Sound as symbolic gesture: Spanish *sonidos*

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This study examines the preference of the Spanish suffix IDO over the equally viable and morphologically preferable suffix ADO and explores the possibility that this preference may be morphosemantic in nature; i.e. the effect of a nonarbitrary association between meaning and phonetic form.

Spanish regular past participles end either in ADO or IDO, the ending generally determined by the thematic vowel of the verb. Verbs ending in *-ar* typically take ADO (*amar-amado*) whereas *-er* and *-ir* verbs typically take IDO (*comer-comido*, *dormir-dormido*). These suffixes are commonly used to form the corresponding nominalization. In such instances, the *-ar* verbs are nominalized with ADO (as in *cuidar-cuidado*) whereas *-er* and *-ir* verbs use IDO (as in *querer-querido*, *pedir-pedido*) (see 1).

(1) Deverbal nominalization in Spanish: Regular pattern

infinitive	**past participle**	**nominalization**
cuidar 'to care for'	*cuidado*	***cuidado*** 'care' (N)
querer 'to love' *pedir* 'to ask for'	*querido* *pedido*	***querido*** 'beloved' (N) ***pedido*** 'request' (N)

In many cases, the semantics of the verb allow a small semantic extension in its nominalization to refer not to the action itself but rather to the specific sound commonly associated with the action. It is this set of nominalizations which is of primary interest in this paper. The former will be termed dynamic nominals, and the latter sound nominals. The minute difference in meaning between the dynamic nominal and the sound nominal is essentially one of sensation, usually between tactile sensation and acoustic sensation. Some examples of both are shown in (2).

(2) Dynamic nominals and sound nominals: -ER and -IR verbs

El **lamido** *del gato me despertó*. (*lamer* = 'to lick')
dynamic nominal 'The cat's **licking** (touch) awakened me.'
sound nominal 'The cat's **licking** (sound) awakened me.'

El **latido** *de su corazón era casi imperceptible*. (*latir* = 'to beat')
dynamic nominal 'The **pulse** (touch) of his heart was almost imperceptible.'
sound nominal 'The **pulse** (sound) of his heart was almost imperceptible.'

A sizable number of AR verbs fail to nominalize following the regular pattern; instead of suffixing with ADO, they suffix with IDO. Some AR verbs, such as ladrar 'to bark,' may nominalize both ways; in which case the regular ADO nominalization is dynamic and the IDO nominalization is acoustic (some examples are shown in (3).

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(3) Dynamic nominals and sound nominals: - AR verbs

El **ladrado** *del perro me molestó.*
'The dog's **barking** (activity) bothered me.'
El **ladrido** *del perro me molestó*.
'The dog's **barking** (sound) bothered me.'

The most interesting characteristic of the IDO nominalizations built upon AR verbs is their semantic uniformity; all refer not just to sounds, but to natural sounds, whether those related to the elements or environmental noises, the cries of animals, or the vocalizations of humans. Sounds of machines or other man-made devices apparently may not use this suffix. Whereas the regular nominalization pattern permits a range of connotations beyond mere nominalization - from intangible *pecado* 'sin' or *cuidado* 'care' to personified *querido* 'darling' to concrete *helado* 'frost' - the special nominalization pattern reserved for the AR verbs is semantically narrow, and denotes only the sound inherent in a particular action. A working list of special sound nominals, all derived from AR verbs, is shown in (4).

(4) Special Sound Nominals (AR→IDO) in Spanish[1]

infinitive	sound nominal	gloss: "____ing sound"
alarar	*alarido*	shriek
aullar	*aullido*	howl
balar	*balido*	bleat (of sheep)
barbullar	*barbullido*	babble
berrear	*berrido*	squeal, yelp
bramar	*bramido*	bellow, roar
bufar	*bufido*	snort
chascar	*chasquido*	crack (of wood)
chiflar	*chiflido*	whistle
chillar	*chillido*	squeak, screech
chirlear	*chirlido*	chirp
chirriar	*chirrido*	chirp, chirr
estallar	*estallido*	explosion
estampar	*estampido*	bang, boom
garlar	*garlido*	babble
graznar	*graznido*	squawk, caw
hipar, jipar	*hipido, jipido*	hiccup
ladrar	*ladrido*	bark (of dog)
maullar	*maullido*	meow (of cat)
pitar	*pitido*	whistle
quejar	*quejido*	moan
rasguear	*rasguido*	strum (of string)
rechinar	*rechinido*	creak, clatter
relinchar	*relinchido*	whinny (of horse)
roncar	*ronquido*	snore
silbar	*silbido*	whistle
sonar	*sonido*	sound
soplar	*soplido*	blow, rustle
susurrar	*susurrido*	whisper, murmur
traquear	*traquido*	bang (of firecracker)
vagear	*vagido*	squeal
zumbar	*zumbido*	hum, buzz
zurrar	*zurrido*	lash, spank

Why do these exceptional nominalizations exist? In morphological terms, one might argue that the suffix IDO is an allomorph of ADO that is conditioned semantically. Such an explanation - by itself - is

riddled with problems. First of all, allomorphy is usually conditioned phonologically or syntactically, not semantically. Second, allomorphy increases irregularity and therefore arises at a cost. This cost is usually recouped in some phonological benefit, such as ease or economy of articulation. In this case, the morphological stipulation (however one chooses to formalize it) that requires IDO where ADO would be expected yields irregularity without any apparent benefit whatsoever. So why has this class of nominalizations not only been meticulously maintained but also continually added to since its emergence about 700 years ago (cf. Corominas 1967)?

It is not uncommon in any language for a class of words to reflect semantic relatedness with morphological relatedness. What is interesting, however, is when semantic relatedness overrides the satisfaction of either synchronic morphological rules or diachronic morphological changes. Such examples are often explained as the result of sound symbolism, meaning that some phoneme or phoneme sequence within a set of semantically similar words is assigned pseudo-morphological status, although the exact nature of the symbolism is usually unclear.

Resistance to phonological or morphological substitution both synchronically and diachronically often involves words in which there is a salient unifying semantic element. In the case of the Spanish sound nominals, there is cross-linguistic evidence that the semantic feature 'noisiness' is more salient than one might initially expect, possibly because of the capability of language not only to label but also to imitate. Some examples of unique morphology that highlights the "noisy" characteristics of a concept are shown in (5).

(5) Noisifier Morphology?

- Indonesian

Uses a productive 'noisifier' nominalizing prefix *də-* whose sole function is to indicate the 'sound of *X*,' where *X* is a monosyllabic echo-word. Dynamic nominalization uses different morphology (Uri Tadmor, personal communication).

bak!	'thump!'
də-bak	'thump (sound)'

- Russian

Uses a productive 'delocutive' verbalizing suffix {kaj} to indicate 'utter ___' (Daniel Collins, personal communication)

ty	French *tu*	*mjau*	'meow!'
tykat'	'to say *tu* in French; tutoyer'	*mjaukat'*	'to meow'
xixi	'heehee!'	*spasibo*	'thank you!'
xixikat'	'to hee-hee'	*spasibkat'*	'to thank-you'

- Guaraní

Nominalizes echoic verbs with a complex yet fully productive system of expressing fine nuances of sound sensation. This language has a class of words that all refer to sound and all fit a unique three-syllable template. Certain inventory and co-occurrence restrictions also apply. Within the word set, each initial consonant and each vowel has a recurrent meaning. (cf. Langdon 1994).

	/p/ 'sharp, happy'	/x/ 'friction'	/t/ 'neutral' (?)
/i/ 'high-pitched'	*piriri* 'fire burning dry grass'	*xiriri* 'water coming out of faucet'	*tiriri* 'splintering glass, just one crack'
/o/ 'burst'	*pororo* 'popcorn, sparks'	*xororo* 'torrential rain'	
/y/ 'random'		*xyryry* 'grease spatter, sizzle'	*tyryry* 'dragging, shuffling'
/ã/ 'tinny'	*pãrãrã* 'rocks in tin can'	*xãrãrã* 'tinny, no tone, shooting at tin can'	

- English

  Echo-words are routinely accommodated by way of phonotactic lenience not usually granted to other semantic categories. For example, the initial consonant cluster /spl–/ is found in quite a few words that denote loud wet noises, such as *splash, splat, splatter, split, splotch, splurge, splutter*, but is extremely scarce in words unrelated to noise (cf. Marchand 1959).

Thus assigning special morphology to the nominalization of echo-words and noisy verbs in Spanish is not without precedent cross-linguistically. But what specific evidence exists that the motivating factor in choosing IDO over ADO is sound-symbolic and not the result of some other factor? One clue is found in the distribution of vowels before the IDO suffix (i.e. the last vowel in the verbal stem), which is skewed in favor of /a/ and /i/, with relatively few instances of /e/, /o/, or /u/. On chi-square test, the probability of this distribution arising by chance is significantly small ($p < .05$). In a landmark analysis of the use of voice pitch (F0) to connote physical or abstract size, Ohala proposes that elements containing stark contrasts invoke a greater reaction in the listener and are therefore preferable in the expression of symbolic information:

> If the purpose of communication is to effect a change in the receiver – one might say a change in the "cognitive map" of the receiver… – then the use of different extremes of frequency in the signal is quite an effective way to accomplish this, whether with an emotive or denotative intent (Ohala 1994: 331).

Although Ohala is referring to contrasts in F0 (fundamental voice frequency), his argument can be extended to include other frequencies as well, such as F1 and F2, which also make up part of the speech signal. The vowels [i] and [a] represent two acoustic extremes: in [i], F1 and F2 are spread, whereas in [a] the formants are narrow (cf. Ladefoged 1993: 193).

In Spanish, preference for a contrasting high-low or reinforcing high-high pattern appears to have guided the adoption of echo-words, as noted in the following word pairs (6).[2]

(6) Vowel contrast and vowel reinforcement in Spanish echo-words (cf. Alonso 1968; Beinhauer 1968; Casares 1997)

[i] contrasting		[i] reinforcing	
chiquichaque	'squeaking'	*chinchín*	'rattle'
titiritaina	'toodling' (musical)	*(tin)tirintín*	'ringing'
tilín-tilán	'ding-dong'	*tilín-tilán*	'ding-dong'
zipizape	'hubbub'	*chipichipi*	'drizzle'
triquitraque	'clickety-clack'	*quiquiriquí*	'cock-a-doodle-'
pimpampum	'eenie-meenie-miney-mo'	*(re)tintín*	'tinkling'

The significantly skewed distribution of vowels in contrastive (stem-final) position reflects two phenomena that are quite common in sound-symbolic word sets cross-linguistically. First, such sets commonly use a reduced vowel inventory (cf. Oswalt 1994: 296-297). Second, vowels in such sets are usually either maximally contrastive or identical (mutually reinforcing). As we have seen, both generalizations hold true for the Spanish sound-nominals, and lend considerable support to the idea that the benefit gained from the IDO allomorphy is sound-symbolic in nature.

Yet this conclusion, however tentative it may be, immediately begs the question, "Why is IDO any more sound-symbolic (and therefore preferable in sound nominalizations) than ADO?"

One explanation is that the same acoustic value of [i] that makes it a prominent vowel in echo-words (recall 6) intervenes in the transmission of meaning. If so, then each utterance is processed as a sort of palimpsest in which arbitrary phonetic information is overlaid with symbolic acoustic information, and the two are processed together (cf. Liberman et al. 1967; Tsur 1992: 13). When arbitrary meaning and symbolic meaning coincide, comprehension ought to be both facilitated and accelerated. This follows from a general principle of imageability in cognitive psychology, which Richardson (1980: 87) articulates thus:

> Ratings of the ***ease*** with which a stimulus evokes a mental image are highly correlated with the ***speed*** with which that stimulus evokes a mental image [emphasis mine].

When we embellish our speech with kinesic gestures such as hand movements or facial expressions, we are actually highlighting the linguistic message by providing additional cues and hints to guide the listener in decoding it; as a result, communication is accelerated.[3]

Following the line of reasoning first raised by Ohala, we propose to demonstrate that sound-symbolic value in language may be measured empirically as a function of lexical access time. Specifically, a sound-word that contains sound-symbolic information should be comprehended more quickly than one that does not, by virtue of the dual coding of information. In a similar vein, a word containing the acoustic cu but not the semantic prerequisite for noisiness should not be recognized as quickly.

To test this hypothesis, we conducted an experiment similar to one done by Sereno (1994) for English. Twelve native-Spanish-speaking adult subjects participated in the experiment. The corpus was made up of 68 standard Spanish words; half were suffixed with IDO; the other half were not. These two categories were further subdivided by semantic category, +SOUND and –SOUND, giving a total of four categories containing 16 or 17 words each. Words were balanced as closely as possible across categories for orthographic regularity, syllable count, syllable structure, morphological structure, syntactic category, distribution of vowels and consonants, and frequency by authoritative count (Eaton, Thorndike, Chandler-Burns) (see Appendix A).

The experiment was conducted on a PC with an SVGA monitor, in a small office. The presentation of stimuli and collection of reaction times and accuracy was done with E-Prime version 1.0.

At the beginning of the experiment, instructions were given in Spanish on the computer screen. These instructions explained the task, stressing the importance of responding quickly and accurately. Subjects were told that they would be sorting words by meaning, and that for each word they were to ask themselves if the word could fit the sentence "An *X* is a type of sound." Testing began with a set of eight practice trials and then continued with 68 actual trials. The words were presented in a different random order for each subject.

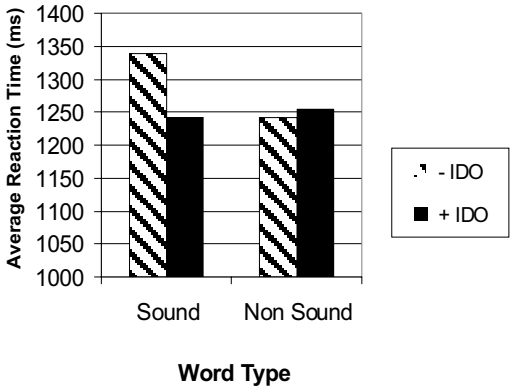
Each trial began with the presentation of a fixation point - a plus (+) symbol - which appeared in the center of the screen for one second. The target word then appeared in the center of the screen. Targets remained until the subject responded by pressing the forward-slash key for a word that was a SONIDO or the Z key for a word that was not a SONIDO. Participants kept one finger above each key at all times. Feedback about accuracy was presented after each response. The next trial began after a one-second interval.

Repeated measures analyses of variance were performed on reaction times for correct responses. In the first ANOVA, participants served as the random factor, and in the second ANOVA, items served as the random factor. The within-groups factors were +SOUND/–SOUND and +IDO/–IDO.

There was no overall difference in response times to the +SOUND and –SOUND words. There was also no overall difference in response times to the +IDO and –IDO words. Although sound did not significantly interact with IDO, in the planned comparison, participants responded marginally faster to +IDO,+SOUND words (M = 1242, SD = 421) than to –IDO+SOUND words (M=1340, SD=542). The

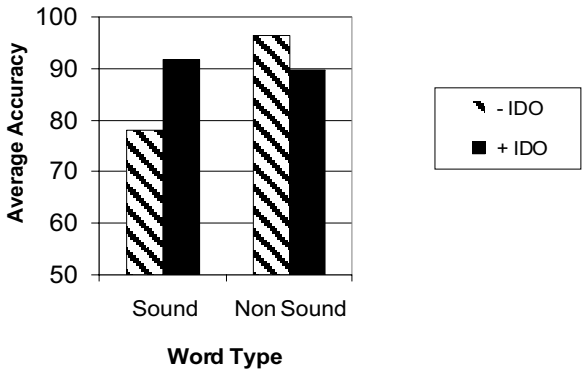
effect of the IDO suffix on reaction time is plotted in figure (7).

(7) Average Reaction Time for Correct Responses in Semantic Classification



The effect of IDO on accuracy was analyzed with the same ANOVAs performed on the reaction time data. +SOUND and +IDO interacted significantly by participants, but not by items. This interaction is graphed in figure (8). Post-hoc comparisons show that the IDO suffix resulted in a significant 14% increase in accuracy for +SOUND items, and a significant 7% decrease in accuracy for –SOUND items.

(8) Average Semantic Classification Accuracy



The results of this experiment provide insufficient evidence to determine whether a symbolic link exists between the morpheme IDO (or any part thereof) and the semantic category +SOUND in Spanish. If there were such a link, participants in the classification task would have been able to respond positively to the semantic feature +SOUND more rapidly, but no less accurately, for sound items ending in IDO than for control items that did not. They were in fact significantly more accurate for these items. However, responses to +SOUND items were not significantly faster when the item had the suffix IDO.

The significant accuracy benefit observed might be interpreted in different ways. One possibility is that accuracy was enhanced by the presence of the IDO suffix, and reduced when the suffix was absent, because the suffix carries the symbolic value we hypothesized. Another possibility is that the accuracy benefit was the result of some other factor altogether. For example, it is possible that the entire morpheme IDO - not just the high vowel [i] that distinguishes it from ADO - produced the benefit. However, it is unclear whether semantic transparency would assist accuracy in that fashion, especially if it were not also accompanied by a reduction in response time.

NOTES

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1 This working list was compiled from several different sources, including primarily Bosque & Pérez Fernández' (1987) *Diccionario inverso de la lengua española*, Casares' (1997) *Diccionario ideológico de la lengua española*, and native speaker knowledge.

2 English provides numerous examples of both patterns, including almost all the apophonic word pairs that appear to be of echoic origin (cf.Marchand 1959; Chastaing 1965; Langdon 1994):

> Contrasting (high-low or low-high): *tick-tock, flip-flop, ping-pong, ding-dong, clickety-clack, splish-splash, scritch-scratch, jingle-jangle, hee-haw, zig-zag, hip-hop, sing-song, doo-dah, la-de-da, hem-and-haw, gew-gaw, hoot-and-holler…*
>
> Reinforcing (high-high or low-low): *bow-wow, ding-a-ling, yackety-yack, cheep-cheep, mumbo-jumbo, hubbub, cock-a-doodle-doo, hocus-pocus, boo-hoo, goo-goo, ho-ho, hee-hee, ha-ha, baa-baa, ribbit, naah-naah…*

3 Not surprisingly, this principle is a likely organizing factor in the ideophone, which Kunene (1965: 20) calls "a dramatization of actions or states," and which is used primarily in echo-words and movement-words.

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