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Reference Specificity, Comprehension of Pronouns and Levels of Representation

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1. Introduction

In studies of the mechanisms of mental representation involved in discourse comprehension, anaphora has become crucial because of its effectiveness in showing the way listeners or readers coordinate superficial linguistic representation and content-based representation¹ of the previous parts of a discourse in comprehending an ongoing portion of the discourse.

Many experimental studies have been dedicated to the issue of how and in what order these two types of discourse representation are accessed for assigning pronominal reference. But two sharply differing psychological accounts of the cognitive processes have emerged: (1) some psychological theories (e.g. Garnham & Oakhill, 1985; Carreiras, Garnham & Oakhill, 1993; Garnham, Oakhill, Ehrlich & Carreiras, 1995; others) have provided the experimental evidence that the resolution of definite pronominal anaphors always implies a kind of sequential search, from superficial representation to discourse model; while (2) in contrast, according to other empirical research, those anaphors are claimed to be interpreted by direct access to elements contained in a discourse model, without being filtered first by grammatical constraints of the surface representation (e.g. Sag & Hankamer, 1984; Tanenhaus, Carlson & Seidenberg, 1985; Lucas, Tanenhaus & Carlson, 1990; others). This binary division, inspired by syntactic tradition on the one hand and pragmatic distinction tradition on the other, does not make correct predictions of some processing relation status between morphosyntactic and pragmatic-based anaphora in Spanish.

This paper aims to show that anaphor resolution requires a more flexible and integrative processing model than that postulated in the above two models of mental representation mechanisms. To this end, we adopt tactics to compare gender cueing effects in comprehending singular and plural pronouns of so-called hybrid nouns² in three different discourse contexts. First, we review in brief the main theorems of the two theoretical explanations of anaphor resolution processing in relation to Spanish anaphora, followed by a discussion of some peculiar properties of gender use in hybrid noun pronouns concerning the controversial time-course of pragmatic inference in resolving pronominal anaphors. Finally, we discuss the implications of our experimental data for anaphor resolution processing.

2. Backward Sequential Search

It is generally held that pronouns must match their nominal antecedents at least in respect to number and gender, particularly in languages with a non-semantic gender system. According to this view, pronominal anaphors are generally conceived as substitutes for linguistic expressions, that is, rather than having their own semantic interpretations, they are just words that make reference to linguistic antecedents for their interpretation. The accusative pronoun 'las'³ in sentence (1) is an example of a prototypical agreement between antecedent and its anaphor⁴:

(1) Juan prestó *unas plumas* a su amiga hace un mes.
Juan (nom.) lent some pens (acc. fem. pl.) to his friend (dat. fem. sg.) ago one month
'Juan lent some pens to his (girl) friend a month ago'

Pero nunca se **los/las* devolvió.
but ∅ (she) never to him (dat.) them (acc. pro. pl. masc./ fem. pl.) returned
'But she never gave them back to him'

In this semantically-empty view of pronouns, the interpretation of anaphor thus has to be linked first of all with grammatical information of the superficial representation in the active memory of listener or reader (Kintsch & van Dijk 1978; van Dijk & Kintsch 1983). However, if the reference search results in a failure at this stage, or if there is more than one likely candidate agreeing with the antecedent in lexical markings, the search naturally expands to include additional processes which might single out an adequate coreference by semantic constraints in a discourse model (Frederiksen, 1981). For example:

(2) *La gente* de esta zona nos quiere mucho.
people (nom. sg. fem.) of this area us (acc.) to like much
'The people of this area like us very much'

Por eso *los* respetamos mucho *a ellos* también.
)for that them (acc. pl. masc.) to respect (1P. pl.) much to they (acc. dupl.) too
'So, we respect them very much too'

In the second sentence of (2), the accusative 'los' is not in accordance with its antecedent 'gente' in number and gender. The listener or reader having made a greater cognitive effort, therefore, could assign a reference with a semantically consistent concept among elements configured in the discourse model of the first sentence. This process can be guided more effectively by the availability of discourse factors such as topic, foregrounding, thematic saliency, and agent status (e.g. Frederiksen, *ibid.*). Further, in cases where the resolution still has not been performed successfully on semantic grounds, inference will be drawn, as a final step, on the basis of pragmatic world knowledge permitted in the discourse model (Garnham & Oakhill, *ibid.*). This view is based on the assumption that pragmatic inference is not the core of the comprehension process and comes into play later than

other processes. We may observe this very case in the example (3):

(3) A: Creo que estoy embarazada.
 to believe (1P. sg.) that am pregnant
 'I believe that I am pregnant.'

B: ¿Qué? ¿De quién es ?
 what? of whom is Ø (pro-drop)?
 'What? Whose is it?'

The pro-drop subject in '¿de quién es Ø?' clearly lacks a lexical antecedent in the previous sentence. Besides, in the strict sense there is no element which is semantically consistent with the omitted subject. To comprehend the omitted subject, some necessary information has to be supplied via world knowledge inferred in relation to the predicate 'to be pregnant', state of affairs that supposes the target baby in the woman as a result of the woman's relations with a man (who is usually regarded as responsible for that situation in many cultures). In this backward sequential search approach, the issue of anaphor resolution is addressed in terms of multiple cognitive processes where a rigidly bottom-up search is performed; the discourse model is relegated to a secondary role and takes part in the comprehension only after a preceding surface representation search has failed.

On this premise, three conclusions are logically drawn concerning time effects in comprehension: processing time will increase with each additional step required to resolve an anaphor; the comprehension of grammatically disagreeing or ambiguous anaphors will be more time-consuming than that of grammatical ones because of one or two additional processes; finally, the increase in processing time will show up at or immediately after the anaphor, which will affect in turn the reading time of the whole sentence that contains it.

3. Direct Access to Discourse Model

Contrary to the sequential search in which information in two discourse representations is applied in order, Sag & Hankamer (1984) argued that the reference of a pronominal anaphor is assigned directly from elements of a discourse model. Their claims appear to challenge the traditional view of pronominal anaphors as copying forms for lexical markings of the antecedent: the interpretation of a pronominal anaphor is not mediated by its relation with any representation of an antecedent expression, but by direct reference to elements of a discourse model. Semantic and pragmatic-based inference accompanies comprehension from the start through elements evoked in the discourse model which is a model of the situation in the world that the discourse is about. Similar claims have long been made in the psychological literature (e.g. Bransford, Barclay & Franks, 1972; Lucas, Tanenhaus & Carlson, *ibid.*; Marslen-Wilson, Tyler & Koster, 1993). Following this approach, it is reasonably assumed that grammatical mismatch

between pronoun and antecedent does not cause any delay in processing if a plausible inference is made by semantic consistency or the state of affairs described in the discourse. In this way, the omitted pronoun in example (3) may be resolved with ease, even though an explicit antecedent does not appear in the preceding sentence.

Other clear evidence vis-à-vis discourse understanding through direct access to a discourse model is found in the following example of Spanish neuter:

(4) *La renuncia del gerente* sorprendió al dueño.
 the resignation of the manager (nom. sg. fem.) surprised the owner (acc. masc. sg.)
 'The resignation of the manager surprised the owner'

Pero él tomó *?ésa/eso* con calma porque estaba provista/o.⁵
 but he accepted it (acc. sg. fem./neut.) with calm because Ø was foreseen (fem./masc.)
 'But he accepted it with calm because it was foreseen'

Surprisingly, 'ésa' being the grammatical demonstrative sounds somewhat unnatural, whereas the neuter 'eso' sounds more natural in this context. The theoretical interest of the neuter anaphors in Spanish⁶ resides in the fact that their occurrence is obviously influenced by the character of the referent itself, rather than by aspects of its lexical designation, specifically, its gender (Klein, 1979, P. 173). The reference of the neuter anaphor 'eso' in (4) is not identified by the lexical markings of its antecedent contained in superficial representation. Insofar as the nominal neuter of the above example does not match its antecedent in morphosyntactic categories, the best clue to recover its reference must be found in a direct manner via a discourse model token allotted to the event referred to by the noun phrase 'resignation of the manager'. This phenomenon may originate from an intrinsic function of the neuter to make direct reference to events (or action), situations, abstract concepts, without passing through the morphosyntactic route, although there is a nominal antecedent in the discourse.

However, if anaphors, in fact, do not serve a pointer function for instructing the hearer to identify the reference on the morphosyntactic basis, it seems most likely that the information semantically or pragmatically evoked in a discourse model will always be taken, from the outset of resolution processing, as a crucial key to the references' identity. Thus, this direct approach makes two strong predictions. On the one hand, the resolution of mismatching anaphors (e.g. examples (2) to (4)) will not be more time-consuming than that of grammatically agreeing ones, if those anaphors can make a semantic or pragmatic-based reference. On the other hand, it claims that in the interpretation of pronominal anaphors the reader or listener makes use of only the discourse model, whatever discourse or situational context those anaphors may occur in, and that, as a result, the representation of superficial features of the discourse plays no role in the interpretation of such expressions.

4. Inference and Gender Agreement Patterns of Hybrid Nouns

In some of the previous examples of conceptual and neuter anaphors, we have observed that not all anaphors satisfy the simple agreement pattern as a copy of lexical markings. To pursue the issue in detail, some peculiar anaphoric properties of so-called hybrid nouns will be discussed. Hybrid nouns in Spanish are those nouns which neither simply take the agreements of one consistent agreement pattern nor belong to two natural sexes at the same time. Person-related generic nouns meet this definition (see Note 2 for the examples). Since these nouns do not make reference to a specific sex-determined person, problems of pronominal agreement patterns arise in two situations: first, when a speaker, consciously or unconsciously, needs to reveal the real sex of the referent as the conversation unfolds; and second, when a speaker is willing to use indicators of sex supposing that the hearer can easily infer the sex of the referred person by discourse context. The following assumption can be made: the pronominal agreement form to be used for hybrid nouns depends in part on the morphosyntactic basis and in part on the type of target involved. More specifically, four situations can be considered for the possible agreement patterns:

- (i) where a hybrid noun refers to a singular person without any information that is relevant for the real sex of the referent;
- (ii) where a hybrid noun refers to plural persons without any information relevant for their sex;
- (iii) where a hybrid noun refers to a singular person with information by which the sex of the referent can be inferred;
- (iv) where a hybrid noun refers to plural persons with information by which the sex of the referents can be inferred.

First, if information relevant for the sex of the referent in question is not available, the scope of possible agreement would be reduced to the morphosyntactic gender category, as shown in the following example:

- (6) *La visita que llegó* es del país vecino.
 the visitor who arrived (nom. sg. fem.) is from the country neighboring
 'The visitor who arrived is from the neighboring country'

El personal del municipio *la/ (?)lo* recibió con una ceremonia
 the personnel of the City Hall her/him (acc. sg. fem./ masc.) received with a ceremony
 'The personnel of the City Hall received her/him with a ceremony'

The second sentence in (6) shows that the agreement form (e.g. pronoun 'la') is subject to the gender cue imposed by its antecedent. The listener (or reader) may have trouble in comprehending the masculine pronoun 'lo', whereas the speaker may intend to reveal the real male sex of the referred person beyond grammatical restrictions. Nevertheless, in the situation where those nouns refer to persons in

plural, such scope is shown to be extended to plural pronoun with masculine gender, besides grammatical pronoun 'las':

- (7) *Las visitas que llegaron* son del país vecino.
the visitors who arrived (nom. pl. fem.) are from the country neighboring
'The visitors who arrived are from the neighboring country'

El personal del municipio *las/ los* recibió con una ceremonia.
the personnel of the City Hall them (acc. pl. fem./ masc.) received with a ceremony
'The personnel of the City Hall received them with a ceremony'

The reason for this double pattern might arise from the compounding relation between the antecedent's generic sense reinforced by its plural number and the fact that the plural masculine gender can also refer to a mixed set of people of female and male sex, as observed in 'padres' (literally, 'fathers', but it also means parents). Obviously, this implies that the speaker can either anaphorize a plural hybrid noun by its morphosyntactic features, or by a masculine gender plural pronoun with recourse to the generic-sense reading.

In some cases where the sex of the person referred by the antecedent can be inferred in linguistic context, the speaker is expected to pronominalize it according to gender marking of the antecedent expression and the pragmatic source as well:

- (8) *Esa persona con bigote grande* se quedó calvo hace 10 años.
that person with mustache big (nom. sg. fem.) went bald ago ten years
'That person with a big mustache went bald ten years ago'

Las señoras de su barrio siempre *lo/ ?la* saludan con cariño.
the ladies of his neighborhood always him/ her (acc. sg. masc./ fem.) greet with affection
'In his neighborhood, ladies always greet him/ her with affection'

- (9) *Dos bellos personajes* del cine han superado el cancer mamario.
two beautiful personalities (nom. pl. masc.) of the film have overcome the cancer mammary
'Two beautiful film personalities have overcome breast cancer'

Una revista quiere entrevistar *?los/las* para sus lectores.
a magazine want to interview them (acc. pl. masc./ fem.) for its readers
'A magazine wants to interview them for its readers'

Contrary to expectation, the morphosyntactic-based singular anaphor 'la' in (8) sounds somewhat unacceptable. Equally in (9) where a masculine hybrid noun is arranged to refer to the female sex, the grammatically disagreeing anaphor 'las' appears to be preferred. Among the four possible situations supposed, grammatical anaphors are judged more acceptable only in the first case, while pragmatic inference-based anaphors are more acceptable forms in the rest of the situations, including the second case. All of these accounts can be resumed in three patterns of agreement:

- (i) a hybrid noun tends to be pronominalized on the basis of lexical markings when there is no information relevant for real sex of the referential target;
- (ii) nevertheless, in the same context, a plural hybrid noun shows two different patterns of agreement on the basis of either feminine (grammatical) or masculine marking for the generic sense;
- (iii) a hybrid noun shows a strong tendency to be pronominalized by semantic features on the basis of pragmatic information of the real sex of the referential target, if this information is explicitly available.

Number and availability of pragmatic information about real sex can be introduced as main factors which have influence in the patterns of agreement. In many other languages, number has been considered (Corbett, 1991, p.189) to be of more importance for gender match, because it is the category most often realized together with gender.

5. Experiments

The core question we are addressing is whether the use of superficial representation is routinely used from the beginning of definite pronominal anaphor resolution for hybrid nouns (with feminine gender), or whether such resolution comes about directly via a discourse model without passing through the superficial representation.

Three experiments were conducted to compare our previous linguistic analysis-based observations with number and gender cueing effects in on-line processing. In the discourse without sex-relevant pragmatic information (Experiment 1), gender effect would be maximized in resolving singular pronouns, while the plural pronouns were expected to be resolved with no statistically significant time-consuming difference, because gender cueing effect and generic sense reading would both be commonly involved. It was predicted (Experiments 2 and 3) that reading times of sentences containing pragmatic-based pronouns would be slower than those of sentences with grammatical ones, if they are resolved on the basis of a gender cue; however, if inference can be made from the outset of the resolution, pragmatic pronouns would be interpreted faster than grammatical ones.

The sentence-by-sentence self-paced reading technique was employed. 10 hybrid nouns with feminine gender (shown in Note 2) were used for the experimental texts. Each experimental text consisted of two separate sentences: the first sentence contained a feminine hybrid noun in grammatical subject position, and in the second sentence an accusative pronoun was used for such a hybrid noun. The structure of the second sentence of each text is symmetrical except for pronouns through the three experiments. In each experiment, there were four versions of each text: a 2 x 2 factorial design with the following factors:

1. Sentences with singular antecedent vs. sentences with plural antecedent.
2. Sentences with agreeing pronoun vs. sentences with disagreeing pronoun.

5.1. Experiment 1

Subjects and Materials:

The subjects were 59 volunteers from the undergraduate Psychology Department of the Universidad Nacional Autónoma de México. 10 sets of 4 texts were constructed with combinations of the 4 factors. In the first sentences of each text, pragmatic information of sex of the referred target was not supplied.

TABLE 1: Example without Pragmatic Information about Natural Sex of Antecedent

<i>Una autoridad en educación pública</i> vino a la Universidad ayer. 'An authority on public education came to the university yesterday'
La Universidad <i>la/lo</i> invitó a dar conferencias de su tema. 'The university invited her/him to give lectures on her/his subject'

<i>Unas autoridades en educación pública</i> vinieron a la Universidad ayer. 'Some authorities on public education came to the university yesterday'
La Universidad <i>las/los</i> invitó a dar conferencias de su tema. 'The university invited them to give lectures on their subject'

Result and Discussion⁷:

Table 2 shows the results of Experiment 1 which differ in gender cueing effects, depending on the number category. In the case of singular number, the gender matching pronoun ('la') was processed faster than the mismatching one ('lo'). But this effect was not repeated with plural pronouns. Unexpectedly, the masculine form 'los' was preferred for generic-sense reading triggered by plural number, rather than the pronoun 'las' containing feminine gender marking. The fact that the generic-sense reading was imposed in plural pronouns suggests that they can be resolved on the basis of pragmatic plausibility without commitment to morphosyntactic computation, even in the discourse without pragmatic information of the referred target. In this regard, the data also implies that predictions based on linguistic judgment can turn out not to coincide with the result of on-line processing.

TABLE 2: Mean Reading Times (msec.) for Second Sentences as a Function of Type of Pronoun and Gender Cue

	Sentences with singular antecedent	:	Sentences with plural antecedent
Pronoun with gender cue (la : las)	2536	:	2561
Pronoun with no gender cue (lo : los)	2593	:	2541

5.2. Experiment 2

Subjects and Materials:

58 subjects from the same Psychology Department as in Experiment 1 volunteered for the test. Altogether, 10 sets of 4 texts were constructed, each of which contained information relevant for female sex in the first sentence. The information excluded, however, female sex-marked professions or proper names to avoid matching ambiguities between pronominal anaphors and these nouns that generally have feminine gender marking in Spanish.

TABLE 3 : Example with Information about Female Sex of Antecedent

Una autoridad en educación de la mujer vino vestida de minifalda.
‘An authority on the education of women came wearing a miniskirt’

La Universidad *lallo* invitó a dar conferencias de su tema.
‘The university invited her/him to give lectures on her/his subject’

Unas autoridades en educación de la mujer vinieron vestidas de minifalda.
‘Some authorities on the education of women came wearing miniskirts’

La Universidad *las/los* invitó a dar conferencias de su tema.
‘The university invited them to give lectures on their subject’

Result and Discussion:

The data of this experiment can prove neither the gender cueing effect nor inference making because pronouns with grammatical gender marking have the same form (i.e. ‘la’ and ‘las’) as pronouns with semantic gender. Therefore, mean reading times of these pronouns do not guarantee which of the two factors (i.e. gender cueing and pragmatic inference) is engaged in the resolution. On the contrary, it may be suggested that the uniformity of the result comes from crossing effects of both factors. The clue to the correct interpretation has to be found in the results of Experiments 1 and 3 where we clearly can observe effects of gender cueing and pragmatic inference.

TABLE 4 (Experiment 2): Mean Reading Times (msec.) for Second Sentences as a Function of Type of Sentence, Type of Pronoun and Gender Cue

	Sentences about fem. sex : Sentences about fem. sex	
	with singular antecedent	with plural antecedent
Pronoun with gender cue (la : las)	2468	2533 → 2509 (mean time)
Pronoun with no gender cue (lo : los)	2617	2648 → 2632 (mean time)

5.3. Experiment 3

Subjects and Materials:

The subjects were undergraduate Psychology 75 volunteers of the Universidad Nacional Autónoma de México. The design was the same as in Experiment 2, except that male sex relevant information was used in the first sentence.

TABLE 5 : Example with Information about Male Sex of Antecedent

Una autoridad en seguridad nacional llegó ayer fumando el puro.
 ‘An authority on national security came smoking cigar yesterday’

La Universidad *lallo* invitó a dar conferencias de su tema.
 ‘The university invited her/ him to give lectures on her/his subject’

Unas autoridades en seguridad nacional llegaron ayer fumando el puro.
 ‘Some authorities on national security came smoking cigar yesterday’

La Universidad *las/los* invitó a dar conferencias de su tema.
 ‘The university invited them to give lectures on their subject’

Result and Discussion:

The result of Experiment 3 shows the same pattern of resolution between 4 types of anaphor: that is, pronouns have a regular tendency to be resolved faster on the basis of real sex, rather than grammatical gender marking, evidence that the resolution was plausibly performed by pragmatic inference.

TABLE 6 (Experiment 3): Mean Reading Times (msec.) for Second Sentences as a Function of Type of Sentence, Type of Pronoun and Gender Cue

	Sentences about male sex	
	with singular antecedent	with plural antecedent
Pronoun with gender cue (la : las)	2592	: 2655 → 2623 (mean time)
Pronoun with no gender cue (lo : los)	2464	: 2568 → 2516 (mean time)

6. General Discussion and Concluding Remarks

Concerning anaphor resolution processing, experimental research has proceeded along two opposing theoretical lines. On the one hand, it is commonly assumed that pronominal anaphors must originally be interpreted from the superficial representation of discourse. On the other hand, some empirical studies have argued that such resolution is performed using a discourse model only.

These opposing explanations were also replicated in Spanish anaphors. It has

been claimed (Garnham, Oakhill, Ehrlich & Carreiras, 1995) that processing of all pronouns in Spanish is heavily based on gender marking, apart from number. However, according to another experimental study based on grammatical judgment and on-line processing (Carreiras & Gernsbacher, 1992), a discourse model is plausibly accessed to resolve Spanish conceptual anaphors that have grammatically mismatching markings. The discrepancy of the results has to be explained by the types of anaphor employed. Garnham *et al.* used anaphors for nouns with semantic-based gender, while Carreiras *et al.* employed texts containing anaphors for collective, generic and multiple item nouns in the singular form.

The anaphors observed in our examples and experiments show that their matching scope with antecedents is not confined simply to linguistic representation, but expands to the pragmatic domain. The comprehension of pronouns of hybrid nouns in Spanish is affected by the availability of specific information concerning the referred persons' sex, and also by number category as one possible determinant factor in processing. Contrary to the claims that inference is drawn as a last resort in anaphor processing, anaphors that require pragmatic inference for their comprehension did not cause difficulties when the discourse context provided the information relevant for a specific natural sex of the referred target. Further, the fact that the resolution of the masculine plural pronouns in the discourse which lacked pragmatic information was not affected by gender marking suggests that number effect for generic sense was made only in plural number. Plural hybrid nouns seem to be contextually free to generate generic sense, even if relevant information is not supplied.

The data presented here suggest that a theory of anaphor interpretation must allow both superficial representation and a discourse model to take part in the interpretation of anaphors from the beginning. As a consequence, it is necessary to postulate an integral model of processing where the anaphor resolution process could be equally controlled by syntactic, semantic and pragmatic factors under the right conditions, without necessarily being used in a strict preestablished order. Our finding is consistent with a system, postulated in some empirical studies (i.e. Carreiras *et al.*, 1992; Marslen-wilson *et al.*, 1993), that is highly flexible and opportunistic in its use of superficial and pragmatic information. In such a model open to multiple information sources, both the plural number associated with the generic sense and the grade of pragmatic information specificity can play guiding roles in the interpretation processing of anaphors, at least for hybrid nouns in Spanish. Again, the complexity involved in using different sources of information suggests that discourse comprehension does not always depend on unilateral order from the computation of morphosyntactic information to pragmatic-based information or vice versa.

Notes

Abbreviations:

Acc.- accusative, Dat.- dative, Dupl.- duplicative, Fem.- feminine, Masc- masculine, Neut.- neuter, Nom.- nominative, 1P.- first person, 3P.- third person, Pl.- plural, Sg.- singular.

¹ It has been commonly accepted (Kintch & van Dijk, 1978; Webber, 1979; van Dijk & Kintch, 1983; Johnson-Laird, 1983) that there are at least two levels of discourse representation: that is, superficial representation as morphosyntactic information of discourse; and its associated content-based abstract representation (called 'discourse model' or 'mental model of discourse') as a model of the state of affairs described in the discourse, i.e. a conceptual representation of the real or imaginary world portrayed in discourse.

² The term 'hybrid noun' comes from Corbett (1991, pp. 225-259), a term which refers to generic-person nouns without any relation to the real sex of referent. In languages with non-semantic gender system such as Spanish, these nouns show interesting phenomena of pronominalization, particularly when there is a mismatch between the grammatical gender of the noun and the real sex of the referred person. This is because nouns with reference to human beings tend to have semantic genders and, therefore, be anaphorized on semantic basis in place of morphosyntactic markings. Hybrid nouns in Spanish can be grouped into two grammatical genders, feminine and masculine: 1) examples of nouns with feminine gender - amistad, autoridad, celebridad, criatura, estrella, figura, persona, personalidad, víctima, visita, etc. (friend, authority, celebrity, little child, star, figure, person, personality, victim, visitor, respectively); and 2) examples of nouns with masculine gender - ídolo, individuo, personaje, etc. (idol, individual, personality, respectively).

³ The accusative pronoun system in Spanish is organized in number and gender as follows:

	feminine	masculine	neuter
	personal : demonstrative	personal : demonstrative	personal : demonstrative
sg.	la ésta, ésa, aquella	lo éste, ése, aquél	lo esto, eso, aquello
pl.	las éstas, ésas, aquellas	los éstos, éstos, aquéllos	

All Spanish nouns are assigned one of two arbitrary syntactic genders, masculine or feminine. Large numbers of nouns fall outside the semantic criteria except for some nouns referring to human beings and to a limited range of domestic animals. Agreement forms such as pronouns are also marked for gender and number. But curiously, pronouns have a three gender system which includes neuter. All these pronouns are used indifferently for nouns with reference to animate or inanimate things.

⁴ Henceforth, both antecedents and their anaphors are italicized.

⁵ Spanish adjectives have to agree in number and gender with nouns and pronouns that they qualify. For neuter pronouns, adjective markings are subject to the masculine agreeing form.

⁶ Traditionally normative grammarians of Spanish (e.g. Real Academia Española, 1973, p.228; Whitley, 1986, pp. 160-162) have not accepted the nominality of neuter pronouns, but treat them as referring units for unnamed concepts, ideas, events or propositions expressed in preceding sentences. However, in some dialects (Klein, 1979; Ojeda, 1992) including in the standard use of the language (Fernández Ramírez, pp. 71-72), the neuters are shown to anaphorize feminine or masculine nouns in order to trigger abstract concept, event and generic sense.

⁷ The difference of the results in each experiment is statistically significant. However, analyses of variance by subject and texts (stimulus) of each data are not included by the reason of space.

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