

WHAT DO OVERREGULARIZATIONS TELL US ABOUT MORPHOLOGICAL KNOWLEDGE?

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Abstract

It is suggested that a static vs. dynamic morphology model can offer an adequate explanation of the emergence and evolution of overregularizations in Spanish verbal morphology. On the other hand the development of overregularizations in Spanish supports Dressler's model of the mental representation of morphology. It is claimed that, in the case of Spanish, overregularizations reveal the beginnings of modularized morphology. It is a form of evidence that a new rule system is emerging in the morphological component, and with it dynamic morphology begins to develop.

Key words: dynamic morphology, overregularization, Spanish, verbal morphology

Introduction

The representational status of inflected forms has been the subject of much debate in recent years, and two main groups of proposals have emerged. On the one hand there are those who consider that productivity is based on morphological rules; on the other are those who consider that all inflected words are rote learned and that productivity is the consequence of analogy¹.

For proponents of the former (Aronoff 1976, Marcus et al. 1992, Pinker 1999, among others), rules are used to utter all regular forms while irregular forms are listed in memory. For proponents of the latter (Bybee 1995, Elman et al. 1996, Marchman et al.

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1997, among others) two different representational and processing mechanisms are not necessary. Regular and irregular forms alike are built without reference to rules; all are taken from the lexicon.

Dressler (1999, 2002) proposes a model of inflectional morphology that consists of two overlapping morphologies: dynamic morphology, based on productive patterns, and static morphology, which organizes the stored inflectional forms. The main contribution of this model is that not only are unproductive patterns (the irregular forms) stored in the lexicon as static morphology, but so too are all frequent forms from productive patterns. The result is considerable overlap and rivalry between dynamic and static morphology, a competition between forms created by rules and forms drawn directly from the lexicon.

Overregularization in language acquisition is one of the most typical manifestations of productivity. It has been widely used as evidence for the use of rules, although this approach has been challenged by connectionist models, which consider overregularization a manifestation of analogy.

In this paper we will suggest that a static vs. dynamic morphology model can offer an adequate explanation of the emergence and evolution of overregularizations in Spanish verbal morphology. On the other hand the development of overregularizations in Spanish supports Dressler's model of the mental representation of morphology.

Our claim is that, in the case of Spanish, overregularizations reveal the beginnings of modularized morphology. It is a form of evidence that a new rule system is emerging in the morphological component, and with it dynamic morphology begins to develop.

Methodology

Our hypothesis is based on longitudinal spontaneous speech data taken from one monolingual Spanish child, Magín. Recordings were made from 1;7 until 2;7.

Stages of development

Magín's data show three stages in verb morphology acquisition.

- 1- A first stage in which overregularizations are not yet present. This covers:
 - The pre-morphological stage, a lexical stage, in which morphological elements are present but as yet unanalysed. At this stage most of the verbs are used in only one form. As a consequence, verbs are semantically, but not always morphologically, appropriate in context.
 - The proto-morphological stage, in which morphological affixes begin to be analysed as meaningful elements and the first three-member miniparadigms begin to develop. At this stage, the morphological elements are still stored in the lexicon together with the corresponding verb.

- 2- An overregularization stage.

- These overregularizations announce the arrival of modularised morphology. Dynamic morphology emerges with the appearance of rules.
- 3- A third stage in which overregularization decreases.
- The new rules system overlaps with the old, item-by-item, storage system.

The overregularization stage

At the beginning of the morphological stage the power of morphological rules is so strong that the earlier one-by-one storage is partially cancelled out, and the first overgeneralizations appear. We see these overregularizations as one of the sources of evidence that the new rule system is already present. The application of rules enables the child to deduce new forms easily. Confronted with a complex verbal form, the child can extract the base and build a new form by adding a different suffix. The earlier one-by-one storage is never eliminated, but at the onset of the morphological stage the power of morphological rules is so strong that it impinges on the static morphological system and overregularizations appear.

Table 1: Number of regular tokens, irregular tokens and overregularizations (excluding the suppletives *haber, ser, ir*).

Age	Total lemmas	Regular tokens/ types	% regular tokens	Irregular tokens/ types	% irregular tokens	Overreg. Errors	% overreg. errors
1;7	8	76/13	100 %	-	%	-	0%
1;8	27	162/25	91.0 %	16/3	9.0 %	-	0%
1;9	41	193/37	87.3 %	28/14	12.7 %	-	0%
1;10	64	437/88	80.5 %	108/10	19.5 %	-	0%
1;11	81	210/63	85.7 %	35/15	14.3 %	-	0%
2;0	90	200/70	69.3 %	87/14	30.7 %	5	5.7 %
2;1	97	104/55	60.1 %	69/21	39.9 %	2	2.9 %
2;2	113	431/137	78.2 %	120/30	21.8 %	5	4.2 %
2;3	128	479/138	83.4 %	95/24	16.6 %	12	12.6 %
2;4	152	408/156	72.7 %	153/35	27.3 %	6	3.9 %
2;5	156	216/90	70.8 %	89/19	29.2 %	8	9.0 %
2;6	173	557/197	80.8 %	132/35	19.2%	4	3.0 %
2;7	188	376/199	80.7 %	90/29	19.3%	3	3.3 %

The Spanish verbal morphological system is highly regular and few overgeneralizations are possible. But where such overgeneralizations are feasible their occurrence is widespread.

Suffix overregularizations (with or without stem regularizations):

- a. Imperatives: *hace* 'do' (2;1), instead of the correct form *haz*; *pone* 'put' (2;1), in place of the correct form *pon*)

- b. Strong participles: *ponido* 'put' (2;2), instead of the correct form *puesto*; *rompido* 'broken' (2;5), instead of the correct form *roto*.
- c. Strong preterits: *ponió* '(She) put' (2;7) in place of the correct form *puso*.

Stem overregularizations:

- a. Root generalizations: *pono, pona* 'put 1st per. sg. PRES, 1st per. sg. SUB' (2;2), instead of the correct forms *pongo, ponga*; *juguen* 'play 3rd per. pl. PRES' (2;7) instead of the correct form *jueguen*.
- b. Overapplications of the irregular diphthongized forms: *muevido* 'moved' (2;5), *tieno* '(I) have' (2;4), instead of the correct forms *movido, tengo*.
- c. Special forms with strong changes in the stem: *cabo* '(I) fit' (2;1), instead of the correct form *quepo*; *sabo* '(I) know' (2;3) instead of the correct form *sé*.

These overregularizations are found not only in new verbal items, but also in items that had been previously acquired in their correct forms.

Some of these forms appear for the first time as overgeneralizations. Significantly, these are forms which appear for the first time at the morphological stage (after 2;0) That is the case for *hace* (imp.), instead of *haz*; *cabo* instead of *quepo*, and *ponió* instead of *puso*.

There are also very frequent forms that are never overregularized (such as *visto, hecho, ven*). Nevertheless, it is interesting to note that overgeneralizations do appear in items already acquired in their correct form. These correct forms never disappear but alternate with the overgeneralizations. That is the case with *sabo* (*sé* appears at 1;9), *rompido* (*roto* appears at 1;8), *pone* (imp.) (*pon* appears at 1;11), *ponido* (*puesto* appears at 2;1).

Table 2 Verbal forms used by Magín with irregular suffixes and strong changes in the stem: correct / overregularized forms.

	1;9	1;10	1;11	2;0	2;1	2;2	2;3	2;4	2;5	2;6	2;7
roto / rompido 'broken`	8	11	1		6	4	13	4		2/1	11
puesto / ponido 'put PART`					1	-/1		10	5/2	4/1	
visto 'seen`	1		1	2			5		2		3
hecho 'done`			1	4	2	2	1	14	2		4
dicho 'said`						2				2	
abierto 'opened`									1		
ven 'come IMP`		26	8	2		3	1	2		1	1
pon / pone 'put IMP`			1	1/4	-/1		3	3			2
di 'say IMP`						1					
ten 'take IMP`						3					
haz / hace 'do IMP`				-/1			-/4			-/1	1
doy 'I give`					1		1			6	
estoy 'I am`		9		1		2		1	1	11	
puso 'I put PRET`											-/1
sé 'I know`	1				1	3	1/1	3/2	1	4	1
quepo 'I fit`					-/1				-/1		

Further evidence of morphological development

At this same stage we find various other sources of evidence of morphological development:

1. There is a marked increase in lemma verbs (see table 2), most of them belonging to the first productive microclass in the first conjugation.
2. New forms begin to be productive: 2nd p. sg., 3rd p. pl. (ind), and subjunctive appear, followed shortly afterwards (at 2;2 - 2;3) by the analytical future, the gerund for the present progressive, the imperfect past and the synthetic perfect past tenses (see table 3).
3. The overuse of the 3rd p. sg. decreases steadily throughout this period (see table 4).
4. The development of paradigms accelerates considerably at this stage. More than 20% of the verb lemmas are used in more than 3 forms (see table 5).

We can examine all these significant changes in tables 3, 4 and 5.

Table 3: Emergence of verbal categories (tokens per month, excluding repetitions and frozen forms)

Age	Pres. Ind.	Imp.	Inf.	Past Part.	Anal. Perf. Past	Pres. Subj.	Ger.	Anal. Fut.	Syn. Perf. Past	Imp. Past	Pres. Prog.	Syn. Fut.
1;7	26	13	23	-	-	7	-	-	-	-	-	-
1;8	94	56	24	25	-	8	-	-	1	-	-	-
1;9	199	12	16	29	14	1	-	-	7	1	-	-
1;10	414	101	97	29	20	11	5	-	-	-	2	-
1;11	160	35	33	56	48	8	-	-	4	-	-	-
2;0	235	35	30	13	9	22	-	6	-	-	-	1
2;1	125	27	10	23	20	2	2	2	-	-	1	-
2;2	360	130	57	44	47	14	3	11	3	6	-	2
2;3	337	168	51	64	52	13	10	8	3	7	7	-
2;4	380	86	52	77	72	20	8	10	8	6	3	6
2;5	258	34	31	52	53	15	7	9	1	6	4	-
2;6	464	114	49	99	78	31	14	10	5	12	8	2
2;7	293	71	53	47	48	20	12	10	12	10	10	-

Table 4: Development in the use of grammatical persons (tokens per month, excluding repetitions and frozen forms)

Age	Utter.	Present forms (tokens)						Past forms (tokens)					
		Singular			Plural			Singular			Plural		
		1 st	2 nd	3 rd	1 st	2 nd	3 rd	1 st	2 nd	3 rd	1 st	2 nd	3 rd
1;7	182	1	-	25	-	-	-	-	-	-	-	-	-
1;8	626	4	-	62	-	-	1	-	-	1	-	-	-
1;9	892	27	-	113	15	-	-	-	-	22	-	-	-
1;10	1742	45	1	299	24	-	9	2	-	18	-	-	-
1;11	717	23	6	109	17	-	3	3	-	46	-	-	3
2;0	693	70	4	136	5	-	20	1	2	6	-	-	-
2;1	392	42	8	68	-	-	7	2	1	17	-	-	-
2;2	1145	75	40	220	10	-	14	6	1	44	-	-	2
2;3	995	65	31	216	2	-	25	12	3	45	-	-	2
2;4	1067	115	26	197	11	-	29	11	7	59	1	-	6
2;5	583	56	14	170	1	-	15	1	2	56	-	-	-
2;6	1151	138	35	257	17	-	24	18	3	67	5	-	2
2;7	704	74	22	151	21	-	25	16	1	50	-	-	2

Table 5: Emergence of mini-paradigms

Age	2 mem. contrasts	Mini-paradigms							% parad. per lem.
		3 mem.	4 mem.	5 mem.	6 mem.	7 mem.	8 mem.	9 mem.	
1;7	1								0 %
1;8	5								0 %
1;9	6	1	1						5.7 %
1;10	10	6	2						13.7 %
1;11	7	4	3						14 %
2;0	11	4	2	3					20.4 %
2;1	14	7	1						18.1 %
2;2	7	10	6	4	3	1			21.8%
2;3	19	6	9	3	2				24.3 %
2;4	21	9	4	7	2	1			24.4 %
2;5	11	3	8	3	2				33.3 %
2;6	22	14	3	4	3	2	2	2	32.2 %
2;7	17	11	3	8	2	1			30.4 %

Discussion

We claim that overregularizations, in Spanish verbal morphology, are a direct consequence of the development of the morphological component. The large number of verb lemmas acquired, the dramatic increase in verbal miniparadigms, and the emergence of new productive verbal forms (as we have shown in the previous section) enable the child to create morphological rules. It is a powerful, dynamic system. This new system overlaps with the previous static morphological system, and we find an important number of overgeneralizations, even in items that had already been acquired in their correct forms. Some researchers defend the dual mechanism (Marcus et al. 1992, Clahsen 1999) and explain the overregularization in terms of a breakdown that occurs in the blocking system, resulting in a failure to retrieve the correct irregular form. They base their proposal on the small minority of overregularizations and on the fact that they never appear in very frequent items. On careful examination of the data, however, we find that some of the overregularized forms belong to very common items. This is the case of *roto* 'broken'; a very high frequency form that is acquired at a very early stage. As for the number of overregularizations, we have shown that they are not so scarce. In table 6, we present a breakdown of the overregularizations in the root and in the suffix. There are few examples of the former, and they may be viewed as analogical. The fact that we find some irregularized tokens in the root supports this claim. Overregularizations in the suffix are the product of the new rule system, and their rate of occurrence is significantly higher.

We view rule application as a possibility rather than an obligation, and overregularization not as a breakdown in the blocking system but rather as an overuse of the rule.

Like the connectionist hypothesis, we do not find an empirical need for morphological rules to learn the verbal morphology and to explain overregularizations. We do believe, however, that such rules are a theoretical necessity if we aim to understand the potential behaviour of morphology, its core.

Comparing our findings with the latest studies in Spanish overregularizations (Clahsen et al. 2002), like them we find a clear connection between the appearance of overregularization and the development of tense. In contrast to their conclusions, however, we feel that the dramatic increase in verbal forms, linked to the development of morphology in other domains like nouns and diminutives, offers a much better explanation for the development of morphological rules and early overregularizations.

Table 6: Irregular forms and overregularizations.

Age	Tok./Typ. with irreg. root	Overreg. errors	Irregularized tokens	Tok./Typ. with irreg. suffix	Overreg. errors	% Overreg. in suffix
1;7	-	-	-	-	-	-
1;8	3/1	-	-	13/1	-	0%
1;9	24/10	-	-	10/3	-	0%
1;10	68/9	-	-	46/3	-	0%
1;11	31/12	-	-	11/5	-	0%
2;0	68/9	-	-	14/5	5	35.7 %
2;1	48/15	1	-	11/5	2	18.1 %
2;2	63/14	4	-	20/9	5	25.0 %
2;3	71/15	7	-	27/8	5	18.5 %
2;4	107/24	4	1	39/7	2	5.1 %
2;5	73/11	4	4	12/6	2	16.6 %
2;6	94/24	-	1	32/8	3	9.3 %
2;7	67/21	2	-	23/7	1	4.3 %

The number of tokens have been taken not counting the suppletives *haber*, *ser* and *ir*.

Conclusions

1. Overregularizations, in Spanish, signal the beginning of a modularized and dynamic morphology.
2. The development of verb lemmas and the dramatic increase in the use of miniparadigms lead the child to discover morphological rules.
3. As soon as the child discovers the rules and dynamic morphology develops, it overlaps with the previous static morphology. Overregularizations are a direct consequence of this overlap.

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