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Imperfect Spanish Meanings Acquisition by Advanced Russian Learners. Evidence from Acceptability Judgments Data

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Abstract. This study explores the difficulties on grammatical representation descriptions of Spanish Imperfect meanings by 54 first language Russian learners of Spanish with advanced proficiency levels and a control group of 18 Spanish native speakers. The results from the on-line acceptability judgments task the participants carried out indicated that interpretations of aspectual meanings typical of the Spanish Imperfect had been formed in the non-native speaker's grammar. Moreover, a general tendency to over-accept non-adequate Preterite sentences was observed in non-native Spanish speaker groups. Furthermore, the findings revealed that progressive meaning represented a greater challenge for Russian learners of Spanish with upper-intermediate proficiency level, whereas at more advanced levels the perceptions of this meaning became closer to that of Spanish native speakers. However, the accuracy and sensitivity scores on lexical aspectual classes evidenced a persistent difficulty for non-native speakers in non-prototypical lexical-grammatical aspect combinations, which suggested a possible remaining effect of L1 transfer.
Keywords: Spanish Imperfect; tense-aspect acquisition; advanced Russian learners of Spanish; acceptability judgments

[es] La adquisición de los valores del pretérito imperfecto en español L2 en los juicios de aceptabilidad de estudiantes rusófonos de niveles avanzados de competencia

Resumen. El presente estudio explora las representaciones gramaticales de las interpretaciones aspectuales del Imperfecto en español que manejan 54 estudiantes rusófonos de español con niveles avanzados de competencia y un grupo control de 18 hablantes nativos de español. Los resultados de la prueba de juicios de aceptabilidad que realizaron los participantes revelan una formación estable de las representaciones de las interpretaciones aspectuales del Imperfecto en la gramática del hablante no nativo. Además, se observó una tendencia generalizada entre los grupos de español L2 a sobreaceptar enunciados no adecuados en Indefinido. Los resultados demuestran también que el significado progresivo del Imperfecto supone una especial dificultad para los estudiantes rusófonos de español de nivel intermedio-alto, mientras que en niveles más avanzados de competencia las representaciones de este significado aspectual se equiparan a las de los nativos. Sin embargo, los resultados del análisis de precisión y sensibilidad de la prueba, según el aspecto léxico del verbo, evidencian una dificultad persistente entre los hablantes no nativos frente a combinaciones no prototípicas de aspecto léxico y aspecto gramatical; este fenómeno sugiere un posible efecto de transferencia de la L1.
Palabras clave: pretérito imperfecto español; adquisición tiempo-aspecto; estudiantes rusófonos de español; juicios de aceptabilidad

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1. Introduction

Tense–aspect and modality system (TAM) is a grammatical phenomenon of interest both for Theoretical Linguistics (Arche, 2006) as well as for Language Acquisition (Labeau & Saddour, 2012) and, especially, Second Language Acquisition (SLA) (Salaberry & Comajoan, 2013; Salaberry & Shirai, 2002).

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Research carried out in this area has gathered a substantial amount of evidence that pinpoints the intrinsic difficulty of the non-native acquisition of TAM systems (Ayoun & Rothman, 2013; Howard & Leclercq, 2017). Although the nature and scope of ultimate attainment in second language (L2) acquisition remains an open question (Salaberry, 2018), it is beyond doubt that mastery of tense, aspect, and modality is a challenging task for initial and intermediate L2 learners (Montrul, 2004; 2008). Learners' first language (L1) and parametric variation are the most likely candidates for explaining the nature of this process (Kempchinsky & Slabakova, 2005; among others). Several authors have confirmed an L1 effect in the interpretation and use of aspectual information throughout the development of non-native languages (Montrul & Slabakova, 2002, 2003; Gabriele, Martohardjono & McClure, 2005). Additionally, it has been noted that to have grammaticalized aspect in the L1 might be a facilitating factor for the acquisition of aspect marking in the L2 (Roberts & Liszka, 2013). Besides, universal trends have been observed in the acquisition of tense-aspect morphology that reveal the influence of factors, such as the semantic properties of the verb and the narrative structure of discourse (Shirai, 2004).

Full mastery of past tenses and, more specifically, of the aspectual distinction between Imperfect and Preterite is a persistent problem throughout all competence levels of L2 Spanish (Comajoan, 2014; Sanz, 2015). Production and interpretation of these verb tenses pose a challenge for non-native Spanish speakers that continues up to advanced levels (Cadierno, 2000; Domínguez, Tracy-Ventura, Arche, Mitchell & Myles, 2013; Diaubalick & Guijarro-Fuentes, 2016), even among learners with typologically related L1s, such as French and Portuguese (Amenós-Pons, Ahern & Guijarro-Fuentes, 2019; Salaberry, 2005).

This study focuses on the acquisition of Spanish Imperfect by Russian learners of Spanish at advanced proficiency levels. Although several studies have addressed this issue (Gorbova, 2017; Molkova, 2017), they have not focused solely and systematically on the meanings of the Imperfect. Given the more complex aspectual structure of imperfective aspect (Doiz, 2002), as well as the differences between Russian and Spanish coding of meanings associated with it, the results of our research will help gain a more fine-grained description of the nature and development of L2 tense-aspect representations.

2. Coding (of) Imperfective interpretations/meanings in Spanish and Russian

Previous definitions of Aspect (Bary, 2009; Klein, 1994; Smith, 1991) do not include a reference to specific languages, but rather a reference to the speakers' resources and/or abilities: "aspect concerns the different perspectives which a speaker can take and express concerning the temporal course of some event, action, process, etc." (Klein, 1994, p. 16). Instead, the description of Grammatical Aspect includes a reference to the aspectual meanings encoded by the inflectional morphology of specific languages (Slabakova, 2016).

AspP is a functional category that contains information which becomes essential to fully interpret the VP since "[n]o sentence meaning is complete without taking the functional and especially, the inflectional morphology contributions into account" (Slabakova, 2018, p. 382). This information is combined with the aspectual semantic properties of verbs (see the Vendlerian classification into four classes of verbs: states, activities, accomplishments, and achievements). The aspectual structure of an event is defined by the interaction between grammatical and lexical aspect.

Grammatical aspect is conveyed by perfective and imperfective morphemes (see, among others, Smith, 1991). While perfective morphemes mark the [+perfective] feature, the imperfective ones are used for marking [+progressive], [+habitual] and [+continuous] features (Kempchinsky & Slabakova, 2005). By default, the imperfective aspectual view focuses on the internal structure of the situation and is not concerned with its beginning or its end. All three imperfective meanings stem from this primary aspectual view. In this study, it is assumed that every imperfective feature activates a matching imperfective meaning (Bertinetto, 1994; Comrie, 1976) (an alternative classification of imperfective aspectual classes is provided in Dahl [1985] and Bybee, Perkins & Pagliuca [1994]).

Such meanings are conveyed by specific morphological verb markings in both Spanish and Russian. In Spanish, all three imperfective interpretations can be expressed by Imperfect verbal forms (García Fernández, 1998); while in Russian, it is imperfective verb forms that convey these meanings (Maslov, 1985) (for a detailed explanation of the Russian verbal system and, in particular, of Russian aspectual pairs, see Bondarko [1971] and Forsyth [1970]). We assume an a priori correspondence between the verbal systems of the two languages whereby "Spanish imperfect and Russian imperfective refer to the same phenomenon" (Borik & González, 2001). As illustrated in Table 1, Russian Imperfective forms can have all the three readings of Spanish Imperfect, i.e., habitual, progressive, and continuous (note that for this study, we do not address perfective meaning(s) and focus solely on imperfective meanings). Spanish Imperfect forms may express the repetition of a certain event that constitutes a habit for the subject (Martínez-Atienza, 2004). Such perception of the event is encoded by the past imperfective form *igrat'* ('to play'). As can be seen in the example in Table 1, and in contrast to Spanish, there is no Russian equivalent of the periphrasis *soler* + infinitive ('use to') to express habitual meanings.

As far as progressive Imperfect is concerned, morphological marking indicates that "an event is dynamic over the event frame (Chung & Timberlake, 1985, p. 219). A progressive reading implicitly imposes a dynamic reading of the event. In Spanish, the combination of progressive periphrasis (*estar* + gerund) with stative verbs is either ungrammatical, (1), or yields an unnatural reading, (2), (Carrasco Gutiérrez, 2017), whereby aspectual

coercion affects the stative features of the verb (aspectual shift is not possible with all state verbs, only with those expressing a complex feature of the Subject [Moreno Cabrera, 2003]) and forces a dynamic interpretation (see De Swart, 1998):

(1) *Estoy sabiendo matemáticas.
'I'm knowing mathematics'.
(2) ?Te estoy amando locamente.
'I'm loving you madly'.

There is no equivalent progressive periphrasis in Russian and, consequently, these combinatory constraints do not emerge explicitly. In Russian, the imperfect forms of dynamic predicates, such as activities and accomplishments, take on a progressive interpretation. Instead, when these forms are combined with non-dynamic predicates (e.g., states), the resulting interpretation is the continuous meaning. This meaning is usually characterized in terms of density, a feature typical of static predicates, as claimed by Smith: "[W] hen a state holds for a certain period of time, the whole schema is true every moment" (1991, p. 37). Particularly, Mair (2012, p. 808) points out that continuous meaning is the prototypical interpretation for predicates for which there is no limited duration, no change in intensity, and usually no conscious control. Stative predicates, therefore, are the natural option for continuous meanings. On this matter, Arche (2006) points out that "when the predicate is stative, like tener una casa [to have a house], it cannot be understood as an eventuality in progress or as usual. In this case, the imperfect form corresponds to the imperfect continuous" (p. 160). However, as Arche (2006) also points out, although continuous imperfect typically appears with states, eventive predicates are not completely excluded:

Table 1. Characteristics of aspectual meanings in Spanish and Russian.

Meaning	**Spanish**	**Russian**
Perfective	Preterite Mónica pidió$_{3.sing.pret}$ una revisión del examen Mónica asked-for a review of-the exam 'Mónica asked for a review of the exam'.	Perfective verbal forms Monika poprosila$_{fem.sing.perf}$, pereproverit' resultaty eksamena. Monika asked-for revise results exam 'Monika asked for a review of the exam.'
Imperfect Habitual	Imperfect / Periphrasis (soler + infinitive) Serguei jugaba$_{3.sing.imp.}$ / solía$_{3.sing.imp.}$ jugar al ajedrez de pequeño. Sergei played used play to-the chess of child 'Sergei played chess as a child'.	Imperfective verbal forms Sergei igral$_{masc.sing.imperf}$, v shakhmaty v detsve Sergei played to chess in childhood 'Sergei played chess as a child'.
Imperfect Progressive	Imperfect / Periphrasis (estar + gerund) Pável corregía$_{3.sing.imp.}$ /estaba$_{3.sing.imp.}$ corrigiendo los exámenes. Pável corrected / was correcting the exams 'Pável was correcting the exams'.	Imperfective verbal forms Pavel proveria$_{masc.sing.imperf}$, eksameny Pavel corrected exams 'Pavel was correcting the exams'.
Imperfect Continuous	Imperfecto Carlos estaba$_{3.sing.imp.}$ enfermo en casa. Carlos was sick at home 'Carlos was sick at home'.	Imperfective verbal forms Karlos bolel$_{masc.sing.imperf}$, doma Carlos was-sick at-home 'Carlos was sick at home'.

As previously noted, the aspectual structure of a VP is highly complex since it involves not only inflectional morphology and lexical aspect of the verb, but also several peripheral elements, such as temporal adverbs. The presence of temporary adjuncts may trigger changes in the interpretation of the imperfective aspect, as shown in the example in Spanish in (3a), adapted from Martínez-Atienza (2004):

(3a) María pintaba$_{3.sing.imp}$ corazones en la pared [durante la siesta].
María painted hearts on the wall [during the nap].
(3b) María risovala $_{fem.sing.imp.}$ serdečki na stene [vo vremja siesty].
María painted hearts on wall [in time nap].
'María painted hearts on the wall [during the nap]'.

The absence of the temporary adverbial complement favours the continuous meaning of the VP in Imperfect. The event expressed by *pintar corazones* ('painting hearts') is interpreted as a typical feature of María; the predication about María holds for every moment of the situation as a whole (Cipria & Roberts, 2000). On the other hand, if we add the time interval 'during the nap', the habitual reading of the imperfect emerges, and the event *pintar corazones*

(‘painting hearts’) becomes a recurring situation that repeats itself an indefinite number of times. Due to the compositional nature of aspect, this variation in the interpretation of imperfective readings is a constant across languages, as demonstrated by the Russian counterparts of the Spanish example in (3b).

Despite the similarities, meaningful differences are observed in the comparison between Russian and Spanish regarding the encoding of the aspectual information of a situation. These differences are essential if we want to reach a detailed and complete interpretation of the development of non-native grammars.

2.1. Cross-linguistic differences between Spanish and Russian tense-aspectual systems

Contrastive studies on Russian and Spanish Tense-Aspect systems (Gorbova, 2017; Guzmán Tirado & Herrador del Pino, 2000; Westerholm, 2010) have identified some areas of disagreement in the correspondence between Spanish Imperfect forms and Imperfective Russian verbs. The presence of the factual imperfective in Russian, by which the event or situation is expressed as a statement of fact, is probably the most relevant (Padučeva, 1996; Groenn, 2003). The meaning of the Russian factual imperfective, (4a), is in contrast to the perfective reading of perfective verbs, which is the default option:

(4a) Anton pokupal$_{\text{masc.sing.imperf.}}$ vino na užin.
Anton bought wine to dinner.
‘Anton bought wine for dinner’.
(4b) Anton kupil$_{\text{masc.sing.perf.}}$ vino na uzhin.
Anton bought wine to dinner.
‘Anton bought wine for dinner’.

The perfective perspective of the event in (4b) focuses on its endpoint (Smith, 1991). The result of *kupit* (‘to buy’) has a prominent value in the description of the event. Instead, imperfective verbs in this context, (4a), only highlight that the action has taken place (Zaliznjak & Šmelev, 2015, p. 45). Spanish does not encode this distinction in the verbal form. Therefore, these two meanings correspond to a single equivalent in Spanish with the perfective aspect verb: *Antón compró vino para la cena* (‘Anton bought wine for dinner’).

Another difference between Spanish and Russian aspectual systems involves the distribution of perfective and imperfective forms into lexical aspect classes. As noted by Slabakova and Montrul (2002), in Spanish all four lexical aspect classes can be expressed with Imperfect and Preterite. In Russian, however, the relationship between grammatical aspect and the lexical aspect classes is not so straightforward due to the very structure of the verbal system (Braginsky & Rothstein, 2008):

(5a) La televisión costaba$_{\text{3.sing.imp,}}$ / costó$_{\text{3.sing.indef.}}$ unos seiscientos euros. [state]
The televisor cost a six hundred euros.
(5b) Televisor stoil$_{\text{masc.sing.imperf.}}$ / –-– okolo šestisot evro.
Televisor cost. near six hundred euro.
‘The TV set cost about six hundred euros’.
(6a) Gloria Fuertes escribía$_{\text{3.sing.imp,}}$ / escribió$_{\text{3.sing.pret.}}$ libros infantiles. [activity]
Gloria Fuertes wrote books children’s.
(6b) Gloria Fuertes pisala $_{\text{fem.sing.imperf.}}$ / *napisala$_{\text{fem.sing.perf.}}$ detskie knigi.
Gloria Fuertes wrote children’s books.
‘Gloria Fuertes wrote children’s books’.
(7a) Raúl se leyó$_{\text{3.sing.pret.}}$ / se leía$_{\text{3.sing.imp.}}$ el libro con mucho interés. [accomplisment]
Raul read the book with lot interest.
(7b) Raúl čital$_{\text{masc.sing.imperf.}}$ / pročital$_{\text{masc.sing.perf.}}$ knigu s bol’šim interesom.
Raul read book with great interest.
‘Raul read the book with great interest‘.
(8a) Cuando llegué$_{\text{1.sing.pret.}}$ / llegaba$_{\text{1.sing.imp.}}$ a casa me llamaron de la oficina. [achievement]
When arrived at home I=OBJ called of the office.
(8b) Kogda prikhodil$_{\text{masc.sing.imperf.}}$ / prišol$_{\text{masc.sing.perf.}}$ domoj mnie pozvonili iz ofisa.
When arrived at-home I=OBJ called from office.
‘When I got home, they called from the office’.

The examples in (5a)-(8b) illustrate how the grammatical aspect is encoded in Spanish and Russian. In Spanish, past tenses encode grammatical aspect using inflectional morphology, be it Preterite or Imperfect. In Russian, since each verb bears a default grammatical aspect (Schmiedtová & Flecken, 2008), the perfective/imperfective view shift is realized in the aspectual pairs.

Thus, Russian has two verbal forms for one form in Spanish. The Spanish verb *beber* (‘to drink’) corresponds to Russian imperfective verb *pit’* (‘to drink’) for the in-process view of the action and the perfective verb *vypit’* for

the resultative event view of the action. Prefixation is one of the most productive mechanisms for forming aspectual pairs in Russian. Many perfective verbs are created from imperfect simple verb forms (Padučeva, 1990), as in the previous examples.

Examples (7a-7b) and (8a-8b) show how telic events, that is, those that include an endpoint, present a similar behaviour in both languages. Although the perfective view is preferred, a combination with an imperfective view (Spanish Imperfect and Russian imperfective verb) is also possible. In (7), the accomplishment predication referring to a single situation in imperfective "denotes a situation only partially realized at the point of focus" (Mehlig, 2007, p. 269), i.e., a processual reading. With achievements, as in (8), the imperfective view can project a conation meaning, focused on the beginning state of the action (Hedin, 2000).

Correspondingly, cross-linguistic differences are attested in atelic verbs. While activities in Spanish (6a) are variable concerning aspectual view shifting, in Russian (6b) activities usually reject perfective tenses/verbs (Padučeva [1996], among others, identifies a subgroup of descriptive predicates (*Delimitativ*), which includes imperfect verbs and the prefix *po–*, and perfective activities with the meaning of doing the activity for a time. (For a detailed description of this type of activities, see Braginsky and Rothstein [2008]). This is because verbal prefixes, rather than complements, set the aspectual interpretations in Russian (Slabakova, 2005). Since state verbs do not have an eventual structure, they are only realized in the imperfective form (Petrukhina, 2000; Zaliznjak & Šmelev, 2015). The perfective view of a state-predicate, which is legitimate in Spanish, (5a), occasionally entails changes in verb meaning (Morimoto, 1998, Martínez-Atienza, 2017). For instance, in (5a), Preterite *costó* is interpreted as 'the TV was bought', but the use of Preterite may also signal (only) the end of the referred state, without implying a change in verb meaning, as in (9a). Such flexibility in Spanish state verbs presents, nonetheless, several restrictions marked by the semantic properties of verb arguments (10a):

(9a) El niño pesaba$_{3.sing.imp.}$ / pesó$_{3.sing.pret.}$ tres kilos.
The baby weighed three kilos.
(9b) Rebionok vesil$_{masc.sing.imperf.}$ / –-– tri kilogramma.
Baby weighed three kilo.
'The baby weighed three kilos'.
(10a) El artículo contenía$_{3.sing.imp.}$ /*contuvo$_{3.sing.pret.}$ información útil para nuestra investigación.
The paper contained information useful for our research.
(10b) Statja soderžala$_{fem.sing.imperf.}$ / –-– poleznuju informatsiju dlja našego issledovanija.
Paper contained useful information for our research.

'The article included useful information for our investigation'.

These examples illustrate the high complexity of aspectual systems, affected by a set of elements encoding aspectual information, and guiding different interpretations. Both this complexity and the cross-linguistic differences that arise as a result of different feature bundles crucially determine the nature of the development of TAM systems (Li & Shirai, 2000). Surprisingly, little research has been devoted to tracking L1 effects (Slabakova, 2002, p. 186). Allegedly, the results of this study might help identify and discuss the influence of L1 Russian in the acquisition of past systems in L2 Spanish.

2.2. The Spanish Imperfect in second language acquisition

The acquisition of the imperfective/perfective contrast is a complex phenomenon of great interest to both SLA researchers and language teachers (Comajoan, 2014; Rothman, 2008). Many studies have pointed out that, given its complex aspectual structure and the resulting range of meanings, imperfective forms seem more difficult to acquire (Arche, 2014; Ayoun & Salaberry, 2005; Doiz, 2002; Salaberry, 2011). Compared to the robust findings of the perfective aspect, there are to date fewer studies on imperfective and the available ones have examined a limited array of data (Bardovi-Harlig, 2005).

In Spanish past tense acquisition, the existing results on the mastery of Imperfect are contradictory. Findings from data production studies do show native-like attainment in advanced proficiency levels (Amenós-Pons, Ahern & Guijarro-Fuentes, 2017; Cadierno, 2000; Domínguez et al., 2013; Salaberry, 2011). Non-native speakers maintain the prototypical associations between grammatical and lexical aspect (i.e., telic verbs appear mostly in Preterite and atelic verbs in Imperfect) also found in the production of native speakers (Tracy-Ventura & Cuesta Medina, 2018). Such findings confirm the validity of the Distributional Bias Hypothesis (Shirai, 2004), but fail to provide conclusive evidence about mastery of less prototypical combinations, such as state-predicates in Preterite.

However, data from judgments and interpretation tasks do not show such limitations. The fact that stimuli can be manipulated ensures a balanced exposure to all possible aspectual combinations. Studies analyzing experimental data on the Imperfect/Preterite contrast did not find differences between L2 Spanish advanced speakers and native speakers (Montrul, 2008; Montrul & Slabakova, 2003; Slabakova & Montrul, 2002). This suggests that L2 speakers can reset the way aspectual meanings are mapped from one language onto another. Despite this, other studies reported on

differences on the accuracy levels of L2 advanced learners and native speakers that are usually attributed either to the influence of the L1 (Amenós et al., 2017; Diaubalick & Guijarro-Fuentes, 2019; Díaz, Bel & Bekiou, 2008) or to the effect of explicit instruction (Rothman, 2008). Furthermore, when the study focused exclusively on the acquisition of Spanish imperfect meanings, differences among native and non-native groups emerged steadily (Domínguez, Arche & Myles, 2018; Salaberry, 2013; Salaberry & Martins, 2015).

The study by Salaberry (2013) addressed the representations of advanced learners of Spanish with respect to event iteration, i.e., the habitual and iterative meanings expressed by the Imperfect and Preterite, respectively. The results of his judgments task showed that L2 speakers have difficulties in discriminating aspectual nuances between habitual and iterative meanings. In the same vein, the judgments task in the study by Salaberry and Martins (2015) also included adverbially-qualified sentences. Their results confirmed that L2 speakers show a clear preference for Imperfect forms irrespectively of the restrictions imposed by the adverbial expressions. In both cases, the results indicated persistent difficulties in the acquisition of Spanish Imperfect meanings by non-native speakers.

The study by Domínguez et al. (2018) analyzed the oral productions and interpretations of English-speaking learners of Spanish with three proficiency levels. The results of a Sentence-Context Preference Matching Task showed how it is easier for the Intermediate level group to accept grammatical items than to reject ungrammatical stimuli. Particularly, they showed difficulties in rejecting Preterite forms for continuous and progressive meanings. Conversely, advanced learners showed native-like performance in the acceptance of grammatical items. However, their answers differed significantly from those of native speakers in the case of continuous readings. More specifically, "advanced learners have more problems abandoning perfective morphology than accepting the Imperfect in continuous contexts" (Domínguez et al, 2018, p. 450). The results demonstrated that, for all three meanings, the tendency to accept imperfect forms increases with proficiency levels.

Taking this into consideration, this study aims to describe and to analyze the grammatical representations of the Spanish Imperfect meanings of L1 Russian learners with advanced proficiency levels. Accordingly, the following research questions were formulated:

RQ1: To what degree do L1 Russian learners of Spanish master the interpretation of the different aspectual meanings of Spanish past imperfect?

Considering previous research, we expect high levels of accuracy in the responses provided by L2 learners, especially in the acceptance of Imperfect forms. Conversely, lower accuracy levels are expected in the rejection of Preterite forms, especially, in continuous readings in Imperfect. We assume that if Aspect is grammaticalized in the L1, this may, to some extent, facilitate the acquisition of aspect marking in the L2 (Diaubalick & Guijarro-Fuentes, 2019; Díaz, Bel & Bekiou, 2008).

RQ2: How do combinations of lexical and grammatical aspect affect the correct interpretation of the Spanish Imperfect meanings in the judgments of L2 speakers of Spanish?

As has been pointed out, non-prototypical lexical-grammatical aspect combinations usually pose a difficulty for L2 speakers. In this sense, we expect that, at intermediate levels, Imperfect forms of telic verbs will show low levels of acceptance, though gradually L2 behaviour will resemble that of native speakers.

3. Methodology

In order to describe Spanish L2 learners' representations of Imperfect aspectual meanings, an on-line acceptability judgments task was designed. The collected data on L1 Russian learners of Spanish was then analyzed to examine which conditions play a crucial role in the acceptance and rejection of sentences containing Imperfect meanings, as well as in the accuracy index measured in terms of specificity and sensitivity.

3.1. Participants

The present study was conducted at Saint Petersburg State University (Russian Federation). The participants were 54 L1 Russian learners of Spanish, distributed into three groups according to their proficiency level in Spanish. They were all current or former students majoring in Spanish in the Romanic Languages and Translation Department. A control group of 18 Spanish native speakers also participated in the study. The control group comprised Spanish-Catalan adult bilinguals – with Spanish being their dominant language – in Barcelona, who did not hold a degree in Linguistics or any related fields of study.

A sociolinguistic questionnaire adapted from the LEAP-Q questionnaire (Marian, Blumenfeld & Kaushanskaya, 2007) was administered to Russian learners of Spanish to determine their proficiency level in the L2. They were classified into three proficiency levels –i.e., upper-intermediate (UPINT), advanced (ADVN), and proficient (PROF)– according to the number of years of formal instruction they had received in Spanish and to their DELE (Diploma de Español como Lengua Extranjera) language proficiency certificate issued within less than two years at the time of data collection. Table 2 summarizes the main characteristics of the participant groups in the study:

Table 2. Characteristics of participant groups in the study.

Group	N	Chronological age M (min-max)	Years of formal instruction M (SD)	Language proficiency certificate DELE
UPINT	18	20.6 (19 – 22)	3.8 (1.27)	100%
ADVN	18	23.6 (22 – 26)	6.2 (1.23)	100%
PROF	18	29.8 (23 – 55)	11.5 (2.37)	44%
NAT	18	32.7 (28 – 56)	NA	NA

Note: UPINT = upper-intermediate; ADVN = advanced; PROF = proficient; NAT = Spanish native speakers.

As shown in Table 2, the UPINT and ADVN groups were more homogeneous than the PROF group in relation to their chronological age and amount of formal instruction in Spanish. The UPINT and ADVN groups were third-year undergraduate students and first-year MA students, respectively. Both official certifications in Spanish –DELE B2 for UPINT students and DELE C1 for ADVN students– were a compulsory requirement to follow their studies. In the case of the PROF group, the participants were PhD students with the DELE C2 certificate, former students, and current lecturers in Spanish, all of them from Saint Petersburg State University. Those participants who did not have the official DELE certificate were rated as proficient L2 speakers based on the fact their careers were continuously linked to Spanish, either as university lecturers, translators, or as tour guides. All L2 learners reported knowing other foreign languages, mainly English and French, and 86% of them considered Spanish to be their dominant foreign language as stated by their self-reported proficiency level in the questionnaire.

3.2. Task design and procedure

Participants carried out an acceptability judgments task (AJT) consisting of 60 stimuli (36 experimental items and 24 distractors). The experimental sentence items were balanced across three sets according to their Imperfect aspectual meaning. In total, three subsets of 12 items were devised, each subset focusing on either continuous (CONT), progressive (PROG) or habitual (HAB) meaning. Within each subset, and in order to provide a detailed picture of the L2 speakers' knowledge regarding these aspectual meanings, half of the sentences were adequate and the other half non-adequate (Spinner & Gass, 2019). To create non-adequate sentences the Imperfect tense verbs were replaced with Preterite verbs. Each adequate/non-adequate sentence pair was fully or highly lexically matched, whereby the members of each sentence pair only differed in the inflection of the main verb (see examples 11a-13b below). Therefore, Imperfect tense verbs made adequate sentences, whereas Preterite verbs clashed with Imperfect meanings, resulting in odd and less adequate interpretations:

(11a) Lucía de pequeña tenía$_{3.sing.imp.}$ unos increíbles ojos azules. [CONT]
Lucia of young had a incredible eyes blue.
(11b) ?Lucía de pequeña tuvo$_{3.sing.pret.}$ unos increíbles ojos azules.
Lucía of young had a incredible eyes blue.
'As a child, Lucía had incredible blue eyes'.
(12a) La presidenta leía$_{3.sing.imp.}$ el discurso mientras los periodistas tomaban$_{3.pl.imp.}$ notas. [PROG]
The president read the speech while the journalists took notes.
(12b) ?La presidenta leyó$_{3.sing.pret.}$ el discurso mientras los periodistas tomaban$_{3.pl.imp.}$ notas.
The president read the speech while the journalists took notes.
'The president was reading / read her speech while the journalists were taking notes'.
(13a) De joven Paco conducía$_{3.sing.imp.}$ muy rápido; le encantaba$_{3.sing.imp}$ la velocidad. [HAB]
Of young Paco drove very fast; He=OBJ loved the speed.
(13b) ?De joven Paco condujo$_{3.sing.pret.}$ muy rápido; le encantaba$_{3.sing.imp}$ la velocidad.
Of young Paco drove very fast; He=OBJ loved the speed.
'In his youth Paco was driving / drove very fast. He liked speeding'.

As mentioned above, the combination of adequate and non-adequate items in the AJT allowed for gauging the participants' knowledge of Imperfect meanings and their formal realization through inflectional verbal morphology. The AJT design also controlled for the length and the location of the critical region of the stimuli within each subset. The PROG and HAB items were usually created from complex sentences, as more context was needed in order to avoid potential ambiguous interpretations. Consequently, the PROG and HAB stimuli were longer than the CONT items. Moreover, lexical aspectual class was manipulated in each subset. For CONT meaning, all the chosen verbs were state predicates, due to the strong semantic link between these two properties of the verb. For PROG and HAB meanings, atelic verbs (activities) as well as telic verbs (accomplishments and achievements) were selected under the events category. In sum, three conditions were manipulated when designing the AJT: the verbal form which distinguishes between adequate and non-adequate items, lexical aspect and aspectual meaning.

Concerning distractors, they were similar in length and in the proportion of adequate vs. non-adequate stimuli to the experimental items. The mismatches in the non-adequate sentences involved problems with functional words, such as articles and pronouns, or functional morphology, such as verbal mood selection.

To avoid participants' response bias due to lexical imprecisions or lack of contextual information, which constitutes a widespread threat in this type of data elicitation technique (Gass & Mackey, 2011), the task was piloted with a group of eight native Spanish experts in teaching Spanish as a foreign language. In addition to carrying out the AJT, they were asked to assess the writing quality of the stimuli and rate each sentence context for its degree of genuineness and clarity. After that, several adjustments had to be made to the choice of vocabulary by replacing some words and expressions with higher frequency counterparts. This way, the possibility of the learners' lower lexical knowledge level negatively affecting the understanding of the task stimuli was reduced.

The final version of the AJT consisting of 60 sentences (36 experimental ones and 24 distractors) was computer-based and administered via E-prime 2.0 (Psychology Software Tools), so that both participants' responses (or answers) and reaction time scores could be collected. This study only looks at participants' responses or accuracy scores. Participants were asked to judge whether a sentence was grammatical or not. The presentation order of the stimuli was randomly different for each test taker. The stimuli appeared on the screen one at a time and each item remained on the screen until the participant provided an answer by pressing "K" to accept a stimulus or "S" to reject it. After that, the following stimulus appeared immediately on the screen. A dichotomous response scale was chosen to force participants' judgment choices, and thus prevent them from giving neutral responses. Correction protocol was not required and therefore participants did not have to provide a correct version of the stimuli they deemed ungrammatical.

The acceptability judgments task started with an introduction phase that included the task instructions. The two possible response options were written in non-technical Spanish. So, participants had to indicate whether the sentence being rated sounded well/was fine (*suena bien/está bien*) or sounded odd/was not fine (*suena rara/no está bien*). A brief familiarization phase consisting of six distractor items followed. After the last item in this phase, a message popped up letting participants know that the task was about to start and that they should press any key when ready to do the task. No breaks were set up during the completion of the task, since the total number of items was not expected to result in a fatigue effect (Schütze & Sprouse, 2013).

The Russian learners of Spanish first filled in the sociolinguistic questionnaire and then did the AJT. Before starting the acceptability judgments task and after reading the task instructions, they were encouraged to respond as quickly as possible once they had read each stimulus. There was no time limit to do the AJT.

3.3. Analysis

The participants' responses obtained by means of the AJT were coded as a function of group factor (four levels: UPINT, ADVN, PROF, NAT) and manipulated stimulus conditions, specifically, lexical aspectual class (three levels: states, activities, events), aspectual meaning (three levels: continuous, progressive, habitual), and verbal form (two levels: Imperfect, Preterite). Two statistical analyses were performed: the first one on the all participants' accuracy scores and the second analysis explored the effects of independent variables for Imperfect and Preterite sentences separately. Both the acceptance of an adequate stimulus and the rejection of an inadequate stimulus were recoded with a value of 1, whereas the acceptance of an inadequate stimulus and the rejection of an adequate stimulus were assigned a value of 0. For both analyses generalized mixed models were fitted on the data. This statistical technique is a suitable instrument for dealing with hierarchical designs, and includes the possibility of managing the variance of subject as crossed, independent random factor (Baayen, Davidson, & Bates, 2008). All statistical analyses were performed using R Software (R Core Team, 2013) and the packages *lme4* (Bates, Mächler, Bolker, Walker, 2015), *lmerTest* (Kuznetsova, Brockhoff & Christensen, 2017) and *emmeans* (Lenth, 2018).

In the first analysis, a logistic generalized mixed model was run on the participants' raw responses to determine the effect of the variables of the present study on the probability of accepting or rejecting the experimental stimuli. All independent variables and their interactions with proficiency level as the between-subjects factor were fitted as fixed effects and with participant as random effects. Post-hoc pairwise comparisons were carried out to further investigate differences between competence/proficiency levels and interactions with the variables of verbal form, lexical aspect, and aspectual meaning.

For the second analysis, accuracy scores were split into two parts by verbal form: Imperfect and Preterite. The accuracy scores were analyzed and discussed separately since previous research points out that different knowledge and cognitive mechanisms are used to decide on the acceptability of Imperfect and Preterite verbal forms (Loewen, 2009; Gutiérrez, 2013). Certain trends have also been reported between native and non-native speakers, whereby the latter tend to over-accept ungrammatical and infelicitous sentences at higher rates than native speakers (McDonald, 2000). In the present study, it was assumed that the analysis of accuracy scores in two distinct ways would result in a more detailed profile of the participants' knowledge of Imperfect meanings in terms of accuracy. Therefore, by first looking at Imperfect verbal forms alone, it was possible to assess the participants' knowledge of Imperfect

meanings and the degree of association between those meanings and the Imperfect verbal form. On the other hand, the analysis of Preterite verbal forms allowed for the examination of the effects of the independent variables on the participants' degree of sensitivity to detect semantic disagreements between Imperfect meaning situations and the aspectual features in the functional verbal morphology. In both cases, a linear mixed model was performed fitting all independent variables and their two– and three-way interactions with the participants' competence level as fixed effects and participant as random effects. The analyses were conducted on aggregated data; for each participant the proportion of correct responses was measured, and was used as a dependent variable. Post-hoc pairwise comparisons were subsequently conducted to pinpoint differences between competence levels and interactions with verbal form, lexical aspect, and aspectual meaning.

4. Results

To address the possible effects of the manipulated task conditions on the probability of accepting or rejecting the experimental stimuli, logistic generalized modelling was performed. The dependent variable was participants' answer (Accept/Reject); independent variables were Group (UPINT, ADVN, PRO, NAT), Lexical aspect (States, Activities, Events), Aspectual meaning (Continuous, Progressive, Habitual), and Verbal form (two levels: Imperfect, Preterite). The rejection response was adopted as the reference level of the dependent variable, so that all statistical models measured the contribution of each factor to the increased probability of accepting a given stimulus.

To identify the optimal model (i.e., the model that best describes the data) the following procedure was conducted. At first, two logistic generalized mixed models were performed on the data: the first model included main effects only, while the second added interaction effects between each task condition and group. The comparison between models revealed that the model with interactions involved a significant improvement in accounting for the response variable (deviance difference = –47.608, $p < 0.001$). The Likelihood Ratio Test of fixed effects on the fitted model did not yield a significant contribution of the interaction between lexical aspect and group ($X^2(3) = 1.243$, $p = 0.742$) or main effect of lexical aspect ($X^2(1) = 1.82$, $p= 0.177$). Analyses of deviance showed that it was only lexical aspect class that did not contribute to the goodness of fit (deviance difference = –3.207, $p = 0.523$). Therefore, the final model included main effects of group, verbal form and aspectual meaning, as well as an interaction between group and verbal form and group and aspectual meaning. The latter model, summarized in Table 4, also displays the amount of variance explained by participant as random factors ($SD = 0.33$, ICC: 0.33). Table 3 shows the descriptive statistics of predictive accuracy scores (proportion of "accept" answers) depending on group and experimental condition.

Table 3. Predictive mean proportions and standard deviation (in parentheses) of "accept"-answer by groups and experimental conditions.

Group	IMP_CONT	IND_CONT	IMP_PROG	IND_PROG	IMP_HAB	IND_HAB
UPINT	0.91 (0.31)	0.47 (0.50)	0.89 (0.34)	0.41 (0.49)	0.87 (0.24)	0.38 (0.47)
ADVN	0.90 (0.31)	0.60 (0.48)	0.79 (0.42)	0.37 (0.49)	0.83 (0.30)	0.43 (0.48)
PROF	0.93 (0.26)	0.51 (0.50)	0.89 (0.34)	0.38 (0.49)	0.85 (0.30)	0.30 (0.44)
NAT	0.94 (0.27)	0.33 (0.48)	0.85 (0.36)	0.14 (0.36)	0.94 (0.13)	0.30 (0.44)

Note: IMP_CONT: Imperfect forms with continuous meaning; IND_CONT: Preterite forms with continuous meaning; IMP_PROG: Imperfect forms with progressive meaning; IND_PROG: Preterite forms with progressive meaning; IMP_HAB: Imperfect forms with habitual meaning; IND_HAB: Preterite forms with habitual meaning.

As predicted (see Table 3), all participant groups consistently obtained a higher probability mean score for "accept" responses on Imperfect form stimuli than on Preterite forms. This was expected as the sentences with Preterite forms were selected to be non-adequate or less grammatical and were assumed to be rejected in the AJT. This pattern was also observed in the three aspectual meanings analyzed. Within each group, the difference in the mean scores on Imperfect vs. Preterite forms was more evident in the NAT group than in the non-native Spanish groups (compare, for example, columns 2 and 3 in Table 3). This suggests that the "reject" response on Preterite stimuli as the expected response was more salient in the native Spanish group, particularly in continuous and progressive meanings. The results of the final model (see Table 4) show whether each level of each factors differs from the reference level of each factor.

As for verbal form, Table 4 illustrates that Preterite forms (verbformIND) resulted in a significant drop in the probability of accepting the stimulus sentences for all groups ($\beta = –2.466$, SE=0.214, $p < 0.001$). In addition, a significant effect was found on the interaction between Preterite forms and the Spanish native speaker group ($\beta = –1.085$, SE=0.329, $p < 0.001$), meaning that native speakers more easily identified sentences with Preterite forms as ungrammatical. This replicated the results presented in Table 3.

Table 4. Predictive Logistic Regression Model results on the probability of "accept" responses.

Predictors	Estimate	SE	Z	p-value	95% Conf. Interval	
					Lower	Upper
Intercept	2.153	0.181	11.841	<0.001	1.812	2.527
groupADVN	-0.378	0.241	-1.571	0.116	-0.857	0.090
groupPROF	0.036	0.258	0.143	0.886	-0.471	0.546
groupNAT	0.307	0.274	1.118	0.263	-0.228	0.852
verbformIND	-2.466	0.214	-11.517	<0.001	-2.899	-2.058
meaningHAB	-0.272	0.166	-1.637	0.101	-0.601	0.052
meaningPROG	0.046	0.165	0.281	0.779	-0.279	0.371
groupADVN:verbformIND	0.578	0.289	1.999	0.045	0.013	1.149
groupPROF:verbformIND	-0.135	0.305	-0.443	0.657	-0.735	0.464
groupNAT:formIND	-1.085	0.329	-3.299	<0.001	-1.738	-0.444
groupADVN:meaningHAB	-0.187	0.233	-0.805	0.420	-0.645	0.269
groupPROF:meaningHAB	-0.326	0.238	-1.369	0.171	-0.796	0.140
groupNAT:meaningHAB	0.200	0.248	0.806	0.419	-0.286	0.688
groupADVN:meaningPROG	0.433	0.228	1.897	0.057	-0.013	0.881
groupPROF:meaningPROG	0.028	0.235	0.119	0.905	-0.434	0.490
groupNAT:meaningPROG	0.791	0.259	3.048	0.002	0.287	1.307

Note: For group the reference level is UPINT, for verbal form it is Imperfect, and for aspectual meaning it is continuous.

Main and interaction effects of group, verbal form, and aspectual meaning were explored through the analysis of deviance. The Likelihood Ratio Test found a significant main effect for group ($X^2(3) = 13.83$, $p = 0.003$), and for verbal form ($X^2(1) = 714.69$, $p < 0.001$), but not for aspectual meaning ($X^2(1) = 1.13$, $p = 0.288$). However, a significant effect was observed for group and aspectual meaning interaction ($X^2(6) = 18.06$, $p = 0.006$), and also for group and verbal form interaction ($X^2(3) = 29.60$, $p < 0.001$).

In order to identify which levels of factors differed significantly, Tukey HDS post-hoc pairwise comparisons tests were performed on significant interaction effects. Between-groups contrasts found a significant difference between native speakers and the ADVN group for the responses to Imperfect form items ($z = –2.64$, $p = 0.041$). The ADVN group significantly accepted sentences with Imperfect forms less frequently than native speakers (see Figure 1). For other groups there were no significant differences (all $p > 0.05$).

For the subset of Preterite form items, native speakers' behaviour significantly differed from that of the non-native speaker groups [UPINT group ($z = 4.49$, $p < 0.001$), ADVN group ($z = 5.63$, $p < 0.001$), and PROF group ($z = 3.88$, $p < 0.001$)]. That is, native speakers accepted Preterite forms at significantly higher rates than non-native groups (see Figure 1).There were no significant differences among non-native Spanish speaker groups, who performed equally on Preterite forms (all $p > 0.05$).

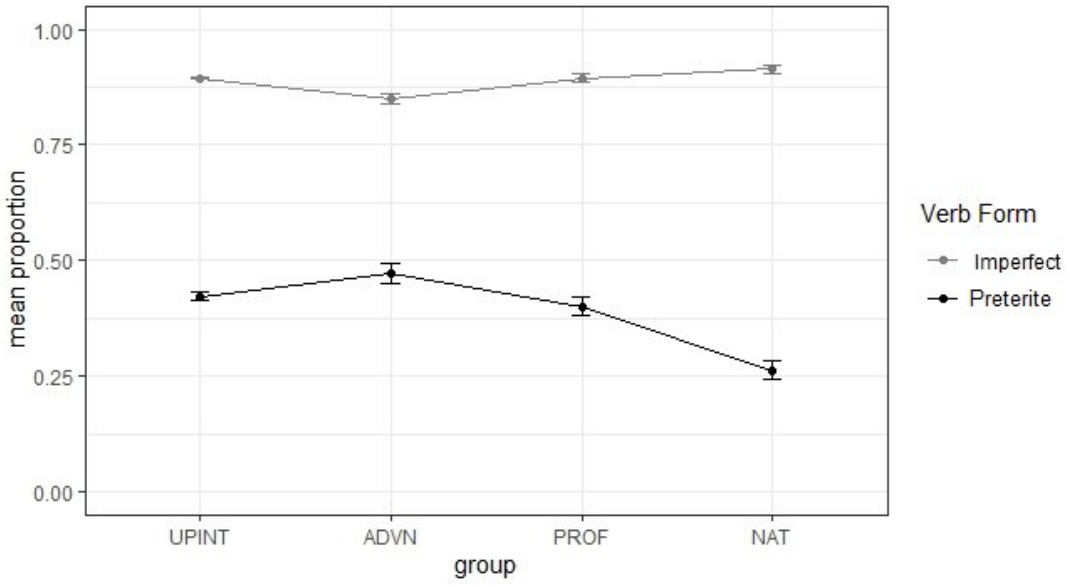

Figure 1. Mean proportions of "accept" responses by verbal form across groups.

Regarding main effects of aspectual meanings, no significant differences were observed across groups for continuous and habitual meanings (all $p > 0.05$). As for the interaction between verbal form and aspectual meanings, the analysis of the responses to progressive Imperfect items revealed significant differences between the UPINT and NAT groups ($z = 3.41$, $p = 0.003$), and between the PROF and NAT groups ($z = 3.18$, $p = 0.007$). The sign of the z-ratio indicated that in both cases the probability of an "accept" response was higher in L2 Spanish groups than in the native Spanish group, suggesting that native speakers of Spanish were more reluctant to accept items with progressive meaning in both Imperfect and Preterite. On the other hand, L2 learners behaved similarly to Spanish native speakers when their responses were considered for continuous and habitual aspectual readings (see Figure 2).

Within-groups comparisons for aspectual meanings showed no significant differences in the UPINT group (all $p > 0.05$). This implied that the probability of acceptance does not seem to be influenced by the type of aspectual meaning of the stimuli. In the ADVN group, the continuous meaning resulted in a significantly higher probability of acceptance than the progressive meaning ($z = 3.96$, $p < 0.001$). For the PROF group, the continuous meaning also increased the probability of acceptance significantly in contrast to the habitual meaning ($z = 3.50$, $p = 0.001$). In the NAT group, the probability of acceptance of progressive meaning stimuli was significantly lower both for continuous ($z = 3.87$, $p < 0.001$) and habitual ($z = 3.51$, $p = 0.001$) meanings. Therefore, Spanish natives' responses to progressive meaning items showed a lower probability of acceptance in comparisons across groups and across the continuous and habitual aspectual meanings within the group.

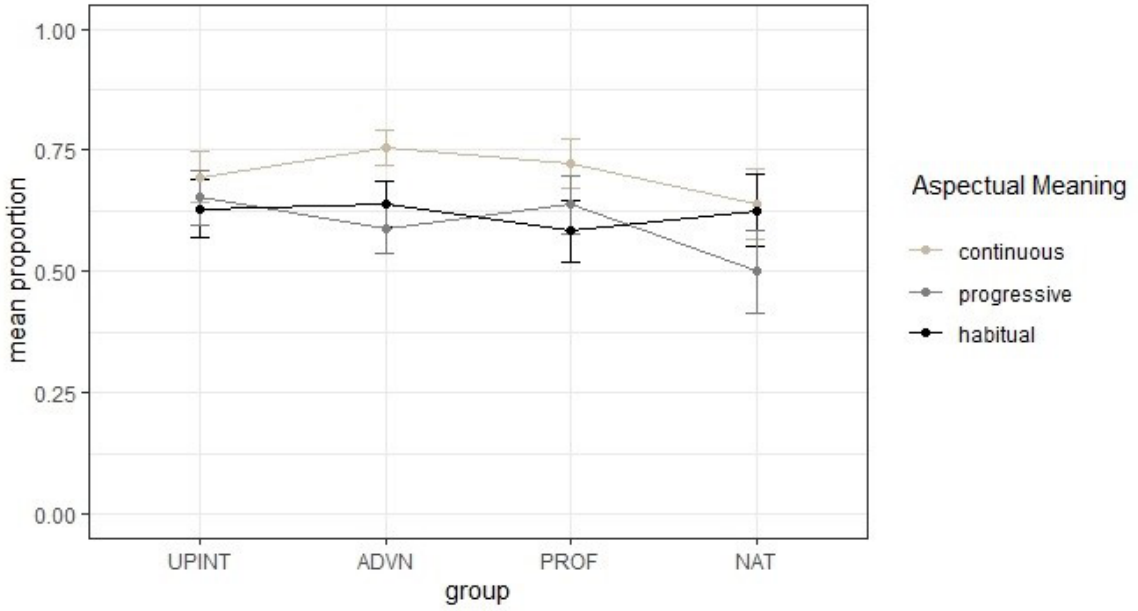

Figure 2. Mean proportions of "accept" responses by aspectual meaning across groups.

The differences that the logistic regression model found in the groups' responses to Imperfect and Preterite items (see verbal form effect above) are in line with previous research on differences between grammatical and ungrammatical sentences in non-native and native participants' performance (Clahsen & Felser, 2006; Juffs, 2001). To further investigate this difference, a second analysis was conducted.

Based on the assumption that the present findings point to the existence of two distinct types of underlying linguistic knowledge (Gutiérrez, 2013; Zobl, 1992), the analysis of the participants' accuracy scores was further divided into two separate analyses, as suggested by Jiang (2018). As mentioned in the Method section above, the first part focused on sentences with Imperfect forms that constitute congruent scenarios between grammatical aspect and aspectual meaning. The second part addressed sentences with Preterite forms that contain some incongruity between grammatical aspect and aspectual meaning.

In relation to Imperfect sentences, linear mixed model with group, lexical aspect, aspectual meaning, interaction between group and lexical aspect class, lexical aspect class and lexical aspect meaning interaction between group and lexical aspect meaning and interaction between group, as fixed effects and participants as random effects was performed. The analyses were conducted on aggregated data; for each participant the proportion of correct responses ("accept" responses) was measured, and this was used as a dependent variable.

At first, the expected responses from the model were measured (see description of Table 3 above) for each group within each experimental condition (see Table 5 below). Table 5 displays the descriptive statistics of the scores on the sentences with Imperfect forms, which show the participants' accuracy rates in recognizing imperfective aspectual meanings and how they relate to Imperfective verbal morphemes:

Group	CONT_states	PROG_activities	PROG_events	HAB_activities	HAB_events
UPINT	88.88 (12.78)	79.62 (20.25)	88.88 (16.17)	92.59 (18.27)	92.59 (18.27)
ADVN	90.73 (13.06)	90.73 (15.36)	74.07 (21.56)	90.73 (15.36)	90.73 (15.36)
PROF	92.59 (8.52)	94.44 (17.15)	77.77 (28.00)	92.59 (18.27)	87.03 (20.25)
NAT	93.51 (8.36)	92.59 (14.26)	79.62 (23.26)	100 (0.00)	98.14 (7.85)

Note: CONT_states: states in continuous contexts; PROG_activities: activities in progressive contexts; PROG_events: events in progressive contexts; HAB_activities: activities in habitual contexts; HAB_events: events in habitual contexts.

Table 5. Percent mean scores and standard deviation (in parentheses) for accuracy by aspectual meanings and lexical aspect across groups for Imperfect sentences.

Except for UPINT, all groups obtained higher mean accuracy scores for stimuli with Imperfect forms in progressive and habitual meanings combined with activities, that is, in contexts of aspectual concordance. The combinations of Imperfect forms of telic verbs (events) in these aspectual meanings had lower accuracy rates in the ADVN, PROF and NAT groups. As expected, the scenarios of aspectual coercion seemed to elicit a larger degree of variability (as shown by SD values) among the responses of the participants with a high proficiency level –ADVN and PROF groups– in line with the NAT group's responses.

The estimated coefficients of the mixed model performed on the data showed a statistically significant contribution of the interaction between group, aspectual meaning, and lexical aspect of the verb to the model ($\beta = -23.573$, $SE = 10.035$, $t = -2.349$, $p = 0.019$ [CI:-42.75; –4.39]). Further analysis of the linear mixed effect model results showed that the participant variable included as random effects amounted to 19.3% of the residual variance (var = 54.39, $SD = 7.37$). The analysis of variance (comparison of models with and without a fixed effect at hand) yielded a significant main effect of aspectual meaning ($F_{(2,272)} = 14.039$, $p < 0.001$) and lexical aspect ($F_{(1,272)} = 9.809$, $p = 0.002$), but not of group ($F_{(3,90.3)} = 1.094$, $p = 0.355$). Furthermore, a significant three-way interaction effect of group, lexical aspect, and aspectual meaning was revealed ($F_{(4,272)} = 3.031$, $p = 0.018$). Figure 2 illustrates the groups' responses as a function of the lexical aspect and aspectual meaning. In order to explore the three-way interaction, post-hoc pairwise comparisons tests with Bonferroni adjustment were conducted on the results.

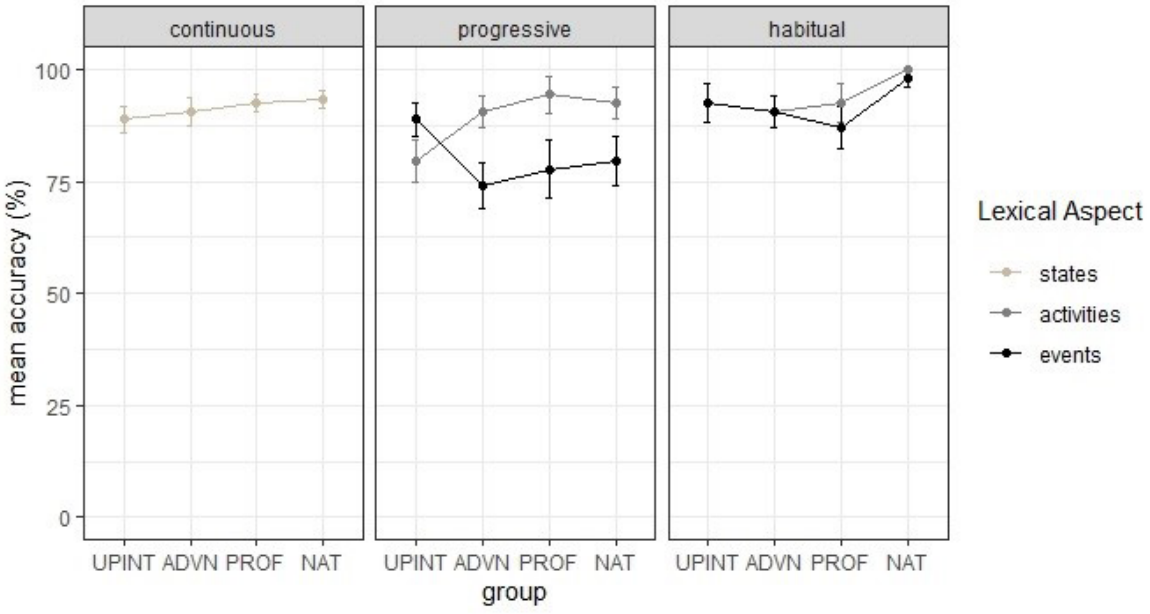

Figure 3. Mean proportions of correct responses by aspectual meaning and aspectual class across groups for Imperfect sentences.

Pairwise comparisons did not yield significant differences between groups in the various level combinations between aspectual meaning and lexical aspect (all $p > 0.05$). This finding, together with the lack of a significant main effect of group, pointed to Spanish L2 learners' native-like performance and supported the possibility of learners' full acquisition of aspectual features in L2 grammar development of Imperfect forms (Montrul & Slabakova, 2001; Slabakova & Montrul, 2008). However, differences were found in the distribution of accuracy rates across levels of aspectual meaning and lexical aspect within each group. As for progressive reading sentences, activities led to more accurate responses in comparison to events for ADVN ($t = 3.322$, $p = 0.003$), PROF ($t = 3.322$, $p = 0.003$), and NAT ($t = 2.584$, $p = 0.030$) groups, but not for the UPINT group ($t = -1.846$, $p = 0.198$). This meant that as non-native

speakers increased their proficiency level in the L2, they gradually resembled the native Spanish group's behaviour. In the case of Imperfect verbal forms in continuous and habitual readings, learner groups did not show any difficulty. Finally, the difference between activities and events remained non-significant for habitual and continuous readings in all groups (all $p > 0.05$).

Last, when considering the results on progressive and habitual meanings by lexical aspect, only the NAT group showed a significant improvement in their responses to events ($t = –3.602$, $p = 0.001$). Among L2 Spanish groups the accuracy rate was constant across all aspectual meanings. In light of these results, it could be inferred that, concerning the processing of Imperfect verbal forms, native-like aspectual interpretations are accessible for L2 Spanish speakers with high proficiency levels. The preference for predicates containing aspectual congruence between grammatical and lexical aspects was only evident in the scenarios of progressive meaning, but not in habitual meaning sentences.

In the case of Preterite sentences, the second part of the analysis looked at Preterite verbal form sentences in order to determine the participants' degree of sensitivity to inadequate contexts where there is a clash between the verbal form and the aspectual meaning of the sentence. These sensitivity scores were calculated to add to the participants' proficiency profile through measuring the capability of accepting sentences which are expected to be accepted (accuracy scores) and the capability of rejecting sentences which are expected to be rejected (sensitivity scores). The same linear mixed effect model as for Imperfect sentences was performed (see above). Table 6 shows the descriptive statistics of the participants' sensitivity scores based on the expected responses from the model:

Table 6. Percent mean scores and standard deviation (in parentheses) of sensitivity by aspectual meanings and lexical aspect across groups for Preterite sentences

Group	CONT_states	PROG_activities	PROG_events	HAB_activities	HAB_events
UPINT	49.99 (16.16)	58.88 (33.23)	22.22 (42.77)	70.83 (26.07)	75.00 (30.91)
ADVN	45.36 (21.24)	73.33 (24.75)	16.66 (38.34)	66.66 (25.72)	52.77 (20.80)
PROF	49.07 (14.54)	65.55 (23.57)	22.22 (42.77)	72.22 (20.80)	75.00 (35.35)
NAT	82.95 (10.77)	85.55 (13.38)	77.77 (42.77)	86.11 (12.78)	72.22 (25.56)

Note: CONT_states: states in continuous contexts; PROG_activities: activities in progressive contexts; PROG_events: events in progressive contexts; HAB_activities: activities in habitual contexts; HAB_events: events in habitual contexts.

As can be observed in Table 6, the mean scores for the L2 Spanish groups vs. those for the native speaker group were largely different. The degree of variability (as shown by SD values) was consistently higher among the three learner groups, which demonstrates the participants' less steady performance. And as opposed to the variability indices of the accuracy scores for Imperfect sentences, the learners' average sensitivity scores were systematically lower. These results suggested that the L2 Spanish groups' ability to detect the illegitimacy or incongruency of Preterite forms in imperfective aspectual meaning contexts was less homogeneous than their ability to recognize the adequacy of Imperfect forms in the same contexts. Learners found it particularly difficult to reject progressive context sentences with events. As shown in example (14), the content of the second predicate *dar una respuesta* ('to give an answer') requires the first predicate *decir nada* ('to say nothing') to adopt an aspectually unbounded view of the situation, and this can only be achieved by means of Imperfect verbal forms:

(14) ?César no dijo$_{3.sing.pret.}$ nada y finalmente dio$_{3.sing.pret.}$ una respuesta sin pensar.
César no said anything and finally gave a answer without think.
'César did not say anything and in the end he gave an answer without thinking'.

The exploration of the estimated coefficients obtained from the fitted mixed effects model returned a statistically significant contribution of the native speaker group ($\beta = –21.913$, $SE = 6.241$, $t = 3.511$, $p < 0.001$ [CI:9.93; 33.89]) and a significant contribution of a three-way interaction with UPINT ($\beta = 57.747$, $SE = 17.001$, $t = –3.397$, $p < 0.001$ [CI:-90.23; –25.25]), ADVN ($\beta = –60.496$, $SE = 17.001$, $t = –3.558$, $p < 0.001$ [CI:-92.98; –28.06]), and PROF groups ($\beta = –65.211$, $SE = 17.001$, $t = –3.836$, $p < 0.001$ [CI:-97.70; –32.72]). The analysis of random effects results indicated that 17% of residual variance was attributed to participant (var = 133.8, $SD = 11.57$). From the ANOVA table of the model a significant main effect of group was confirmed ($F_{(3,92.27)} = 10.098$, $p < 0.001$), in addition to a main effect of aspectual meaning ($F_{(2,272)} = 19.103$, $p < 0.001$) and lexical aspect ($F_{(1,272)} = 47.255$ $p < 0.001$). Moreover, a significant overall effect of a three-way interaction was confirmed ($F_{(4,272)} = 9.792$, $p < 0.001$). Figure 4 summarizes the main statistical results reported above. In order to explore the three-way interaction effect, post-hoc pairwise comparisons tests with Bonferroni adjustment were conducted on the results.

Pairwise comparisons between groups across all possible level combinations of aspectual meaning and lexical aspect showed significant differences in progressive and habitual meanings. As for progressive meaning, the native speakers obtained significantly higher sensitivity scores than each L2 Spanish group in activities (UPINT: $t = –4.460$, $p = <0.001$; ADVN: $t = –2.839$, $p = 0.029$; PROF: $t = –3.839$, $p < 0.001$) and events (UPINT: $t = –5.090$, $p = <0.001$; ADVN: $t = –5.678$, $p < 0.001$; PROF: $t = –4.936$, $p < 0.001$). The responses to habitual meaning sentences were significantly different only in event verbs between NAT and ADVN groups ($t = –3.678$, $p = 0.002$), and marginally sig-

nificant between UPINT and ADVN groups ($t = 2.638$, $p = 0.052$). The comparisons within the continuous meaning sentences did not yield any significant differences between non-native groups (all $p > 0.05$). In fact, their degree of sensitivity to reject infelicitous combinations of Preterite verbal forms in continuous aspectual meaning contexts was significantly lower – and below 50% – than that of Spanish native speakers (UPINT: $t = –2.941$, $p = 0.002$; ADVN: $t = –3.272$, $p < 0.001$; PROF: $t = –3.039$, $p < 0.001$). The learner groups' behaviour differed to a large extent from the results they obtained on accuracy scores of Imperfect sentences for continuous meaning, where L2 Spanish groups exhibited a degree of accuracy equivalent to that of the native Spanish group.

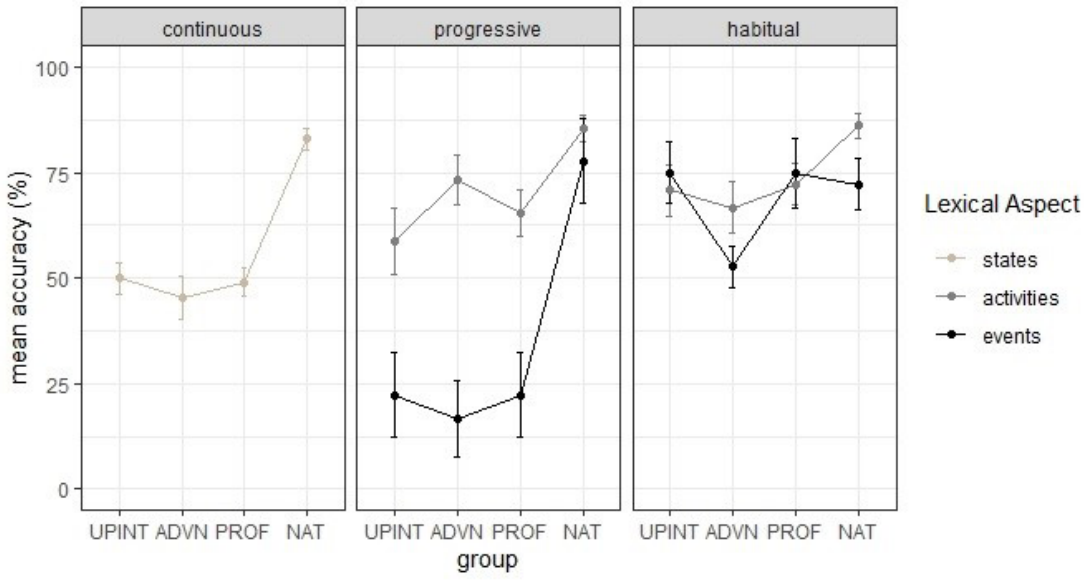

Figure 4. Mean proportions of correct responses by aspectual meaning and aspectual class across groups for Preterite sentences.

Statistically significant differences were also found in the distribution of sensitivity scores between the levels of the condition sentences within groups. L2 Spanish groups' responses to progressive meaning sentences showed a systematically higher sensitivity with activities over event verbs (UPINT: $t = 4.313$, $p < 0.001$; ADVN: $t = 6.666$, $p < 0.001$; PROF: $t = 5.098$, $p < 0.001$). Unlike learners, the NAT group's scores did not display this pattern and did not result in significant differences ($t = 0.915$, $p = > 0.05$). Based on these results, we assume L2 Spanish groups' greatest difficulty might lie in rejecting event verbs inflected for Preterite. This difficulty significantly increased when Preterite verbal forms were embedded in progressive meaning contexts, compared to habitual meaning contexts, in UPINT ($t = –5.070$, $p < 0.001$) and PROF groups ($t = –4.657$, $p < 0.001$). In the case of the ADVN group, this difference failed to reach significance ($t = –2.307$, $p = 0.065$).

As seen above, the differences in the aspectual representations of Spanish Imperfect meanings between groups arose mainly in the analysis of the participants' sensitivity to detect unexpected Preterite verbal forms in prototypical imperfective aspectual meanings. Continuous meaning did not lead to differences in the groups' accuracy of Imperfect forms or sensitivity scores of Preterite forms, which could confirm L2 learners' native-like competence in Spanish. On the contrary, progressive meaning entailed more difficulties in aspectual imperfective reading for all learner groups, particularly in sensitivity scores. The subset of habitual meaning sentences did not seem to pose any difficulty among groups, although the L2 Spanish groups' behavioural pattern of sensitivity scores was less stable for event predicates.

In sum, all groups obtained lower scores on sensitivity than on accuracy, thus revealing that the representations of aspectual meanings are not based on categorical and unquestionable knowledge. Since the configuration of this knowledge involves the integration of several sources of aspectual information (Salaberry, 2018), a certain degree of variability might be expected both in native and non-native grammars.

5. Discussion

As mentioned in the Introduction, the acquisition of aspectual relations in languages like Spanish that encode the grammatical aspect in the verb entails the recognition and processing of verbal morphology. This, in turn, involves the integration of information of lexical and pragmatic aspects (Kempchinsky & Slabakova, 2005). Therefore, the acquisition of aspectual features stands in the interface domain, making it a very complex process for L2 learners (Schmiedtová & Flecken, 2008). The findings of the present study support this view and agree with previous research reporting on differences between native and advanced non-native speakers in their interpretation and use of aspectual relations in Spanish (Amenós-Pons et al., 2019; Diaubalick & Guijarro-Fuentes, 2016; Montrul & Perpiñán, 2011; Rothman, 2008; Salaberry, 2013).

The results of the logistic model showed that both the interaction between groups and verbal forms of sentences, on the one hand, and between groups and aspectual meaning, on the other hand, led to a significant increase in the probability of accepting a stimulus sentence. In the first place, the forms in Imperfect were found to contribute to this significantly higher probability of accepting sentences in all groups, although for the forms in Preterite native speakers differed from non-natives. The fact that the forms in Preterite resulted in a lower acceptance response rate, though expected, revealed an additional difference between native and non-native speakers, with the latter having lower rejection rates of such stimuli. This finding might be due to the influence of the "yes" bias observed in many AJT studies with non-native speakers (Han, 2000). Furthermore, recent studies have demonstrated a common trend to accept ungrammatical or inadequate sentences by non-native speakers, which has been interpreted as the result of incomplete grammatical knowledge or of differences in the processing mechanisms of such structures (Orfitelli & Polinsky, 2019). Together with task effects, those results corroborate a tendency to overuse Preterite forms in L2 Spanish narratives (Domínguez et al., 2013; Salaberry, 2003) which could be retained in advanced proficiency levels.

The significant interaction between groups and aspectual meaning confirmed that the probability of acceptance varied in the different aspectual meaning readings among groups. Specifically, the differences were significant in progressive reading, as the native speaker group was reluctant to accept sentences which theoretically should have been accepted. While the NAT group's behaviour might at first sight seem counterintuitive, it can be attributed to different processing mechanisms between native and non-native speakers. By way of illustration, Spanish native speakers' rejection of the Imperfect *preparaba* in (15) might derive from their preference for the periphrastic construction in gerund *estaba preparando* (*was finishing the last details of the dinner*), which is consistent with the context of progressive reading:

(15) Cuando llegaron$_{3.pl.pret.}$ los primeros invitados yo preparaba$_{3.sing.imp.}$ los últimos detalles de la cena.
When come the first guests I prepared the last details of the dinner.
'When the first guests arrived I was finishing the last details of the dinner'.

When both structures are compared in the evaluation of the sentence, Spanish native speakers will opt for a progressive periphrasis, which is probably the expected choice for this aspectual reading. If a similar process for non-native speakers is assumed, their responses will display a higher acceptance rate of the Imperfect form. Likewise, a more straightforward processing of these stimuli by non-native speakers might be inferred. That is, if the verbal form under evaluation –the Imperfect form– meets all the requirements for an aspectual interpretation, the sentence in question will be accepted without considering other possible options. The lack of contrast among converging verbal forms might be the result of a deliberate decision on the part of the speaker, although there is the possibility that the speaker is less conscious of the contrast between Imperfect and periphrasis in the processing of aspectual information.

It is worth noting that the results from the pilot study of the AJT with Spanish native speakers (see Task design and procedures above) did not point to this direction. Considering that the participants in the pilot were long-term native Spanish immigrants with a high command of Russian, the differences between the two native Spanish groups –pilot group vs. NAT group– could be due to L1 attrition, as tense-aspect relations are especially vulnerable to language loss processes (Cuza, 2010; Montrul, 2002).

In light of the findings from the linear regression model, the examination of accuracy scores was undertaken based on two distinct measures: an accuracy measure derived from the responses to stimuli containing Imperfect verbs and a sensitivity measure calculated from the responses to stimuli with Preterite verbs. The analysis of accuracy scores did not yield any significant differences among native and proficient non-native groups in the interpretation of Imperfect in any of the examined imperfective aspectual readings. This suggests that it might be possible to attain a near-native competence in the formation of representations of aspectual relations in the L2, as previous studies pointed out (Amenós-Pons et al., 2017; Montrul & Slabakova, 2003; Rothman & Iverson, 2007; Slabakova & Montrul, 2003). However, these findings should be taken with caution, specifically when the analysis of the lexical aspect of the verb is considered for the UPINT group. That is, in progressive aspectual readings the ADVN and PROF groups exhibited a response pattern similar to that of the NAT group, obtaining higher accuracy scores for Imperfect forms combined with activities than Imperfect forms combined with events (i.e., telic predicates). These results agree with Amenós-Pons et al.'s (2017) study on L1 French speakers. All this shows that non-native speaker groups with a higher proficiency level can discriminate congruent contexts, such as (16) below, from aspectual coercion contexts, as in (17), to a similar extent to native speakers. On the contrary, the UPINT group's responses did not vary in their accuracy scores for these two aspectual classes. This might suggest a certain degree of randomness in the UPT group, as their mean accuracy scores for events in Imperfect (M = 88.88, SD = 16.17) was higher than for activities in Imperfect (M =79.62, SD = 20.25). Although the difference in mean scores was not significant, these results confirmed that the UPINT group failed to recognize this contrast in the combination between grammatical aspect and lexical aspect as opposed to native speakers and L2 Spanish speakers with a higher proficiency level:

(16) A principios de los 90 Rafa estudiaba$_{3.sing.imp.}$ Medicina, pero después cambió$_{3.sing.pret.}$ de carrera.
At beginning of the 90 Rafa studied Medicine but after changed of degree.
'In the early 1990's Rafa studied Medicine, but a few months later he switched his BA degree'.
(17) A las 16 h empezaba$_{3.sing.imp.}$ la clase, pero se canceló$_{3.sing.pret.}$ por problemas de salud del profesor.

At the 16 h. started the class, but SE cancelled for problems of health of the teacher
'The class started at 4pm, but it was cancelled due to the teacher's health problems'.

As contexts of aspectual coercion entail a high processing load in comparison to contexts of aspectual congruency on the part of native speakers (Todorova et al., 2000; Piñago et al., 2006), the ADV and PROF groups' performance is interpreted as an indication of native-like attainment in the domain of the grammatical category of aspect. The challenge that aspectual coercion predicates pose to non-native speakers of Spanish has been well documented both in production studies (Cadierno, 2000; Bardovi-Harlig, 2005) and in interpretation and comprehension studies (Cuza, 2010; Diaubalick & Guijarro-Fuentes, 2019; Shell, 2001). This difficulty did not surface in any of the groups' responses to habitual context sentences, where no further differences in accuracy scores among groups were noted. These results support previous findings of studies on iterated situations (Pérez-Leroux et al., 2008; Salaberry, 2013) that confirmed full mastery of Imperfect interpretations in habitual aspectual reading in the development of L2 Spanish.

A parallel conclusion can be drawn from the accuracy scores on the contexts of continuous aspectual meaning in Imperfect. Non-native speakers obtained high accuracy scores when the task focused on accepting Imperfect forms with state predicates which are congruent with a continuous reading. Accuracy percentages increased with development L2 proficiency, nearing those of native speakers. Following Domínguez et al. (2018), the results of the present study also indicate a strong relationship between Imperfect forms and state verbs in the configuration of non-native grammars. In both cases, this relationship is reinforced as a function of proficiency development in the L2.

By looking at sentences with verbal forms inflected for Preterite, the present study was able to address the processing of aspectual relations based on the speakers' capability of recognizing and rejecting contexts that combine clashing aspectual features. In this case, the focus was placed on the presence of features of perfective grammatical aspect –as conveyed by the verbal morphology of the Preterite– in contexts of imperfective aspectual interpretations.

The results of both analyses shed light on the interpretation of habitual readings to a large extent. More precisely, non-native Spanish speaker groups obtained higher sensitivity scores on habitual readings, which led to the conclusion that non-native speakers' representations of this aspectual value of Spanish Imperfect are comparable to those of Spanish native speakers' grammars.

As regards responses to continuous reading stimuli, the comparison between sensitivity and accuracy scores revealed a long-lasting and common difficulty to the three L2 Spanish groups in rejecting state verbs in Preterite in this context. Mean scores for stimuli such as (18) below did not reach 50% of accuracy in any of the non-native groups, whereas the native group obtained 82.95% of accuracy. This is in line with Domínguez et al. (2018) who in their comprehension study noted the same difficulty in advanced learners. The authors interpreted this finding as an outcome of the learners' L1 influence – English, in their case – that remains even at advanced proficiency levels:

(18) ?El ordenador costó$_{3.sing.pret.}$ mucho dinero; si quieres$_{2.sing.pres}$., lo compramos$_{1.pl.pres.}$ entre los dos.
The computer cost much money; if (you)want It=OBJ bought between the two.
'The computer cost a lot of money. If you want, we can buy it between the two of us.'

Similarly, the results of the present study can be accounted for in terms of the participants' L1 influence. As mentioned earlier, state classes of lexical aspect in Russian include more defective verbs that cannot form aspectual pairs. Then, the reassembling process of features between the two languages becomes more difficult since "morphophonological exponents are not perfectly aligned in the L1 and the L2" (Slabakova, 2016, p.398). This makes it impossible to establish a one-to-one correspondence between Russian imperfective forms and Spanish Imperfect verbal forms, on the one hand, and between Russian perfective forms and Spanish Preterite verbal forms, on the other. However, the non-prototypicality of the aspectual structure of predicates could also explain the reported sensitivity scores in non-native speakers. Therefore, we assume that a combination of both intra– and interlinguistic phenomena explain our findings concerning this aspectual meaning on the part of L2 Spanish speakers. That is, the lack of morphological encoding in Russian for this aspectual contrast might block the saliency of the non-prototypical combination between lexical and grammatical aspect, making the non-native speaker less sensitive to aspectual coercion.

Unlike the findings of Domínguez et al. (2018), the interpretations of our non-native participants concerning progressive reading in Imperfect posed a great challenge when combined with telic verbs as in (19). The challenge is diminished to a certain extent when Imperfect is combined with activities, as in (20). Even so, in both conditions L2 groups' sensitivity scores were significantly lower than those of the native group. Moreover, no development as a function of proficiency level in the L2 was observed and, therefore, L2 Spanish speakers' performance failed to approximate native speakers' scores This, in turn, suggests a continuing influence of the degree of prototypicality of predicates and extends the predictions of the Distributional Bias Hypothesis (Shirai, 2004) to the interpretation and processing data in the L2.

(19) ?Carla completó$_{3.sing.pret.}$ un formulario cuando me encontré$_{1.sing.pret.}$ con ella en el bar.
Carla filled-in a form when I=OBJ met with she in the bar.
'Carla filled in a questionnaire when I met her in the pub'.

(20) ?A las 5 hablé$_{1.sing.pret.}$ con mi hermano por Skype, por eso no te oí$_{1.sing.pret.}$ entrar.
At the 5 spoke with my brother by Skype, for that no you=OBJ heard come-in.

'I spoke with my brother on Skype at 5pm. That's why I didn't hear you come in'.

The prototypical aspectual combinations, such as the inflection of events for Preterite in (19), yielded a very marginal reject rate even in imperfective aspectual contexts. As these are high frequency combinations in native speech (Tracy-Ventura & Cuesta, 2018), non-native speakers generally accept these combinations by default. However, the non-prototypical combination of activities in Preterite (20) was by and large rejected by the L2 Spanish groups. This is consistent with previous interpretation and comprehension research showing the effect of frequency on the acquisition of aspectual relations in L2 Spanish (Amenós-Pons et al., 2017; Diaubalick & Guijarro-Fuentes, 2019).

On the contrary, for L2 Spanish speakers, the observed differences in accuracy and sensitivity scores between activities and events in progressive, but not in habitual readings, might indicate that dynamism is a more salient semantic feature than telicity in the processing of aspectual relations, at least as far as non-native grammars are concerned. These findings confirm and extend the results of previous production studies (Domínguez et al., 2013; Sun et al., 2019) to interpretation data.

6. Conclusion

This study aimed at identifying the role of the L1 and the combinations between lexical and grammatical aspects in the configuration and processing of aspectual relations of L2 Spanish advanced learners.

As for the influence of the L1, the results confirmed previous investigations reporting on an L1 effect even at advanced proficiency levels (Amenós-Pons et al., 2017; McManus, 2015; Diaubalick & Guijarro-Fuentes, 2019; Domínguez et al., 2017, among others). In the present study, the participants' L1 (Russian) entailed a difficulty in continuous aspectual readings, yet it also acted as a facilitating learning strategy in the interpretation of progressive and habitual readings, as illustrated by accuracy scores and, to a lesser extent, by sensitivity scores. These findings corroborate Slabakova's (2009) refinement of the Feature Reassembly Hypothesis (Lardiere, 2005; see also Roberts & Liszka, 2013) for the acquisition of aspectual relations in the L2. Specifically, this hypothesis predicts that if aspect is grammaticalized in the learner's L1, this might facilitate the acquisition of aspectual information in the L2, even if it is encoded differently in the two languages.

Moreover, the specific features of the combinations between lexical and grammatical aspect were found to be determinant for the sensitivity scores obtained in this study, but not for the accuracy scores. This outcome was particularly evident in progressive reading contexts. Thus, higher accuracy scores were obtained on the acceptance of prototypical aspectual combinations (activities or states in Imperfect) than on the acceptance of non-prototypical aspectual combinations (events in Imperfect). When asked to reject illegitimate or non-congruent predicates, prototypical predicates (events in Preterite) were discarded to a very low degree by all non-native groups. In contrast, and as expected, non-prototypical predicates (activities in Preterite) obtained higher rejection scores. As these non-prototypical predicate combinations are less familiar to non-native speakers, they might result in higher rejection rates. Conversely, prototypical combinations are processed as acceptable even in illegitimate or non-congruent aspectual contexts. This behaviour is in line with the tendencies outlined by the Distributional Bias Hypothesis (Shirai, 2004), which have been also observed for high proficiency levels in L2 Spanish (Hasbún, 2000).

Although the results on acceptability judgment tasks do not provide a full picture of speakers' grammatical knowledge, up to a point, they are able to capture speakers' grammatical representations and processing of linguistic phenomena (Orfitelli & Polinsky, 2019; Spinner & Gass, 2019). In the current investigation, the separate analysis of adequate and non-adequate stimuli demonstrated that sensitivity scores were consistently lower than accuracy scores. This corroborates previous findings on the performance differences in both native and non-native speakers when judging ungrammatical – but not grammatical – items (Juffs, 2001; Clahsen & Felser, 2006),

As Domínguez et al. (2018) have recently pointed out, "[t]here are no previous studies examining the acquisition of the three meanings of the Spanish Imperfect (progressive, habitual and continuous) separately" (p. 440). Within these authors' framework, the results of the present study contribute to ongoing research into the acquisition of aspectual relations in L2 by looking at Russian learners of Spanish with advanced proficiency levels. Further studies should focus on learners' production, comprehension, and metalinguistic knowledge in order to fully depict the nature of the non-native use and representations of tense-aspect relations.

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