999), we take the position that such knowledge is supplied gratis by setting the NSP to the Spanish-type
value. We also join them in claiming that OPC restrictions are not explicitly taught to classroom learners and, given the specificity of the constraint, that relevant OPC sentences are infrequently exemplified in both classroom and natural input.

The relevance of examining the OPC rests on the fact that both child and adult L2 learners acquire the OPC and correctly apply it to relevant Spanish sentences. Given the OPC’s underlying connection to the setting of the NSP, we interpret knowledge of OPC restrictions in L2 Spanish as an indication that the NSP has been reset. Our data demonstrate that two thirds of our intermediate L2 Spanish sample had native-like knowledge of OPC restrictions in Spanish prior to their extended stay abroad. This finding provides evidence against the predictions of Failed Features approaches to adult L2 acquisition and in favor of Full Access approaches. Furthermore, our data indicate that not one individual who lacked this knowledge at the onset of the study acquired it during five months of study abroad. As a result, exposure to abundant amounts of naturalistic input did not affect its acquisition, which suggests that naturalistic exposure is not qualitatively privileged over classroom input per se for the acquisition of less commonly exemplified properties.

The article is set up in the following manner. Section 2 discusses the notion of parameterization and its explanatory value via the hypothesis of clustering. Section 3 presents the NSP and reviews L2 NSP studies in general and the findings of Isabelli (2004) in particular. The remainder of the article deals with our empirical study.

2. Parameterization and the clustering of properties

The notion of parameterization was introduced in the early 1980s within the Principles and Parameters framework (Chomsky 1981). Parameters are principles of grammar whose values are left open by UG. Via an interaction with a particular grammar (PG), these open principles are set. In Minimalism, parameters are hypothesized to be set (or reset in L2 grammars) via the acquisition of the target functional lexicon. In other words, the acquisition of functional categories and their associated features has syntactic consequences, which manifest as parametric differences.

Given generative assumptions, the notion of parameters and clusters has great explanatory value. Crucially, a cluster is assumed to be a group of seemingly unrelated properties, which are assumed to be corollaries of a particular parameter value. In other words, if value X of parameter Y is assumed to entail properties A, B, and C, we should expect to find that all languages with value X of parameter Y have properties A, B, and C and that languages with value Z of parameter Y do not have properties A, B and C. Consequently, the
language learner needs only converge on one property of any given parameter to set the proper value from UG. The other properties come for free via their underlying relationship to one another. If true, this clustering phenomenon accounts for POS effects, assumed to be instantiated via the acquisition of related properties acquired directly from the input.

Under these assumptions, proof of parameters depends critically on the surfacing of their cluster of properties. In the case of the NSP, there is debate as to what constitutes the cluster of properties. Such theoretical debates weigh heavily on the methodology, discussion, interpretation, and verifiability of L2 acquisition studies. Ultimately, L2 acquisition studies may help us determine what properties are actually clustered with a given parameter and which are simply co-existing and happen to emerge at roughly the same time in L1 acquisition.

3. The Null Subject Parameter

One extensively studied example of a parameter, the Null Subject Parameter (NSP)\(^3\) (Chomsky 1981; Jaeggli 1982; Rizzi 1982, 1986), divides languages into two types. Pro-drop languages ( [+null-subject]), like Spanish, allow for subject pronouns to be pronounced or not pronounced in discourse, whereas non pro-drop languages ( −null-subject), such as English, always require subject pronouns to be phonetically spelled out in tensed clauses.\(^4\) Unlike English, the rich nominal nature of Spanish verbal morphology enables non-overt subjects ubiquitously (Alexiadou and Agnostopulou 1998). However, in certain pragmatic conditions (regulated in the pragmatics by [Focus] and [Topic-Shift] features) they are restricted in some environments (e.g. when introducing new information and contrastive focus environments) (see Montrul 2004; Montrul and Rodríguez-Louro 2006; Rothman 2007; Sorace 2004).

Alexiadou and Agnostopulou (1998) and others (see Note 3) have demonstrated that the Spanish value of the NSP obtains as a result of EPP-feature checking in T (or AgrSP). They argue that the interpretable phi-features of Spanish verbal morphology (person, number and case), being nominal in nature, are sufficient to check a universally strong EPP-feature of T via X-move ment alone (i.e., via verb-raising), resulting in null subjects. In contrast, English lacks these nominal features and therefore must check the EPP-feature via XP-merge of a DP to the Spec of T (or AgrSP). Therefore, English learners of L2 Spanish must acquire the nominal phi-features of Spanish verbal morphology. If they can do so, it will constitute evidence against Failed Features approaches to SLA, which predict that L2 learners will map the English [−interpretable] phi-features onto Spanish morpho-phonological paradigms. As a result, they should not be able to converge on an L2 grammar that is [+null-subject] in its underlying representation.
Conversely, if L2 learners cannot acquire these interpretable phi-features, the underlying system will not be native-like, providing evidence in favor of Failed Features and against the Full Access approaches. Even if English learners drop subjects in L2 Spanish, it should not be taken for granted that this usage entails a system that licenses null subjects in a target-like manner (see Liceras and Díaz 1999; Tsimpli and Roussou 1991). How, therefore, does one gauge underlying competence? We propose that testing knowledge of clustered properties, crucially ones that are not easily acquirable from the input alone, will provide strong supporting evidence.

It has been argued that the Spanish-type value of the NSP comprises a well-known cluster of derived properties, as in (1) (Rizzi 1982, 1986).

(1) a. the co-occurrence of null and overt subject pronouns in tensed clauses
b. obligatorily null expletive subjects
c. free word order
d. no that-trace effects
e. the instantiation of the Overt Pronoun Constraint (Montalbetti 1984)

With others, we take the position that the cluster of properties is narrower than original accounts suggest. In addition to the significant consequences this debate on the status of NSP clustering properties invokes for L2 acquisition studies, it is important to note that of the properties in (1), all but Overt Pronoun Constraint (OPC) restrictions are to a greater or lesser extent exemplified in the input as well as explicitly taught to adult L2 learners. That is, whether or not these properties cluster with the possibility of null subjects, they are directly derivable from available input on a case-by-case basis and are made conscious to tutored learners via pedagogical instruction and explicit comparisons to English. Since the subtlety of the semantic restriction imposed by the OPC is in no way derivable from the input, it embodies a classical example of the POS. Given its relationship to the status of the NSP, its proper application in Spanish sentences provides evidence that the NSP is correctly set or, conversely, that is not.

Stating that “overt pronouns cannot link to formal variables iff the alternation overt/empty obtains” (Montalbetti 1984: 94), the OPC, exemplified in (2), captures the distribution of null and overt subjects with variable expressions (quantified DPs (QDP) such as cada persona ‘each person/everyone’ and nadie ‘no one’ and wh-words like quién ‘who’) in null-subject languages, correctly predicting that bound variable interpretations (co-reference between the matrix and embedded subjects) between QDP or wh- matrix clause subjects and overt embedded subjects cannot obtain. As can be seen in (2), (2e) is the only Spanish sentence in which co-reference between the matrix clause subject
and the embedded subject is blocked. A bound-variable interpretation is possible in analogous sentences if the embedded subject in null, as in (2f) or if the matrix subject is a simple DP (NP), as in (2g). In English, a \([-\text{null-subject}]\) language, the OPC cannot apply because null pronouns are never grammatical in embedded subject position and therefore the “alternation overt/empty” does not obtain.

(2)

a. Every man_i thinks that he_{ij} is smarter than Jill.

b. *Every man_i thinks that pro_{ij} is smarter than Jill.

c. John_i thinks that he_{ij} is smarter than Jill.

d. *John_i thinks that pro_{ij} is smarter than Jill.

e. Cada_i hombre cree que él_{ij} es más inteligente que Jill.

(Spanish)

f. Cada_i hombre cree que pro_{ij} es más inteligente que Jill.

g. Juan_i cree que él_{ij} es más inteligente que Jill.

h. Juan_i cree que pro_{ij} es más inteligente que Jill.

Neither children nor adult learners receive negative evidence in regard to \([*\text{QDP/wh}_i...\ [\text{overt pronoun}_i]]\) sentences from natural Spanish input, nor do adult learners receive relevant explicit teaching in regard to this specific restriction (cf. Pérez-Leroux and Glass, 1997, 1999). Given that the OPC applies in all null-subject languages whether typologically similar to Spanish (e.g., Italian, Portuguese, Catalan) or not (e.g., Korean, Japanese, Greek, Turkish), the OPC is believed to be a linguistic universal. Thus, it is equally available to all learners at birth. However, its instantiation is conditioned upon the status of the possibility of null subjects in a particular language (but see Pérez-Leroux 1995 and Sells 1984). As a result, knowledge of the OPC by adult English learners of L2 Spanish represents the same clear POS knowledge as it does in L1 Spanish.

3.1. Review of L2 NSP studies

The NSP has received a privileged amount of attention in L2 research over the years (e.g., Al-Kasey and Pérez-Leroux 1998; Clahsen and Hong 1995; Hilles 1986, 1991; Isabelli 2002, 2004; Kaltenbacher 2001; Lakshmanan 1991, 1994; Liceras 1989; Liceras and Díaz 1999; Meisel 1991; Montrul and Rodríguez-Louro 2006; Park 2004; Phinney 1987; Rothman 2007; Tsimpli and Roussou 1991; Vainikka and Young-Scholten 1994, 1996; White 1985, 1986). These studies indicate consistently that L2 learners of \([-\text{null-subject}]\) languages are able to produce and interpret null subjects early on. However, their distribution of null and overt pronoun use is often target-deviant and, the hypothesized cluster of properties in (1) seems to emerge gradually.

These facts are puzzling. Licensing null subjects in environments where they are illicit in the L1 suggests accessibility to UG and the possibility of adult pa-
rameter resetting (but see Liceras and Díaz 1999). However, even if the target-deviant distribution is a pragmatic problem, not a syntactic one (see Montrul and Rodríguez-Louro 2006; Rothman 2007), the gradual emergence of clustered properties is still unexpected. What is more, it seems to contradict the explanatory value of parameters.

The notion of parameters was established to explain how seemingly unrelated properties emerge at the same time and how children acquire properties that the input underdetermines. The argument that certain properties cluster together, rests on the hypothesis that the same proverbial switch that controls a single property determines them all. And so, once the switch has been set in the right position for one, all of the properties are activated. Following this reasoning, one could argue that the NSP cluster as in (1) is not accurate; that is, the properties that have been consistently shown to emerge later (subject-verb inversion and that-trace sequences) may not be NSP clustering properties, but co-occurring properties in Spanish. This approach could account for their later emergence without assuming a breakdown of the notion of clusters in SLA or inaccessibility to UG for adult L2 learners.

To our knowledge, only one other study (Isabelli 2002, 2004) investigates the resetting of the NSP in intermediate English learners of L2 Spanish in a study-abroad context to address the question of whether naturalistic input is particularly beneficial to access universal linguistic properties. Isabelli’s conclusion is that naturalistic input is helpful and, in fact, necessary to acquire properties of the NSP (as in 1c, d) that are not frequently available from classroom input. She assumes that subject-verb inversion and lack of that-trace effects derive from the Spanish-value of the NSP, although, with others, we do not (e.g., Jaeggli and Hyams 1988; Safir 1982, 1985). Like ours, her data demonstrate that learners had ‘at ceiling’ knowledge of null subjects in a variety of positions in Spanish prior to studying abroad (Isabelli 2004: 158). However, they lacked determinate knowledge that Spanish allows subject-verb inversion in declaratives and that that-trace effects do not pertain to Spanish. She demonstrated that after studying abroad the learners had acquired knowledge of subject-verb inversion, yet they still did not accept that-trace sequences above chance levels (Isabelli 2004: 157–158). Given her assumption about the NSP cluster of properties she concluded that (i) the NSP cluster of properties emerges gradually and (ii) exposure to naturalistic input motivates the emergence of the less frequently exemplified properties.

Although it is intuitively appealing to believe that more exposure to subject-verb inversion and lack of that-trace effects results in increased acquisition of these properties, such a belief is incompatible with the notion that these properties derive from the NSP. As discussed above, if they belong to the NSP cluster of properties, they should be acquired on the basis of evidence that the language allows null subjects; their acquisition should not be conditioned upon
repeated exposure to them in naturalistic input. To resolve this dilemma, Isabelli takes the position that clustering does not occur in L2 acquisition and, consequently, that the properties of parameters must be learned on a one-to-one basis. However, we assume that confirmation of the existence of the NSP (any parameter really) as well as the possibility of its resetting is crucially conditioned on the emergence of its clustered properties. Conversely, if clustering does not take place in SLA we are left with two interrelated questions: (1) why would this be? and (2) how can we differentiate between a construction-specific rule and parametric values in SLA? This same argument pertains to determining the properties of a parameter, since after all a parameter is only distinguishable from a construction-specific rule insofar as it relates seemingly unrelated properties and makes predictions about their emergence.

Our approach differs crucially from that of Isabelli in our consideration of the OPC. Isabelli does not consider the OPC in her analysis, nor does she discuss studies that have demonstrated sensitivity to it in intermediate L2 null-subject grammars (Kanno 1998a, b; Pérez-Leroux and Glass 1997, 1999). We, in contrast, provide data that demonstrate its appropriate application for relevant Spanish sentences by comparatively similar intermediate English learners of L2 Spanish. Like Isabelli, our study is longitudinal, tests intermediate learners before and after study abroad and tests for the resetting of the NSP. Unlike Isabelli, we consider knowledge of the OPC as the ultimate criterion for determining whether the NSP has been reset. Moreover, if naturalistic exposure is helpful in acquiring properties that are less frequent in the input, then one would expect a correlation between greater exposure to naturalistic input and application of the OPC in relevant L2 Spanish interpretations. Furthermore, we would expect that L2 learners at the onset of the study would demonstrate indeterminate knowledge of OPC restrictions, much like Isabelli demonstrated for knowledge of subject-verb inversion and lack of that-trace effects. However, neither of these predictions is supported by our data. In the remainder of this article, we present our study and discuss the results.

4. Empirical Study

Although classroom-only L2 learners have less access to input than L2 learners who study in a target-language environment, it is not clear that increased exposure to L2 input provides the latter group an advantage in terms of their ability to access new L2 parametric values. An alternate view is that sufficient exposure to relevant features coupled with a learner’s access to UG and subsequent capacity to acquire new features in adulthood, and not the input type per se (i.e., naturalistic vs. classroom), ultimately determines whether a learner will be able to access new parameter values for the target L2. With this in mind, the research questions that frame this study are:
a. Is parameter resetting possible in adult L2 acquisition, and what evidence does examining the OPC in L2 interlanguage bring to bear on this question?

b. Is exposure to naturalistic input in a target language environment particularly beneficial for acquiring POS structures such as the OPC?

4.1. Subjects

The present study keeps the L1 of the L2 learners constant by including native speakers of English who are adult L2 learners of Spanish. All of the participants were enrolled in a study-abroad program in Spain at the time of data collection. This particular program was chosen for several reasons. First, participants must have successfully completed the second year of college-level Spanish. Upon arrival in Spain students take a series of proficiency tests for placement into five levels of intermediate proficiency for a month-long intensive language immersion jumpstart program.

The proficiency assessment involves three types of tasks (oral interview, writing exercise and grammar tests). The L2 participants were selected from a pool of 80 program participants, according to the following criteria: (1) their L1 was English; (2) they were not bilinguals of [+null-subject] languages nor was a [+null-subject] language spoken in their home; (3) Spanish was the only [+null-subject] language they had studied; (4) this was their first extended stay in a Spanish-speaking country; (5) they reported having no significant exposure to Spanish other than their Spanish courses prior to their arrival in Spain; (6) they were placed into proficiency levels 3 or 4, which corresponded to a mid-to-high level of intermediate proficiency; and (7) they completed both data-collection tasks at the onset and after five months of study abroad. The final group consisted of 30 participants. The mean age was 20.36 with a range of 18–21 and a mean and mode age of 20. All participants reported having studied Spanish in high school. Therefore, the mean total years of Spanish study was 4.27 years of study with a range of 4-6 years and a median and mode of 4 years.

In addition to the L2 group, we report data from an age-matched control group of native Spanish speakers (SNSs). This group consisted of 20 native speakers of Spanish, half of whom are from Spain and the other half are from Colombia, Mexico or Peru.

4.2. Design

We present data from three elicitation tasks to determine the status of the NSP in the L2 Spanish interlanguage grammar of these adult learners. The first was designed to test the L2 participants’ ability to produce null-subject pronouns...
(both referential and expletive). This test is necessary, given that the ability to produce and interpret null-subject pronouns is the hallmark of the [+null-subject] value. As a result, we should not expect that a learner who disallows null subjects would make co-reference interpretations in line with the OPC restriction in relevant Spanish sentences. The other two tests investigate the OPC restriction in L2 Spanish, as in (2) above. Contemporary research has highlighted the usefulness of investigating the acquisition of poverty-of-the-stimulus (POS) semantic constraints in L2 interlanguage (e.g., Dekydtspotter and Sprouse 2001; Dekydtspotter et al. 1997; Slabakova 2001, 2006 a, b; Slabakova and Montrul 2003; White 2003). Accordingly, application of OPC restrictions on bound variable interpretations for relevant sentences in L2 Spanish by L1 English learners provides evidence in support of adult UG-continuity in general and NSP resetting in particular. There are two types of OPC tasks. One combines a traditional interpretive task with a production task (contextualized sentence translation), and the other is a traditional interpretation task (a context sentence match). Although interpretation evidence is sufficient to demonstrate knowledge of OPC restrictions in L2 Spanish, production data will strengthen our claims.

4.2.1. Task 1. Task 1 was a logical sentence formation task. The purpose of this task was to test the ability of the L2 participants to produce null-subject pronouns in Spanish in environments that are ungrammatical in English, yet obligatory (expletive subjects) or highly favored (non-stressed subjects) in Spanish. The task consisted of 20 contexts in Spanish after which uninflected lexical items were provided. The participants were instructed to read the Spanish contexts and then to use the provided vocabulary to construct logical sentences based on them. All verbs were provided as infinitives without subjects. Of the 20 sentences to be constructed, 10 contained uninflected verbs requiring expletive subjects. The remaining 10 sentences contained verbs that must take lexical or pronominal subjects. This second group of 10 sentences were divided into two types. Five sentences had contexts with contrastive focus, and the remaining five contexts did not assign any type of stress (focal or contrastive). In accord with Spanish discourse pragmatic conditions, contrastive focus environments require the use of overt subject pronouns for native speakers. Native-like use is expected to reflect null expletives obligatorily, null referential pronouns without contrastive focus and overt pronouns with contrastive focus. Examples of task sentence types are provided in (4) below.

(4) a. Expletive Subject Contexts:

Acabo de escuchar en la radio que una tormenta fuerte viene pronto.

Mañana llover mucho. → Mañana lloverá (va a llover) mucho.
I just heard on the radio that a strong storm is coming. Tomorrow/ to rain/ a lot. → **Tomorrow it will (is going to) rain a lot.**

b. Referential Subject Contexts: (null)

Maria y su esposo fueron de vacaciones a las Filipinas. Quedarse/ tres semanas/ y/ regresar/ el mes pasado. → **Se quedaron tres semanas y regresaron el mes pasado.**

Mary and her husband went on vacation to the Philippines. To stay/ three weeks/ and/ to return/ last month. → **They stayed for three weeks and (they) returned last month.**

c. Referential Subject Contexts: (overt subjects with contrastive focus)

Laura, Mónica y Yolanda estudian inglés en Puerto Rico en una escuela de niñas. Sus padres hablan inglés más o menos bien y creen que es sumamente importante saber hablarlo. Les agrada saber que su escuela tiene las mejores profesoras de inglés. En comparación con sus niñas . . .

Los padres/estar/ seguros de/ que/ hablar/ inglés/ mejor → **Los padres están seguros de que ellas hablan inglés mejor.**

Laura, Monica and Yolanda are studying English at a girls’ school in Puerto Rico. Their parents speak English relatively well and believe that it is extremely important to know how to speak it. They are happy that this school has the best English teachers. Compared to their daughters . . .

the parents/ to be/ sure/ that/ to speak/ English/ better → **The parents are sure that they speak better English.**

Because the task required the composition of sentences given vocabulary that included uninflected verbs without subjects, the L2 learners were given a similar task in English first to ensure that the absence of subject pronouns from the provided vocabulary would not result in a bias of null-subject use in their sentence constructions in Spanish. Each L2 learner performed the English-language task with 100% accuracy, which required the insertion of subject pronouns (both referential and expletive) that were not provided.

4.2.2. **Task 2.** Task 2, the first OPC task, was a co-reference judgment-matching task modeled after Kanno’s (1998) OPC task for L2 Japanese. After reading Spanish sentences with quantified determiner phrase (QDP)/wh-matrix clause subjects or DP/NP matrix clause subjects with overt or null embedded subjects, as in (5), the participants were asked to indicate whether they derived a bound variable interpretation, disjoint referential interpretation, or both interpretations. Irrespective of the context, the OPC blocks bound variable
interpretations only in sentences with QDP/wh-matrix clause subjects if the embedded subject is overtly expressed, as in (5a).

(5)  

a. Overt embedded pronoun (OPC forces (b) as the only answer)  
¿Quién dice que él lo sabe todo?  
‘Who says that he knows it all?’  
Who do you suppose says that he knows everything?  
a) the same person as Quién  
b) someone else  

b. Null embedded pronoun with quantified/wh-matrix subject  
¿Quién no sabe que pro tiene derecho a tomar cervezas a los 21 años?  
‘Who does not know that pro (he) has the right to drink beer at 21?’  
Who do you suppose does not know that he has the right to drink beer at 21?  
a) the same as Quién  
b) someone else  

c. Null embedded pronoun with NP subject  
Ayer Juan y yo estábamos hablando en la cocina cuando Jorge nos informó que  
pro pronto se mudaría a México.  
Yesterday Juan and I were talking in the kitchen when Jorge informed us that he would be moving to Mexico soon.  
Who do you think will move to Mexico soon?  
a) Jorge  
b) someone else who is not Jorge  

d. Overt embedded pronoun with NP subject  
Mi amiga Sandra es muy inteligente y conoce a todos. Ayer tenía algunas preguntas sobre mi tarea para la clase de español. Por suerte, vi a Sandra esta mañana en la biblioteca con su amiga Yolanda. Le pregunté a Sandra si conocía a alguien que me pudiera ayudar. Sandra me dijo que no me preocupara ya que ella sabía todo acerca de la gramática española.  
My friend Sandra is very intelligent and knows everyone. Yesterday, I had some questions about my Spanish homework. Luckily, I saw Sandra in the library this morning with her friend Yolanda. I asked Sandra if she knew anyone who could help me. Sandra told me to not worry since she knew everything about Spanish grammar.  
Who do you suppose knows everything about Spanish grammar?  
a) Sandra  
b) someone else  

As can be seen in (5) above, the questions that followed the Spanish context were in the L1 and restated in English the important vocabulary from the Spanish context. This ensured that lack of knowledge of particular vocabulary would not interfere with participants’ interpretation of co-reference.
4.2.3. Task 3. The second OPC task was a context translation task, a modified version of the task employed by Pérez-Leroux and Glass (1999). The participants were presented with three stories in English, each of which was divided into four sections. After each section, they were provided with question-and-answer sentences in English that corresponded to the previous context. The participants were instructed to translate the answer sentences into Spanish, keeping in mind the context. As can be seen in (6) below, the vocabulary of the answer sentences was controlled for level appropriateness. In the case that the answer sentence resulted in an OPC restriction (i.e., a quantified DP matrix subject with a context that presents co-reference between the matrix and embedded subjects), the Spanish translation should always contain an embedded null subject. Conversely, an overt subject pronoun is possible in any other context. Examples of this task can be seen in (6) below.

(6) Robert and five of his close friends decided to pool their money together and start a company. Robert’s wife, María, is an excellent cook and makes the best brownies and cookies ever. In fact, all of the wives of these gentlemen make excellent desserts, but María is clearly the most talented. In an effort to convince the wives to invest in the idea, each one was told that her desserts were the inspiration for the idea. None of the wives had any reason to doubt her husband and each agreed to invest her life’s savings in the endeavor. After a few months of production, the families were ready to start selling. By this point each wife had realized that María’s desserts were the real inspiration and that she would be the spokesperson, the next Ms. Fields. All of the wives said that María would do a good job. However, they all were, at the very least, a little upset that she was chosen.

Translate the answers in italics into Spanish:

Context creates bound variable interpretation, overt embedded pronoun is restricted as per the OPC
Initially, who believed she was the inspiration for the idea?
Each wife believed she was the inspiration for the company.

Context creates discourse referential interpretation, no OPC restriction
What did the wives think about María being the spokesperson?
Every wife thought that she would do well in that position.

Agitated by the situation, the wives, one by one, began to take out their frustrations on both their husbands and María. One wife, Linda, was especially resentful and accused María of being extremely selfish
and full of herself. María couldn’t understand why Linda was so annoyed and mistook her frustration as jealousy. María and Linda, who were once best friends, stopped speaking to each other.

The products were released and the company was a huge success. Linda began to feel bad and realized that she was acting very childishly. She called María and earnestly apologized. María gladly accepted.

Translate the answers in *italics* into Spanish:

Context creates discourse referential interpretation, no OPC restriction

What did Linda believe about María as a result of this situation?

*Linda thought that she was very selfish.*

Context creates bound variable interpretation, no OPC restriction because the matrix subject is an NP

Translate answer in *italics*:

What did Linda eventually realize?

*Linda realized that she was wrong and apologized.*

5. Results and Discussion

This section is divided into three parts, which correspond to the three empirical tests. Each section is organized as follows: (a) a descriptive analysis of the results; (b) a quantitative analysis of the group data, which compares the mean score performance of the L2 learners at each interval against the SNS control as well as against themselves over time (L2 interval 1 vs. L2 interval 2); and (c) a discussion of each data set. We utilized a series of paired (for intragroup comparisons) and two-sample t-tests (for SNS versus L2 learner comparisons) as a measure of statistical significance. As is standard, we set the alpha at ($\alpha = 0.05$) to ensure statistical confidence. The statistics were calculated using the mean number correct for each group. An answer was deemed correct if it was in line with the SNS control consensus. Additionally, in an effort to understand the significance of the group data for the two OPC tasks, we also provide descriptive and quantitative analyses of two L2 subgroups, based on patterns revealed at the individual learner level.

5.1. Task 1

*Descriptive analysis.* As can be seen in Table 1 below, the L2 learners perform somewhat like native Spanish speakers on Task 1, which tests for the production of referential and expletive subject pronouns. The data indicated
Table 1. Logical sentence formation task for NSP

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Uses of overt expletive subjects</th>
<th>Uses of overt referential subjects without contrastive focus</th>
<th>Uses of overt referential subjects with contrastive focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natives</td>
<td>0 out of 10</td>
<td>0 out of 5</td>
<td>4.85 out of 5</td>
</tr>
<tr>
<td>L2 pre-study</td>
<td>0 out of 10</td>
<td>.10 out of 5</td>
<td>.73 out of 5</td>
</tr>
<tr>
<td>L2 post-study</td>
<td>0 out of 10</td>
<td>.16 out of 5</td>
<td>1.33 out of 527%</td>
</tr>
</tbody>
</table>

that these L2 learners reliably produced null-subject pronouns at both testing intervals. Specifically, at intervals 1 and 2 the L2 learners performed at a native-like level in their production of expletive subject pronouns in Spanish, which are obligatorily null. The L2 learners also produced null-subject pronouns consistently for referential subjects at levels similar to native speakers in environments without contrastive focus. However, overall the L2 learners produced more null referential subjects than the Spanish natives. That is, the L2 learners produced more null referential subjects in contrastive focus environments where, in accord with Spanish discursive-pragmatic conditions, overt subject pronouns are required.

Statistical analysis. T-tests were used to assess the significance of the difference between Spanish native speaker (SNS) group and L2 group performance. At both intervals the L2 learners performed significantly different from the SNS (interval 1: \( t = 17.58, p < 0.001 \); interval 2: \( t = 14.89, p < 0.001 \)). The L2 group was also compared against itself at interval 1 and interval 2, using a paired t-test. This analysis also yielded statistical significance (\( t = 2.38, p = 0.024 \)).

As discussed in the methodology section (see example 6c above), five of ten referential subject exemplars presented contexts with contrastive focus (CF), which for native speakers of Spanish forced the use of overt referential subjects in accord with Spanish discourse pragmatic conditions. The SNS group produced overt referential subjects reliably and exclusively in CF environments, 97% of the time. Conversely, as can be seen in Figure 1, the L2 learners did not use nearly as many overt subject pronouns in these contexts, although there is modest improvement towards target-like use of overt subject pronouns in contrastive focus environments between interval 1 and 2.
**Group Usage of Overt Subject Pronouns in Contrastive Focus Environments**

![Graph showing group average and usage of overt subject pronouns in contrastive focus environments.](image)

**Figure 1. Overt subject production in contrastive focus contexts**

**Discussion.** The data from Task 1 indicate that these intermediate learners of L2 Spanish are able to license null subjects in environments where they are ungrammatical in English. Furthermore, although the data demonstrate a target-deviant distribution of null vs. overt subjects in contrastive focus environments, this behavior does not entail that the L2 underlying syntactic mental representation is target deviant. It is possible that these L2 learners have deficits in associated pragmatic knowledge that result in this behavior despite having reset the syntactic NSP (see Sorace 2004; Montrul and Rodríguez-Louro 2006; Rothman 2007). Thus far, the results indicate the possibility of adult parameter resetting, which is possible only if adult learners have access to new L2 features. Furthermore, the data indicate NSP resetting at the onset of the study. The L2 learners show improvement in overt subject use in discourse expected environments over time, which suggests that naturalistic input may be helpful in acquiring discursive-pragmatic knowledge.

**5.2. Task 2**

*Descriptive analysis.* This first of two Overt Pronoun Constraint (OPC) tasks sought to test for OPC instantiation in L2 Spanish grammars via L2 interpretations of co-reference in OPC restricted environments and in similar sentences to which the OPC does not apply. The group results for task 2 can be seen in Figure 2.

The relevant comparisons are the differences in bound variable interpretations depending on either the interaction between the type of embedded subject (i.e., overt embedded subject vs. null embedded subject) with a quantified DP/wh-matrix subject, or the interaction between type of matrix clause subject (i.e., quantified DP/wh-phrase matrix subject vs. NP matrix subject) and the embedded overt subject pronouns. It is important to remember that the OPC restricts bound variable interpretations between QDP/wh-matrix subjects and
Table 2. The OPC co-reference matching task

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Natives</td>
<td>0.9 out of 10</td>
<td>7.65 out of 10</td>
<td>3.9 out of 10</td>
</tr>
<tr>
<td>9 %</td>
<td>76.5 %</td>
<td>39 %</td>
<td></td>
</tr>
<tr>
<td>L2 Pre-test</td>
<td>3 out of 10</td>
<td>7.7 out of 10</td>
<td>6.8 out of 10</td>
</tr>
<tr>
<td>30 %</td>
<td>77 %</td>
<td>68 %</td>
<td></td>
</tr>
<tr>
<td>L2 Post-test</td>
<td>3.43 out of 10</td>
<td>8.10 out of 10</td>
<td>6.1 out of 10</td>
</tr>
<tr>
<td>34.3 %</td>
<td>81 %</td>
<td>61 %</td>
<td></td>
</tr>
</tbody>
</table>

Overt embedded subject pronouns only. That is, any of the other sentence types can be interpreted felicitously with a bound variable or a disjoint referential interpretation. This is why the reported numbers do not approximate 100 % or 0 % for any context, except for relevant OPC contexts for the native speakers.

From Table 2, it can be seen that in only one case, bound variable interpretations with QDP/wh-phrase matrix subject with an overt embedded subject vs. an NP matrix subject with an overt embedded subject, does the group of L2 learners approximate the SNSs’ difference (the L2 post-study group yielded a difference of 2.67 to the SNS’ 3).

Statistical analysis. As expected, the SNSs yielded a significant difference in co-reference interpretation when the matrix clause subject was a quantified determiner phrase (QDP) or a wh-element, depending on whether or not the embedded clause was a null or an overt subject pronoun ($t = 24.98, p < 0.001$). Furthermore, they yielded a significant difference in deriving bound variable interpretations when the embedded subject was overt depending on the type of subject in matrix position (QDP/wh-phrase vs. NP; $t = 11.94, p < 0.001$).

Taken together, the aforementioned confirms the OPC restriction on available interpretations for relevant Spanish sentences.
Turning to the L2 learner group for test interval 1, the data point to a tendency towards interpretations in line with the OPC restriction. That is, the L2 group derived a bound variable interpretation significantly less frequently when a biclausal sentence had a QDP or \textit{wh}-phrase matrix clause subject antecedent and the embedded subject pronoun was overt, compared to a null subject pronoun ($t = 10.16$, $p < 0.001$). Furthermore, they rendered a considerable difference in bound variable interpretations when the embedded subject was overt depending on the type of subject in matrix position (QDP/\textit{wh}-phrase vs. NP, $t = 8.25$, $p < 0.001$). Despite this L2 tendency towards the OPC, a comparison between the SNS group and the L2 learner group revealed significant differences. As a group, the L2 learners were more likely to allow bound variable interpretations with QDP/\textit{wh}-matrix clause subjects with overt embedded subject pronouns ($t = 4.87$, $p < 0.001$) than were the native speakers.

Test interval 2 yielded similar results as compared to interval 1. In sentences with a QDP/\textit{wh}- matrix subject, bound variable interpretations were derived by the L2 learners, on average, 34.3\% of the time when the embedded subject was overt, compared to 81\% of the time when the embedded subject pronoun was null, yielding a significant difference ($t = 7.98$, $p < 0.001$) in interpretations in line with the OPC restriction. Additionally, the L2 group yielded a significant difference in bound variable interpretation as a function of the type of subject in matrix position (QDP/\textit{wh}-phrase vs. NP) when the embedded subject was overt ($t = 6.32$, $p < 0.001$). A comparison of the L2 group data from both testing intervals revealed no measurable change over time ($t = 0.15$, $p = 0.878$). A comparison of the SNS group to the L2 learner group at interval 2 also revealed a significant difference in bound variable interpretation in QDP/\textit{wh}- matrix clause subject contexts depending on the type of embedded subject pronoun (null vs. overt; $t = 3.31$, $p = 0.002$). Surprisingly, there was no significant difference between SNSs and L2 learners at interval 2 in their use of overt embedded subjects depending on the type of matrix subject, (QDP/\textit{wh}- vs. NP; $t = 0.68$, $p = 0.501$). However, upon further inspection, it was seen that this statistical insignificance was due only to a similar interval of difference in use of the overt embedded subjects with a given matrix subject (QDP/\textit{wh}- vs. NP) instead of actual native-like behavior.

Discussion. The results of Task 2 indicate that the L2 learners make a significant distinction in interpretation of co-reference in relevant sentences, in line with the OPC. However, as a group, this distinction is less polarized than it is for the native-speaker group. This provides evidence in favor of parameter resetting. Moreover, the fact that there is no group improvement over time indicates that naturalistic exposure is not particularly helpful in the acquisition of this property. We return to this topic in Section 4.4, where we analyze individual data.
Figure 3. Results Task 3

Table 3. OPC sentence translation task

<table>
<thead>
<tr>
<th>Overt embedded pronouns produced</th>
<th>Matrix Subject: QDP</th>
<th>Matrix subject: QDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bound variable context</td>
<td>Discourse referential context</td>
</tr>
<tr>
<td>Natives</td>
<td>0.5 out of 6</td>
<td>4.10 out of 6</td>
</tr>
<tr>
<td></td>
<td>8.3 %</td>
<td>68.3 %</td>
</tr>
<tr>
<td>L2 Pre-test</td>
<td>2 out of 6</td>
<td>4.2 out of 6</td>
</tr>
<tr>
<td></td>
<td>33.3 %</td>
<td>70 %</td>
</tr>
<tr>
<td>L2 Post-test</td>
<td>1.77 out of 6</td>
<td>4.83 out of 6</td>
</tr>
<tr>
<td></td>
<td>29.4 %</td>
<td>81.0 %</td>
</tr>
</tbody>
</table>

5.3. Task 3

Descriptive analysis. The second OPC task tested for OPC instantiation in L2 Spanish grammars via the production of embedded subject pronouns (null vs. overt) in the translation of contextualized OPC-restricted sentences and similar sentences to which the OPC does not apply. The group results for Task 3 can be seen in Figure 3.

As was the case for Task 2, the SNS data confirmed the OPC restriction in Spanish. The Spanish natives produced overt and null referential subject pronouns differently in embedded position depending on two variables: (i) whether or not the matrix clause subject was a quantified DP, and (ii) the relationship between (i) and the type of semantic interpretation, bound variable or discourse referential, presented in the context.

As can be seen in Table 3, the SNSs used overt subject pronouns only 8.33% of the time in bound variable contexts when the matrix subject was a QDP. Conversely, the native aggregate produced overt pronouns an average of 68.33% of the time in similar sentences when a discourse-referential interpretation was favored by the context. Overall, the L2 group data confirm the tendency towards the OPC noted in Task 2. That is, the L2 group produced embedded overt
referential subject pronouns with significantly less frequency in translations of sentences with QDP matrix clause subjects when the context presented a bound-variable interpretation (33.33% of the time) compared to when the context presented a discourse-referential interpretation (70% of the time). Furthermore, these data confirm the results of Pérez-Leroux and Glass (1999) for adult L2 intermediate learners of Spanish. At interval 2, the L2 group produced overt referential subject pronouns 29.5% of the time in embedded clauses when the matrix subject was a QDP and a bound-variable interpretation was presented by the context. In contrast, the L2 learners produced overt subject pronouns 80.5% of the time when the context presented a discourse-referential interpretation.

Statistical analysis. As expected, the SNS yielded statistically significant difference in overt embedded subject pronoun production in quantified DP/bound variable contexts compared to QDP/discourse referential context translations ($t = 16.9, p < 0.001$). For the L2 group at Interval 1, the difference in overt embedded subject production based on matrix clause subject type and semantic interpretation (bound variable vs. discourse referential) is significant ($t = 6.46, p < .001$). As was the case for task 2, despite a clear L2 group tendency towards the OPC at interval 1, a comparison of the mean difference of overt embedded pronoun production with QDP matrix subjects in bound-variable or discourse-referential contexts yielded a significant native vs. non-native difference in relevant OPC-restricted sentence translations ($t = 3.44, p = 0.001$).

For the L2 group at interval 2, the difference in embedded overt pronoun production in clauses with a QDP matrix subject and a bound-variable interpretation compared to contexts with discourse-referential interpretations is statistically significant ($t = 8.06, p < .001$). As was the case at interval 1, the L2 group use of overt subject pronouns in OPC-restricted environments was significantly different from the Spanish native group ($t = 2.4, p = 0.023$). Nevertheless, at both testing intervals, the L2 group differentiated between null and overt referential subject pronoun production based on type of matrix subject in conjunction with the co-reference interpretation favored by the context. Moreover, as compared to interval 1, the data from interval 2 indicate a modest decrease in overt subject use in OPC restricted environments ($t = 1.70, p = 0.095$), again comparing the mean difference of overt embedded pronoun production with QDP matrix subjects in bound variable vs. discourse referential contexts.

Discussion. Despite the overall difference between the SNS and the L2 learners, it is important to note that the L2 learners made clear distinctions between null and overt pronoun production, in line with OPC restrictions. Similar to the interpretation evidence provided by Task 2, the L2 group demonstrates a tendency to avoid producing overt pronouns in contextualized sentences where
their use would be semantically infelicitous with respect to the OPC. This provides further evidence that parameter resetting is possible. Similar to the results of Task 2, the lack of improvement over time indicates that naturalistic input is not particularly helpful in acquiring OPC restrictions in Spanish.

5.4. Exploring individual results for OPC tasks

Bringing together the L2 group data at both intervals on both OPC tasks, two noteworthy points can be made. First, there is no significant change from pre-to post-study abroad in the L2 group results for either task. Second, as noted in similar studies at the intermediate level of proficiency\(^\text{10}\) (Kanno 1998a, b; Pérez-Leroux and Glass 1999), there is only a tendency towards respecting the OPC restriction as it relates to L2 interpretations and production of embedded subject pronouns. What explains this apparent tendency? After all, it is reasonable to suppose that if the OPC were instantiated and the L2 learners had acquired the conditions for empty subject licensing in Spanish their production of embedded clause subject pronouns and their interpretations of relevant OPC sentences would be constrained with native-like consistency.

This expectation leads us to examine individual learner data in an effort to contextualize this apparent tendency. There are two plausible possibilities. First, it is conceivable that the results of the OPC tasks, reported as means, obscure L2 intra-group variability and, therefore, the possibility that some learners demonstrated native-like knowledge of the OPC. Conversely, it is possible that the L2 group data indicate the performances of the learners. Only in the latter case could we interpret the group results as a tendency. In the former case, the sensitivity to the OPC is simply a by-product of looking only at the aggregate, which can inadvertently mask important facts. Indeed, if some (even many) of the L2 learner at Interval 1 interpret OPC restrictions like natives while others clearly do not and the average of both subgroups yields unintentionally misleading aggregate data, revealing this serves to account for both the so-called OPC tendency and confirms that NSP resetting is possible with or without extended exposure to naturalistic input.

Turning to the individual data in Task 2, we note that the group results reflect the averaging of two subgroups: (i) L2 individuals who demonstrated native-like knowledge of the OPC (n=20) and (ii) L2 individuals who did not show knowledge of the OPC (n=10), performing at or below chance level. These results held for both test intervals; that is, none of the learners who failed to demonstrate native-like knowledge of the OPC at interval 1 did so by interval 2. If the group statistics were recalculated for the 20 L2 subjects who demonstrated native-like knowledge of the OPC, the performance of this L2 subgroup would be completely native like, as can be seen in Figure 4 and Table 4.

Reevaluating the statistics for only the 20 L2 participants who demonstrate
knowledge of the OPC, the group mean of bound variable interpretations in OPC restricted contexts drops from 34.3% to 17.5% at interval 1 and to 19.5% at interval 2 for this subgroup. The rate of bound-variable interpretations in contexts with QDP/wh-matrix clause subjects and null referential subject pronouns in the embedded clause is 76.5% and 83% at intervals 1 and 2, respectively. Thus, the difference in interpretation of co-reference based on embedded subject pronoun type would be 59% at interval 1 and 63.5% at interval 2 for this group. These differences are statistically significant (interval 1: $t = 25.8, p < .001$, interval 2: $t = 12.22, p < .001$) and are comparable to the SNS mean difference (interval 1: $t = 1.21, p = 0.233$, interval 2: $t = 0.68, p = 0.5$).

Furthermore, the difference in bound-variable interpretations for this subgroup with reference to the type of subject in matrix position (QDP/wh-phrase vs. NP) when the embedded subject is overt (interval 1: $t = 11.85, p < .001$, interval 2: $t = 7.93, p < .001$) does not suggest deviation from native-like behavior (interval 1: $t = 0.89, p = 0.4$, interval 2: $t = 1.24, p = 0.225$).

Turning to the individual results for Task 3, we note that the same subgroups are present and that the individuals who failed to demonstrate native-like knowledge of the OPC at intervals 1 and 2 for Task 2 also failed to do so at both intervals of Task 3.
As can be seen in Table 5, the L2 subgroup that demonstrated native-like knowledge of the OPC produced overt subject pronouns in bound-variable OPC contexts for task 3 15.83 % of the time (interval 1) and 11.67 % of the time (interval 2), in contrast with 65.83 % (interval 1) and 80 % (interval 2) for overt pronoun production in similar referential contexts.

These differences in performance from interval 1 to interval 2 are statistically significant (interval 1: \( t = 8.62, p < 0.001 \), interval 2: \( t = 10.7, p < 0.001 \)). Comparing these L2 subgroup results to those of the SNS group, who used overt pronouns in bound-variable OPC restricted contexts 8.33 % of the time and produced overt pronouns in similar referential contexts at a rate of 68.33 % of the time, revealed no significant differences (interval 1: \( t = 1.45, p = 0.156 \), interval 2: \( t = 1.13, p = 0.268 \)). This comparison was based on the mean difference of overt embedded pronoun production with in QDP matrix subjects in bound-variable versus discourse-referential contexts between the SNS group and the L2 subgroup.

6. Discussion

In this section, we bring together the results of all three tasks in light of our research questions. The data from the three tasks support the conclusion that
NSP resetting is possible in general and, in particular, that it was accomplished by two-thirds (n=20) of the L2 learners in this study prior to their study-abroad experience (i.e., prior to interval 1 testing). As it relates to the first research question, this finding suggests that parameter resetting is possible, implications of which provide evidence in favor of Full Access approaches to adult SLA and provide counter evidence to Failed Features approaches. Failed Features approaches claim that parameter resetting is impossible, based on a purported inability to acquire new L2 features. In the present case, English learners of L2 Spanish must have acquired the [+interpretable] phi-features associated with Spanish verbal morphology to have converged on a grammar that licenses null subjects in a native-like fashion. Tsimpli and Roussou (1991) and Liceras and Díaz (1999), who assume that parameters cannot be reset in SLA, have independently provided analyses to explain null pronouns in L2 grammars. Although they acknowledge the production of non-overt subjects by English learners of L2 Spanish in environments that are ungrammatical in their L1, they claim that the underlying representation of these L2 subjects is target deviant. However, the findings from Tasks 2 and 3 of the present study provide evidence against such a claim. That is, NSP parameter resetting must have taken place for 20 of the 30 intermediate learners who demonstrate knowledge of OPC restrictions for relevant sentences in Spanish, given that the application of the OPC is accessed via the features needed to license null subjects. Further discussion of the results from each task is warranted and will serve to address further both research questions.

For Task 1, we reported that the L2 learner group produced more null-subject pronouns than the native Spanish speaker (SNS) group in their production of contextualized sentences given uninflected vocabulary. The difference between the two groups was noted in referential subject production in contrastive focus environments only and at both testing intervals. Assuming that contrastive focus was interpretable from these contexts, L2 deficits of associated Spanish pragmatic conditions, which regulate the discursive distribution of overt and null-pronoun use explain why the L2 learners did not use overt subject pronouns with the same frequency in these environments as the SNS group. Interestingly, in this task, the L2 learners demonstrated a tendency to overuse null-subject pronouns, which contrasts with the reported overuse of overt subject pronouns by English learners of L2 Spanish (e.g., Liceras 1989; Phinney 1987; Sorace 2004; White 1985, 1986) in production (but see Montrul and Rodriguez-Louro 2006).

The observation that the L2 learners in this study under-produce overt subject pronouns is related to the status of the Avoid Pronoun Principle (APP) (Chomsky 1981), a pragmatic principle which requires that pronouns be overtly expressed only when null pronouns are impossible. In his Pisa lectures, Chomsky (1981) wrote that the APP might be regarded as a sub-case of an economic
conversational principle of not saying more than is actually required. He further suggested the possibility that the APP “might be related to a principle of deletion-up-to-recoverability”. Finally, he considered the possibility that the APP could function as a principle of grammar. The interesting question therefore is the status of the APP, its universality and its instantiation in English. If the APP is a pragmatic principle, adults should have it available via their L1 and one would not predict the overuse of overt referential subject pronouns that has been observed in numerous studies. Missing associated pragmatic conditions of Spanish that regulate the discourse distribution of null/overt subject pronouns could explain the under-use of overt subject pronouns in specific environments in the present study. If the APP were a principle of deletion, the same would hold, in that one would assume that adults know this principle; overt pronoun overuse would again not be predicted. If, however, the APP were a principle of grammar, one could argue that this principle accounts for null subjects, not the null-subject parameter; that is, the environments which license an empty category are defined independently, and recourse to the APP is permitted in pro-drop languages by virtue of the definitions of the licensing conditions for empty subjects. In essence, the APP holds generally, but it is applicable only in languages pro-drop languages like Spanish.

Although there is evidence that the APP is instantiated in English as well\(^\text{11}\) (e.g., for resumptive pronouns and imperatives), it is possible that the APP applies only to pro-drop languages accessed via the definitions of licensing conditions of empty subjects in those languages. In this case, apparent L2 knowledge of the APP provides further evidence that the L2 learners in the present study have acquired the Spanish licensing conditions of empty subjects. In the case that the APP is accessible via the L1, the data from Task 1 provide evidence in favor of NSF resetting, in that the acquisition of empty subject licensing conditions would be needed to apply the APP as extensively as the L2 learners applied it in this task. We must also remember that the APP merely stipulates that a null subject must be used unless it is impossible to do so. What defines the impossibility of null pronoun use is language specific; that is, Spanish learners must learn what Spanish-specific pragmatic contexts render null subjects pragmatically odd. However, the fact that the L2 group under-used overt subjects in general must be understood in light of two facts. First, all of these learners are tutored learners who have received explicit instruction that Spanish allows and greatly prefers null subject pronouns. Second, with few exceptions, the tendency to under-use overt pronouns was true of all of the L2 learners, despite the fact that only two-thirds of them demonstrated knowledge of the OPC in Tasks 2 and 3.

Another interesting observation from the present study was the L2 OPC group tendency revealed in tasks 2 and 3, which had been observed in similar learner samples in other L2 OPC studies (Kanno 1998 a, b; Pérez-Leroux
To investigate the nature of this tendency, we offered an analysis of individual data, which revealed two L2 subgroups, those that had native-like knowledge of the OPC and those that did not. These two subgroups were constant across tasks and across intervals; that is, failure on the part of an individual learner to demonstrate knowledge of the OPC at interval 1 for Task 2 meant that this same individual failed to demonstrate knowledge of the OPC in interval 2 for Task 2 and at both intervals for Task 3. Having separated these two subgroups, it became clear that the so-called OPC tendency was an artifact of a strict aggregate analysis. This finding highlights the importance of examining individual data. Interpretations based solely on group data, an almost universal research methodology in language acquisition studies, should be pursued with caution. The goal of group analyses is the identification of trends that can be generalized to language learners beyond the sample involved in a particular study. Nevertheless, as was the case in this study, significant individual variation can be inadvertently concealed within aggregate analyses.

In the present study, this resulted in an OPC tendency for the L2 group that, in fact, did not accurately represent the knowledge of the L2 learner participants who either had native-like knowledge of the OPC or did not have this knowledge. Since the OPC must apply to relevant sentences in null-subject grammars, we interpret the lack of knowledge of OPC restrictions for the individuals of the smaller subgroup as evidence that these individuals had not reset the NSP through testing at interval 2. Although it is clear that parameter resetting is possible, it must be the case that there is individual variation in L2 interlanguage development. Since parameter resetting is contingent on learning relevant properties from the input (i.e., features encoded in the lexicon and morphology), it is possible that the timing for this process of learning varies for adult learners. This explanation accounts for the fact that two-thirds of the L2 group had reset the NSP before their residency in Spain, whereas the remaining third had not done so even after five months in Spain. In the absence of an examination of individual data, we would not have been able to evaluate the impact of the intra-group variation in interpreting our results.

Despite this variation, however, the larger subgroup from Tasks 2 and 3 showed that two-thirds of the L2 learners demonstrated native-like knowledge of the OPC at the first testing interval, at which point their only exposure to Spanish was in a classroom setting. This finding supports the view that exposure to classroom input is sufficient to some aspects of target-language syntax, in this case to reset the NSP, and that knowledge of clustered properties comes for free once the parameter is reset. Indirectly, this finding provides evidence that subject-verb inversion and lack of that-trace effects are not clustered properties of the NSP. As we discussed, many NSP studies have demonstrated that these properties emerge considerably later than null-subject licensing (e.g., Isabelli 2004; Liceras 1989; White 1985, 1986). Notwithstanding, the interme-
mediate learners in the present study demonstrated clear knowledge of OPC restrictions in L2 Spanish, an uncontroversial NSP clustered property. The fact that this property emerges gratis but subject-verb inversion and lack of that-trace effects do not suggests that only the former is an NSP-clustered property, whereas the others co-occur in Spanish.

Furthermore, the fact that the individuals from the smaller subgroup failed to demonstrate NSP resetting (via OPC restrictions) after five months of exposure to naturalistic input calls into question the tenability of claims suggesting that such input is privileged over classroom input for the acquisition of less frequently exemplified structures. Previously, we discussed the undesirability of this proposal within a UG framework: The notion of parameters makes the prediction that one need not be exposed to all properties from the input to acquire them. The assumption is that Spanish-speaking children acquire OPC restrictions given the underlying relationship of the OPC to the [+null-subject] setting of the NSP. The same should hold for L2 learners as well. Classroom input provides ample evidence for NSP resetting. It is assumed that the Spanish value of the NSP is acquired via the acquisition of features encoded in verbal morphology. Given that all grammatical input (classroom and naturalistic) provides ample evidence in that all sentences have verbal conjugations with inflectional morphology, classroom input is no different from naturalistic input, notwithstanding quantity. Crucially, our results demonstrate that L2 learners can acquire OPC restrictions whether or not they have extended exposure to naturalistic input. We also demonstrated that despite naturalistic input, some learners did not acquire these restrictions.

It is important to note that the participants in this study are intermediate learners. The fact that two-thirds of the larger group had reset the NSP suggests that eventually the other third will do so as well. In other words, parameter resetting is clearly possible in a general sense. Apparently, parameters are not reset within the same timeframe for all individual learners and increased exposure to naturalistic input is not a sufficient condition to speed up this process.

7. Conclusion

This article was born of a desire to address empirically the question of whether exposure to naturalistic input is particularly helpful to access UG in general or whether such input is privileged over classroom input in terms of accessing linguistic properties of parameters that are less salient compared to others. We examined the acquisition of NSP properties in adult L2 Spanish before and after a study-abroad experience. Our findings support the possibility of parameter resetting. In accord with other research that has examined semantic POS effects associated with the acquisition of L2 morphosyntactic features, we tested for knowledge of the OPC restrictions on bound-variable interpretations.
in L2 Spanish. We used knowledge of the OPC as the ultimate variable in determining NSP resetting. Moreover, in light of the results at interval 1 for all three tasks, we concluded that NSP resetting occurred prior to arrival in Spain for 20 of the 30 L2 learners. The results at interval 2 revealed that the increased native exposure via study abroad did not lead to knowledge of OPC restrictions for the remaining 10 learners. We interpret this finding to mean that although exposure to naturalistic input is invaluable for a multitude of linguistic and sociolinguistic reasons, extended exposure to naturalistic input is not needed or exceptionally gainful to reset particular parameters.

It seems to be reasonable to claim that quality target L2 input from the classroom, provided it contains necessary grammatical features, is sufficient to set target language syntax, at least for the NSP. Since the resetting of the NSP requires the acquisition of new L2 features, the whole of the data provided is consistent with Full Access approaches to adult L2 acquisition (Duffield and White 1999; Schwartz and Sprouse 1996; White 1989) and provides evidence against so-called Failed Features models (e.g., Beck 1998; Franceschina 2001; Hawkins 2005; Hawkins and Franceschina 2004; Hawkins and Chan 1997; Liceras and Diaz 1999), which claim that the acquisition of new features (and thus parameter resetting) is impossible in adult acquisition as a result of a post-critical period inability to acquire functional features that are absent from the learner’s L1.

University of Iowa
<jason-rothman@uiowa.edu>
<michael-iverson@uiowa.edu>

Notes

* We wish to thank Nina Hyams, who provided invaluable help and comments on the research that gave rise to this article. We thank Carlos Quicoli and Susan Plann for similar help. We acknowledge the graciousness of Jacobo Sefamí and his staff at the Centro de California in Madrid for allowing us to have access to the participants and for their support. We are indebted to Judith Liskin-Gasparro for her editorial expertise. Finally, we are very grateful for the detailed comments of three anonymous reviewers whose suggestions and questions resulted in a much better product. Any and all remaining errors or oversight are entirely our own.

1. SLA models that assume full access to UG must explain L1/L2 differences. A recent claim is that surface performance errors arise from a dissociation between syntax and morphology (Prévost and White 2000; Lardiere 1998, 2006). Researchers have also considered the role of L1 prosodic interference in L2 morphological use (Goad and White 2006) and interface vulnerabilities stemming from Sorace’s (2000, 2003, 2004) suggestions. For example, Montrul and Rodríguez-Louro (2006) and Rothman (2007) have investigated the syntax-pragmatics interface in explaining the target-deviant discursive distribution of null vs. overt subjects in L2 Spanish.
2. While we do not wish to discuss the merits of the argument herein, we do recognize the fact that not all linguistic researchers see eye-to-eye with respect to the poverty-of-the-stimulus argument. We refer the reader to Cowie (1999) for discussion and Laurence and Margolis (2001) for a rebuttal.

3. The NSP has been reanalyzed several times over the past 25 years (see Huang 1984; Jaeggli 1982; Jaeggli and Hyams 1988; Jaeggli and Safir 1989; Rizzi 1982, 1986; Safir 1985 for earlier work). In light of advancements within the Minimalist Program, more recent feature checking approaches (e.g., Alexiadou and Agnostopoulou 1998; Platzack 2003; Wakabayashi, S. 2002) envisage this parametric difference in terms of how languages check a purported universally strong EPP-feature of AgrSP (either by X-movement as in Spanish or XP-merge in English) given the features encoded in their inflectional morphology. In any case, all PandP and MP approaches call attention to the relationship between rich morphology and null-subject licensing for Spanish-type pro-drop languages.

4. Non-overt referential subjects are possible in English in coordinated clauses (e.g., I went home and ___ ate everything). Additionally, in a very particular register known as “diary-drop” both expletive and referential subjects can be dropped (e.g., ___ called Jill yesterday, ___ rained all day long). However, these non-overt pronouns are not parallel to null-subjects of Spanish. They are analyzed as a limited form of topic-drop or truncation following Rizzi (1994) and are restricted to non-stressed first position in matrix clauses (see Haegeman 1990, 1997). Non-overt subjects are never permitted in embedded clauses in English.

5. Despite the observable co-occurrence of these properties in languages like Spanish and Italian, typologically broader studies have provided evidence from lesser studied languages that question the connection of these so-called clustering properties to the possibility of null subjects in finite clauses. For example, European Portuguese, Bangla, Galician and Old French are among pro-drop languages that allow overt expletive subjects. (Arteaga 1990; Haiman 1974; Raposo and Uriagereka 1990; Williams 1991). Furthermore, Auwera’s (1984) work on subject and non-subject asymmetries in the relativization of embedded NPs indicates that the relation between extraction of subjects and phonetically empty subjects has to be redefined.

6. In earlier work by Luján (1985, 1986), it was contended that the OPC restriction could be reduced to contrastive focus (but see Pérez-Leroux and Glass 1999). Even if the OPC is instantiated in English “because similar effects appear in different constructions, even in non-prodrop languages (Sells 1984; Pérez-Leroux 1995).” (Pérez-Leroux and Glass 1999: 227) English learner of L2 Spanish would still have had to access the Spanish-type value of the NSP for the OPC to operate in their L2 grammar for relevant Spanish sentences.

7. The discourse use of null and overt referential subject pronouns in Spanish is not in free variation. There are relatively complex discourse pragmatic rules that require the use of overt pronouns, such as contrastive and focal stress environments. Otherwise, null subject pronouns are exclusively used. (see Zagona 2002).

8. On a suggestion from Kanno (1998), the learners were permitted to indicate if both interpretation types (bound variable and discourse referential) were possible by circling both choices (a) and (b). In the case the learner indicated that both a
bound variable and a disjoint referential interpretation was possible, this choice was counted as a bound variable interpretation for the statistical analysis.

9. This task was modified for the native control group. The NS version consisted of the same stories in Spanish and provided the same questions. Unlike the L2 learner translation task, their job was to finish the answer sentences, which was started for them in accord with the previous story. By starting the sentence for them, we were able to insure that what they wrote would contain some type of embedded pronoun (null or full) depending on the context type.

10. Of the studies cited that look at the OPC in L2 Japanese (Kanno 1998 a, b) and L2 Spanish (Pérez-Leroux and Glass 1999), all demonstrate an OPC tendency at the intermediate level, yet none look at the learners individually.

11. It could be argued that child L1 acquisition of English provides evidence that the APP is instantiated in English since children produce sentences with dropped subjects, eventually learning that this is not possible in English. Although other analyses have argued that English children do not drop subjects, but rather truncate the clausal structure such that there is no projection of a subject position (see Rizzi 1994).

References
Alexiadou, Artemis and Elena Agnostopulou (1998). Parametrizing AGR: Word order, V-move-
ment and EPP-checking. Natural Language and Linguistic Science 16: 491–539.
Arteaga, Deborah (1994). Impersonal constructions in Old French. In Issues and Theory in Ro-
Auwer, Johan van der (1984). Subject and non-subject asymmetries in the relativization of em-
Beck, Maria-Luise (1998). L2 acquisition and obligatory head movement: English-speaking learn-
bridge, MA: MIT Press.
Clahsen, Harald and Upyong Hong (1995). Agreement and null-subjects in German L2 develop-
Dekydtspotter, Laurent and Rex Sprouse (2001). Mental design and (second) language episte-
Jason Rothman and Michael Iverson


