ADULT ACQUISITION OF GRAMMATICAL GENDER IN INSTRUCTED L2 SPANISH AND THE ROLE OF METACOGNITION

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1.　　Introduction

Despite being a grammatical feature uniformly present in all native mental grammars of Spanish and acquired early on in first language (L1) development (Pérez Pereira 1991, Hernández Pina 1984), grammatical gender presents persistent difficulty for adult second language (L2) learners of Spanish (Fernández-García 1999, McCarthy 2008, Montrul et al. 2008). Speakers of a dominant language that lacks grammatical gender (Montrul et al. 2008, Spino-Seijas 2017) produce errors in both the interpretation and production of Spanish gender arguably (and partially) due to influence from their dominant language. Gender, therefore, presents a unique opportunity to examine the development of Spanish as an L2 among adult learners. This study investigates the nature of grammatical gender knowledge of adult native English speakers (N=24) learning L2 Spanish in the instructed (university) context and examines the effect of metacognitive awareness on learner performance. Metacognition denotes the ability to reflect upon, understand, and regulate one's own learning process (Schraw and Dennison 1994) and pertains to learning in general. Therefore, metacognition may be particularly relevant to adult language learners in the instructed context. To more closely examine metacognition for language learning, we crucially consider how its influence on language performance of a morphosyntactic feature (i.e. grammatical gender) may be modulated by both task modality (written vs. oral) and the linguistic features inherent to Spanish grammatical gender: gender class (masculine or feminine), agreement domain (determiner, adjective), and noun morphology (overt or non-overt gender marking). The varying effects of these variables are examined in Spanish gender determiner (Det-N) and adjective (N-Adj) agreement in both written recognition and oral description tasks. The present study therefore seeks both to corroborate abundant previous research on the linguistic variables of grammatical gender and to examine the role of metacognitive awareness as a new learner variable not analyzed in previous research on the acquisition of morphosyntax. As such, this study aims to contribute needed data and analysis of the role that metacognition may play in the acquisition of L2 grammatical gender in an instructed context. Furthermore, this study introduces a new tool for measuring metacognitive awareness applied to second language learning by adapting the original version of the Metacognitive Awareness Inventory (MAI) questionnaire (Schraw and Dennison 1994) to fit the specific knowledge and skills associated with language learning in the instructed context.

## 2.	Background and motivation

### 2.1	Grammatical gender in Spanish

Grammatical gender in Spanish, like most Romance languages, is a binary system in which all nouns are assigned as masculine or feminine. Although gender assignation is a lexical property of nouns, grammatical gender is realized at the syntactic level in which there must be agreement between a noun and its determiner and modifier(s), thus resulting in two domains of grammatical gender in Spanish: assignment (lexical) and agreement (syntactic) (Alarcón 2009, 2011). The feature of animacy also plays a role at the lexical and semantic level in grammatical gender assignment. Animate nouns are those in which gender is assigned in accordance with biological sex and thus is semantically motivated (e.g., *doctor* "doctor-masc.", *doctora* "doctor-fem."), whereas inanimate nouns are those whose gender is not semantically motivated and is purely grammatical (e.g., *el libro* "the-masc. book", *la silla* "the-fem. chair"), making their classification arbitrary as compared to that of animate nouns (Montrul et al. 2008). Finally, noun morphology is also a relevant linguistic feature of grammatical gender in Spanish in which nouns can also be classified based on their level of morphological marking. Most nouns in Spanish follow a canonical or prototypical pattern in which their respective morphology reveals their grammatical gender class, such that masculine nouns tend to end in /-o/ and feminine nouns tend to end in /-a/ (e.g., *el libro* "the-masc. book"; *la silla* "the-fem. chair") (Montrul et al. 2008). This morphologically prototypical group of nouns can be described as canonical or overt, with regards to their morphology.

### 2.2	Acquisition of grammatical gender

Acquiring the parameter of grammatical gender in language learning (L1 and L2) involves both the lexical level—by learning the meaning of a noun together with its inherent gender feature (gender assignment)—and the syntactic level—by learning to establish agreement between the noun and other elements in verb and noun phrases (gender agreement). Thus, it can be argued that learners of Spanish need to acquire the nominal feature of gender in their implicit mental grammar system before making valid form-function mappings (Alarcón 2011). Previous studies in L1 acquisition (Pérez Pereira 1991, Hernández Pina 1984) have confirmed that grammatical gender is acquired completely by around age three. Nonetheless, empirical research also shows that in L2 acquisition of Spanish, grammatical gender is persistently problematic and therefore is acquired relatively late in the L2 learning process (McCarthy 2008, Fernández-García 1999). Grammatical gender is also vulnerable to fossilization, or incomplete acquisition, resulting in permanent non-target-like forms, despite increasing overall L2 proficiency. Even advanced L2 learners display persistent errors with gender agreement, primarily in their spontaneous oral production (Montrul et al. 2008).

Contrary to Spanish, English does not have purely grammatical gender, only semantic (biological) gender, and thus English nouns do not display morphological marking for gender. Therefore, adult English-speaking learners of L2 Spanish must acquire a new parameter setting for nouns in their developing L2 system and then subsequently learn to map these newly acquired gendered nouns onto syntactic structures to produce agreement in noun and verb phrases (Montrul et al. 2008). The essential question then becomes if L2 learners of Spanish can acquire a parametrized functional feature (i.e., grammatical gender) that is not instantiated in their L1 (e.g., English) (Spino-Seijas 2017). Empirical evidence suggests that L2 learners whose L1 lacks grammatical gender generally find gender agreement more difficult to master than learners whose L1 has grammatical gender (Montrul et al. 2008), although there is some empirical evidence to the contrary (see: Bruhn de Garavito and White 2002). Given an L1 in which grammatical gender is not instantiated, such as English, L2 Spanish interpretation and production errors can be linked to the linguistic variables involved in grammatical gender assignment and agreement: gender class (masculine or feminine), domain of agreement (article, adjective), animacy (semantic/biological or grammatical/ arbitrary), and morphology (overt/canonical or non-overt/noncanonical) (Foote 2015, Alarcón 2011). The results of most previous research examining adult L1 English-speakers acquiring L2 Spanish suggest that production errors are more common for feminine nouns than for masculine, errors in agreement (syntactic level) are more frequent than errors in assignment (lexical level), and that errors with overtly marked nouns are much less common than errors with nouns that display non-overt or exceptional morphology (see: Spino-Seijas 2017, López Prego 2015, Gamboa 2012, Alarcón 2011, Montrul et al. 2008, Bruhn de Garavito and White 2002).

Several contradictions and gaps still remain from previous research on the acquisition of grammatical gender. For example, Alarcón (2009) found that L2 learners do not appear to process grammatical gender morphologically, whereas other studies (Foote 2015, Montrul et al. 2008) have shown that L2 learners actually perform better in both comprehension and production tasks with nouns that have overt morphological marking for gender (i.e., canonical nouns), thus indicating that L2 learners do in fact use noun morphology as a cue when processing and learning grammatical gender. With regards to gender class, López Prego (2015) found that L2 learners of Spanish were more sensitive to feminine nouns, while other studies have found that L2 learners tend to overgeneralize the masculine and erroneously apply it to feminine inanimate nouns (Gamboa 2012, Montrul et al. 2008). Grüter et al. (2012) found that assignment errors (as assessed by determiner choice) were ten times more frequent than agreement errors among L2 learners, which also supports the results of Alarcón (2011); however, these results contradict other empirical studies in which both L2 learners and HL speakers performed better with the lexical domain of grammatical gender (i.e., assignment) than they did with the syntactic domain (i.e., agreement) (e.g. López Prego 2015, Gamboa 2012).

Based on contradictions in previous research, this study closely examines the role that noun morphology, domain of agreement, and gender class may play in L2 learners'

recognition and production of Spanish gender. Moreover, previous studies have not considered learners' metacognitive awareness as an independent learner variable that may modulate linguistic competency and performance. Therefore, the present study examines metacognitive awareness scores to compare to both the written recognition and oral production of grammatical gender in L2 Spanish.

2.3 Metacognitive awareness and instructed L2 learning

The concept of metacognition is particularly relevant to adult language learners in the instructed context as it refers to the ability to reflect upon, understand, and control one's entire learning process and is comprised of different subcomponents, namely knowledge about cognition and regulation of cognition (Schraw and Dennison 1994). Because metacognition crucially involves both knowledge about and the regulation of cognition, its development uniquely prepares learners to be more strategic and ultimately perform better than their peers with less developed metacognitive awareness, as more metacognitively aware individuals are also more able to plan, sequence and monitor their learning in a way that can directly improve their performance (Schraw and Dennison 1994).

García Magaldi (2010) presents an account of language learning theories related to metacognition and their effects on learning outcomes, concluding that metacognitive knowledge compensates for low ability or lack of relevant prior knowledge and promotes the development of autonomous learners. Khodabakhshzadeh et al. (2017) examined the predictive power of three independent learner variables—creativity, metacognition and learning style—on foreign language achievement among Iranian English learners (N=122) and found metacognitive awareness (as assessed by Schraw and Dennison's MAI) to be the strongest predictor of academic achievement in English, as measured by final course grade. Similarly, Nosratinia et al. (2014) examined self-efficacy, metacognitive awareness, and language learning strategy use as three interrelated learner variables among university students (N=150) learning English as a foreign language and found a significant positive correlation between both self-efficacy and metacognitive awareness and also between metacognitive awareness and language learning strategy use.

Raoofi et al. (2013) review previous empirical research on metacognitive interventions in language learning, examining data from numerous studies (N=33) published between 1999 and 2013, and conclude that the more learners use metacognitive resources in their language learning, the more successful they are at performing language tasks. Empirical studies examining the effect of metacognitive training interventions on different language learning outcomes have reported a positive effect of metacognitive training on learner autonomy (Kissling and O'Donnell 2015, Victori and Lockhart 1995), depth and precision in self-correction (Kissling and O'Donnell 2015), listening comprehension (Vandergrift and Tafaghodtari 2010, Kohler 2002), vocabulary acquisition (Kohler 2002), and overall self-reported proficiency (Victori and Lockhart 1995).

We attempt to address several gaps left by previous research on the role of metacognitive awareness in language learning. Specifically, no objective measure of language proficiency (other than self-report), nor competency in a specific linguistic phenomenon, has been addressed, to our knowledge, by previous empirical studies examining the role of metacognition in adult second language acquisition. Implications for proficiency gains have been discussed by previous studies (Kissling and O'Donnell 2015, Nosratinia et al. 2014, Victori and Lockhart 1995), yet have not been empirically tested, and other studies have examined the effect of metacognition on comprehension (Kohler 2012, Vandergrift and Tafaghodtari 2010) and writing (Gorlewski and Annable 2012). However, as Raoofi et al. (2013) aptly note, there exists a gap in previous research on the effect metacognition may have on oral production. Therefore, the present study examines the effect that metacognitive awareness may have on both the recognition and oral production of grammatical gender, as both a specific morphosyntactic phenomenon and as an objective approximation of target language proficiency.

2.4   Research questions

In order to address gaps and inconsistencies in previous research on adult L2 acquisition of grammatical gender in Spanish as well as to explore the specific effect that metacognitive awareness may have on adults learning L2 Spanish in the instructed context, the present study is guided by the following research questions:

Question 1: What is the effect of each of the following linguistic variables on accuracy in grammatical gender in Spanish: domain, class, and morphological marking? Furthermore, what is the effect of task modality (written vs. oral) on grammatical gender accuracy?

Question 2: To what extent, if any, is metacognitive awareness correlated with performance with grammatical gender in Spanish and how does this compare to self-reported proficiency?

Question 3: If there is a correlation between metacognition and grammatical accuracy, how might this relationship change with task modality (written vs. oral) and with the various linguistic variables inherent to grammatical gender in Spanish?

3.   Materials and methods

3.1   Participants

L2 Spanish learners (N=24) who are native (L1) speakers of English and were enrolled in a university Spanish course at the time of the study were recruited to participate. All participants began learning Spanish after the age of 13 in order to focus on cases of late bilingualism as those most applicable to the university classroom context. Information on age, sex, current course level, instructional time with Spanish, age of onset (AO), other languages known (novice-level proficiency), as well as self-reported proficiency in

Spanish was collected from each participant in the language background questionnaire and this information is summarized in *Table 1*.

Table 1. Summary of participant data (N=24).

Age (yrs.)	Sex	Course Level	Instruction Time (months)	AO* (yrs.)	Other Languages Known	Self-reported proficiency**
M = 20.5 Range = 18-28 SD = 2.4	female = 15 male = 9 other = 0	Year 1 = 12 Year 2 = 9 Year 3 = 3	M = 28.0 Range = 6-126 SD = 27.5	M = 16.5 Range = 1-26 SD = 4.6	French = 9 Mandarin = 2 Hindi = 2 Arabic = 2 Other = 7	M = 48.8% Range = 21%-67% SD = 13.5%

*AO: age of onset: the age at which the participant first started learning Spanish.
**Self-reported proficiency: measured on a scale of 0 (no proficiency) to 6 (native-like) across reading, writing, speaking, and listening skills. Total score was calculated out of 24 possible points and converted to a percentage.

3.2 Tasks

Task 1 was the *Language Background Questionnaire,* which measures self-reported proficiency and collects general biographical information about each participant (see *Table 1* for a summary of this information) in a pencil-and-paper written questionnaire format.

Task 2 was the *Oral Picture Description Task*, which measures oral production of grammatical gender agreement between determiners (indefinite articles: un(MASC), una(FEM)) and nouns (Det-N) as well as between nouns and descriptive adjectives (N-Adj) in Spanish noun phrases. Task modality was used as a way to operationalize the distinction between cognitively online and offline language processing, in a similar way to that described by Skehan and Foster (1997), in which cognitively online tasks are those which are more spontaneous, more complex, and do not allow for planning time. Although this task was untimed, participants were instructed to respond as quickly as they could and received no planning time. Therefore, this oral picture description task can be used to access online language processing of grammatical gender, requiring the use of implicit/procedural knowledge. During this task, participants used the carrier phrase "Veo un/una [provided noun] + [participant generated adjective] (I see a Noun - Given adjective)" to describe a series of pictures presented in PowerPoint slides with their corresponding singular inanimate noun above each picture (to control for dialectical variation in lexicon). The target nouns (N=40), with no distractors, were distributed between masculine (n=20) and feminine (n=20), and between overt (n=20) and non-overt (n=20) and were presented in randomized order. The carrier phrase "Veo un/una…" appeared on the screen along with the corresponding noun above each picture and participants were provided with a list of relevant adjectives taken from their course

textbook (*Vistas*, 5th Ed.) to ensure that a lack of vocabulary knowledge did not prevent them from completing the task.

Task 3 was the *Metacognitive Awareness Inventory for Language Learning (MAILL)* questionnaire which is a language-oriented adaptation of the original Metacognitive Awareness Inventory (MAI) (Schraw and Dennison, 1994), designed to measure and quantify level of metacognitive awareness in language learning through 40 statements regarding knowledge about language learning and strategies. Participants were asked to rank how well each statement represented them personally as a language learner on a 5-point Likert scale of 1 (never) to 5 (always) in a paper-and-pencil written questionnaire format.

Task 4 was the *Written Gender Recognition Task* to measure recognition of grammatical gender agreement between determiners (definite articles: el(MASC), la(FEM)) and nouns (Det-N) as well as between nouns and descriptive adjectives (N-Adj) in Spanish verb phrases and was adapted from Montrul et al. (2008) and Alarcón (2011). The written gender recognition task serves as a means by which to access offline language processing of grammatical gender since this task allows for greater planning time, thus allowing participants to tap into their explicit/declarative grammar knowledge while they explicitly focus on form (given the binary forced-choice nature of the task). Participants were presented with forty sentences, with no distractors, and were instructed to choose the correct article and adjective between two options.

4.   Results

In both experimental tasks, the variables of domain of agreement (determiner vs. adjective), morphological marking (overtly-marked vs. non-overtly marked), gender class (masculine vs. feminine), as well as task modality (written vs. oral) were all found to variably modulate learner accuracy in grammatical gender, as shown in *Figure 1*. The results of a paired samples *t*-test demonstrate that the mean differences in scores are significant ($p < .001$) and exhibit the following decreasing order in effect size of each binary variable analyzed: morphological marking ($t(23) = 10.58$, $d = 2.16$) > task modality ($t(23) = 10.28$, $d = 2.10$) > gender class ($t(23) = 8.29$, $d = 1.7$) > domain of agreement ($t(23) = -7.97$, $d = -1.63$). Overall, learners were more accurate with overtly marked nouns than non-overtly marked nouns, performed better on the written task than on the oral task, were more accurate with masculine nouns than with feminine nouns, and demonstrated greater accuracy with adjective agreement than with determiner agreement. Therefore, L2 learners' accuracy with grammatical gender recognition and production is modulated to varying degrees by the linguistic variables inherent to grammatical gender in Spanish. Average scores, standard deviations (SD), *t* values, and relative effect sizes in standard deviations (Cohen's *d*) are presented in *Table 2*.
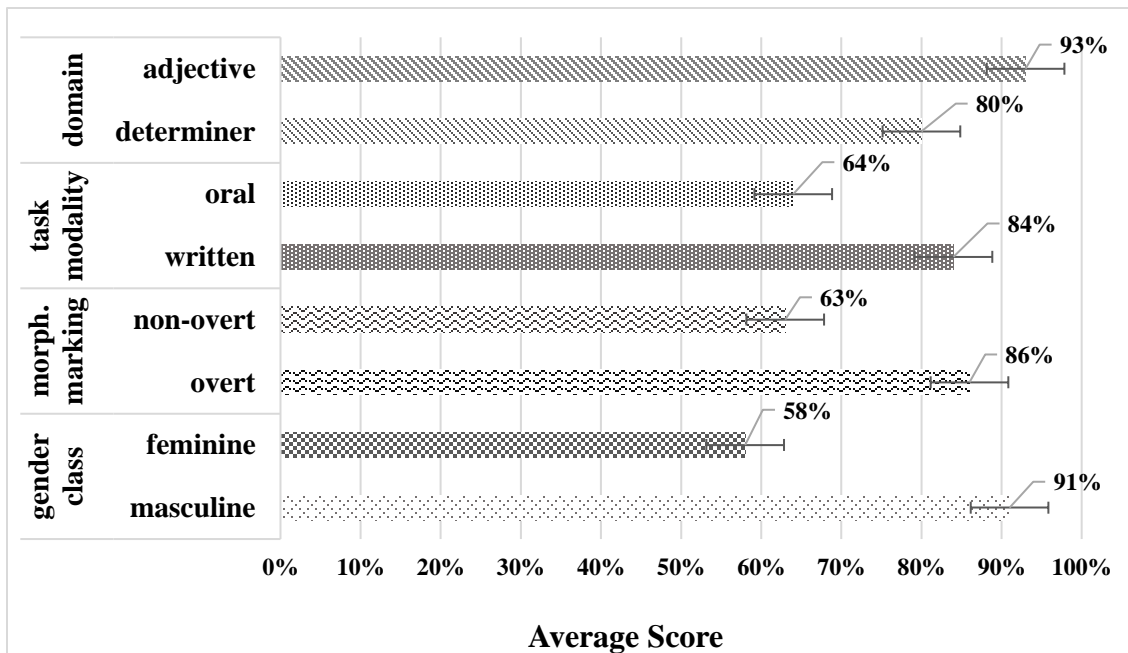
Figure 1. Descriptive summary of relative effect of each binary variable analyzed across both experimental tasks: gender class (masculine or feminine), morphological marking (overt or non-overt), task modality (written or oral), and domain of agreement (determiner or adjective).

Table 2. Average scores and standard deviations for each linguistic variable. Paired samples t statistic and Cohen's d (effect size in standard deviations) are provided for each binary variable pair ($p < .001$).

Linguistic variable	Avg. score	SD	Linguistic variable	Avg. score	SD	t	Cohen's d
Masculine	91%	6.59%	Feminine	58%	17.06%	8.29	1.691
Overt	86%	10.35%	Non-overt	63%	10.27%	10.58	2.159
Written	84%	8.92%	Oral	64%	10.91%	10.28	2.098
Adjective	93%	4.63%	Determiner	80%	7.02%	-7.97	-1.672

Metacognitive awareness demonstrated a moderate positive correlation ($r = .34$, $p = .05$) with accuracy in Spanish gender. Self-reported proficiency was also similarly positively correlated ($r = .31$, $p = .07$). Task modality (written vs. oral) was shown to modulate the positive effect of metacognitive awareness on gender accuracy in which a stronger positive correlation was observed during the written gender recognition task ($r = .33$, $p = .06$) than during the oral gender production task ($r = .28$, $p = .09$). With regards to the interaction between noun gender class (masculine vs. feminine) and metacognitive awareness scores, a moderate positive correlation was detected between metacognitive awareness and the combined (written and oral) feminine score ($r = .33$, $p = .05$). However, no correlation was detected with accuracy on masculine nouns. With regards to the effect

of morphological gender marking, results show a positive correlation ($r = .32$, $p = .06$) between the combined (written and oral) non-overt (i.e., no explicit gender marking on noun) scores and metacognitive awareness scores. However, a smaller and non-significant correlation ($r = .25$, $p = .12$) was found for accuracy with nouns that are overtly marked for grammatical gender. Finally, with regards to the relative effect of domain of agreement (i.e., determiner vs. adjective), moderate positive correlations were found between metacognitive awareness scores and written determiner scores ($r = .33$, $p = .05$), oral determiner scores ($r = .31$, $p = .05$), and combined (written and oral) determiner scores ($r = .35$, $p = .05$). However, no correlation was found between metacognition and adjective scores on either task. *Figure 2* illustrates how each linguistic feature variably modulates the effect that metacognitive awareness has on learner accuracy scores with grammatical gender. Overall, of the three linguistic variables analyzed, domain of gender agreement, gender class, and morphological marking appear to modulate the effect that metacognitive awareness has on the grammatical accuracy of L2 learners in the instructed context such that metacognition is more closely associated with feminine nouns, non-overtly marked nouns, and gender-inflected determiner use.
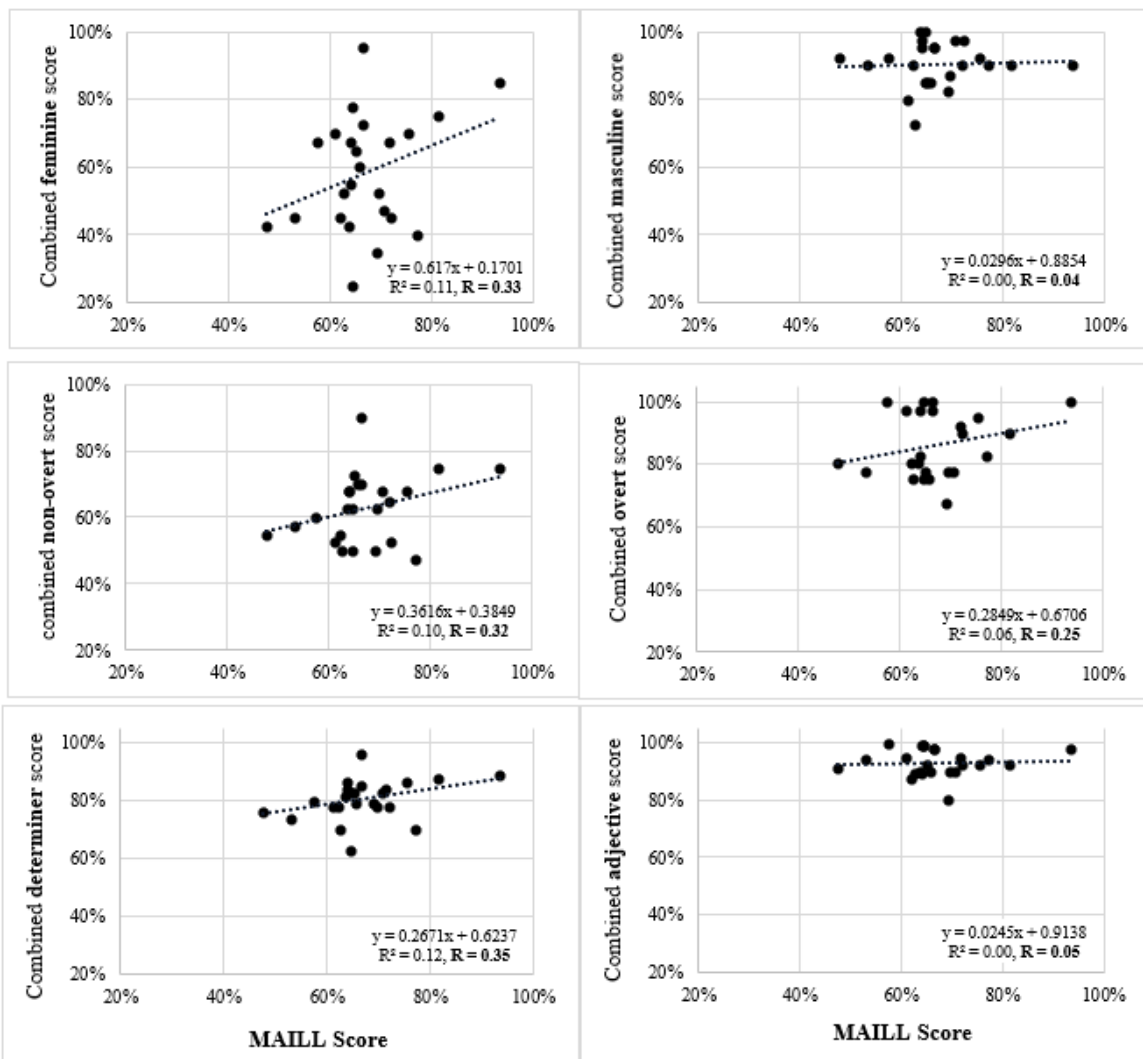
Figure 2. Scatterplot linear correlations demonstrating relative effect of noun gender class (feminine: *left*; masculine: *right*), morphological marking (non-overt: *left*; overt: *right*), and domain of agreement (determiner: *left*; adjective: *right*) on combined accuracy scores compared to metacognitive awareness scores (MAILL questionnaire).

5.   Discussion

The goal of the present study was to examine the nature of grammatical gender knowledge of adult native English speakers learning L2 Spanish in the instructed context in order to determine the effect of metacognitive awareness and self-reported proficiency as key learner variables in addition to the relative effects of domain, class, and morphology as linguistic variables inherent to grammatical gender. Furthermore, the effect of task modality—written vs. oral—was also investigated as an independent variable to explain some variation in learner accuracy scores as well as to examine the role of metacognitive awareness in L2 learning through the lens of explicit language knowledge, favored in offline processing during a structured written recognition task, as compared to implicit language knowledge, required for online processing during an unplanned oral production task.

With regards to our first research question concerning the effect of each linguistic variable and task modality, statistical analysis revealed that noun morphology, task modality, gender class, and domain of agreement all have significant and strong effects on L2 learner accuracy with grammatical gender in Spanish. In line with previous research examining the effect of gender class (e.g., Montrul et al. 2008), more errors were in fact observed with feminine than with masculine nouns. Gender class resulted in a 33% difference between the average accuracy on masculine and feminine nouns across both written and oral tasks combined. This finding can be explained by the Morphological Underspecification Hypothesis (McCarthy 2008) in which grammatical gender errors are proposed to be more common with one gender than the other due to the overgeneralization of a default form in the learner's mental grammar. The present data suggest that the masculine form is being treated as a default form that is overextended to feminine nouns. With regards to noun morphology, the results of this study support the idea that L2 learners are, in fact, using morphological marking as a cue for gender class assignment as they performed significantly better with overtly marked nouns than with non-overtly marked nouns on untimed oral and written tasks. These results contradict Alarcón's (2009) findings assessing L2 learners during timed grammatical gender tasks but do corroborate the results of other studies (e.g., Foote 2015, Montrul et al. 2008). With regards to domain, the findings of this study are consistent with those of Grüter et al. (2012) in which determiner errors were more frequent than adjective errors, a finding which also contradicts other previous studies (e.g., López Prego 2015, Gamboa 2012). It appears possible that, contrary to Alarcón's (2011) claim, L2 learners may not need to acquire the nominal feature of gender before making form-function mappings at the syntactic level. Although the late L2 learners in this study appear to understand how to operationalize grammatical gender at the syntactic level in the form of N-Adj. agreement, particularly during an offline task in

which they can employ their explicit grammatical knowledge, their performance with gender assignment, or more precisely, with gender-inflected determiner use, is still lagging significantly behind their performance with adjective agreement, likely because this assignment, which dictates determiner use, is arbitrary (no semantic component) and is not represented in their L1 (English).

A logical pedagogical implication of this finding is that gender assignment on Spanish nouns should be explicitly taught simultaneously as learners acquire new vocabulary knowledge so that the inherent gender of inanimate nouns is encoded in their lexical learning of the noun itself. Although most vocabulary lists appearing in the Spanish textbook to which participants in this study were exposed contained the gendered article (i.e., el or la, 'the.singular') along with the noun (so as to indicate the gender of the noun), learners are evidently not processing and/or retaining this connection between the new vocabulary word and its corresponding inherent gender assignment. The persistent errors observed in the sample, despite increasing instructional time and course level, point to potential fossilization in the domain of grammatical gender L2 knowledge. Therefore, adult L2 instruction should consider grammatical gender as a problematic area of morphosyntax and explicitly focus instruction on the specific forms that present the greatest challenge for adult L2 learners, namely, gender assignment as cued by the use of the appropriate gender-inflected determiner, particularly of non-overtly marked nouns and feminine nouns.

Finally, with regards to the effect of task modality as a means by which to examine the contrast between offline and online language processing, L2 learners performed better on the written recognition task than on the oral production task, as expected. This finding could be explained by the Missing Surface Inflection Hypothesis (Prévost and White 2000), which claims that L2 learners do, in fact, have the feature gender represented in their L2 grammars at an abstract syntactic level, but gender errors still occur due to an assembly or production problem or a computational difficulty during online processing (i.e., during unplanned oral production). The present results further corroborate those of previous studies that show a higher accuracy rate during (offline) structured written tasks than during (online) unplanned oral production tasks (e.g., Grüter et al. 2012, Sagarra and Herschensohn 2010).

With regards to our second research question concerning the effect of language proficiency and metacognitive awareness, metacognitive awareness turned out to be the learner variable that was most strongly correlated with grammatical gender accuracy, followed by self-reported proficiency. These results support those of previous studies that have found a positive correlation between metacognitive awareness and self-reported language proficiency (e.g., Vandergrift et al. 2006, Kohler 2002) as well as studies that have demonstrated a positive correlation between accuracy in grammatical gender and proficiency (e.g., Gamboa 2012, Alarcón 2009). In addition, the present study demonstrates a positive association between metacognition and an objective measure of proficiency (grammatical gender accuracy), which had not been previously investigated. Perhaps we can now add metacognitive awareness to the list of learner variables that show potential to affect L2 attainment in late learners. The positive correlation between metacognitive awareness scores and self-reported proficiency scores observed in this study indicates that they are potentially related constructs, suggesting that

metacognitive awareness may increase as proficiency increases, particularly in the instructed language learning context. Nonetheless, such a claim would require further research.

With regards to our third research question concerning how task modality and the linguistic features of grammatical gender would interact with metacognitive awareness, results showed a more pronounced correlation between metacognition and accuracy on the written recognition task than on the oral production task. This suggests that metacognition affects learners' declarative or explicit knowledge—accessible during offline written tasks, in which learners have sufficient time to process information—more than their procedural or implicit knowledge—needed during online/spontaneous tasks (Schraw and Dennison 1994). These results are consistent with previous studies that report learning gains as a result of metacognitive classroom activities (e.g., Kissling and O'Donnell 2015 Brooks and Kempe 2013) and further make an original contribution demonstrating this positive correlation with grammatical gender knowledge, as both a specific morphosyntactic phenomenon and as an objective measure of target language proficiency, that is variably modulated by task modality. Furthermore, to explore potential modulating effects of the linguistic features of grammatical gender, linear correlations were compared between metacognitive awareness scores and scores on each linguistic feature of grammatical gender. From the correlation matrix analysis, it was determined that gender class, domain of agreement, and morphological marking appear to modulate the effect of metacognitive awareness such that scores on feminine nouns, determiner agreement, and non-overtly marked nouns were positively correlated with metacognitive awareness scores. Nonetheless, ceiling effects were observed for combined masculine scores. These ceiling effects could possibly explain why metacognitive awareness is not correlated with scores on masculine nouns. Due to an observed overgeneralization of the masculine gender class as default, more learners tended to perform at ceiling with masculine nouns than with feminine nouns. However, if overgeneralization of the masculine class had not occurred or if the tasks themselves had been more demanding, greater variation in scores could potentially be observed for masculine nouns, allowing room for a potential effect of metacognitive awareness.

Based on the results of which forms produced the highest error rates, and the relative correlational results with metacognitive awareness scores, the findings of this study support the argument that if a structure is already quite acquirable by the L1 English speaker, differences in metacognitive awareness appear to not have much of an impact. However, metacognitive awareness appears to have a stronger effect on the L2 acquisition of those forms that are more difficult to acquire. A possible explanation for these findings is that enhanced metacognition has been shown to compensate for a lack of prior knowledge and ability (García Magaldi 2010), perhaps similarly to the way in which high motivation and aptitude can compensate for age effects in cases of late bilingualism (Hyltenstam and Abrahamsson 2003). Within this theoretical framework, it is understandable, then, that metacognitive awareness scores would be more strongly correlated with areas of grammatical gender knowledge that are most difficult for L1 speakers of English to learn. In other words, if a particular structure has an L1 counterpart or can somehow be generalized from L1 (as is the case with the overgeneralization of the masculine gender class as default), or if the structure in question displays a salient pattern

(as is the case with overt or canonical gender marking with /-o/ for masculine and /-a/ for feminine), nearly all learners exposed to formal instruction acquire this structure, even in the absence of awareness and regulation of their own L2 learning (i.e., metacognition). On the other hand, metacognitive awareness may help learners to become aware of problematic areas of L2 grammar, focus their attention on these specific areas, and employ strategies to help them overcome the various obstacles that learning a completely novel L2 structure presents (as is the case for non-overtly marked feminine nouns).

Furthermore, the task modality effect detected in this study shows that although metacognitive awareness is helpful overall for L2 grammar learning, its influence is most direct when learners have sufficient time to plan (i.e., offline language processing) and to explicitly focus on form during a written task, at least until their L2 knowledge becomes automatized. As this study demonstrates, the most problematic forms of grammatical gender in L2 Spanish include the correct gender-inflected determiner use, both determiner and adjective agreement with non-overtly marked nouns, and feminine nouns in general. It is precisely with these areas of L2 knowledge that metacognitive awareness is most strongly associated.

6. Conclusions

This study contributes to our understanding of how the L2 processing and learning of grammatical gender is variably modulated by both the linguistic variables inherent to grammatical gender and by metacognitive awareness as a learner variable of particular relevance to the instructed context. It also provides further evidence that learners do, in fact, use noun morphology as a cue when learning and producing gender, appear to have more trouble with determiner agreement, tend to overgeneralize the masculine form, and perform better during an explicit written task than during oral production. Furthermore, the present study tests a tool for measuring metacognitive awareness as it relates to adult language learning in the instructed context and demonstrates a positive correlation between a metacognitive awareness score and accuracy in a specific morphosyntactic phenomenon as an objective approximation of target language proficiency. Results demonstrate the particular role of metacognition in adult L2 learning as a factor more strongly associated with offline, explicit processing of language rather than online/spontaneous production. Finally, metacognitive awareness appears to improve accuracy with those forms of grammatical gender which are most difficult to acquire, possibly because learners with higher levels of metacognitive awareness are better able to notice problematic areas, focus their learning efforts, and employ effective strategies to overcome difficult linguistic forms of grammatical gender, namely, the domain of determiner agreement with feminine and non-overtly marked nouns.

Future research should examine the relationship between metacognition and another linguistic phenomenon as well as examine the effect of metacognitive consciousness-raising activities in the classroom environment to determine if and how a learner's level of metacognitive awareness can be increased through classroom intervention and what effect such intervention would have on target language proficiency. In addition, future work should examine a more robust and objective measure of

proficiency that goes beyond self-report and accuracy with grammatical gender. Overall, grammatical gender in Spanish provides a lens through which to analyze both the linguistic and learner variables that variably affect adult L2 learning of a morphosyntactic feature not instantiated in L1 and therefore reveals what factors should be considered in language pedagogy for adult learners. Metacognitive awareness appears to modulate accuracy with grammatical gender of those forms which are most difficult to acquire and, therefore, is an important skill worth developing in adult L2 instruction as it may lead to specific proficiency gains in problematic areas of morphosyntax.

References

Alarcón, Irma. 2009. The processing of gender agreement in L1 and L2 Spanish: Evidence from reaction time data. *Hispania* 92(4): 814–828.

Alarcón, Irma. 2011. Spanish gender agreement under complete and incomplete acquisition: Early and late bilinguals' linguistic behavior within the noun phrase. *Bilingualism: Language and Cognition* 14(3): 332–350.

Brooks, Patricia J., and Vera Kempe. 2013. Individual differences in adult foreign language learning: The mediating effect of metalinguistic awareness. *Memory and Cognition* 41(2): 281–296.

Bruhn de Garavito, Joyce, and Lydia White. 2002. The second language acquisition of Spanish DPs: The status of grammatical features. In *The acquisition of Spanish morphosyntax: The L1/L2 connection*, ed. Ana Teresa Pérez-Leroux and Juana Muñoz Liceras, 153–178. Dordrecht: Kluwer.

Fernández-García, Marisol. 1999. Patterns of gender agreement in the speech of second language learners. In *Advances in Hispanic linguistics: Papers from the 2nd Hispanic Linguistics Symposium*, ed. Javier Gutiérrez-Rexach and Fernando Martínez-Gil, 3–15. Somerville, MA: Cascadilla Press.

Foote, Rebecca. 2015. The production of gender agreement in native and L2 Spanish: The role of morphophonological form. *Second Language Research* 31(3): 343–373.

Gamboa, Arnold. 2012. The acquisition of grammatical gender in Spanish by English-speaking L2 learners. Master's dissertation, Purdue University.

García Magaldi, Lucía. 2010. Metacognitive strategies based instruction to support learner autonomy in language learning. *Revista Canaria de Estudios Ingleses* 61: 73–86.

Gorlewski, Julie, and Jill Annable. 2012. Research for the classroom: Becoming self-editors: Using metacognition to improve student's grammar knowledge. *The English Journal* 101(3): 89–91.

Grüter, Theres, Casey Lew-Williams, and Anne Fernald. 2012. Grammatical gender in L2: A production or a real-time processing problem? *Second Language Research* 28(2): 191–215.

Hernández Pina, Fuensanta. 1984. *Teorías psicosociolingüísticas y su aplicación a la adquisición del español como lengua materna.* Madrid: Siglo XXI.

Hyltenstam, Kenneth, and Niclas Abrahamsson. 2003. Maturational constraints in SLA. In *The handbook of second language acquisition*, ed. Catherine Doughty and Michael H. Long, 538-588. Malden, MA: Blackwell Pub.

Khodabakhshzadeh, Hossein, Mansooreh Hosseinnia, and Shaghayegh Rahimian. 2017. Learning style, metacognition and creativity as predictors of the foreign language achievement: A structural equation modeling approach. *Psychological Studies* 62(4): 377–385.

Kissling, Elizabeth M., and Mary E. O'Donnell. 2015. Increasing language awareness and self-efficacy of FL students using self-assessment and the ACTFL proficiency guidelines. *Language Awareness* 24(4): 283–302.

Kohler, Brian. 2002. The effects of metacognitive language learning strategy training on lower-achieving second language learners. Doctoral dissertation, Brigham Young University.

López Prego, Beatriz. 2015. The online use of markedness information in L1 and L2 Spanish gender agreement. Doctoral dissertation, University of Kansas.

McCarthy, Corrine. 2008. Morphological variability in the comprehension of agreement: An argument for

representation over computation. *Second Language Research* 24(4): 459–486.

Montrul, Silvina, Rebecca Foote, and Silvia Perpiñán. 2008. Gender agreement in adult second language learners and Spanish heritage speakers: The effects of age and context of acquisition. *Language Learning* 58(3): 503–553.

Nosratinia, Mania, Maryam Saveiy, and Alireza Zaker. 2014. EFL learners' self-efficacy, metacognitive awareness, and use of language learning strategies: how are they associated? *Theory and Practice in Language Studies* 4(5): 1080–1092.

Pérez Pereira, Miguel. 1991. The acquisition of gender: What Spanish children tell us. *Journal of Child Language* 18(3): 571–590.

Prévost, Phillipe, and Lydia White. 2000. Missing surface inflection or impairment in second language acquisition? Evidence from tense and agreement. *Second language research* 16(2): 103-133.

Raoofi, Saeid, Swee Heng Chan, Jayakaran Mukundan, and Sabariah Md Rashid. 2013. Metacognition and Second/Foreign Language Learning. *English Language Teaching* 7(1): 36–49.

Sagarra, Nuria, and Julia Herschensohn. 2010. The role of proficiency and working memory in gender and number agreement processing in L1 and L2 Spanish. *Lingua* 120(8): 2022–2039.

Schraw, Gregory, and Rayne S. Dennison. 1994. Assessing metacognitive awareness. *Contemporary Educational Psychology* 19(4): 460–475.

Skehan, Peter, and Pauline Foster. 1997. Task type and task processing conditions as influences on foreign language performance. *Language Teaching Research* 1(3): 185-211.

Spino-Seijas, Le Anne. 2017. Grammatical gender agreement in L2 Spanish: The role of syntactic context. Doctoral dissertation, Michigan State University.

Vandergrift, Larry, Christine M. Goh, Catherine J. Mareschal, and Marzieh H. Tafaghodtari. 2006. The Metacognitive Awareness Listening Questionnaire: Development and Validation. *Language Learning* 56(3): 431–462.

Vandergrift, Larry, and Marzieh H. Tafaghodtari. 2010. Teaching L2 learners how to listen does make a difference: An empirical study. *Language Learning* 60(2): 470–497.

Victori, Mia, and Walter Lockhart. 1995. Enhancing metacognition in self-directed language learning. *System* 23(2): 223–234.