

# Acquisition of Attributive and Predicative Adjective Agreement in L2 Spanish

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## 1. Introduction

How do second language learners acquire a structure that is not instantiated in their first language? What can this tell us about adult language learning? Inflectional morphology, including gender and number agreement in particular, is a difficult hurdle for language learners. Despite being taught early, adjective agreement is late acquired, especially for learners whose L1 does not have grammatical gender features. Errors such as omission of obligatory morphology, incorrect determiners, overgeneralization of the default gender, and lack of sensitivity to gender discord persist even to advanced levels (Franceschina, 2003; 2005). One explanation for this difficulty is the Failed Functional Features Hypothesis (FFFH; Hawkins & Chan, 1997). According to this hypothesis, if a certain purely grammatical feature is not instantiated in the L1, learners will never acquire it in the L2. The FFFH claims that learners have faulty underlying knowledge of agreement. In contrast, other theories such as the Missing Surface Inflection Hypothesis (Prévost & White, 2000) argue that learners can acquire targetlike competence for even purely grammatical features, but that processing issues lead them to overuse default forms in production.

Because acquisition of agreement is difficult and slow, studying its development can shed light on several areas of second language acquisition. First, developmental stages in the acquisition of agreement can tell us how learners construct temporary interlanguage grammars, and if they do so in ways that suggest access to Universal Grammar. Second, distance effects in agreement discord detection show us how beginning learners are affected by processing difficulties. Third, comparisons between more and less explicit tasks can show that explicit knowledge of agreement does not necessarily transfer to implicit tasks. This paper investigates these three issues by examining beginning and intermediate L1 English- L2 Spanish learners' sensitivity to adjective discord.

## 2. Linguistic Background: Agreement in Spanish

In Spanish, adjectives must agree in number and gender with the noun they modify. Spanish gender marking is usually unambiguous; there is little syncretism in the endings and determiners have different forms for each gender-number combination. Nouns have canonical endings –o for masculine and –a for feminine, although there are exceptions to these rules (see Montrul, Foote, & Perpiñán, 2008.) The canonical nouns are the most common and thus the easiest to acquire, followed by – consonant and –e endings, which may be feminine or masculine, and finally “opposite” endings –a for certain masculine nouns and –o for certain feminine nouns, which are rare and therefore difficult.

Attributive adjectives, which are within the noun phrase, differ in word order as well as agreement marking between Spanish and English. The adjective precedes the noun in English but follows it in Spanish (1). Predicative word order, where the adjective is joined to the noun with a copula, is the same in both languages (2).

(1) Attributive: Hay un **gato** **amarillo**.  
There is a.M **cat.M** **yellow.M**  
'There is a yellow cat.'

(noun and adjective are adjacent)

- (2) Predicative: El **gato** es **amarillo**.  
 The.M **cat.M** is **yellow.M**  
 ‘The cat is yellow.’ (noun + copula + adjective)

Adjective endings that do not match both the gender and number of the noun they modify make sentences ungrammatical. This is true for both attributive (3) and predicative adjectives (4):

- (3) La **chica** **simpática** está en mi clase.  
 The.F.sg **girl.F.sg** **nice.F.sg** is in my class  
 ‘The nice girl is in my class’  
 \*La **chica** **simpático/ simpáticas/ simpáticos** está en mi clase.  
 \*The.F.sg **girl.F.sg** **nice.M.sg/ nice.F.pl/ nice.M.pl** is in my class  
 ‘The nice girl is in my class’
- (4) La **chica** es **simpática**.  
 The.F.sg girl.F.sg is nice.F.sg  
 ‘The girl is nice’  
 \*La **chica** es **simpático/ simpáticas/ simpáticos**  
 \*The.F.sg **girl.F.sg** is **nice.M.sg/ nice.F.pl/ nice.M.pl**  
 ‘The girl is nice.’

### 3. Theoretical Issues

A central concern in SLA is why adults have such difficulty with language learning. In contrast to child first language acquisition, which is effortless and uniformly successful, adult language learning is difficult and often unsuccessful (Bley-Vroman, 1990). One explanation for this is that children may have access to a Language Acquisition Device, or Universal Grammar. Because adults lack access to this mechanism, they are forced to use general problem-solving techniques to learn a new language (ibid.; Johnson & Newport, 1989). A strong piece of evidence for children’s innate language-learning mechanism is the Poverty of the Stimulus (PoS) problem: given imperfect, incomplete input, children nevertheless learn a perfect, regular, infinite language. Although PoS was developed to explain first language acquisition, it has also been applied to second language acquisition in different ways. The present paper uses Spanish gender and number agreement to test Poverty of the Stimulus effects in SLA, as well as processing and task differences.

#### 3.1. *Developmental Poverty of the Stimulus Phenomena*

With respect to second language acquisition, Poverty of the Stimulus effects refer to knowledge of the second language that arises from an unknown source. If learners acquire targetlike knowledge of a structure that is scarce or ambiguous in the input, not the subject of instruction, and not transferable from the L1, then presumably they must have help from some sort of universal language faculty. Traditionally, PoS effects have been formulated in reference to the target grammar (Schwartz & Sprouse, 2000). They refer to structures that are difficult, subtle, or rare, but of which learners nevertheless develop targetlike knowledge.

Schwartz & Sprouse (2000) provide a framework for a different kind of PoS phenomenon: developmental PoS. If a learner constructs a temporary, nontargetlike grammar that cannot be accounted for by input, instruction, or the L1, but (crucially) is an option selected by some other natural language, this is evidence of the same sort of underdetermined linguistic knowledge found in traditional L1 PoS. For instance, in Schwartz & Sprouse (1994), a learner of German passes through a stage where he exhibits targetlike subject-verb inversion with pronominal subjects, but not with nonpronominal subjects—a distinction which is found in French, but not in German. This temporary grammar lasts for over a year, but is then replaced by the target grammar.

One idea explored in this paper is that of a temporary “German stage” in the acquisition of Spanish adjective agreement by English speakers. English has no adjective agreement (5) and Spanish has agreement on all adjectives (6). German provides an intermediate option in marking agreement on attributive adjectives (7a), but not predicative adjectives (7b).

- |        |                        |  |                         |
|--------|------------------------|--|-------------------------|
| (5) a. | a <b>nice boy</b>      |  | a <b>nice girl</b>      |
| b.     | the <b>boy is nice</b> |  | the <b>girl is nice</b> |
- 
- |        |                              |  |                              |
|--------|------------------------------|--|------------------------------|
| (6) a. | un <b>chico simpático</b>    |  | una <b>chica simpática</b>   |
|        | a <b>boy.M nice.M</b>        |  | a <b>girl.F nice.F</b>       |
|        | ‘a nice boy’                 |  | ‘a nice girl’                |
| b.     | el <b>chico es simpático</b> |  | la <b>chica es simpática</b> |
|        | the <b>boy.M is nice.M</b>   |  | the <b>girl.F is nice.F</b>  |
|        | ‘the boy is nice’            |  | ‘the girl is nice’           |
- 
- |        |                                      |  |                                       |
|--------|--------------------------------------|--|---------------------------------------|
| (7) a. | ein <b>netter Junge</b>              |  | ein <b>nettes Mädchen</b>             |
|        | a <b>nice.M boy.M</b>                |  | a <b>nice.N girl.N</b>                |
|        | ‘a nice boy’                         |  | ‘a nice girl’                         |
| b.     | der <b>Junge ist nett</b>            |  | das <b>Mädchen ist nett</b>           |
|        | the <b>boy.M is nice.uninflected</b> |  | the <b>girl.N is nice.uninflected</b> |
|        | ‘the boy is nice’                    |  | ‘the girl is nice’                    |

Mallen (1996) accounts for the differences between Spanish and German adjective agreement by pointing to the allowance of referential null subjects in Spanish but not in German, as well as the right-governing properties of Spanish verbs in contrast to the left-governing properties of German verbs. Mallen proposes that the dominant, designated case-assigning head in Spanish is Infl(ection), and in German, it is Comp(lementizer) (172). He then assumes that all predicative adjectives contain a null pronominal element *pro* in their specifier position (176). In Spanish, Infl can structurally assign case, number, and person to the *pro* within the adjective phrase, because referential null subjects are allowed. But in German, Comp assigns case only to the NP, not to the null *pro*. Because of this, predicative adjective agreement “fails” in German—inflectional morphology cannot be realized on predicative adjectives. According to this formulation of case, learners of Spanish may have deficits in predicative adjective agreement if they have not yet acquired the null subject parameter. English is not a null subject language, so this very well may be a hurdle for English-speaking learners of Spanish.

If learners pass through a temporary stage where they inflect attributive but not predicative adjectives, as in German, this would meet all Schwartz & Sprouse’s criteria for a developmental PoS phenomenon. Although gender is frequent in the input and is a subject of instruction, both input and instruction would tell students to inflect all adjectives, not just some. Moreover, the difference between attributive and predicative adjectives is relatively subtle and not the subject of instruction. Since the L1, English, has no adjective inflection, a “German stage” would not be accounted for by transfer.

### 3.2. Distance and Processing

Of course, another explanation for less accurate performance as distance increases could be processing difficulties. Even for native speakers, intervening material between elements with a long-distance dependency can cause agreement errors (Bock & Miller, 1991; Haskell & MacDonald, 2005).

A theory formulated for L2 learners that models the processing difficulties associated with increased distance is Pienemann’s (1998) Processability Theory. This theory posits that in order to be available for real-time production, linguistic knowledge must be automatized. This automatized knowledge has also been called procedural (vs. declarative) knowledge (Ullman 2001) automatic (vs. controlled) processing (Posner & Snyder, 1975), and implicit (vs. explicit) knowledge (Ellis, 2005).

Processability Theory describes a developmental sequence for the order in which processing routines are automatized. *Words* are acquired in stage 1, followed by *lexical morphology* in stage 2, *phrasal morphology* including attributive adjective agreement in stage 3, *interphrasal morphology*

including predicative adjective agreement in stage 4, and finally *main and subordinate clauses* including adjective agreement in a relative clause in stage 5. These stages are summarized in Table 1 below. The first two columns are taken directly from Piennemann (1998), while the application of Processability Theory to adjective agreement in the third column is drawn from Bartning (2000).

**Table 1: Summary of Piennemann's (1998) Processability Theory**

Stage	Processing procedure acquired	Structures produced consistently	Adjective agreement
1	lemma access	words	---
2	the category procedure	lexical morphology	---
3	the phrasal procedure	phrasal morphology	attributive
4	the S-procedure	interphrasal morphology	predicative
5	the subordinate clause procedure (if applicable)	main and subordinate clauses	predicative in a relative clause

Piennemann predicts that when a stage is missing in this hierarchy, the stages above it will also be missing. However, the learner is not completely helpless in this case. Instead, the rest of the sentence will be parsed by “direct mapping of conceptual structures onto surface form, as long as there are lemmata that match the conceptually instigated searches of the lexicon” (7). That is, structures that have not yet been automatized will be processed very shallowly, in the sense of Clahsen & Felser’s (2006) shallow structure hypothesis (see Keating, in press, for application of the SSH to Spanish agreement). Processability Theory, then, describes how the learner’s habit of forming shallow syntactic trees becomes, step-by-step, a habit of building more complete trees.

In terms of adjective agreement, Processability Theory predicts that increasing syntactic distance will make agreement more difficult to process. Although the current study uses offline tasks, learners must nevertheless process each sentence in order to complete the tasks—they simply have more time to do so than in online tasks. Indeed, controlled processing (as in offline tasks) and automatic processing (which occurs automatically in both online and offline tasks) are both considered parts of “processing” as a whole (Posner & Snyder, 1975). We can expect that processing routines which have become automatic will show more systematicity than those which are still in the domain of controlled processing—but controlled processing is processing nonetheless. At each level of distance in Piennemann’s hierarchy, some subjects should show a decline in accuracy, provided that the stage is present in the target population. In Keating (2006), the most advanced learners seemed to have progressed only to Piennemann’s stage 3 in an eyetracking task, while in Bartning (2000), all the learners seemed to have progressed nearly to the end of stage 5, causing the effect of distance to be nonsignificant. These studies are further discussed in section 4 below.

### 3.3. *Explicit vs. Implicit Tasks*

Finally, it is important to consider task effects with respect to agreement. Many accounts of gender agreement focus on the well-known discrepancy between performance and competence (Sagarra & Herschensohn 2008; Keating 2006). Production (e.g. Franceschina, 2005; Montrul et al., 2008) is particularly susceptible to agreement errors. Because automatized, reliable ability to compute gender is late-acquired, it is often found that beginners have no sensitivity to gender on online measures (Keating, 2006; in press), or at least very little knowledge of feminine gender, the marked gender in Spanish (Bruhn de Garavito & White, 2002). However, on explicit written tasks, even low-proficiency learners can do well at gender (Montrul et al., 2008.)

Typically, task effect studies compare an online task to an offline task, but this paper will show that differences in performance can be found even between two offline tasks. A forced-choice task was used to test whether subjects have learned adjective agreement, and an acceptability judgment test was used to measure sensitivity to adjective discord in a sentence. The fact that both of these are untimed, offline measures predicts that subjects should do well on both of them (in contrast to, say, an oral task), because they have time to use explicit knowledge.

Ellis (2005) provides criteria for measuring the explicitness vs. implicitness of tasks. The features contributing to implicitness are the use of “feel” rather than rules, time pressure, and ability to be completed without use of metalinguistic knowledge. Additional factors favoring, but not sufficient to guarantee implicitness, are meaning-focus rather than form-focus and oral modality rather than written modality. Of these five factors, the most important in differentiating the implicit vs. explicit tasks in this study is meaning-focus vs. form-focus. The explicit task requires almost no attention to meaning and focuses directly on adjective agreement, whereas the acceptability judgment task requires more vocabulary and grammatical knowledge, and has distracting fillers.

Differences found between explicit and more implicit tasks suggest that learned rules do not transfer immediately to the interlanguage of the learner. Rules may be useful for very explicit tasks including grammar exercises and tests, but in order to be able to apply these rules in implicit and online tasks, they must be automatized through additional exposure and practice. Implicit tasks should show greater processing difficulties than explicit tasks. In an explicit task the learner can devote all his processing energy to the structure that is explicitly focused on. In contrast, grammatical phenomena such as developmental PoS should occur in both kinds of tasks, since they represent the learner’s temporary underlying grammar. If the learner performs according to his developing system rather than using instructed explicit knowledge, he should use the same grammar to complete both types of tasks.

#### **4. Prior experimental findings on Spanish agreement**

Native speakers acquire gender quickly, accurately, and with few mistakes. The gender systems of native Spanish-speaking children are developed by age three (e.g. Pérez Pereira, 1991). Many studies have used L2 gender and/or number agreement to test theories about access to Universal Grammar, language transfer, and critical period or age effects. Researchers who are interested in UG and critical periods typically focus on advanced learners, because they are seeking instances of nativelike attainment. Some of these studies have found targetlike attainment (Montrul et al., 2008; Bruhn de Garavito & White, 2002; White et al. 2004), while others have not (Franceschina, 2003, 2005).

In a study of an end-state learner who had lived in South America for 24 years, Franceschina (2003) found 8% errors on adjective agreement despite no errors matching nouns to their determiners. Franceschina’s (2005) experimental studies of Spanish gender agreement showed that learners from [+gender] native languages match native speakers and outperform those from [-gender] native languages on agreement. This data supports Hawkins & Chan’s (1997) Failed Functional Features Hypothesis (FFFH), which claims that that features not instantiated in the L1 can never be represented syntactically in the L2 grammar. However, much of Franceschina’s data is oral production data from interviews. Production errors in L2 speakers do not necessarily provide evidence for faulty underlying representations. The Missing Surface Inflection Hypothesis (Prévost & White, 2000) proposes that although learners know the syntactic and morphological features that control (verb) agreement and tense, they often have problems with the realization of surface morphology. In the case of verbs, learners resort to nonfinite default forms. For adjectives, the default form in Spanish is not a nonfinite or uninflected form, but the masculine singular (Harris, 1991). Thus, learners’ overuse of the masculine singular with adjectives is analogous to their overuse of nonfinite verbs.

Not all studies, though, have found impaired agreement for L2 speakers. Montrul et al. (2008) found evidence of nativelike attainment for both L2 learners and heritage speakers—adults who learned Spanish in the home as children, but later switched to English as the dominant language—in a comprehension task and a cloze task. Over 50% of L2 learners, and over 46% of heritage speakers, performed within the range of native speakers on the written tasks. An oral picture description task yielded very different results. Only 3% of L2 learners, but 24% of heritage speakers, performed like natives. These results show that at least in comprehension and in exceptional cases in production, nativelike performance on agreement can be achieved by L2 learners.

Doubt has also been cast on the FFFH’s predicted effects of native language. Bruhn de Garavito & White (2002) studied [+gender] French-speaking high school students who learned [+gender] Spanish in the classroom. These students were highly accurate on definite determiners (suggesting a gender representation), but rather inaccurate on adjectives. This is not predicted by the FFFH, because gender is instantiated in these learners’ L1. White et al. (2004) studied French- and English-speaking learners

of Spanish, and found that intermediate and advanced university students performed like native speakers on two elicited production tasks, a comprehension task, and a lexical knowledge task. Beginning students from both [+gender] French and [-gender] English again had difficulty with agreement, and there was no effect of native language typology. This is further evidence for nativelike attainment and also points to the importance of studying the development of agreement systems.

Several studies show development of agreement using pseudo-longitudinal data. Alarcon (2006) elicited sentence completions from beginning, intermediate, and advanced learners as well as native speakers, and found that both learners and natives were sensitive to the gender of nouns. Learners and natives were sensitive to the same gender cues and made the same kinds of attraction errors. Other researchers have found a dividing line between certain proficiency levels: in Keating (2006; in press), beginning and intermediate learners differed from natives on all sentence types, but advanced learners showed nativelike sensitivity on the sentences with attributive adjective discord. Sagarra & Herschensohn (2008) place the dividing line lower, between beginners and intermediate learners. Beginners were not sensitive to agreement violations, but intermediate learners showed the same pattern as native speakers, albeit with slower overall reading times.

The only generalization that can be drawn from these disparate results is that sometime after the beginner level and before the advanced level, subjects acquire grammatical agreement. But do they acquire agreement on all types of adjectives simultaneously? Most studies focus on only predicative adjective agreement (Alarcon, 2006) or only attributive agreement (Gass & Alvarez Torres 2005; Sagarra & Herschensohn 2008). Only a few studies have examined the role of distance in agreement. Keating (2006) presented subjects wearing an eyetracker with adjectives that were in the same syntactic phrase (8a), in another syntactic phrase (8b), or in another clause (8c).

- (8) a. DP[ La **cerveza fría**] satisface cuando hace calor afuera.  
'Cold beer satisfies when it's hot outside'.  
b. DP[ La **cerveza** VP[está bien **fría**]] en los bares y cafés de Texas.  
'Beer is quite cold in Texas bars and cafes'.  
c. DP[ La **cerveza** VP[sabe mejor CP[quando VP[se sirve bien **fría** y con un limón]]]  
'Beer tastes better when it's served very cold and with a lemon.'

Keating used subjects' eye movements to measure sensitivity to sentences with adjective discord. He found that no learners, only native speakers, showed sensitivity to predicative adjective discord in sentences like (8b) and (8c). However, advanced learners did show sensitivity to attributive adjective discord in sentences like (8a). This shows that sensitivity to attributive adjectives in an online task develops before sensitivity to predicative adjectives (if the latter develops at all). Keating was more interested in syntactic boundaries than in attributive vs. predicative adjectives per se. To explain his results, he proposes the Syntactic Distance Principle: "The more syntactic nodes that separate a controller from its target, the more difficult it will be to perform the syntactic computation" (31). One potential issue with his study is that his sentences are necessarily quite complex; the beginning and intermediate learners might have had so much difficulty processing the vocabulary and structure that they did not have processing resources to devote to adjective agreement.

Bartning (2000) examined agreement in French using a corpus of interviews with advanced and pre-advanced students. French is similar to Spanish with regard to adjective agreement, but allows (and requires) more attributive adjectives in anteposition (before the noun) than Spanish. When Spanish adjectives appear in anteposition, it causes a change in meaning. For example, the adjective "grande" means "big" in all three of the French sentences in (9), but in Spanish, a change in word order changes the meaning of the adjective from "great" to "big".

- |                      |                      |
|----------------------|----------------------|
| (9) <u>French</u>    | <u>Spanish</u>       |
| une grande famille   | una gran familia     |
| 'a.F big.F family.F' | 'a.F great family.F' |
| *une famille grande  | una familia grande   |
| 'a.F big.F family.F' | 'a.F big.F family.F' |

Bartning found that for advanced learners, predicative adjectives were actually significantly more accurate than attributive adjectives, despite being farther from the noun. However, this difference was driven by low performance on anteposition adjectives, which require anticipation of the gender of a noun that has not yet been pronounced. Postposition attributive adjectives had exactly the same correctness rate (84%) as predicative adjectives.

The theoretical framework for Bartning's study is Pienemann's (1998) Processability Theory, which (as discussed above) predicts that attributive adjectives will be acquired before predicative. Bartning's results do not directly support this theory, but the high levels of correctness suggest that the learners in this study may have already advanced past the point at which there would be a meaningful distinction in Processability Theory (between stages 3 and 4 out of a total of 5 stages).

Finally, Bruhn de Garavito and White (2002) examined attributive vs. predicative adjective agreement in Spanish with an oral picture description task. Their results showed piecemeal development of the adjective agreement system. Beginning learners were accurate on masculine attributive adjectives (4% errors), less so on masculine predicative adjectives (21.5% errors), and highly inaccurate with feminine adjectives in both positions (78% and 70% errors.) Second year learners were accurate on masculine adjectives in both positions (4% errors), but more accurate with feminine attributive adjectives (63.5% errors) than feminine predicative adjectives (88% errors). The authors observe that: "...it looks as if these learners may not in fact realize that adjectives in Spanish inflect for gender" (p. 171). However, given the improvement in at least masculine adjectives for the second-year students, it seems that learners are gradually acquiring this knowledge.

To summarize the results of the three studies examining the role of distance in agreement, there seems to be an advantage for attributive adjectives over predicative adjectives, when attributive adjectives appear in postposition as in Spanish rather than anteposition as in French. Importantly, all the data from these studies is from online tasks: one eyetracking task and two semispontaneous speech tasks. Given Montrul's (2008) finding of much higher performance for offline tasks than for production in L2 learners, and the preponderance of evidence showing the difficulty of agreement for beginners, the present study uses offline tasks to measure beginners' sensitivity to agreement.

This experiment was designed to investigate Spanish learners' knowledge of adjective agreement as linear and syntactic distance between the adjective and the noun increases. In addition to looking for evidence of a possible "German stage" in which attributive adjective agreement has been acquired but predicative adjective agreement has not, the study considers distance-related processing issues and shows task effects in the ability of beginning English L1- Spanish L2 students to apply their knowledge of adjective agreement. The research questions are as follows:

- RQ#1** Do beginning English L1/Spanish L2 speakers pass through a "German stage," where attributive adjective agreement is seen as obligatory, but predicative adjective agreement is ignored?
- RQ#2** Do beginning English L1/Spanish L2 speakers detect incorrect adjective agreement more accurately when the adjective is closer to the noun, in linear and/or syntactic distance?
- RQ#3** Are there task effects for acquisition of agreement, such that learners perform better on explicit than implicit tasks?

## 5. Methods

### 5.1. Participants

Participants were recruited from first, second, third, and fourth semester Spanish classes at the University of Illinois. Of the 47 subjects tested, nine were excluded from analysis because their native language was not English (5), they were much older than the other subjects (1), or their proficiency test scores were low outliers (under 10 where the next lowest subject scored 13 out of 20; 3 subjects). This yielded a sample size of 38. All the subjects were true adult classroom learners; none had started studying Spanish before age 11.

The cloze test used to determine proficiency was a fill-in-the-blank passage about Ecuador adapted from Sabías Que, a first-year college Spanish textbook, with every ninth word removed. This

was presented in a multiple-choice format, with three possible answers for each of 20 questions, and was specifically geared towards beginning students. However, because University entrance requirements include at least two years of a foreign language, very few actual beginners were found in the study. Since many subjects performed better than expected on the beginner proficiency test, both a beginning and an intermediate group were formed. The division was made based on K means analysis in SPSS, which seeks clusters of scores. Characteristics of the learners are summarized in Table 2.

**Table 2: Learner characteristics**

		Proficiency score (maximum=20)	Age of acquisition	Years of study	Semester
Intermediate (n=24)	mean (SD)	18.9 (0.2)	14.2 (0.5)	4.3 (0.4)	2.1 (0.2)
	range	17-20	11-20	0.2-9.5	1-4
Beginner (n=14)	mean (SD)	14.6 (0.3)	16.3 (0.7)	2.3 (0.4)	1.0 (0.1)
	range	13-16	14-22	0.2-6.0	1-2

As the table shows, the intermediate students were more proficient than the beginners, had started learning Spanish at a slightly younger age (but still after puberty), had studied for longer, and were in higher level Spanish classes at the University of Illinois. There is extremely wide variation in years of study within each proficiency group. In addition to the information reported above, students were asked about their exposure to Spanish outside the classroom. Only eight of them reported any kind of Spanish exposure outside the classroom, only one had ever taken a trip over 2 months to a Spanish-speaking country, and only four knew any other languages besides Spanish.

The ten native speaker controls were graduate students at the University of Illinois, aged 24-30. All had grown up as monolingual Spanish speakers, and had learned English only later in school.

## 5.2. Materials

The main test instrument was an acceptability judgment task consisting of 32 test items and 32 fillers. The response scale had options of 1 (unacceptable), 2, 3, and 4 (acceptable), plus an option of ‘¿?’ if the subject didn’t know or didn’t understand the sentence. For ratings of 1 or 2, subjects were also asked to circle the word or words that made the sentence bad, so that it would be apparent if they rejected the sentence based on the experimental manipulation or on other confounding factors. The test items were organized into eight categories, based on four levels of distance crossed with two levels of grammaticality (see Table 3).

**Table 3: Test items**

Test items	Location of adjective
1a) En mi clase, hay un <b>chico simpático</b> . ‘In my class, there’s a <b>nice.M boy.M</b> .’ 1b) *En mi escuela, hay un <b>maestro antipática</b> . ‘In my school, there’s a <b>mean.M teacher.F</b> .’	adjacent (attributive)
2a) En mi oficina, el <b>director</b> es <b>simpático</b> . ‘In my office, the <b>director.M</b> is <b>nice.M</b> .’ 2b) *En mi grupo, un <b>chico</b> es <b>simpática</b> . ‘In my group, one <b>boy.M</b> is <b>nice.F</b> .’	+1 word (predicative)
3a) El <b>chico</b> en mi apartamento es <b>antipático</b> . ‘The <b>boy.M</b> in my apartment is <b>nice.M</b> .’ 3b) *El <b>secretario</b> en tu oficina es <b>antipática</b> . ‘The <b>secretary.M</b> in your office is <b>mean.F</b> .’	+4 words (predicative)
4a) El <b>profesor</b> que trabaja conmigo es <b>simpático</b> . The <b>professor.M</b> that works with me is <b>nice.M</b> .’ 4b) *El <b>chico</b> que estudia contigo es <b>antipática</b> . ‘The <b>boy.M</b> that studies with you is <b>mean.F</b> .’	+4 words with relative clause (predicative)



These categories allowed learners' competence on both grammatical and ungrammatical sentences to be tested, and the effects of distance to be examined. Nearly all of the sentences were seven words long, so that processing demands would not cause longer sentences to be rejected or misunderstood. The adjectives were all equally salient because they always appeared at the end of the sentence. The vocabulary was all beginning level or cognate with English, and the articles were all canonically marked for gender. Categories 1a and 1b had the shortest linear and syntactic distance, while categories 4a and 4b had the longest linear and syntactic distance.

Category 1 compared with category 2 allows the prediction about a "German stage" to be tested by adding only one word, *es* 'is,' to form a predicative adjective rather than an attributive adjective. This adds syntactic distance while keeping linear distance as close as possible. Category 3 adds linear distance between the noun and the adjective, creating a longer-distance dependency which may be more difficult for L2 learners to process. Category 4 adds syntactic distance by inserting a relative clause between the noun and the adjective. Processability Theory predicts dropoffs in sensitivity for each individual between a single pair of distance levels. Some subjects will be sensitive to category 1 but not to categories 2, 3, and 4; others will be sensitive to 1 and 2 but not 3 and 4, etc. In contrast, a German stage predicts dropoffs in discord sensitivity between attributive category 1 and predicative categories 2-4, but not between other levels of distance.

The fillers were half grammatical and half ungrammatical. Twelve manipulated verb conjugation (10), twelve manipulated word order (11) and the last eight tested number marking on nouns (12).

- (10) Mis amigos y yo **jugamos** / \***jugar** al fútbol.  
My friends and I **play.1.pl** / \***to.play** soccer.
- (11) Cristina (**tiene**) tres hermanas y un hermano (\***tiene**).  
Cristina (**has**) three sisters and a brother (\***has**).
- (12) Tengo dos **cuaderno** / \***cuadernos** para la clase.  
I have two **notebook** / \***notebooks** for (the) class.

The sentences were blocked into 16 blocks of four, with each block containing two test items and two fillers. The order within blocks and as a whole was randomized, although two items from the same token set or category within a single block were avoided. Only one test order and script were created.

Finally, subjects also completed a forced-choice task testing their explicit knowledge of adjective agreement. In a short passage about the Simpson family, subjects were asked to circle the correct form of twelve adjectives. The task was constructed to test each gender combination and each distance present in the grammaticality judgment task. No fillers were used, which made the task maximally explicit. Nine of the items had no potential attractors between the noun and adjective (13), while three had potential attractors (14).

- (13) El padre es muy (**perezoso/perezosa/perezosos/perezosas**).  
The father.MS is very ✓ lazy.MS/ \*lazy.FS/ \*lazy.MP/ \*lazy.FP
- (14) Los hijos de la familia son (**diferente/diferentes**).  
The children.MP of the family.FS are \*different.S / ✓ different.P

### 5.3. Procedures

The first semester Spanish classes completed the tasks during their regular classes for normal course credit. In order to better accommodate their normal coursework, they completed the test during 15 minutes set aside on two different class days. The second, third, and fourth semester students were recruited from their classes, but completed the tasks in the lab in exchange for a payment of \$4 for a single 30-minute session. The native speakers completed the tasks outside of the lab. All tasks were presented on paper.

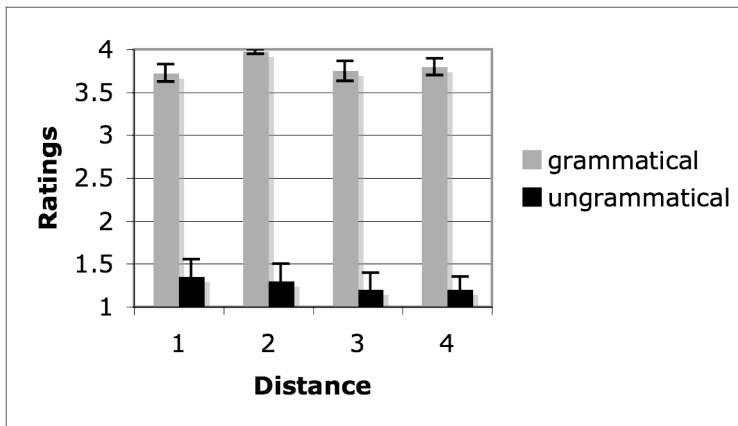
## 6. Results

### 6.1. Group Results

The independent within-subjects variables for this study were distance and grammaticality, and the dependent variable was ratings on a four-point Likert scale. The between-subjects variable was group (beginner, intermediate, or native.)

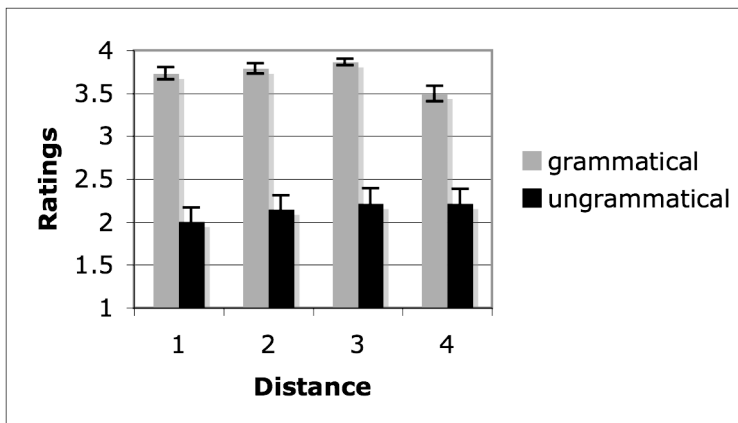
The native speakers (Figure 1) performed as expected, with strong intuitions about grammaticality. Native speakers found most of the sentences highly grammatical (a rating of 4) or highly ungrammatical (a rating of 1). The exception to this was one subject who rated adjective concord as 4 and discord as 3 (see Cowart, 1997 for a discussion of individual differences in making grammaticality judgments.) Other than this one subject, ratings were quite uniform across the subjects and the different countries of origin.

**Figure 1: Native speaker grammaticality judgments**



The intermediate learner group (Figure 2 below) accepted grammatical sentences as strongly as the native speakers, but rated ungrammatical sentences around 2 instead of around 1 on the four-point scale. Learners' intuitions are typically less strong than those of native speakers. It is also common for learners to be better at accepting grammatical sentences than at rejecting ungrammatical sentences (Cowart, 1997).

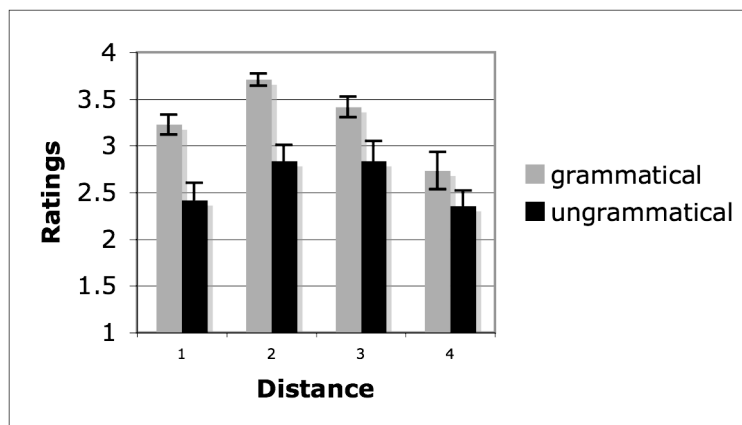
**Figure 2: Intermediate learner grammaticality judgments**



Finally, beginning learners (Figure 3 below) showed a very different pattern than either native speakers or intermediates. As predicted, beginners show the biggest distinction between adjective concord and adjective discord when the adjective and noun are close together (distance 1 and 2).

However, unlike the intermediate students and the native speakers, the beginners showed a main effect of distance as well as a main effect for grammaticality.

**Figure 3: Beginning learner grammaticality judgments**



## 6.2. Statistical Analysis

Because the design was factorial with four levels of distance crossed with two levels of grammaticality, as well as the between-subjects factor of group, a repeated-measures ANOVA was performed. Native speakers were analyzed separately from learners, because native speakers typically have less variability than learners on clear sentences such as these. Beginning and intermediate learners were analyzed together, with level as a between-subjects factor.

For the native speakers, there was a significant main effect for grammaticality,  $F(1,9) = 178.865$ ,  $p < .05$ . As expected, there was no significant effect for distance,  $F(3,27) = 1.627$ ,  $p = .21$ , and no interaction between distance and grammaticality,  $F(3,27) = 2.404$ ,  $p = .09$ .

For the learners, there was a significant main effect for grammaticality,  $F(1,35) = 86.470$ ,  $p < .05$ , as well as a significant main effect for distance,  $F(3,105) = 13.789$ ,  $p < .05$ . There were also several significant interactions. The interaction for distance \* group,  $F(3,105) = 6.677$ ,  $p < .05$ , is due to the beginning learners, but not the intermediate learners, being affected by distance (see Figure 2 vs. 3).

There was also a significant effect of grammaticality \* group,  $F(1,35) = 15.106$ ,  $p < .05$ , because the intermediate learners made stronger distinctions between grammatical and ungrammatical sentences than the beginners. The beginners made distinctions of less than one point on average, while the intermediates made distinctions of over one and a half points.

Finally, there was a significant effect for distance \* grammaticality,  $F(3,105) = 4.709$ ,  $p < .05$ . This effect was caused by stronger distinctions for grammaticality at shorter distances. For the group of learners as a whole, a distinction of about 1.3 points for category 1 narrowed to a distinction of less than one point at category 4. The three-way interaction of group \* distance \* grammaticality was nonsignificant,  $F(3,105) = .48$ ,  $p = .70$ .

Pairwise comparisons were performed between the different distance levels to isolate the effects of linear and syntactic distance. The Bonferroni correction was used to reduce the risk of a Type I error. These comparisons showed that, as predicted, category 1, attributive adjectives, differed from categories 2 and 3, predicative adjectives with one intervening word (mean difference =  $-.280$ ,  $p = .00$ ), and predicative adjectives with three intervening words (mean difference =  $-.247$ ,  $p = .01$ ). But, surprisingly, they did not differ from category 4, predicative adjectives with a subordinate clause (mean difference =  $.123$ ,  $p = .77$ ). This is due to beginners' low ratings of category 1 grammatical sentences, and will be explained with the results of the error correction task in section 6.3 below.

Corrected pairwise comparisons were also used to check whether distinctions for grammaticality were significant at all distance levels. For the intermediate group, each difference (1a vs. 1b, 2a vs. 2b, 3a vs. 3b, and 4a vs. 4b) was significant at the  $p = .00$  level. For the beginning learners, only 2a vs. 2b

was significant ( $p = .01$ ). 1a vs. 1b also trended toward significance ( $p = .057$ ). Categories 3a vs. 3b and 4a vs. 4b were nonsignificant,  $p = .10$  and  $1.00$  respectively.

### 6.3. Error Correction Task

Twenty-three of the 24 intermediate subjects and 9 of the 14 beginning subjects indicated why they rejected ungrammatical sentences by circling the word or words that made the sentence bad. Results of this task indicated several structures that learners rejected despite their being correct Spanish: the word “hay” meaning “there is/ there are,” pro-drop, the demonstrative adjective “esta” meaning “this.F,” rejection of all past tense verb forms, etc.

Since the research questions concerned only adjective agreement, rejections of non-adjectives caused noise in the data. Fortunately, the error correction test allowed the effects of adjective discord on ratings to be isolated, by excluding rejection of grammatical words from analysis. All such rejections were excluded, whether the direction of the error was for or against the research hypothesis.

Twenty of the 32 subjects who circled errors incorrectly rejected grammatical words. The mean number of errors for intermediates was 0.96, while the mean number of errors for beginners was much higher at 2.56. There was also a difference in distribution of errors. Intermediates’ errors were equally distributed among categories, but for beginners, the largest number of errors occurred in category 4a, followed by 1a. Three of the four category 1a sentences contained the word hay “there is; there are,” and the fourth contained the demonstrative adjective esta, “this.F.” In category 4a, two of the four sentences had correct past tense verb forms which were rejected by beginners, possibly because they had not learned the past tense yet. Grammatical categories 2a and 3a did not contain any of these problematic words.

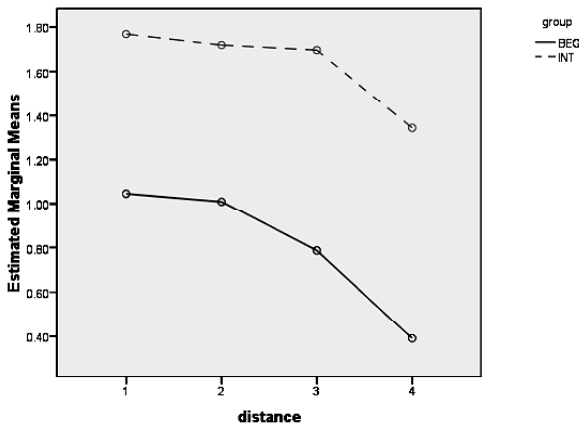
### 6.4. Difference scores

Using the error-corrected data, difference scores were computed for each subject. These scores represent the degree to which subjects distinguish between adjective concord and discord at each distance, and were computed simply by subtracting the ratings for the ungrammatical categories from the corresponding grammatical category ratings (Table 4 and Figure 4).

**Table 4: Difference scores**

	Category 1	Category 2	Category 3	Category 4
Intermediate	1.73 (SD=.18)	1.70 (SD=.18)	1.67 (SD=.19)	1.34 (SD=.21)
Beginners	1.05 (SD=.24)	1.01 (SD=.20)	0.79 (SD=.19)	0.39 (SD=.34)

**Figure 4: Difference scores**



A repeated measures ANOVA with distance as the within-subjects variable, group as the between-subjects variable, and difference score as the dependent variable, was performed to see if the distance levels differed significantly from each other. Distance had a significant effect on ratings,  $F(3,27) =$

3.116,  $p < .05$ . Simple contrasts showed that each distance was significantly different from the others at the .05 level. This was the pattern predicted by Processability Theory, and not that predicted by a German stage.

### 6.5. Explicit Task

The results of the forced-choice task asking subjects to recognize correct adjective endings are reported below. The maximum score is 12. As Table 5 shows, all the learners performed very well on this task, scoring between 8 and 12. The mean for the beginners, 10.5 correct, is slightly lower than that of the intermediate group, 11.6 correct, but the range, 8-12 correct, is the same for both groups.

**Table 5: Explicit task scores**

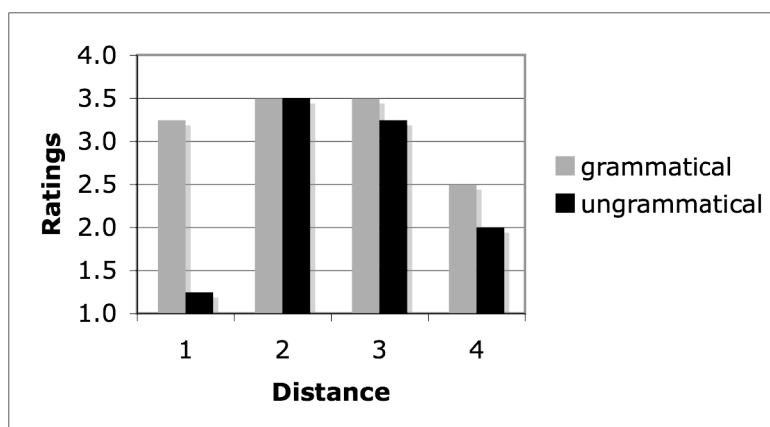
	Mean	Standard Deviation	Range
Native Speakers	12	0	12
Intermediate	11.6	0.2	8-12
Beginners	10.5	0.4	8-12

Interestingly, the three test items with mismatched attractor nouns, such as “los hijos.MP de la familia.FS,” which were all at distance 3, produced only slightly more errors than the items with no mismatched attractors. The highest number of errors (5) was on the attributive adjective *amarilla* in *una casa amarilla* “a yellow house.” This may be because in many curricula, students learn the color yellow as an invariant vocabulary item before they learn how to inflect adjectives. Overall, scores on this task showed that students had very good explicit knowledge of adjective agreement, with errors fairly evenly distributed among both masculine and feminine and singular and plural.

### 6.6. Individual Results

Only one subject, beginning subject 36, displayed exactly the pattern predicted by a “German stage” of adjective agreement. Subject 36 differentiated between adjective concord and discord at distance 1 by two points on the four-point scale, but failed to distinguish between concord and discord at any other distance by more than half a point. This subject was male, 18 years old, was in a 1st semester Spanish class, had 3 years of Spanish study, had started learning Spanish at age 15, scored 16/20 on the proficiency test, scored 11/12 on the explicit test, and had no outside Spanish exposure. His ratings are shown in Figure 5 below.

**Figure 5: Subject 36's ratings**



This subject's high score on the explicit test and his failure to differentiate predicative adjective concord from discord on the grammaticality judgment task show task effects. Other subjects also

showed this same pattern. A cutoff for making a distinction between adjective concord and discord was set as at least one point difference in ratings (the minimum distance on the rating scale as well as the approximate value at which difference scores reached statistical significance in the ANOVAs). Intermediate subject 9 scored 11/12 on the explicit task, but made no one-point distinctions on the grammaticality judgment test. Likewise, beginning subjects 31, 41, and 29 scored 10/12 on the explicit task but made no distinctions on the GJT.

The individual patterns for each subject are summarized in the Table 6 below. As the table shows, the largest number of intermediates (12) made distinctions between concord and discord at all four distances, Stage 5 in Processability Theory. The next largest number (5) made distinctions between concord and discord only when there was no relative clause (Stage 4). Two of the subjects made no distinctions at any distance (Stage 1), and the remaining five patterns are not predicted by either a German stage or by Processability Theory; for instance, one subject made a distinction at distance 3 but not distance 1, 2, or 4. These subjects are grouped as “Unpredicted.”

Of the beginners, the largest number (4) made no distinctions at any distance (Stage 1). Two of the subjects made distinctions at all distances (Stage 5). Two made distinctions at distances 1 and 2, but not at 3 and 4 (Stage 3). The lone Subject 36 made distinctions only at distance 1, the “German stage” pattern or Stage 2. The remaining four subjects showed unpredicted patterns.

**Table 6: Individual rating patterns**

<u>Label</u> Stage Distinctions	<u>Target</u> Stage 5 1,2,3,4	Stage 4 1,2,3	Stage 3 1,2	<u>German</u> Stage 2 1	<u>English</u> Stage 1 none	<u>Unpredicted</u>
# of intermediates	12	5	0	0	2	5
# of beginners	2	0	2	1	4	4

## 7. Discussion

The results show that while native speakers and intermediate learners can detect adjective discord at all levels of distance tested in the study, beginning learners are less skilled at detecting discord altogether, and are more affected by distance. The trend for the entire group showed dropoffs at all distances, not only between categories 1 and 2 as a German stage would predict. Only one subject showed the exact pattern predicted by the German stage. Thus, Research Question 1, whether any of the learners are passing through a German stage, can be answered “yes, but only one.” In the group results, a German stage is not supported.

Ideally, a developmental stage purportedly based on universal grammar principles would be universally experienced by all subjects. Occam’s razor dictates that since Processability Theory predicts a German stage but also predicts dropoffs at other distances, Processability Theory more parsimoniously accounts for the results. The only scenario in which a German stage would be advantaged over Processability Theory is if it could explain something which Processability Theory could not. For instance, if the preponderance of learners did much better at distance 1 than distance 2-4, with very few dropping off between other distance levels, the idea of a German stage would still be needed. Additionally, longitudinal data should be gathered to see if learners progress systematically over time from distance 1 to 2 to 3 to 4, or if they master distance 1, and then the rest in close proximity.

Although a German stage was not found in the current population, there are other learner populations where such a stage might exist. First, less proficient subjects should be tested. Although over half of the subjects were in first-semester Spanish classes, both biographical data and test scores suggest that there were few actual beginners in the study. The “beginner” group had already been studying Spanish for an average of 2.3 years and performed very well on both the proficiency test and the explicit test of adjective agreement. High school students would probably have to be targeted, as the beginning college learners proved too advanced.

Second, is possible that a “German stage” is found more consistently in naturalistic learners, including children. The fluctuation in the current subjects’ data could certainly be an effect of

instruction. Instruction tells learners to inflect all adjectives, so they could have been (inconsistently) applying prescriptive rules on the grammaticality judgment task. Certainly, the written modality and the sentence correction task would both encourage the application of metalinguistic knowledge. Naturalistic learners are another direction for further research.

The answer to Research Question 2, whether beginning learners process agreement less accurately with increasing distance between the noun and adjective, is “yes.” Beginners, but not intermediates, were significantly affected by distance. A smooth decline across all levels was easiest to see using error-corrected data. When using uncorrected sentences, beginners performed best on the close predicative adjectives (category 2) because of the confounding variable of words unfamiliar to beginning learners (hay and esta) being disproportionately present in category 1. With this confounding variable removed, both groups showed a decline in performance at each distance. Intermediates stayed fairly steady through categories 1, 2, and 3, but dropped off a bit in category 4. Beginners dropped off a bit at category 2, more at category 3, and the most at category 4. For both groups, the biggest dropoff was between categories 3 and 4, or between stages 4 and 5 in Processability Theory.

Research question #3, whether there are task effects for adjective discord sensitivity, can be answered, “definitely, and even between two offline tasks.” It is known that even advanced learners have difficulty applying agreement in production. What this study has contributed is the knowledge that features making a task even slightly more implicit, such as fillers, increased vocabulary demands, and focus on the entire sentence rather than just on the adjective, can prevent beginners from applying their explicit knowledge of agreement. It is a fragile system indeed that fails an L2 learner on an offline, written task. This finding raises the question of whether other studies using offline tasks to study underlying competence may have been affected by performance issues. With beginners, task effects are not limited to the oral/written dichotomy; they may be found even between written tasks.

## 8. Conclusion

The results of this study show that L2 learners do not develop adjective agreement all at once. In contrast to native speakers, learners are affected by distance between the noun and the adjective. However, this effect of distance may be overcome with time and practice. The intermediate learners in this study had automatized their knowledge of agreement sufficiently to reject adjective discord at all levels of distance, patterning similarly to native speakers in their ratings.

Both linear and syntactic distance are important in learners’ processing. With each increase in distance, learners are less likely to detect adjective discord. For the learners in this study, the difference between attributive and predicative adjectives was not found to be a particularly salient difference. A “German stage” of acquisition was not supported. Rather, all distance manipulations decreased detection of adjective discord.

In addition to distance, implicitness adds another degree of difficulty to the task for adult L2 learners. All learners scored well on an explicit written task, but much more variability was found when they tried to apply this explicit knowledge to the more implicit grammaticality judgment task. The agreement systems of beginners are fragile.

Despite this fragility, all the learners in this study showed some sensitivity to gender discord. Even on a less explicit task, beginners did distinguish between concord and discord to some degree at all levels of distance. These results support a Missing Surface Inflection account of beginners’ difficulties with agreement. L2 learners do have a representation for gender and number in their grammars, but processing demands interfere with their ability to apply this knowledge. With practice, processing increasingly complex chunks of syntax becomes less effortful, and therefore more successful. Automatization, not representation, is the hurdle that is so difficult for adult L2 learners to overcome.

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